

Integrated Prevention Services for HIV Infection, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis for Persons Who Use Drugs Illicitly: Summary Guidance from CDC and the U.S. Department of Health and Human Services



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Integrated Prevention Services for HIV Infection, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis for Persons Who Use Drugs Illicitly: Summary Guidance from CDC and the U.S. Department of Health and Human Services

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Summary

This report summarizes current (as of 2011) guidelines or recommendations published by multiple agencies of the U.S. Department of Health and Human Services (DHHS) for prevention and control of human immunodeficiency virus (HIV) infection, viral hepatitis, sexually transmitted diseases (STDs), and tuberculosis (TB) for persons who use drugs illicitly. It also summarizes existing evidence of effectiveness for practices to support delivery of integrated prevention services. Implementing integrated services for prevention of HIV infection, viral hepatitis, STDs, and TB is intended to provide persons who use drugs illicitly with increased access to services, to improve timeliness of service delivery, and to increase effectiveness of efforts to prevent infectious diseases that share common risk factors, behaviors, and social determinants. This guidance is intended for use by decision makers (e.g., local and federal agencies and leaders and managers of prevention and treatment services), health-care providers, social service providers, and prevention and treatment support groups. Consolidated guidance can strengthen efforts of health-care providers and public health providers to prevent and treat infectious diseases and substance use and mental disorders, use resources efficiently, and improve health-care services and outcomes in persons who use drugs illicitly.

An integrated approach to service delivery for persons who use drugs incorporates recommended science-based public health strategies, including 1) prevention and treatment of substance use and mental disorders; 2) outreach programs; 3) risk assessment for illicit use of drugs; 4) risk assessment for infectious diseases; 5) screening, diagnosis, and counseling for infectious diseases; 6) vaccination; 7) prevention of mother-to-child transmission of infectious diseases; 8) interventions for reduction of risk behaviors; 9) partner services and contact follow-up; 10) referrals and linkage to care; 11) medical treatment for infectious diseases; and 12) delivery of integrated prevention services. These strategies are science-based, public health strategies to prevent and treat infectious diseases, substance use

This report originated in the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Kevin Fenton, MD, PhD, Director.

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disorders, and mental disorders. Treatment of infectious diseases and treatment of substance use and mental disorders contribute to prevention of transmission of infectious diseases. Integrating prevention services can increase access to and timeliness of prevention and treatment.

Introduction

This report summarizes current (as of 2011) public health recommendations and guidelines from multiple agencies of the U.S. Department of Health and Human Services (DHHS) for science-based public health strategies for the prevention of human immunodeficiency virus (HIV) infection, viral hepatitis, sexually transmitted diseases (STDs), and tuberculosis (TB) (referred to collectively as infectious diseases) among persons who use drugs illicitly and their contacts (sex and drug-using partners) in the United States. In addition, the report recommends integrated delivery of the public health strategies and includes a review of recent programmatic efforts to integrate prevention services for persons who use drugs illicitly. Integrated prevention services provide multiple prevention services at a single venue, coordinate referrals, and provide linkage to services delivered at multiple venues to improve access to high-quality and comprehensive prevention services. Such integration can offer providers and programs the opportunity to address multiple infectious diseases and related health conditions (e.g., substance use and mental disorders) at one time or at a single facility, thereby increasing the likelihood that clients will receive needed services (1). Without access to integrated prevention services, persons who use drugs illicitly would need to go to different facilities to access prevention and treatment services for HIV infection, viral hepatitis, STDs, or TB and for substance use or mental disorders. Implementing integrated services is intended to increase access to services, improve the timeliness of service delivery, and increase the effectiveness of efforts to prevent infectious diseases and disorders that share common risk factors, behaviors, and social determinants. The guidance does not review the topic of physical integration of all medical treatment services for such diseases, especially as different regulatory, accreditation, and licensing policies govern the delivery of treatment services for these diseases. However, the guidance emphasizes the importance of treatment for infectious diseases as a major strategy in preventing their further transmission. The guidance also emphasizes treatment of substance use and mental disorders, comorbidities that must be treated effectively to optimize prevention outcomes for infectious diseases.

This report is divided into seven sections: 1) an introduction to the scope and purpose of the guidance; 2) a summary of the methods, including steps and procedures followed in development of the guidance; 3) a brief outline of the epidemiology of illicit drug use and of HIV infection, viral

hepatitis, STDs, TB, and their sequelae among persons who use drugs illicitly in the United States; 4) a description of science-based public health strategies for prevention of HIV infection, viral hepatitis, STDs, and TB among persons who use drugs illicitly; 5) a brief summary of special considerations that affect the prevention and control of infectious diseases among persons who use drugs illicitly; 6) a section discussing practical aspects of delivery of integrated prevention services; and 7) a short conclusion stating the rationale and importance of integrated prevention services for infectious diseases among persons who use drugs illicitly.

Illicit Use of Drugs and Infectious Diseases

Rates of HIV infection, viral hepatitis, STDs, and TB are substantially higher among persons who use drugs illicitly than among persons who do not use drugs illicitly (2–5). The term “illicit use of drugs” encompasses all levels of use, abuse, and dependence because each level is associated with behaviors that increase the risk for contracting or transmitting infectious diseases. Persons who use drugs illicitly are defined as those who use, without prescription, prescription drugs (e.g., oxycodone), or as those who use illicit drugs such as opiates (e.g., heroin), stimulants (e.g., powder cocaine, crack cocaine, and methamphetamine), or other so-called “club drugs” (e.g., gamma hydroxybutyrate [GHB], ketamine, flunitrazepam, and ecstasy). Marijuana use and nonmedical use of prescription drugs also are associated with risk for contracting or transmitting infectious diseases. Although alcohol and tobacco use is considered illicit for certain age groups (i.e., age <21 years for alcohol in all states; age <18 years for tobacco in most states and <19 years in some states) (6), this report does not focus in great detail on tobacco use or alcohol use, even though excessive alcohol use and tobacco use are associated with infectious diseases (7–9). Illicit use of drugs includes multiple drug use (i.e., simultaneous use of illicit drugs and legal substances).

In general, the risk for acquiring and transmitting infectious disease in a population is a reflection of the prevalence of a given infection in the population, the efficiency of transmission of the organism, and the burden of infectious diseases and patterns of the risk behaviors in which that population engages. The high rates of HIV infection, viral hepatitis, STDs, and TB among persons who use drugs illicitly reflect behavioral, social, cultural, environmental, and structural factors that facilitate disease transmission (10–12). Behavioral factors include the

use and sharing of contaminated injection equipment (i.e., needles and syringes) and drug preparation equipment (e.g., water, cotton, and a cooker). Bloodborne infections such as HIV infection and viral hepatitis are transmitted efficiently through sharing of contaminated needles. The transmission also can occur through unprotected sex. Illicit use of alcohol by youth, alcohol intoxication, and illicit use of drugs are associated with unsafe sexual behaviors, which are risk factors for HIV infection, viral hepatitis, and STDs. Such social and cultural factors as marginalization, stigma, and lack of social support can contribute to disease transmission; these factors often affect persons who are members of a sexual minority (i.e., lesbian, gay, bisexual, and transgender), persons who use drugs illicitly, or persons who have a mental disorder (9,10). Environmental factors common among persons who use drugs illicitly include unstable living conditions, and limited availability of sterile injection and drug preparation equipment (13). Lack of access to and underenrollment in substance abuse treatment programs are other structural factors contributing to infectious disease transmission. In addition, fear of arrest by law enforcement officers and fear of discrimination by health-care providers can discourage persons who use drugs illicitly from using health-care services adequately (14). Persons who use drugs illicitly often have other complex health and social needs, including treatment for substance abuse and for preexisting or concurrent mental disorders (9,15–17). Throughout the guidance provided in this report, efforts to facilitate treatment of infectious diseases and treatment of substance use and mental disorders also are classified as preventive interventions.

Utility of the Guidance

This guidance is intended for public health officials at all levels, leaders and managers of programs, program providers, health-care providers (e.g., clinicians, providers of mental health services, outreach workers, and social workers), and prevention and treatment support groups for persons who use drugs illicitly (e.g., coalitions). Persons who use this guidance should adapt it to meet the specific prevention needs of their communities, while preserving the core missions of the organizations, programs, and venues that provide these services.

A coordinated approach to service delivery needs to incorporate multiple science-based public health strategies. Staff working in prevention programs for HIV infection, viral hepatitis, STDs, and TB and in programs to prevent and treat substance use and mental disorders need to consider program collaboration and service integration as an approach to improve access to multiple services (18–21). Preventing infectious diseases among persons who use drugs illicitly can also help prevent infections among their sex and drug-using partners and among other members of their communities.

Program Collaboration and Service Integration

Program collaboration and service integration are mechanisms that programs use to organize and combine interrelated health issues, activities, and prevention strategies so as to facilitate comprehensive delivery of services, to foster integrated care, and to increase operational efficiencies (18). Agencies and providers at the federal, state, local, tribal, and service delivery levels can provide leadership and resources to develop and implement programs that enhance program collaboration and service integration (19).

To the extent that programs can collaborate and integrate prevention services, they can save time, money, and effort. Providing multiple prevention services at a single venue or coordinating referrals and linkage to care for services delivered at multiple venues can improve access to quality and comprehensive prevention services. Such coordination can offer the opportunity to address multiple infectious diseases and related health conditions, such as substance use and mental disorders, at one time or at a single facility, thus increasing the likelihood that clients will receive needed services. Program collaboration and integration of prevention services can be expected to maximize opportunities for prevention, reduce delays between infection and diagnosis and between diagnosis and treatment, and improve adherence to risk reduction behaviors and to treatment regimens for infectious diseases, substance use disorders, and mental disorders.

Program collaboration is a mutually beneficial and well-defined relationship entered into by two or more programs, organizations, or organizational units to achieve common goals (18). The collaboration usually includes a commitment to relationships and mutual goals, a jointly developed structure, shared responsibility, mutual authority and accountability for success, and shared resources and benefits for programs that are not necessarily all delivered at the same physical location. Service integration is intended to provide persons with seamless services from multiple programs or areas within programs without repeated registration procedures, waiting periods, or other administrative barriers (18). By providing access to services at a single health-care entry point, service integration is different from system coordination, in which multiple agencies provide services but at multiple locations, possibly requiring persons to visit several locations and register separately for each program to obtain the services (1).

Comprehensive and integrated service delivery, either through provision of multiple services at a single venue or through coordination of referrals for services delivered at multiple venues, requires collaborative planning and a coordinated approach among service providers. Such collaboration and coordination are needed to ensure that provided services

meet the needs of persons who use drugs illicitly and that the methods of service delivery are acceptable both to providers and to clients. However, an integrated approach to service delivery requires that local, state, and federal agencies work together, which is often a difficult process because of different regulatory constraints, including those caused by complying with the Health Insurance Portability and Accountability Act (HIPAA) regulations. Electronic and portable health records are inconsistently available, further complicating delivery of health-care services. In addition, patients frequently are lost to follow-up in transition from the detection and diagnosis to the treatment of disease. Despite these concerns, a coordinated approach to integrated service delivery can improve services offered to persons who use drugs illicitly and can improve their health seeking behaviors.

Guidance Development Methods

This guidance was developed and written by a CDC work group (members are listed alphabetically on page 1). The work group included health-care professionals, public health scientists, and public health analysts with experience and expertise in prevention of HIV infection, viral hepatitis, STDs, and TB in persons who use drugs illicitly. The work group developed and wrote the guidance to support the needs of stakeholders (e.g., policymakers, leaders, managers, providers, and recipients of prevention and treatment services) for one document that summarizes recommendations and guidelines of science-based public health strategies that can be integrated to enhance service delivery and public health outcomes for persons who use drugs illicitly.

The guidance is the result of the efforts of several DHHS agencies and offices to synchronize activities and achieve synergies in areas where their missions for persons who use drugs illicitly overlap. Starting in late 2007, the work group met biweekly to develop and write the guidance. The group used multiple search strategies in preparing the guidance, including searching medical and professional computerized databases (e.g., PubMed, Psychinfo, and National Guideline Clearinghouse) using relevant key terms and search strings, previously published guidelines or guidance, review papers, and reference lists of published papers and documents (Appendix A). During 2008–2010, the work group wrote a draft document for discussion. In late 2010 and throughout 2011, DHHS agencies, including DHHS offices, reviewed a draft of this report to ensure that the recommendations were science-based and consistent with the missions and recommendations of DHHS agencies and offices. They provided questions or comments that were addressed or incorporated in this report.

DHHS operating divisions or institutes that approved this guidance included the Agency for Healthcare Research and Quality (AHRQ), CDC, the Centers for Medicare and Medicaid Services, the Food and Drug Administration, the National Institute on Drug Abuse (NIDA), the National Institutes of Health, and the Substance Abuse and Mental Health Services Administration (SAMHSA). The DHHS offices and staff divisions that approved this guidance included the Office of the Secretary, the Office of the Assistant Secretary for Health, the Office of the Assistant Secretary for Legislation, the Office of the Assistant Secretary for Planning and Evaluation, the Office of the Assistant Secretary for Public Affairs, the Office of the Assistant Secretary for Financial Resources, the Office of the General Counsel, and the Office of Global Affairs. In addition, several experts who are not part of the federal or local government reviewed the draft guidance and provided questions or comments that were addressed in this report (see Acknowledgments). These persons have expertise in prevention and treatment of HIV infection, viral hepatitis, STDs, TB, substance use disorders, and mental disorders; they are affiliated with private organizations that support services provided to persons who use drugs illicitly, or else have experience working with this population. None of these reviewers reported financial or other conflicts of interest that would preclude their involvement in reviewing this guidance.

Prior to this guidance, recommendations and guidelines for public health strategies for preventing and treating HIV infection, viral hepatitis, STDs, TB, substance use disorders, and mental disorders among persons who use drugs illicitly have appeared in different publications (Appendix B). This guidance provides a summary of published scientific and programmatic literature, including current (as of 2011) recommendations and guidelines for 12 science-based public health strategies: 1) prevention and treatment of substance use and mental disorders; 2) outreach programs; 3) risk assessment for illicit use of drugs; 4) risk assessment for HIV infection, viral hepatitis, STDs, and TB; 5) screening, diagnosis, and counseling for HIV infection, viral hepatitis, STDs, and TB; 6) vaccination; 7) prevention of mother-to-child transmission of HIV infection, viral hepatitis, and STDs; 8) interventions for reduction of risk behaviors; 9) partner services and contact follow-up; 10) referrals and linkage to care; 11) medical treatment for HIV infection, viral hepatitis, STDs, and TB; and 12) delivery of integrated prevention services.

The recommendations and guidelines of CDC, NIDA, SAMHSA, AHRQ, and the U.S. Preventive Services Task Force (USPSTF) for these science-based public health strategies are consistent across the agencies for this high-risk population, i.e., persons who use drugs illicitly. CDC's recommendations address prevention and treatment of HIV infection, viral hepatitis, STDs,

and TB. The guidelines of NIDA and SAMHSA are for prevention and treatment of substance use and mental disorders. The Advisory Committee on Immunization Practices and CDC issued the vaccination recommendations. The recommendations for screening or testing of persons who use drugs illicitly for HIV infection, viral hepatitis, STDs, and TB made by AHRQ and the U.S. Preventative Services Task Force are consistent with those of CDC.

The recommendations or guidelines from CDC, NIDA, and SAMHSA are based on reviews of the scientific evidence and programmatic literature, expert opinion, field experience, and lessons learned from and results of projects funded by these agencies. Recommendations of AHRQ and the U.S. Preventive Services Task Force are based on systematic reviews of the scientific literature. Evidence for the effectiveness of the delivery of integrated prevention services for persons who use drugs illicitly, like the evidence supporting the previously published recommendations and guidelines, is based on a combination of a literature review, expert opinion, field experience, and results of and lessons learned from delivery of integrated services in projects funded by DHHS agencies. The evidence supports delivery of integrated prevention services at venues that serve persons who use drugs illicitly. The report includes information on relevant practical steps (e.g., development of a coordinating body, analysis of local data, staff training, evaluation) to support service integration and to plan, deliver, monitor, and evaluate integrated services. Earlier versions of this report were presented at the National HIV Prevention Conference held in August 2009 and at the National STD Prevention Conferences held in March 2010 and in March 2012.

Epidemiology of Illicit Use of Drugs and of HIV Infection, Viral Hepatitis, STDs, TB, and Their Sequelae in the United States

Illicit Use of Drugs and Its Sequelae

In the 2009 National Survey on Drug Use and Health (NSDUH), an estimated 8.7% of the U.S. noninstitutionalized population aged ≥ 12 years reported illicit use of drugs (i.e., marijuana, cocaine, heroin, hallucinogens, inhalants, and prescription drugs used for nonmedical purposes) during the month before data collection (22). In the 2006–2008 NSDUH, an estimated 425,000 persons aged ≥ 12 years (0.17% of the age-group population) had injected heroin, cocaine, or stimulants during the year before data collection (23). Relatively recent publications provide relevant information. Approximately 1.2 million persons in the United States injected drugs in 2002 (24). The prevalence of a history of injection-drug use remained relatively stable at 1.5% (95% confidence interval

[CI] = 1.4%–1.6%; weighted estimate: 3.4 million persons) during 1979–2002 (25). Data from the 2008 NSDUH indicate that an estimated 3.8 million persons in the United States have used heroin at least once in their lives and that an estimated 213,000 persons used heroin during the month before data collection (26). In 1998, the estimated number of persons who injected drugs ranged from 19 to 173 persons per 10,000 population (median: 60) across 96 large U.S. metropolitan areas (27). Monitoring changes in drug use among all age groups remains important for developing and implementing relevant prevention and treatment programs (28–30).

Persons who inject drugs illicitly are a heterogeneous group, and >50% of them use more than one drug illicitly through means other than injection (e.g., inhalation, sniffing, smoking, or ingesting). They tend to drink alcohol in excess and tend to smoke tobacco (31–36). Estimates of the number of users of illicit drugs through means other than injection range from 1 million to 1.5 million (26).

Illicit drug use is associated with a high risk for mortality and comorbidities. Of particular significance, overdosing with injected drugs poses a risk for death (37,38). Persons who inject drugs illicitly can overdose when they inject alone. They often are in settings where peers are not trained in overdose prevention or are reluctant to call for medical help because of fear of legal consequences, or they are in settings where medical help is not available or accessible in a timely manner (39–41). Drug overdose death rates increased nearly fivefold during 1990–2007 (from two deaths per 100,000 population in 1990 to nine per 100,000 in 2007) (42). In 2006, among unintentional injury- and accident-related causes of death, rates of drug overdose were second only to motor-vehicle crash deaths (42). Opioid pain medications account for the highest number of unintentional overdose deaths, followed by cocaine and heroin (43). Drug overdose is a leading cause of mortality among persons who inject drugs illicitly (44–49). Overdose can be prevented by overdose prevention training programs (37,38,50–52).

HIV Infection, Viral Hepatitis, STDs, and TB Among Persons Who Use Drugs Illicitly

Persons who use drugs illicitly are at increased risk for acquiring and transmitting infectious diseases via bloodborne exposure (for those who inject), and they are at increased risk for sexual exposure to HIV and STDs (4,53–55). Some persons who use drugs illicitly might share unsterile drug injection equipment as well as engage in unprotected vaginal or anal intercourse with partners who engage in high-risk behaviors or with partners who have infectious diseases (56). In the United States, approximately 9%–12% of new HIV cases (57,58), 50% of new hepatitis C cases (59), and 2% of hepatitis A cases (59,60) are associated with illicit injection of drugs. Among persons who are at risk

for infectious diseases, men who have sex with men (MSM) are affected disproportionately by HIV. For example, CDC estimates that the rate of new HIV diagnoses among MSM is between 44 and 86 times that among other men, and between 40 and 77 times that among women (61). A 2008 survey of MSM from cities with high AIDS prevalence indicated that 5% of MSM had ever injected drugs (62), compared with 1.5% among the general population (25). The number of new HIV infections is highest among MSM, particularly young MSM, and next highest among persons infected through heterosexual contact, followed by persons who inject drugs (58).

The epidemiology of HIV infection differs by groups and is influenced by demographic factors affecting use of health-care services. For example, persistent racial and ethnic disparities in infectious diseases among persons who use illicit drugs remain a challenge (63–71). Data indicate racial and ethnic disparities in use of health-care services, including entry and retention in substance abuse treatment programs and other programs (72–84). Data also exist on the limited number of gender-sensitive interventions that meet the sex-specific needs of women who use drugs (e.g., negotiation and empowerment for adoption of safer behaviors and providing for needs of children) (85).

A large body of research has demonstrated that illicit drug use, regardless of the route of absorption of the drug, puts users at risk for acquiring HIV infection and STDs. For example, illicit injection of drugs can impair judgment, increasing the likelihood of engaging in risky sexual behaviors (86). Illicit noninjection drug use also puts users at risk for infectious diseases (72,87,88). Fortunately, prevention efforts aimed at reducing drug injection risk can be successful (57). For example, in recent years, a convergence in HIV prevalence and incidence among those who engage illicitly in injection or noninjection drug use suggests that a decrease has occurred in HIV transmission; the decrease is associated with safer use of syringes. There has also been a corresponding increase in HIV transmission associated with risky sexual behaviors (89). Illicit noninjection drug use, particularly use of stimulants, “club drugs,” and, to some extent, poppers (e.g., amylnitrite or butylnitrite) and erectile enhancement drugs, plays a substantial role in transmission of infectious diseases although patterns of substance abuse and preferences vary by age group, race, and ethnicity (90). Many studies highlight the role of methamphetamine and other drugs in risky sexual behavior among MSM as well as the effect of crack cocaine use on exchange of sex for illicit drugs, all of which have implications for infection with HIV and STDs (88,91–98).

The prevalence of STDs among persons who use drugs illicitly varies (range: 1%–6% for syphilis, 1%–5% for chlamydia, 1%–3% for gonorrhea, and 38%–61% for herpes simplex virus-2 [HSV-2] infection) (70,99). The moderately high

prevalence of bacterial STDs among persons who inject drugs illicitly is not much different from the prevalence among youth at high risk (100). The high prevalence of HSV-2 among persons who use drugs illicitly contrasts with the 17% prevalence reported for the general population of persons aged 14–49 years (101). In one study of young persons (median age: 24 years) who use drugs illicitly, the seroprevalence of infection with high-risk oncogenic types of human papillomavirus (HPV) was 7% among men and 38% among women for HPV-16 and 7% among men and 42% among women for HPV-18 (68). For comparison, according to 2003–2004 data from CDC’s National Health and Nutrition Examination Survey, the prevalence of infection with these HPV-types among women aged 15–49 years in the general population was 16% and 7% for HPV-16 and HPV-18, respectively; for men in the same age group, the prevalence was 5% and 2%, respectively (102). In the United States, approximately one in five patients with active TB either uses a drug illicitly or drinks alcohol in excess, or both (103). Among U.S.-born TB patients, one in three patients with TB reports substance abuse (103). In 2008, illicit noninjection drug use was reported in 7.3% of U.S. TB patients, and illicit injection drug use was reported in 1.8% (104).

Comorbidities

Persons who use drugs illicitly have moderate-to-high co-infection rates. They often experience more than one infection, disease, or disorder (i.e., substance use or mental disorders) at the same time (17,86,104,105). Epidemiologic synergy, in which co-occurring infections increase the likelihood of infection transmission and progression of infectious diseases, highlights the importance of preventing and treating co-infections, diseases, and disorders.

Increasing awareness of infectious disease comorbidities and of overlapping risks for multiple infections is essential because of the overlapping risk behaviors associated with acquiring these conditions, the synergistic effects of disease progression and treatment needs, and the social determinants for prevention and treatment. Among HIV-infected persons who inject drugs illicitly, 80% also are infected with hepatitis C virus (HCV) (86). In studies of persons who use drugs illicitly in New York City, infection with HSV-2 is associated with HIV infection (106,107). For example, 80% of HIV-positive persons who inject drugs illicitly are HSV-2 positive (106). In a prospective study, newly detected HPV was more common among HIV-infected women than among women who were not infected with HIV (30% and 6%, respectively) (108). Increased awareness of infectious disease comorbidities is especially important for delivery of comprehensive and integrated services.

Science-Based Public Health Strategies for Prevention

Implementing science-based public health strategies in a manner that respects the rights of persons who use drugs illicitly and their partners is vital for preventing HIV infection, viral hepatitis, STDs, and TB in this population (106,109–113). Decision makers can make the most efficient use of public resources by choosing cost-effective, science-based prevention strategies.

Prevention and Treatment of Substance Use and Mental Disorders

In the field of prevention and treatment of substance use disorders, the terms “use,” “abuse,” and “dependence” are defined in ways that reflect their association with risk for infectious diseases, other health conditions, and adverse social consequences (114,115). From an epidemiologic perspective, frequency of use of a substance and total number of times a substance is used in a lifetime are the principal measures of substance use. Abuse refers to a level of use of a substance that has short-term acute personal or social consequences, including sporadic, nondependent patterns of use despite social problems or physical hazards. The clinical definition of dependence includes psychologic as well as physiologic components. Psychiatric diagnosis of dependence requires evidence of consequences during an extended period of time (114). Salient markers of dependence include loss of behavioral control over using drugs, withdrawal symptoms, and an obsessive-compulsive style of use. The criteria commonly used for dependence include 1) more use of a substance than intended, 2) inability to reduce use, 3) amount of time seeking the substance, 4) physical effects of use, 5) use replacing other activities, 6) continued use despite problems, 7) tolerance, 8) withdrawal symptoms, or 9) use to avoid withdrawal symptoms (114). The term “substance abuse” denotes substance abuse or dependence as defined in the diagnostic and statistical manual (DSM) (114), and the term “substance use disorder” sometimes is used in the literature as a synonym for the term “addiction.”

Evidence demonstrates the effectiveness of science-based approaches to prevent and treat substance use and mental disorders (115–117). The evidence base indicates that scaling-up science-based approaches for treating substance use and mental disorders in publicly funded programs would improve health outcomes. Providing persons who use drugs illicitly with increased access to science-based treatment for substance use and mental disorders is one way to improve prevention and control of infectious diseases (116). The national strategy to reduce drug demand focuses on curtailing illicit drug consumption and on improving public health and public safety by reducing the consequences of drug abuse (118,119). The strategy provides a collaborative and

balanced approach that emphasizes community-based prevention, integration of evidence-based treatment into the health-care system, innovations in prevention and treatment strategies in the criminal justice system, and international partnerships to disrupt drug-trafficking organizations (118,119). The priorities of the national strategy to reduce drug demand acknowledge that it is important to prevent drug use, reduce drug use, and treat substance abuse, and that behavioral, social, environmental, and structural factors contribute to illicit use of drugs (119,120).

Evidence points to the efficacy of “screening, brief intervention, referral, and treatment” (SBIRT) approaches in primary care settings to identify problematic use of drugs and to reduce substance abuse (121–123). SBIRT is a comprehensive, integrated, public health approach to the delivery of early intervention and treatment services for persons with substance use disorders and for those at risk for developing them (121). SBIRT can be provided in a range of health facilities, including primary care centers (121). The goals of SBIRT are to 1) encourage health-care providers to screen and provide brief advice or counseling to their patients who misuse alcohol or abuse other drugs so as to reduce hazardous use of substances, 2) reduce vulnerability to the negative consequences of substance use, and 3) improve linkages between general community health care and specialized substance abuse providers to facilitate access to care when needed (121).

The spectrum of science-based treatment for substance use disorders is broad. Medication approaches (often referred to as medication-assisted therapy) are effective for treating nicotine, alcohol, and opioid addiction, as reflected in recommendations of national and international organizations (115). The use of effective medications in conjunction with science-based behavioral treatments remains valuable because combination interventions can be more effective than single interventions. Science-based behavioral treatments include cognitive behavioral therapy (including relapse prevention), motivational interviewing, and community reinforcement approaches (including contingency management as a stand-alone intervention) (124–126).

Outreach Programs

Community-based outreach, in which peer educators or other persons have established trust and rapport with persons who use drugs illicitly, can reduce risky behaviors (127,128). Outreach is particularly useful in reaching and assisting those who use drugs illicitly who are not ready to enter substance abuse treatment or to be involved in other interventions for risk reduction. Outreach has been demonstrated to increase the use of condoms, substance abuse treatment, and other prevention services (127,128). Outreach to persons who use drugs illicitly

can occur at locations where they congregate, on the streets, or in mobile vans (129). It often involves informal leaders, peers (e.g., trained persons who are former drug users), and other volunteers from the community who have existing relationships and access to the target population (130–132). Providing drug- and sex-related risk-reduction information and materials via trusted peers, while not sufficient to reduce the prevalence of behaviors associated with increased risk for infections, can help establish safer peer norms of behavior and common expectations of safer behaviors (4,11,127).

Outreach workers can provide education on drug- and sex-related risks and risk-reduction information to persons who use drugs illicitly. They can provide persons who use drugs illicitly with risk-reduction supplies (e.g., condoms, sterile syringes and needles, and naloxone) and refer them to prevention programs (129). Outreach workers also can refer persons who use drugs illicitly to facilities that offer targeted testing for TB infection; those identified with active TB disease can be treated appropriately, and those identified with TB infection (3) can be given preventive therapy for TB (133,134). Outreach workers also can provide referrals or direct links to counseling, testing, and treatment for HIV infection; to facilities that offer vaccinations for hepatitis A and hepatitis B; to programs that offer screening and treatment for viral hepatitis and STDs; and to substance abuse treatment (135,136). In addition, outreach workers can help in building trust in prevention and treatment services and in health-care providers (106,127,137).

Risk Assessment for Illicit Use of Drugs

The high prevalence of HIV infection, viral hepatitis, STDs, and TB among persons who use drugs illicitly should sensitize prevention and care providers to conduct risk assessment for illicit use of drugs for everyone seeking services for these infectious diseases (138,139). In addition, many users use multiple drugs, as well as alcohol or tobacco, and eliciting information on use of these substances could assist with prevention and treatment services. For multiple reasons, patients might not be forthcoming about illicit use of drugs; the reasons include fear of legal consequences and concerns about confidentiality. Thus, patients need to feel comfortable about their privacy and confidentiality of their data to share their behaviors with providers.

Risk assessment and risk reduction interventions are essential for adoption of safer behaviors and for referral of clients to relevant prevention and treatment programs (32,33,140–142). The Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST) can be used as a screening instrument for drug use (143,144).

The recommendation to assess persons who seek preventive and medical care for infectious diseases for illicit use of drugs

is consistent with recommendations of the USPSTF (145), CDC's STD treatment guidelines (146), and the American Medical Association (AMA) guidelines for adolescents (147), which recommend that health-care providers screen adolescents for substance abuse during preventive-service visits.

Risk Assessment for Infectious Diseases

Persons who use drugs illicitly should receive appropriate screening for other risk factors for infectious diseases (e.g., risky sexual behaviors or being a known contact of a person with active TB). They also should receive relevant preventive services and risk-reduction counseling. CDC's 2010 STD treatment guidelines support this approach by recommending that health-care providers of STD services routinely obtain sexual histories from their patients (146). Risk assessments for infectious diseases can be performed by health-care providers at venues that serve persons who use drugs illicitly (5,148).

Screening, Diagnosis, and Counseling for Infectious Diseases

Screening services for infectious diseases are critical components of a comprehensive strategy to reduce and eliminate incident infections among persons who use drugs illicitly (149–159). Such services identify those who are unaware of their infections and provide them with counseling and education and refer and link to treatment those who are infected. Knowledge of one's infection status can help uninfected persons who use drugs illicitly make behavioral changes to reduce the risk for infection (160–164) and can help infected persons reduce the likelihood of medical sequelae and transmission of infection to others (149–164). Screening for illicit use of drugs, including offering brief interventions and providing referrals, and screening for misuse of prescription drugs, can be useful adjuncts to screening for infectious diseases (121). The screening and counseling recommendations for preventing HIV infection, viral hepatitis, STDs, and TB infection in persons who use drugs illicitly have been summarized (Box 1).

Vaccination

Hepatitis A vaccination is recommended for persons who use drugs illicitly. Hepatitis B vaccination is recommended for all adults in certain settings, including STD clinics, HIV testing and treatment facilities, facilities providing substance abuse treatment and prevention services, correctional facilities, and health-care settings serving persons who inject drugs illicitly (100,165).

Prevaccination testing for hepatitis B is recommended for household, sex, and needle-sharing contacts of hepatitis

B surface antigen (HBsAg)-positive persons and for HIV-infected persons (152). In addition, testing might be cost-effective in adult populations with a prevalence of hepatitis B virus (HBV) infection of >20% (e.g., persons who inject drugs illicitly or incarcerated persons). If prevaccination testing for antibody to the hepatitis B surface antigen (anti-HBs) is used to identify immunity after previous HBV infection, HBsAg testing also must be performed to identify persons with chronic HBV infection. Serologic testing should not be a barrier to vaccination of susceptible persons, especially in hard-to-reach populations. The first vaccine dose typically should be administered immediately after collection of the blood sample for serologic testing (166).

Recommendations for the administration of HPV vaccinations are the same for persons who use drugs illicitly as for the general population (167). No vaccines are available for the prevention of infection with HIV, HCV, or any STD other than HPV and HBV. For TB prevention, use of Bacille Calmette-Guérin (BCG) vaccine generally is not recommended in the United States because of the low risk for infection with *Mycobacterium tuberculosis*, the variable effectiveness of the vaccine against adult pulmonary TB, and the vaccine's potential interference with tuberculin skin test reactivity (155,168).

Prevention of Mother-to-Child Transmission of Infectious Diseases

Pregnant women who use drugs illicitly are at elevated risk for transmitting infections (e.g., HIV, HBV, HCV, syphilis, chlamydia, and gonorrhea) to their children during pregnancy or at delivery if they are infected with these pathogens. Women who use drugs illicitly are less likely to use family planning services than other women (169). Pregnant women who use drugs illicitly are more likely than other women to initiate prenatal care later or not at all (170,171). Pregnant women with HIV infection have cited illicit use of drugs as a barrier to prenatal care, because some fear incarceration for illicit use of drugs and possible placement of their newborns in foster care (171). Although the recommendations of the U.S. Public Health Service Task Force to reduce perinatal HIV transmission do not outline special considerations for pregnant women who use drugs illicitly, the recommendations note that discontinuing illicit use of drugs has been associated with a reduced risk for perinatal transmission of HIV (172). HIV screening should be included in the routine panel of prenatal screening tests for all pregnant women (149). All pregnant women, including those who use drugs illicitly, should be screened for HBsAg, and immunoprophylaxis should be administered to infants born to HBsAg-positive women or to women with unknown HBsAg status (152). Previously unvaccinated women at risk for HBV

infection, including persons who use or inject drugs illicitly, should be vaccinated against HBV infection.

Screening pregnant women for HSV-2 at their first prenatal visit is not recommended, but it is important to test pregnant women with symptoms of genital herpes, including those with symptoms at time of delivery, and to provide treatment for pregnant women with newly acquired HSV-2 (146). A summary of current recommendations and guidelines for prevention of mother-to-child transmission of infectious diseases has been provided (Box 2).

Interventions for Reduction of Risk Behaviors

Four broad strategies have been developed to reduce risk behaviors. They are 1) risk-reduction programs and messages, 2) treatment of substance use and mental disorders to prevent infectious diseases, 3) access to sterile injection and drug preparation equipment, and 4) interventions to increase condom availability (173,174).

Risk-Reduction Programs and Messages

Much of the research on HIV prevention programs for persons who inject drugs illicitly has focused on injection-related risk. In recent years, however, multiple studies have concluded that persons who use drugs illicitly, through injection or noninjection routes, are at increased risk for sexual transmission of HIV, HBV, and other STDs, regardless of the means of introducing the drug into the body (70,89,152,166,175,176). Most persons who use drugs illicitly, through injecting or other means (e.g., inhaling, sniffing, or snorting), are sexually active (87,99). Levels of sexual risk are influenced both by the drugs that are used illicitly and by their route of administration (86). Sexual transmission of HIV among persons who use drugs illicitly is associated with several factors, including a history of other STDs, recent initiation of illicit drug injection, and exchange of sex for money or for illicit drugs (87). Male-to-male sex as well as illicit use of drugs through noninjection means, including the use of such stimulants as crack cocaine and methamphetamine, is associated with increased risky sexual behaviors; these drugs increase the libido or reduce inhibitions (70,86).

Although persons who inject drugs illicitly have reduced their injection risk behaviors in response to behavior-change health interventions (177,178), reducing their risky sexual behaviors remains a challenge, similar to the challenge that faces persons who do not use drugs illicitly (179,180). Results of two meta-analyses of studies of HIV prevention interventions for persons who use drugs illicitly indicate that multisession psychosocial behavioral interventions that address sexual risk behaviors have a modest added effect compared with the effect of shorter educational interventions and a larger added effect compared

BOX 1. Summary of recommended screening, counseling, and vaccination services for persons who use drugs illicitly**HIV infection***

Testing (at least annually) of all persons likely to be at high risk for HIV infection, including persons who use drugs illicitly and their sex partners, is recommended.

Hepatitis A virus (HAV) infection†

Hepatitis A vaccination is recommended for persons who inject drugs illicitly and for persons who use drugs illicitly through noninjection routes. Prevacination testing is not indicated for the vaccination of adolescents who use drugs illicitly but might be warranted depending on the type and duration of illicit drug use. Providers should obtain a thorough history to identify patients who use drugs illicitly or are at risk for using them and who might benefit from hepatitis A vaccination. Implementation strategies to overcome barriers and increase coverage, including use of standing orders (i.e., a note in the medical record) should be considered.

Hepatitis B virus (HBV) infection§

All persons seeking protection from HBV infection are recommended to receive hepatitis B vaccination. Hepatitis B vaccination is recommended for all adults in certain settings, including STD clinics, HIV testing and treatment facilities, facilities providing substance abuse treatment and prevention services, health-care settings providing services to persons who inject drugs illicitly, and correctional facilities. Standing orders can be used to administer hepatitis B vaccine as part of routine services to all adults who have not completed a hepatitis B vaccination regimen (e.g., in settings in which high proportions of persons have risk factors for HBV infection).

Persons who inject drugs illicitly, including persons in substance abuse treatment programs, should be offered screening and counseling for chronic HBV infection. Testing should include a serologic assay for hepatitis B surface antigen (HBsAg) offered as a part of routine care, and if the result is positive, be accompanied by appropriate counseling and referral for recommended clinical evaluation and care. Previous and current sex partners and household and needle-sharing contacts of HBsAg-positive persons should be identified. Unvaccinated sex partners and household and needle-sharing contacts should be tested for HBsAg and for antibody to the hepatitis B core antigen (anti-HBc) or antibody to the hepatitis B surface

antigen (anti-HBsAg). All susceptible persons should receive the first dose of hepatitis B vaccine as soon as the blood sample for serologic testing has been collected, unless an established patient-provider relationship can ensure that the patient will return for serologic test results and that vaccination can be initiated at that time if the patient is susceptible. Susceptible persons (i.e., those who have tested negative for HBsAg and anti-HBc) should complete the vaccine series by use of an age-appropriate vaccine dose and schedule. Those who have not been vaccinated fully should complete the vaccine series. Contacts determined to be HBsAg-positive should be referred for medical care.

Medical providers should advise patients identified as HBsAg-positive about measures they can take to prevent transmission to others and protect their health. Providers also should refer patients for counseling if needed.

Susceptible persons should complete a 3-dose hepatitis B vaccine series to prevent infection from ongoing exposure.

Hepatitis C virus (HCV) infection¶

All persons who use or inject drugs illicitly should routinely be offered screening and counseling for HCV infection. Persons with a history of risk, even those who have injected illicitly once or many years ago, should be offered screening and counseling for HCV infection. Facilities that provide counseling and testing should include services or referrals for medical evaluation and management of persons identified as infected with HCV.

Tuberculosis (TB)**

Targeted testing programs should be considered for persons at high risk for TB infection, including persons who use drugs illicitly. All persons suspected of having had a recent exposure to someone with active TB should be screened for active TB and TB infection.

Sexually transmitted diseases (STDs)††

Health-care providers should routinely (i.e., at baseline, periodically, and as clinically indicated) obtain sexual histories from their patients and address management of risk reduction. High-intensity behavioral counseling is recommended for all sexually active adolescents and for adults at increased risk for STDs and HIV infection. Questions to identify risk related to illicit use of drugs include questions on whether the patients have ever

See footnotes on page 12.

BOX 1. (Continued) Summary of recommended screening, counseling, and vaccination services for persons who use drugs illicitly

injected drugs illicitly or have partners who have exchanged sex or money for illicit drugs. Persons seeking treatment or screening for a particular STD should be evaluated for all common bacterial and parasitic STDs (e.g., chlamydia, gonorrhea, syphilis, and trichomoniasis) and informed if testing for any common STD has not been performed. Although no comprehensive national guidelines regarding STD care and management have been developed for correctional populations, the utility of expanded STD services in correctional settings has been reported. Universal screening of some populations (e.g., adolescent females) for chlamydia and gonorrhea is recommended at intake in juvenile detention and jail facilities. Universal screening for syphilis should be conducted based on local and institutional prevalence.

Chlamydia^{§§}

Annual chlamydia screening for all sexually active women aged <25 years and screening of older women with risk factors (e.g., those who have a new sex partner or multiple sex partners) are recommended. Chlamydia-infected women and men should be retested approximately 3 months after treatment. Among persons in correctional facilities, universal screening of adolescent females for chlamydia should be conducted at intake. Universal screening of adult females should be conducted at intake among women up to age 35 years (or on the basis of local institutional prevalence data).

Pregnant women should be screened routinely for chlamydia at the first prenatal visit. Pregnant women at increased risk for chlamydia and women found to have chlamydial infection during the first trimester should be retested during the third trimester to prevent postnatal complications and chlamydial infection in the infant.

Sexually active men who have sex with men (MSM) who have had insertive or receptive anal intercourse or who have had oral sex in the past year should be screened for chlamydia. Testing should be performed on specimens obtained from the pharynx, urethra, or rectum depending on the site of exposure. Screening at 3- to 6-month intervals is recommended for MSM who have multiple or anonymous sex partners, have sex in conjunction with illicit use of drugs, use methamphetamine, or have partners who participate in these activities.

Gonococcal infections^{¶¶}

Screening all sexually active women for gonorrhea, including those who are pregnant, if they are at increased risk, is recommended. Women aged <25 years are at highest risk for gonorrhea. Other risk factors for gonorrhea include a previous gonococcal infection, other STDs, new or multiple sex partners, inconsistent condom use, commercial sex work, and illicit drug use. Infected women and men should be retested approximately 3 months after treatment.

Among persons in correctional facilities, universal screening of adolescent females for gonorrhea should be conducted at intake in juvenile detention or jail facilities. Universal screening of adult females should be conducted at intake among females up to age 35 years (or on the basis of local institutional prevalence data).

Pregnant women should be screened at the first prenatal visit. Pregnant women found to have gonococcal infection during the first trimester should be retested in 3–6 months, preferably in the third trimester.

Sexually active MSM who have had insertive, receptive anal or oral intercourse during the previous year should be screened for urethral, rectal, and pharyngeal infection with *Neisseria gonorrhoeae* using specimens obtained from exposed sites. Screening at 3–6 month intervals is recommended for MSM who have multiple or anonymous sex partners, have sex in conjunction with illicit use of drugs, use methamphetamine, or have partners who participate in these activities.

Syphilis^{*}**

Syphilis serology should be performed at least annually for sexually active MSM, including MSM with or without established HIV infection. More frequent screening (at 3–6 month intervals) is indicated for MSM who have multiple or anonymous sex partners, have sex in conjunction with illicit drug use, use methamphetamine, or have sex partners who participate in these activities.

A serologic test for syphilis should be performed for all pregnant women at the first prenatal visit. Women who are at high risk for syphilis, live in areas of high syphilis morbidity, are previously untested, or have positive serology in the first trimester should be screened again early in the third trimester (28 weeks of gestation) and at delivery. Among persons in correctional facilities, universal

See footnotes on page 12.

BOX 1. (Continued) Summary of recommended screening, counseling, and vaccination services for persons who use drugs illicitly

screening should be conducted on the basis of the local area and institutional prevalence of early (primary, secondary, and early latent) infectious syphilis.

Herpes simplex virus-2^{†††}

HSV serologic testing should be considered for persons presenting for an STD evaluation (especially for those persons with multiple sex partners), persons with HIV infection, and MSM at increased risk for HIV acquisition.

Human papillomavirus (HPV)^{§§§}

Routine pre-exposure vaccination of those aged 11 or 12 years is recommended to prevent cervical precancer and cancer caused by high-risk HPV types. Catch-up vaccination is recommended for those aged 13–26 years, as indicated and recommended.

* Sources: CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR* 2006;55(No. RR-14); CDC. HIV/AIDS. Available at <http://www.cdc.gov/hiv/>; US Preventive Services Task Force. Screening for HIV: recommendation statement. *Ann Intern Med* 2005;143:32–7. (USPSTF does not have a recommendation on frequency of screening.)

† Sources: CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices. *MMWR* 2006;55(No. RR-7); CDC. Viral hepatitis. Available at <http://www.cdc.gov/hepatitis>.

§ Sources: CDC. Viral hepatitis. Available at <http://www.cdc.gov/hepatitis>; Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>; CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. *MMWR* 2006;55(No. RR-16).

¶ Sources: Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, Infectious Diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>; CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. *MMWR* 2006;55(No. RR-16); CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *MMWR* 1998;47(No. RR-19).

** Sources: CDC. Targeted tuberculin testing and treatment of latent tuberculosis infection. *MMWR* 2000;49(No. RR-6); CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC. *MMWR* 2005;54(No. RR-15); CDC. Tuberculosis. Available at <http://www.cdc.gov/tb>.

†† Sources: CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12); CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>.

§§ Sources: Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>; CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12); US Preventive Services Task Force. Screening for chlamydial infection. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspshlm.htm>; CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>.

¶¶ Sources: Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>; CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>; US Preventive Services Task Force. Screening for gonorrhea. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspsgono.htm>.

*** Sources: Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>; CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12); CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>.

††† Sources: CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12); CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>.

§§§ Sources: CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>; US Preventive Services Task Force. Screening for cervical cancer. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>; CDC. Recommendations on the use of quadrivalent human papillomavirus vaccine in males—Advisory Committee on Immunization Practices (ACIP), 2011. *MMWR* 2011;60:1705–8.

with minimal interventions (e.g., waitlist or provision of a self-help booklet) (179,181). Those results indicate that such interventions should be implemented on a wider scale to reach all persons who use drugs illicitly with messages about safer sex behaviors (87,179,181). However, participants with modest reductions in sexual risk might return to pre-intervention sexual risk (e.g., no condom use or a higher number of sex partners) more rapidly than they would return to pre-intervention injection-risk (e.g., use of contaminated needles and sharing of needles) (182). Decision makers can consider strengthening risk-reduction programs because data from several cities indicate that a greater proportion of HIV infections are attributable to sexual risk than to injection risk among persons who use drugs illicitly (4,107,183). The brief counseling intervention in project RESPECT that reduced sexual risk among persons seeking

care at STD clinics (184) was also effective in reducing sexual risk and bacterial STDs among those who had ever injected drugs illicitly (183). This result indicates the potential value of offering and evaluating brief counseling for reducing sexual risk (183).

Risk-reduction interventions for sexual risk are important because illicit noninjection use of drugs has been associated with participation in high-risk sexual activity and with acquisition of HIV, HBV, HCV, or other STDs (88,106,185–192). For example, methamphetamine use has been associated with unprotected sex and with higher numbers of sex partners, both among MSM and among persons who engage in heterosexual sex (188,193–195). Crack cocaine use has been associated with higher prevalence of HIV and HCV infection and with higher frequencies of unprotected sex, sex with multiple partners, and exchange of sex for money or for illicit drugs (189,196–202). Persons who use drugs illicitly should

BOX 2. Recommendations to improve prenatal care and prevent mother-to-child transmission of human immunodeficiency virus (HIV), sexually transmitted diseases (STDs), hepatitis B virus (HBV), and hepatitis C virus (HCV)

- All pregnant women, including those who use drugs illicitly, should be encouraged to seek prenatal care.
- Providers should counsel pregnant women who use drugs illicitly on the risks associated with illicit use of drugs and should encourage them to stop using drugs illicitly. Providing screening, brief interventions, referral, and treatment is a useful and effective strategy.
- All pregnant women, including pregnant women who use drugs illicitly, should be screened for HIV infection, syphilis, chlamydia, and gonorrhea at the first prenatal visit. Women who are at high risk for syphilis, live in areas of high syphilis morbidity, are previously untested, or live in areas of high HIV prevalence should be screened again early in the third trimester (at approximately 28 weeks of gestation) and at delivery. Any woman who delivers a stillborn infant should be tested for syphilis. Pregnant women who use drugs illicitly should be considered for tuberculosis screening.
- For viral hepatitis,
 - All pregnant women should be tested routinely for hepatitis B surface antigen (HBsAg) during an early prenatal visit (e.g., first trimester) in each pregnancy, even if they have been previously vaccinated or tested. Women who were not screened prenatally, those who engage in behaviors that put them at high risk for infection (e.g., illicit drug injection, having had more than one sex partner in the previous 6 months or an HBsAg-positive sex partner, having undergone evaluation or treatment for an STD, or having engaged in recent or current illicit injection of drugs), and those with clinical hepatitis should be tested at the time of admission to the hospital for delivery.
 - Women who have a history of illicit injection drug use and those who have a history of transfusion or organ transplantation before 1992 are considered at high risk for HCV infection and should be tested for hepatitis C antibodies at the first prenatal visit.
 - Women at risk for HBV infection also should be vaccinated. To avoid misinterpreting a transient positive HBsAg result during the 21 days after vaccination, a provider should perform HBsAg testing before the vaccination.
 - HBsAg-positive pregnant women should be advised of the need for their newborns to receive hepatitis B vaccine and hepatitis B immune globulin beginning at birth and to complete the hepatitis B vaccine series according to the recommended immunization schedule.
 - Infants born to women with unknown HBsAg status should receive immunoprophylaxis.

Sources: CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR 2006;55(No. RR-14); CDC. HIV/AIDS. Available at <http://www.cdc.gov/hiv>; CDC. Sexually transmitted diseases treatment guidelines 2010. MMWR 2010;59(No. RR-12); CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>; CDC. Hepatitis B vaccine: what you need to know. Available at <http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-hep-b.pdf>; CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). Part I: immunization of infants, children, and adolescents. MMWR 2005;54(No. RR-16); CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. Part II: immunization of adults. MMWR 2006;55(No. RR-16).

be provided with or referred to interventions that include some or all of the following prevention components (86,203):

- information on prevention and transmission of infectious diseases and on safer sex and injection practices,
- assessment of personal risk,
- training in how to use condoms correctly and the importance of using condoms consistently,
- counseling to address emotional or practical issues in practicing safe sex,
- training in safer sex negotiation,
- HIV testing,
- STD screening and treatment,
- referral to substance abuse treatment and social services (e.g., housing),

- psychosocial support,
- referrals to relevant mental health and family planning services, and
- training in overdose prevention and provision of naloxone.

CDC has identified several behavioral health interventions for persons who use drugs illicitly. These interventions have been demonstrated to reduce the frequency of high-risk behaviors and ultimately are intended to reduce the risk for acquiring HIV infection or other STDs (204). Other effective interventions can be adapted for use with persons who use drugs illicitly (205). The compendium of science-based HIV prevention interventions includes information on 70 effective interventions, including at least 15 for persons who use drugs illicitly, at least 12 for persons who inject drugs illicitly, and

eight that were evaluated with racial and ethnic minority persons who use drugs illicitly (206). Safety Counts and Community Promise are two evidence-based HIV prevention interventions for persons who use drugs illicitly that were developed based on work with persons who were recruited from settings other than substance abuse treatment. These interventions, which use goal-oriented counseling and peer-support approaches while drawing on several behavior-change principles, have been associated with reductions in high-risk behaviors (207–210). Previously published recommended messages for use by health and social service professionals and by other persons who have clients or client partners who use drugs illicitly have been summarized (Boxes 3 and 4).

Treatment of Substance Use and Mental Disorders to Prevent Infectious Diseases

In general, a short detoxification program from opioids has limited success in leading persons who use drugs illicitly to abstain from such use (211,212). For persons who use drugs illicitly, a longer program for substance abuse treatment that includes medication-assisted therapy (e.g., methadone or buprenorphine) and behavioral interventions is helpful for treating illicit drug use as well as for preventing HIV infection, viral hepatitis, STDs, and TB (116,204–210,213–217). Reducing or eliminating illicit drug use through substance abuse treatment promotes an overall healthy lifestyle and reduces other negative consequences of illicit drug use, including overdose (218).

An estimated 15%–25% of persons addicted to opiates in the United States during 1998–2004 were in methadone maintenance programs (219). Estimates of the percentage of persons who inject drugs illicitly and who are in substance abuse treatment programs have varied greatly (range: 1%–39%) across large U.S. metropolitan areas (27). For persons who use drugs illicitly, both lack of motivation to enter substance abuse treatment and the moderately long waiting periods that face them can be barriers to enrollment (220). Other factors affecting access to substance abuse treatment programs include poverty, lack of health insurance, and fear of being stigmatized as persons who use drugs illicitly (138).

Substance abuse treatment can reduce such risk behaviors as needle-sharing and exchange of sex for money or for illicit drugs (221–227). In addition, substance abuse treatment can serve as an entry point to medical care, and it can improve adherence to medical treatment regimens for infectious diseases (116,228–230). Substance abuse treatment includes nonpharmacologic, psychosocial approaches as well as pharmacologic therapies (174). Often, a combination of the two approaches is employed (215). For example, cognitive and behavioral therapies are effective treatments for abuse of amphetamine-type stimulants; the use of such therapies has

BOX 3. Summary of recommended messages for persons who use drugs illicitly to reduce drug use and infectious disease–related risks

- Get tested for human immunodeficiency virus, hepatitis B, and hepatitis C.
- Get vaccinated against hepatitis A and hepatitis B.
- Stop injection drug use to eliminate the risk for bloodborne infections.
- Get counseling and treatment to stop or reduce drug use.
- Never reuse or share syringes or drug-preparation equipment.
- Use a new, sterile syringe from a reliable source (e.g., a pharmacy or syringe exchange program).
- Use sterile water to prepare drugs, if possible; otherwise, use clean water from a reliable source, such as fresh tap water.
- Use a new container (i.e., cooker) and a new filter (i.e., cotton) to prepare drugs.
- Clean the injection site with a new alcohol swab before injection.
- Dispose of syringes safely after using them.
- Participate in risk-reduction programs.
- Obtain medical treatment for infectious diseases.
- Obtain treatment for substance use and mental disorders.

Sources: CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR 2006;55(No. RR-14); CDC. HIV/AIDS. Available at <http://www.cdc.gov/hiv>; CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR 2006;55(No. RR-7); CDC. Viral hepatitis. Available at <http://www.cdc.gov/hepatitis>; CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. Part II: immunization of adults. MMWR 2006;55(No. RR-16); National Institute on Drug Abuse. Drug facts: nationwide trends. Available at <http://www.drugabuse.gov/publications/drugfacts/nationwide-trends>; CDC. Persons who use drugs. Available at <http://www.cdc.gov/pwud>; National Institute on Drug Abuse. Principles of HIV prevention in drug-using populations: a research-based guide. Available at <http://archives.drugabuse.gov/POHP>; CDC. Questions and answers: HIV prevention. Available at <http://www.cdc.gov/hiv/resources/qa/prevention.htm>; CDC. How can HIV be prevented? Available at <http://www.cdc.gov/hiv/topics/basic/index.htm#prevention>; CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR 1998;47(No. RR-19); CDC. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945–1965. MMWR 2012;61(No. RR-4).

demonstrated reductions in illicit drug use and in high-risk behaviors (125,231). Nonpharmacologic psychotherapies (i.e., behavioral interventions) are valuable when medications are not available or allowable (117,125,126). Adherence interventions might greatly enhance the effects of nonpharmacologic psychotherapies and medications and reduce high-risk behaviors associated with acquisition or transmission of infectious diseases (232,233).

BOX 4. Summary of recommended messages for persons with a history of high-risk sexual practices

- Abstain from sex to avoid infection with sexually transmitted diseases (STDs) or human immunodeficiency virus (HIV).
- Engage in a long-term mutually monogamous relationship with an uninfected partner.
- Limit the number of sex partners.
- Use condoms correctly and consistently.
- Seek counseling to reduce risky sexual behavior.
- Be tested at least once a year for HIV infection.
- Be tested and treated for STDs and insist that your partners do too.
- Assist partner services, if you are told that you have HIV infection or another STD, by voluntarily providing contact information so that partners can be tested and, if appropriate, receive care and treatment.
- Consider encouraging sex partners to get vaccinated against hepatitis A and B or human papillomavirus.

Sources: CDC. Recommendations for partner services programs for HIV infection, syphilis, gonorrhea, and chlamydia infection. MMWR 2008;57(No. RR-9); National Institute on Drug Abuse. Drug facts: nationwide trends. Available at <http://www.drugabuse.gov/publications/drugfacts/nationwide-trends>; CDC. How can HIV be prevented? Available at <http://www.cdc.gov/hiv/topics/basic/index.htm#prevention>. CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>; CDC. Recommendations on the use of quadrivalent human papillomavirus vaccine in males—Advisory Committee on Immunization Practices (ACIP), 2011. MMWR 2011;60:1705–8.

Medication-assisted therapy with methadone or buprenorphine is highly effective for opioid addiction; it can promote adherence to needed medical care (116,234). An extensive body of evidence demonstrates that therapy with methadone or buprenorphine reduces the frequency of heroin injection, increases rates of retention in substance abuse treatment programs (235,236), and markedly decreases criminal activity (11,14,109,112). For example, methadone maintenance therapy has been associated with reductions in the frequency of illicit injection and sharing of injection equipment (212). It also has been associated with reductions in the number of sex partners and in the exchange of sex for money or for illicit drugs (237,238).

Increased condom use (239,240) and increased safer sexual behaviors (132,241) have been reported by persons who have reduced their illicit use of drugs. Substance abuse treatment is also a key step toward successful therapy of infectious diseases (9,242). Substance abuse treatment improves HIV treatment adherence (230,243,244), resulting in lower viral loads and lower likelihood of HIV transmission (245–247). Substance abuse treatment also facilitates the prevention of TB among persons who use drugs illicitly. Treatment of TB infection and of TB disease among persons who use drugs illicitly is more

successful when integrated with substance abuse treatment, incentives (e.g., food coupons), facilitators (e.g., tokens for transportation), and other services (3,98,248,249).

Access to Sterile Injection and Drug Preparation Equipment

Bloodborne pathogens can be transmitted easily through shared injection and drug-preparation equipment (203,250). Evidence suggests that access to sterile injection equipment can reduce transmission of these pathogens among persons who inject drugs illicitly (251). However, access to sterile needles and syringes generally is controlled by federal and state-specific laws and regulations that control their sale, distribution, and possession. In December 2011, the U.S. Congress reinstated a ban on the use of federal funds for carrying out any program that distributes sterile needles or syringes for hypodermic injection of illegal drugs.

Distribution policies for sterile injection equipment (e.g., secondary exchange or conditions and numbers of syringes provided) can allow syringe services programs to overcome operational barriers (e.g., limited locations or hours of operation) (252) and can increase access to sterile equipment for persons who inject drugs illicitly (253,254). The term “syringe services programs” was adopted by DHHS in 2010 (255,256). The term includes all services and interventions that provide sterile needles and syringes, including syringe exchange programs and nonprescription pharmacy sale of sterile needles and syringes, as well as syringe disposal. It also includes referral and linkage to programs for prevention and treatment of infectious diseases and substance use and mental disorders (255,256).

Although most states do not require a prescription to buy syringes, many states and pharmacies require customers to present personal identification or to sign for the purchase of sterile needles and syringes (83). Participation in no-cost syringe exchange programs leads to a decrease in the frequency of needle-sharing without causing an increase in the frequency of illicit use of drugs (177,257–264).

Existing evidence indicates that syringe exchange programs are effective in reducing the incidence of HIV infection (265). Syringe exchange programs reduce the risk for infection with HCV, which is the most common bloodborne pathogen among persons who inject drugs illicitly (153,266–269). Participation in a syringe exchange program was associated with reduced rates of hepatitis B and C in a case-control study in Tacoma, Washington (270). An indirect protective effect of syringe exchange programs on HCV infection through reduced injection risk behaviors was found in a study of young persons (aged 18–30 years) who inject drugs illicitly conducted in several cities (269). However, the prevalence and incidence of HCV infection remain higher among those persons than among the general population (64,271–273).

In addition to providing sterile syringes, most syringe exchange programs provide other health-related supplies and services to their clients (252,274). In 2008, more than 90% of syringe exchange programs provided male condoms, alcohol pads, and education on safer injection practices and on prevention of HIV infection, viral hepatitis, STDs, and abscesses; 87% provided HIV counseling and testing; 65% provided testing and counseling for HCV; 55% provided STD screening; 49% provided vaccination for hepatitis B; 47% provided vaccination for hepatitis A; 24% provided counseling and testing for hepatitis B; 31% provided TB screening; and 18% provided counseling and testing for hepatitis A (275).

Syringe exchange programs often provide referrals to substance abuse treatment and social services (275). Syringe exchange programs also can serve as sites for TB screening and for testing for TB infection (133,276), and they can serve as gateways to treatment for HIV or HCV infection (275,277,278). Innovative strategies and programs should be developed and tested, such as those that prevent the progression of noninjection drug use to injection drug use and those that promote safer and hygienic injection practices and facilities to prevent HIV and HCV transmission among persons who use drugs illicitly (4,37,107,153,272,273).

Interventions to Increase Condom Availability

Increasing the availability of condoms is associated with substantial reductions in HIV risk (274,279). Results of a Louisiana study on the effects of widespread condom distribution indicated that the rates of condom use increased, while the average number of sex partners over a 12-month period did not increase (274). Limited condom availability attributable to high cost, a low concentration of sale outlets in a given area, or limits on free distribution of condoms is often cited as a barrier to condom use (274). Distributing condoms free of charge at clinics, substance abuse treatment centers, jails and prisons, businesses, or other community locations (e.g., outreach and syringe services programs) can serve as a public health intervention or a supplement to existing campaigns and interventions, because prices as low as 25 cents per condom have been demonstrated to deter their use (280). Condom distribution has been demonstrated to reach a substantial segment of the population and to be cost-effective (280). In addition, condom use can reduce risk for oral and vaginal transmission of HIV, viral hepatitis, and bacterial and viral STDs among persons who use drugs illicitly (57,70,71,106,183,281–286). Because gonorrhea, chlamydia, syphilis, HSV-2, and HIV can be transmitted by oral sex, condom use also can reduce transmission of these infections through oral sex (283).

Partner Services and Contact Follow-up

Partner services begin when persons who have an infection are interviewed to obtain information about their partners in a voluntary and confidential manner. Following this step, partners are notified confidentially of their possible exposure to infection (287). Services that can be offered to infected persons and to their partners include risk-reduction counseling, testing (including partner or couple testing), hepatitis A and B vaccination, treatment or referral to medical care, and referral to other services (e.g., substance abuse treatment, social support, housing assistance, and mental health services) (287). Partner notification services for persons at risk for infections transmitted through illicit injection of drugs (e.g., HIV and HCV) are as effective in reducing transmission of these infections as are the partner notification services for infections transmitted through risky sexual behaviors (e.g., bacterial STDs) (288). Partners can be notified by their infected partners. Alternatively, they can be notified (through the use of information provided confidentially and on a voluntary basis by the infected persons) by trained health department personnel or by health-care providers. This can be done without identifying the names of the infected persons (287–289). State and local health departments provide partner notification services according to state and local regulations. Protocols for partner services include services for patients who inject drugs illicitly, engage in risky sexual behaviors, or have signs or symptoms of infections. All patients should receive treatment as well as risk-reduction counseling or be referred for counseling or other prevention interventions (287).

Venues where drugs are used illicitly (e.g., bars and crack houses) have been identified as sites of TB transmission because of factors such as close person-to-person proximity, repetitive exposure, and poor ventilation (98,290–293). Persons with TB disease who use drugs illicitly might be reluctant or unable to name other contacts who engage in illicit drug use or venues where drugs are used illicitly (291–293). The inability to generate a comprehensive list of contacts or venues can contribute to incomplete contact investigations, ongoing transmission of TB, and missed opportunities to prevent cases of TB disease. Therefore, if health-care staff members suspect that a patient with TB disease who uses drugs illicitly is not providing a complete contact list, the staff should expand the contact investigation by seeking alternative sources of information that can include the patient's social network and settings frequented by the patient (e.g., jail, homeless shelters, or venues where drugs are used illicitly).

Referrals and Linkage to Care

Persons who use drugs illicitly and who are identified to be infected with HIV, viral hepatitis, STDs, or TB should be referred and linked actively to medical care. Medical care includes

treatment for these infections as well as treatment for other health conditions that affect the lives and well-being of persons who use drugs illicitly, including treatment for substance use and mental disorders (294). Substance abuse treatment serves as a preventive intervention for HIV infection, viral hepatitis, STDs, and TB (116,126,295). Referral to and linkage with mental health services provide a supportive role for persons receiving treatment for infectious diseases and substance use disorders, including persons who are receiving treatment for hepatitis C infection, because HCV treatment regimens are associated with increased levels of depression (294,296,297).

Three approaches to referrals and linkage to care are used commonly. First, persons who use drugs illicitly are referred, following a needs assessment process, for medical treatment, care, and supportive services. Assistance with follow-up can facilitate initial contact with and linkage to appropriate service providers (18). A second approach is the “strengths-based case management approach,” which calls on clients to identify internal strengths and abilities and to develop a personal plan that includes meetings with case managers to acquire needed resources (298,299). A third approach is active linking, which can include health-care visits accompanied by a linkage coordinator or case manager to ensure that clients obtain appropriate medical care. Such accompaniment is especially important for the first appointment (300,301). TB programs have been using this approach to increase adherence to treatment (302). Active linking based on the principles of a “strengths-based, intensive case management approach” has been more successful than a mere referral in getting persons with newly diagnosed HIV infection to make at least one medical care visit (298,303). Linkage-to-care approaches are effective in improving health-care outcomes; on the other hand, referral alone has not been effective in enhancing linkage and adherence to care (304,305).

Supportive strategies or incentives can be helpful in increasing adherence and linkage to care, e.g., co-location of services, deployment of outreach workers, peer navigators, monetary incentives, and motivational enhancements (306). In a multisite study, onsite linkage to buprenorphine-naloxone treatment delivered in an infectious disease clinic was demonstrated to be more effective than offsite referrals (307). Persons interacting with the criminal justice system or leaving correctional facilities (jails or prisons) can benefit particularly from active linkage to HIV medical care, TB linkage interventions, HCV medical care, STD services, substance abuse treatment, and overdose prevention programs (308–311). HIV-related strategies carried out in different venues and facilities, such as the “seek, test, treat, and retain” strategy, target persons who use drugs illicitly and help to identify those who are HIV-positive and link them to care

(312). Such strategies also can support those in the criminal justice system who need to be linked to care during and after incarceration (308,313–315).

Medical Treatment for Infectious Diseases

Persons who use drugs illicitly need to receive appropriate treatment for infectious diseases and relevant health education messages from trained personnel. An infected person who receives a diagnosis of HIV infection, viral hepatitis, STDs, or TB should be referred to care providers and receive primary medical care and evaluation for progression of infection to disease, as well as treatment. In addition, infected persons need to be provided with counseling and guidance on how to stay healthy and prevent disease progression. They also should be instructed about how to reduce the risk for transmitting their infections to others, receive encouragement to seek further medical evaluation, and, if necessary, be given information about the importance of adhering to medical treatment regimens. Most persons who use drugs illicitly are capable of adhering actively to complex medical regimens (148,316–319). Persons who use drugs illicitly and are HIV-positive are capable of adhering to HIV treatment (318,319). Antiretroviral therapy for HIV infection reduces HIV transmission (320). Therefore, past or current illicit use of drugs should not be considered a contraindication to successful treatment for infectious diseases. Treatment of infectious diseases reduces and potentially prevents transmission of infectious diseases in the communities where persons who use drugs illicitly reside (317). Sex partners and drug-using partners and contacts of infected persons should be identified and provided with prevention information, in addition to referral for medical evaluation and for treatment, if necessary.

Adherence to treatment of infectious diseases among persons who use drugs illicitly can be enhanced by addressing different comorbid conditions, including mental disorders and such other factors as poverty-related issues, including homelessness and limited access to transportation (321–323). HIV treatment is greatly improved by treatment of substance abuse (9). Among persons who use drugs illicitly and who have active TB, use of incentives and enablers to encourage clinic visits has been associated with improved treatment adherence (98,134,324,325), better doctor-patient relationships, and delivery of TB treatment in substance abuse treatment programs or methadone-maintenance programs (326). Directly observed therapy (DOT) for TB, in which the infected person receives treatment for TB infection or TB disease in the presence of a provider, and shorter treatment regimens have improved treatment adherence and completion among patients, including those who use drugs illicitly (3).

There is a potential for harmful medication interactions or toxic effects in the treatment of persons with multiple infections who inject drugs illicitly. Adverse effects of medications can include the effects of HIV antiretroviral medications on liver, kidney, and neurologic functions. Providers should consider how different antiretroviral medications or antibiotics might interact with methadone or with drugs used illicitly when selecting a medical treatment regimen for persons who inject drugs illicitly and have multiple infections (9,327,328). For example, rifampin, a first-line medication for treating TB, interacts both with methadone (for treating addiction to heroin) and with efavirenz and nevirapine (for treating HIV infection) (329,330).

Before 2002, the National Institutes of Health (NIH) considered illicit use of drugs a contraindication for HCV treatment, meaning that persons who used drugs illicitly were routinely denied medical treatment for HCV infection. In 2002, NIH issued a consensus statement that HCV treatment for persons who use drugs illicitly should be considered on a case-by-case basis (331). Since then, according to some studies, illicit use of drugs during HCV therapy has been associated with lower rates of adherence and with increased risk for reinfection (332,333) although this association has not been demonstrated consistently (334). Other studies have indicated that HCV treatment adherence among persons who use drugs illicitly was increased by use of integrated service models that included mental health and substance abuse treatment (335,336), peer-based support groups (335), and a specific version of DOT for HCV treatment (337). Persons who use drugs illicitly should be counseled to avoid alcohol and other drugs that are harmful to the liver and to seek treatment for substance use and, if necessary, for mental disorders (338).

Delivery of Integrated Prevention Services

Persons who use drugs illicitly can benefit from comprehensive (or at least combination) services that meet their individual clinical needs or community needs. They can be expected to benefit from synergy among services that are delivered jointly at the service delivery level as integrated services.

Comprehensive Interventions

The Joint United Nations Programme on HIV/AIDS (UNAIDS), the United Nations Office on Drugs and Crime (UNODC), and the World Health Organization (WHO) have endorsed nine interventions for comprehensive HIV prevention for persons who inject drugs illicitly (5). This comprehensive package includes syringe exchange programs; substance abuse treatment, including medication-assisted therapy; voluntary HIV counseling and testing; antiretroviral therapy for those who are HIV-infected; STD prevention and

treatment; condom distribution; information, education, and communication for persons who inject drugs illicitly and for their partners; hepatitis diagnosis and treatment or vaccination; and TB prevention, diagnosis, and treatment (5).

In endorsing comprehensive prevention using nine interventions for HIV prevention (also referred to as “combination prevention”), UNAIDS, UNODC, and WHO have noted that although each intervention is useful for HIV prevention and care for persons who inject drugs illicitly, the nine interventions form a package and have the greatest beneficial impact when delivered together to a person who needs them (5). Thus, comprehensive prevention can bring scientifically based behavioral, biomedical, and structural interventions to persons who use drugs illicitly (281,339) because it offers a multipronged approach for addressing complex social and public health needs (113,281,340). Decisions about the comprehensive interventions to be offered in a particular program or community need to be influenced by three factors: the local epidemiology of infectious diseases and substance use and mental disorders, the spectrum of already existing services, and the patterns of illicit drug use (5).

Integrated Services

At the service delivery level, service integration offers an opportunity to optimize the effect of comprehensive interventions. CDC defines service integration as a distinct method of service delivery that provides persons with seamless services from multiple programs or areas within programs without repeated registration procedures, waiting periods, or other administrative barriers (18). Service integration differs from system coordination, in which services from multiple agencies are provided but persons might have to visit different locations and register separately for each provider’s programs to obtain these services (18). Service integration is intended to enhance the receipt of comprehensive or multiple interventions that persons who use drugs illicitly need and to target methods of service delivery, with an emphasis on co-locating services or having a single point of entry. Recently, European agencies and partners have called for targeted delivery of services to persons who inject drugs and have suggested that services should be combined, organized, and delivered according to user needs and local conditions (341).

Thus, comprehensive prevention refers to the range, content, type, and combination of interventions that persons need. Delivery and outcomes of comprehensive services for individual and public health benefits can be enhanced by following the principles of service integration at the service delivery level.

Programmatic Initiatives on Service Integration

Syringe exchange programs provide integrated preventive services for persons who use drugs illicitly (275,342). These

services include screening for HBV and HCV infections, vaccination for HAV and HBV (343), and HIV and STD testing (252). Other integrated services include integration of HIV, TB, and substance abuse treatment services (83); integration of HCV and HIV prevention services (343,344); and integration of viral hepatitis, HIV, and STD services (345). In New York State several substance abuse treatment centers have implemented a comprehensive prevention program of outreach, HIV education, counseling, testing, referral, and partner notification (343). The Massachusetts Department of Public Health has integrated its HIV, hepatitis, and addiction services (346). San Diego offers an integrated program of hepatitis, STD, and HIV prevention services (347).

Programmatic evidence supports the need for providing comprehensive or integrated services for persons who use drugs illicitly (113,339,348–352). Other integrated guidelines emphasize the importance of integrated services for optimizing prevention of and treatment of HIV infection, viral hepatitis, STDs, and TB (18,148,353,354).

Evaluation and Research Initiatives on Integration

The scientific evidence is increasing for development, implementation, and evaluation of projects that focus on program collaboration and service integration (349,350,354–356). For example, description of the process of implementing integrated services provides rich information on the feasibility and benefits of this effort (132,214,335,336,342–345,347,357–365). Studies that examined outcomes of integrated services show a decrease in high-risk behaviors; an increase in testing for HIV infection, viral hepatitis, STDs, or TB; an increase in prevention and treatment services; and better adherence to prevention and treatment regimens (340,356,366–369). Economic analyses demonstrate the cost or cost-effectiveness of integrated services (346,347,370–372).

The scientific evidence is largely built on observational studies and demonstration projects. These studies and projects provide sufficient evidence for implementing and evaluating the effectiveness of integrated prevention services (132,214,335,336,340,342–345,347,356–372).

Future Research and Allocation Approaches

New research studies and demonstration projects, including quasi-experimental studies (373,374) and cost-effectiveness studies, would add to the evidence base for integrated services. Such new initiatives would provide a basis for estimating the specific effect of integrated services relative to other concurrent public health services (e.g., comprehensive but not integrated

services, limited integrated services vs. expanded integrated services) and would control for possible confounders (e.g., changes in drug use, injection use, sexual risk behaviors, the drug market, reimbursement mechanisms, funding opportunities).

It is also relevant to identify whether there are certain subpopulations of persons who use drugs illicitly (e.g., younger persons, racial and ethnic minority persons) who need or who would benefit from integrated services more than other subpopulations. To strengthen the evidence-base for integrated services, conducting systematic reviews or a meta-analysis of the effects of integrated services and grading the evidence will be relevant (110,375–379). Meta-analyses of observational studies of public health programs can provide useful information, because although randomized controlled trials have their advantages, they might still have weaknesses in terms of their implementation and analysis or their application to public health programs (380,381).

Mathematical modeling, as well as spatiotemporal epidemiology methods, can inform public health decision making (382,383). The Bradford Hill criteria and other methods for assessing causality remain relevant for evaluation of integrated services (384–387). Clinical and health outcomes can be enhanced by population-specific funding streams and allocation of resources for programs for persons who use drugs illicitly or for integrated services for this population. Tracking the monetary resources allocated for this population, as well as the resources devoted to integrated services for this population can enhance delivery of integrated programs and can be useful in evaluating the cost-effectiveness of integrated services.

Examples of Integrated Services in Particular Settings

Many settings, including primary care settings, are important venues for providing integrated services. Examples of integrated services that are based on recommendations and guidelines of science-based public health strategies for prevention and treatment of infectious diseases for persons who use drugs illicitly, as summarized in this guidance, have been provided (Table). By definition, services that are infection-specific or disorder-specific are nonintegrated services and are not represented in tabular form. Recommended science-based public health strategies that health-care providers and public health providers can implement to reduce the risk for HIV infection, viral hepatitis, STDs, and TB among persons who use drugs illicitly have been summarized (Box 5), and a list of recommendations and guidelines in which these strategies are outlined is provided (Appendix B).

TABLE. Examples of integrated prevention services that can be delivered in different settings to persons who use drugs illicitly and examples of monitoring and evaluation indicators

STD clinical setting	TB clinical setting	Correctional institution	HIV clinical setting	Setting for treatment of substance use disorders	Setting for treatment of mental disorders
Examples of integrated prevention services					
Unless already known to be HIV-positive, all patients seeking treatment for STDs screened routinely for HIV infection during each visit for a new concern, regardless of whether the patient is known or suspected to have specific risk behaviors for HIV infection	All patients who have confirmed or suspected TB screened for HIV infection	Routine HIV testing, TB screening, and vaccination for viral hepatitis A and B	TB, syphilis, chlamydia, and gonorrhea screening conducted for newly diagnosed HIV-positive persons	Routine HIV testing, TB screening, and vaccination for viral hepatitis A and B provided or via coordinated referral	Routine HIV testing, TB screening, and vaccination for viral hepatitis A and B (HAV/HBV) provided or via coordinated referral
STD clinics routinely offer HBV vaccination as recommended to patients	Referrals to care for HIV-positive persons documented and tracked	Screening of young women in jails and juvenile detention centers for gonorrhea and chlamydia	HBV immunization and HCV testing for all patients	HCV testing provided or via coordinated referral	HCV testing provided or via coordinated referral
Referrals to care for HIV-positive persons documented and tracked	Access or referral to services for sterile drug injection or clean preparation equipment and education on prevention of overdose	HIV-infected inmates referred to HIV clinical services during and after incarceration, and progress tracked	Ongoing, routine assessment of risk behaviors and at least annual screening for syphilis and other STDs	HIV-infected patients referred to HIV clinical services during and after treatment for substance abuse and progress of HIV/AIDS status tracked	HIV-infected patients referred to HIV clinical services, during and after treatment for mental disorders and progress of HIV/AIDS status tracked
Partner services offered to HIV-positive persons	Comprehensive HIV, STD, and viral hepatitis prevention services, as well as assessment services for reproductive health, drug use, alcohol misuse, and mental health	Access to sterile drug injection or clean preparation equipment and condoms	Partner services for HIV-positive persons	Chlamydia and gonorrhea urine-based screening at intake for all patients	Chlamydia and gonorrhea urine-based screening at intake for all patients
Access to sterile drug preparation equipment and condoms	Education on prevention of overdose	Education on prevention of overdose	Access to sterile drug injection or clean preparation equipment and condoms	Syphilis screening for patients at intake per local epidemiologic data	Syphilis screening for patients at intake per local epidemiologic data
Education on prevention of overdose	Case management for housing and for prevention and treatment of drug use, alcohol misuse, and mental health disorders	Persons addicted to opiates offered medication-assisted therapy while incarcerated or via referral at discharge	Education on prevention of overdose	Access to sterile drug injection or clean preparation equipment and condoms	Access to sterile drug injection or clean preparation equipment and condoms
Persons at high risk recruited and referred to HIV prevention behavioral health interventions	Persons who inject drugs referred for substance abuse treatment including medication assisted therapy	Comprehensive health risk assessment services for TB, HIV, STDs, and viral hepatitis as well as counseling for reproductive health, drug use, alcohol misuse, and mental health disorders	Comprehensive health risk assessment services for TB, STDs, and viral hepatitis as well as partner services and behavioral health interventions for reproductive health, drug use, alcohol misuse, and mental health disorders	Education on prevention of overdose	Education on prevention of overdose
Persons who inject drugs referred for substance abuse treatment including medication-assisted therapy		Case management for housing/drug/alcohol/mental health services and discharge planning to inmates for appropriate follow-up care in the community		Persons at high risk recruited and referred to STD/HIV prevention behavioral health interventions	Persons at high risk recruited and referred to STD/HIV prevention behavioral health interventions
		Routine screening for syphilis, chlamydia, and gonorrhea		Routine screening for syphilis, chlamydia, and gonorrhea	Routine screening for syphilis, chlamydia, and gonorrhea
Examples of monitoring and evaluation indicators					
% of persons treated for an STD who are tested for HIV infection	% of persons treated for TB who are tested for HIV infection	% of inmates screened for infection with HIV, TB, and viral hepatitis	% of HIV-positive persons who are screened for TB, syphilis, chlamydia, or gonorrhea	% of persons screened for HIV infection, TB, gonorrhea, chlamydia, and viral hepatitis	% of persons screened for HIV infection, TB, gonorrhea, chlamydia, and viral hepatitis
% of eligible persons receiving HBV vaccination	% of persons with newly diagnosed HIV/TB co-infection who are referred and linked to quality HIV care	No. of inmates diagnosed with syphilis, chlamydia, or gonorrhea	% of HIV-positive persons offered partner services	% and no. of patients diagnosed with syphilis, chlamydia, or gonorrhea	% and no. of patients diagnosed with syphilis, chlamydia, or gonorrhea
% of persons at high risk for HIV infection who are enrolled in HIV behavioral health interventions	% of homeless persons being treated for TB who receive case management for social services	% of inmates receiving HAV/ HBV vaccination	% of high-risk persons who have TB, STD, or viral hepatitis infection	% of tested persons who test positive for HIV, TB, or viral hepatitis	% of tested persons who test positive for HIV, TB, or viral hepatitis
		% of tested inmates who test positive for HIV, TB, or viral hepatitis		% of persons receiving HAV/ HBV vaccination	% of persons receiving HAV/ HBV vaccination
		% of inmates with diagnosed HIV infection, syphilis, chlamydia, gonorrhea, TB, or viral hepatitis who receive comprehensive discharge planning and continued care		No. of persons determined to have TB, STDs, or viral hepatitis	No. of persons determined to have TB, STDs, or viral hepatitis

Abbreviations: HAV = hepatitis A virus; HBV = hepatitis B virus; HIV = human immunodeficiency virus; STD = sexually transmitted disease; TB = tuberculosis.

Special Considerations for Prevention and Control of Infectious Diseases

Several factors are integral to the success of prevention of HIV infection, viral hepatitis, STDs, and TB among persons who use drugs illicitly. These factors include understanding how contextual factors, mental health needs, and fear of criminalization or stigmatization, can affect prevention and treatment efforts, and how effective patient-provider relations and communication can help ensure that the needs of persons who use drugs illicitly are met.

Contextual Factors

The general environment, with its different influencing factors (e.g., laws, policies, social factors) and different levels of influence (e.g., macro and micro), affects risk behaviors and transmission of HIV infection, viral hepatitis, STD, and TB (10,388–390). Contextual factors influence differentially the exposure of majority and minority racial and ethnic groups to risky environments, risk-reduction interventions, and access to prevention and treatment services (335,391–394). As an example, the nature of a neighborhood influences risk behaviors (391,392). Black persons who use drugs illicitly have been more likely to be arrested and to receive longer sentences (10,27). Spatial or geographic access to pharmacies that sell syringes over the counter has been lower in areas that have lower proportions of non-Hispanic whites (84). Laws that inadvertently make pregnant drug-using women reluctant to seek prenatal care because of fear of incarceration or fear of losing the newborn child to foster care and prevention programs that do not offer training or services in drug overdose prevention can have a negative impact on the health and well-being of persons who use drugs illicitly (84,88,275,395).

Persons who use drugs illicitly often live in unstable housing or experience periods of homelessness. Their lives are complicated by other factors, such as poverty, unemployment, lack of social support, and discrimination because of prior incarceration. Their health status is often poor because of inconsistent health care, poor nutrition, lack of health insurance, and interruptions in care due to incarceration and loss to follow-up after incarceration (13,396). Long waiting periods during appointments for medical care and the need for repeat visits to receive HAV and HBV vaccinations, HIV and HCV treatment, and test results for infectious diseases are often barriers to receipt of prevention and treatment services (397–402). Providing prevention and treatment services in convenient locations and at convenient times reduces the need for repeat visits and can increase the likelihood of obtaining necessary services (403,404). Providing

BOX 5. Science-based public health strategies for persons who use drugs illicitly to reduce human immunodeficiency virus (HIV) infection, viral hepatitis, sexually transmitted diseases (STDs), and tuberculosis (TB)

- Recommend services for prevention and treatment of substance use and mental disorders.
- Provide information or training in overdose prevention.
- Refer to outreach workers.
- Assess risk for illicit use of drugs.
- Assess risk for HIV infection, viral hepatitis, STDs, and TB.
- Screen for HIV, viral hepatitis, STDs, and TB.
- Provide prevention counseling for HIV infection, viral hepatitis, STDs, and TB.
- Vaccinate against hepatitis A and B and human papillomavirus, as recommended.
- Recommend or offer services for prevention of mother-to-child transmission of infectious diseases.
- Provide information on risk-reduction of high-risk behaviors.
- Provide health education and risk-reduction interventions and programs.
 - Provide substance abuse treatment, including medication-assisted therapy.
 - Provide access to new, sterile needles and to clean drug preparation equipment.
 - Provide access to condoms.
- Provide partner services and contact follow-up.
- Provide public health and medical services to those who test positive for HIV infection, viral hepatitis, STDs, and TB.
- Provide referral and linkage to treatment and care.
- Offer treatment adherence counseling.
- Provide information about interactions of medications and drugs.
- Implement integrated services.
- Address social needs, as feasible.

Sources: See Appendix B for a list of recommendations and guidelines that outline these public health strategies.

treatment for HIV infection, viral hepatitis, STDs, and TB is in itself a preventive intervention that reduces the risk for transmitting infection to others who live in the same high-risk environments or engage in similar risk behaviors. Coordination with public agencies (e.g., Medicaid services and state AIDS drug assistance programs) that provide or reimburse for health care can mitigate barriers associated with cost of care (405).

Mental Health Needs

Persons with substance use disorders are at elevated risk for depression, anxiety, and severe mental illness, compared with persons who do not have substance use disorders (15). At least in part, persons might use drugs illicitly and drink alcohol in excess to self-treat pre-existing or concurrent mental disorders (406,407). Persons with HIV infection who use drugs illicitly often live in socially and economically disadvantaged communities characterized by a high prevalence of psychosocial problems (408). Similarly, depressive symptoms are highly prevalent among HCV-infected persons who use drugs illicitly (409,410). Persons who use drugs illicitly and have depressive symptoms are less likely to be tested for HIV infection than are persons who use drugs illicitly and do not have such symptoms (399). Mental health disorders often hinder persons who use drugs illicitly from receiving health-care services, and such disorders can be a barrier to eligibility for treatment. For example, uncontrolled depression is a contraindication for starting HCV antiviral treatment; thus, screening for and treating depression are prerequisites for providing HCV treatment to HCV-infected persons who use drugs illicitly (338). Providers of mental health services have an important role in substance abuse treatment and clinical HCV treatment.

Fear of Criminalization or Stigmatization

The fear of being arrested because of illicit drug use can prevent persons who use drugs illicitly from seeking prevention services for HIV infection, viral hepatitis, STDs, or TB (248,411). They might fear that interacting with health authorities, prevention providers, or substance abuse treatment programs will lead to arrest or prosecution (253,412). Thus, while the intent of the laws is to reduce illicit drug use, the laws also might unintentionally reduce use of prevention and treatment services by persons who use drugs illicitly.

Perceptions held by peers of persons who use drugs illicitly might stigmatize the use of prevention and treatment services (413–415). For example, persons who inject drugs illicitly might be deterred from participating in syringe services programs for fear of stigmatization (416). Persons who use drugs illicitly cite fear of social discrimination as a reason for not getting tested for HIV infection (417). They often are marginalized socially and estranged from their families; consequently, they might fear being dually stigmatized as having HIV infection or another disease. Because of these fears, persons who use drugs illicitly might have concerns about confidentiality when visiting medical providers or using prevention or treatment services. Community-based organizations, health-care providers, and law enforcement staff should work together to ensure that persons who use prevention services are treated according to ethical principles and human rights considerations, that confidential and identifying information are protected, and that no unintended harm is done (109,418–420).

Patient-Provider Relations and Communication

How persons who use drugs illicitly and health-care providers perceive each other can be a barrier to a person's receipt of services. Persons who use drugs illicitly have reported avoiding screening or counseling and testing because they perceive health-care providers to be uncaring, indifferent, or unfamiliar with treating patients with substance use disorders (399,403,411). Tension in the client-provider relationship can result from the patient's perception that the provider cares more about the disease than about the person with the disease, often making persons who use drugs illicitly feel unacknowledged (421). They might also feel that providers have not given them sufficient information on the effectiveness, complexity, and side effects of medical treatment regimens (422).

Health-care providers might have negative perceptions of persons who use drugs illicitly (332,400,411). For example, HIV and HCV treatment providers might perceive persons who use drugs illicitly as not likely to adhere to treatment regimens or to keep appointments (393,396,423). Such perceptions have led to decreased initiation of medical care by persons who use drugs illicitly (402). In spite of such perceptions, however, health-care providers can be poor predictors of patients' treatment adherence (424); a number of studies have shown that persons who use drugs illicitly have adhered to medical treatment regimens, particularly when special considerations and incentives were provided (243,318,425–427). Researchers have formulated 13 principles for managing health-care relationships with users of heroin and cocaine (332,428). Although these principles were developed specifically for HCV treatment, they can be used for treating other medical conditions, including HIV infection (203,332,428; Box 6).

In addition to ensuring conditions for successful delivery of services for persons who use drugs illicitly, administrative directors and decision makers at local venues providing services to this population need to be cognizant of relevant programmatic considerations. These considerations have been summarized (Box 7).

Practical Aspects of Delivery of Integrated Prevention Services

Overview

Many public health systems have separate organizational structures and programs for the delivery of prevention and treatment services for HIV infection, viral hepatitis, STDs, and TB. These structures and programs often operate separately from substance abuse treatment centers or mental health services, with separate funding streams, management structures, and operating procedures. Integrated prevention

BOX 6. Principles for managing health-care relationships between providers and persons who use drugs illicitly

- Develop a professional relationship that shows mutual respect and avoids blame or judgment.
- Educate persons who use drugs illicitly about health care and how to advocate for their own health.
- Include persons who use drugs illicitly in decisions about their treatment.
- Establish, where practical and affordable, a multidisciplinary case-management team.
- Have a primary care provider be responsible for coordinating care.
- Develop an understanding about the responsibilities of persons who use drugs illicitly and their service providers.
- Respond to behaviors that run against agreed-upon expectations or limits.
- Reduce barriers to accessing health care.
- Establish realistic healthful behavior goals to which persons who use drugs illicitly can commit.
- Emphasize the importance of risk reduction measures.
- Recognize that success in building relationships and healthful behaviors might require several attempts.
- Learn about local health service resources for persons who use drugs illicitly.
- Avoid common pitfalls in treating persons who use drugs illicitly (e.g., having unrealistic expectations, becoming frustrated or angry, moralizing, assigning blame, and withholding therapy).

Sources: Des Jarlais DC, Semaan S. HIV prevention for injecting drug users: the first 25 years and counting. *Psychosom Med* 2008;70:606–11; Edlin BR, Kresina TF, Raymond DB, et al. Overcoming barriers to prevention, care, and treatment of hepatitis C in illicit drug users. *Clin Infect Dis* 2005;40(Suppl 5):S276–85; Edlin BR. Hepatitis C prevention and treatment for substance users in the United States: acknowledging the elephant in the living room. *Int J Drug Policy* 2004;15:81–91.

implies service coordination to ensure delivery and receipt of prevention services (e.g., screening, testing, prevention counseling) for two or more infections or health conditions during a single visit at a venue (336,361). The need for holistic services is particularly great for persons who use drugs illicitly because of increased risk among these persons for having or acquiring multiple infections and health conditions. Delivery of integrated prevention services can help with this need (385) because it can improve the efficiency and the quality of services provided, maximize opportunities for comprehensive services, and reduce service duplication and procurement and distribution costs (148,346).

BOX 7. Programmatic considerations for providers of public health programs to reduce infectious diseases in persons who use drugs illicitly*

- Have knowledge of local syndemics.[†]
- Build partnerships (e.g., with patients, other public services).
- Provide recommended science-based comprehensive services.
- Establish stronger linkages to prevention and care services.
- Deliver integrated services, as relevant and feasible.

*This box provides considerations as recommended in this report.

[†]Syndemics refer to the synergistic interaction of two or more coexistent diseases and to the resultant excess-burden of disease. Source: Singer M, Clair S. Syndemics and public health: reconceptualizing disease in bio-social context. *Med Anthropol Q* 2003;17:423–41.

Referrals, based on the needs of persons who use drugs illicitly, can be made for treatment, care, and supportive services and can include necessary assistance to facilitate initial and follow-up contact with appropriate service providers. Referrals to other service providers through a coordinated referral system represent a useful approach that can improve service provision. Providing treatment for HIV infection, viral hepatitis, STDs, and TB should be facilitated as interventions for preventing transmission of these diseases. Where feasible, treatment for substance use and mental disorders needs to be integrated with prevention and treatment services for HIV infection, viral hepatitis, STDs, and TB, thereby reducing barriers to care associated with illicit use of drugs.

Factors influencing integration of prevention services include separate, often categorical programs (362); program differences in approaches to service delivery; a lack of staff training in implementing integrated services (132,351); program resistance to integration because of fear that it will lower the quality of core services (148,360,362); and providers' resistance to providing prevention services for additional infectious diseases or health conditions, because of concerns about demands on staff and staff burnout (344,351,362,368). Success in reducing these barriers can be rewarded by efficiencies gained through integration of prevention services and improvement in clinical and public health outcomes for persons who use drugs illicitly (367).

Although maximizing opportunities for providing comprehensive services might be ideal, service integration might not be achievable in every setting because it is dependent on local needs and because of funding, organizational, or policy constraints (214). Providing prevention services for HIV infection, viral hepatitis, STDs, and TB for persons who use drugs illicitly, including treatment for substance use and mental disorders, requires coordinated and

collaborative planning approaches, an integrated service delivery plan, and a plan for monitoring and evaluating integrated service delivery (9,352,359,429). An overview of the key practical components necessary for implementing integrated services is provided (Figure 1).

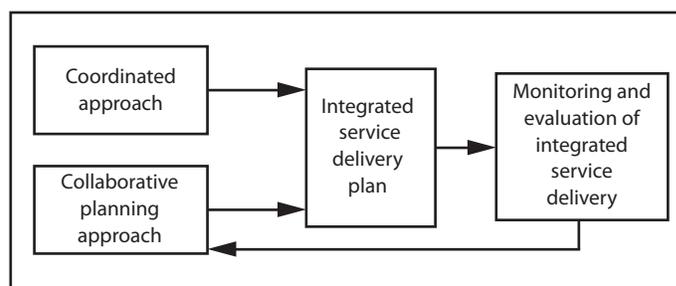
Coordinated and Collaborative Planning Approaches

Health officials who aim to improve delivery of integrated prevention services for persons who use drugs illicitly need to use the best available evidence to understand the local needs regarding services for HIV infection, viral hepatitis, STDs, and TB for this population. They also need to consider the extent to which integrated services are offered and the collaborations that are in place to prevent and reduce infectious diseases, as well as substance use and mental disorders. Relevant settings for integrated services include those that interact with or serve persons who use drugs illicitly, such as outreach programs; syringe services programs; public health clinics; jails, prisons, and juvenile detention centers; and substance use and mental disorders treatment centers.

In general, collaborative planning for service integration requires a high-level coordinating body composed of key staff with expertise in designing, implementing, and managing service delivery for HIV infection, viral hepatitis, STDs, and TB. The composition and authority of the coordinating body are locally determined, and need to be endorsed officially at the highest level possible to enable it to leverage resources and identify or develop policies that support integrated prevention services. Because service integration requires commitment and communication among the agencies whose services are to be integrated, the coordinating body needs to include leaders from these agencies. The coordinating body needs to also include representation from community-based organizations that provide prevention services and representation from the community of persons who use drugs illicitly.

Although strategies for limited service integration might be implemented with existing resources, extensive integration might require additional investments. Cost-sharing among programs might be one way to facilitate collaboration and integration among programs that agree to integrate their services; another way to facilitate such collaboration and integration might include providing free test kits or vaccines through grants and other initiatives (21). The coordinating body also can work to reduce the stigmatization of persons who use drugs illicitly, a factor that often leads to reluctance to fund programs designed to help this population. Ensuring that participating programs are reimbursed adequately and ethically for their cooperation in any plan for integrated services is

FIGURE 1. Key practical components recommended to implement integrated services*



* This figure displays components of integrated services as recommended in this report.

essential (1,343,430). Guidance from state and regional public health officials might be required for implementing integrated services at the local and agency levels; the particulars are best determined locally.

Integrated Service Delivery Plan

The coordinating body needs to develop a mutually beneficial plan across programs. The plan needs to clarify the specific opportunities for collaboration and integration, to use this information to reduce operational barriers, and to outline the specific steps for delivery of integrated services. When developing the plan, the coordinating body needs to evaluate the strengths and weaknesses of the various programs that might be involved in planning and delivering integrated prevention services.

The plan needs to describe how services are currently provided and whether an integrated approach would be an improvement over a single infection- or disease-specific approach. The plan also needs to describe needed changes in policies, procedures, and methods of service delivery; additional training required for staff; and strategies to monitor and evaluate integrated service delivery (70,148).

The coordinating body needs to ensure that the proposed plan does not adversely affect the delivery of services or the mission of the program, meets the public health needs of persons who use drugs illicitly, is acceptable to providers and clients, and is consistent with state and local laws and policies. The plan must ensure that core program activities are sustained and are based on a realistic assessment of each program's capacity for collaboration or integration. The service plan needs to include clear guidance for implementing public health strategies in a coordinated approach. On the basis of available resources, the plan needs to indicate whether specific prevention services are to be provided on-site by cross-trained staff or by providers at other sites to whom those in need of these services are referred through a clearly defined referral and linkage-to-care system. The plan also needs to define the roles and responsibilities of all service providers, ensure that they

are trained appropriately, and clarify lines of communication among venues or programs participating in the proposed delivery of integrated prevention services. The plan needs to specify how confidentiality will be maintained and how client information (e.g., risk assessment, test results, vaccination histories) will be shared among service providers.

The plan also needs to specify the needs for staff training. Whether prevention services are provided in a single or in a coordinated fashion between multiple locations or services, providers might need training in the screening, diagnosis, treatment, and prevention of other related infectious diseases, along with training about issues related to co-infection. Studies have demonstrated that training is essential to integrating services in prevention and treatment settings for substance use and mental disorders (132,351,368). One example of successful cross-training programs for service providers is a hepatitis training program that SAMHSA developed and provided to more than 150 substance abuse treatment programs (21), including training modules on the delivery of hepatitis services to persons who use drugs illicitly in New York City (343). Training in the prevention of multiple conditions can be provided either by expanding an established training program for the treatment of a single infection or disease or by providing separate but coordinated training in the prevention or treatment of each infection or disease (362). Moreover, training in the provision of integrated service delivery should continue after services have been integrated (431).

In addition to cross-training, service providers might need training that is specific to working with persons who use drugs illicitly. Training sessions should address how illicit use of drugs affects persons' lives and how to be sensitive to the stigma and discrimination related to illicit use of drugs and infectious diseases. Improved sensitivity and understanding among service providers about prevention needs might help improve patient-provider relations and reduce barriers to service recipients when they discuss illicit use of drugs with service providers.

Monitoring and Evaluation of Integrated Service Delivery

Monitoring and evaluation have been defined as systematic and rigorous applications of scientific qualitative and quantitative methods to assess the design, implementation, and outcomes of programs (432,433). Monitoring and evaluation projects frequently require such resources as evaluator expertise, staff, time, and a sizeable budget (432). Relevant frameworks and publications can assist in developing and conducting monitoring and evaluation of integrated services (432,434–437). Three tiers of evaluation questions (Are the right things being done? Are they being done right? Are they being done on a large enough scale?) also can be used to determine what is being done, ensure

that enough persons benefit from the program, and achieve the intended outcomes and impact (436). Thus, monitoring and evaluation projects of integrated services can focus on reductions in new infections resulting from service integration, as well as on other health outcomes, such as changes in mortality rates. Pertinent monitoring and evaluation questions of integrated service delivery programs can assess the extent to which these programs identify comorbid infections and diseases, provide relevant prevention and treatment services, and prevent and treat comorbid infections and diseases. An overview of integrated prevention services that can be delivered in multiple settings and in an integrated fashion has been provided (Table).

Other aspects of monitoring and evaluation include those that assess integration strategies (e.g., coordinating groups, co-location of services, pooled funding, cross-training of staff). An organizational index can measure operating costs and can provide an objective structured method to evaluate the organizational process associated with program collaboration and system integration (355).

Monitoring and evaluation activities can benefit from cost-effectiveness analysis that compares the relative costs and outcomes of two or more programs (438). Cost-effectiveness of a program typically is expressed as an incremental cost-effectiveness ratio, i.e., the ratio of change in costs to the change in the outcomes (e.g., years of life gained, number of infections averted, and quality-adjusted life years saved) (439,440). Cost-effectiveness analysis can be useful in comparing similar outcomes of different programs (e.g., integrated vs. nonintegrated programs, limited integrated programs vs. expanded integrated programs). Programs are considered cost-saving when the program implementation cost is less than the health care costs avoided by the program. For example, if an integrated program incurs \$10,000 for screening and treatment costs and avoids \$20,000 in future treatment cost, the program is cost-saving. The program can still be considered to be cost-effective even if it does not avert enough sequelae cost to be cost-saving. A program that has a net cost (program cost minus averted sequelae cost) that is lower than the threshold cost being used per case of infection averted might be considered cost-effective, compared to another program, even if it is more expensive, if it prevented more cases (441,442). When calculating the costs and benefits of integrated service programs, researchers and program planners need to define the perspective of interest (e.g., a specific program, a community-based organization, the entire health care system, or society as a whole). The perspective determines the costs and benefits to be included in the calculations. For example, a societal perspective cost-effectiveness analysis includes all costs and benefits associated with a program, whereas a health care-system perspective cost-effectiveness analysis includes direct medical costs but excludes costs borne solely by patients (e.g., transportation and lost productivity). Economic analysis

can be considered with other factors (e.g., population prevalence and disease prevention goals) in implementing and evaluating integrated services.

From a practical perspective, a monitoring and evaluation plan that discusses and depicts the relationship between implementation and outcomes can guide monitoring and evaluation activities. The plan specifies the goals and objectives of the program and it can be used to develop a conceptual framework that links the input, activities, output, outcomes, and impact of integrated services. An example of how to lay out these components is provided (Figure 2). The plan also can establish realistic expectations for the monitoring and evaluation activities. In addition, monitoring and evaluation plans need to describe in sufficient detail how to evaluate the process, outcomes, and effectiveness, including cost-effectiveness of service integration. Local stakeholders need to be involved in developing monitoring and evaluation plans and in setting goals for improving the delivery and effectiveness of integrated prevention services (368). Monitoring and evaluation activities can be supported by data systems that track services and client data. Data collected for each activity before services are integrated can be used as baseline measures of prevention services, and changes in those measures can be used to assess the effectiveness of service integration. In addition, there is a need to define and to monitor routinely indicators for delivery of new services that are provided as a result of implementing integrated services (Table), including indicators of clients' perspectives and satisfaction. Surveys of persons who use drugs illicitly can assess during the planning phase their opinions about the feasibility of proposed integrated services, and, as part of process evaluations, the extent to which integrated prevention services are implemented as planned. Surveys of frontline service providers can assess during the planning phase their opinions about the feasibility of various proposed integrated services, and as part of process evaluations, the extent to which integration prevention activities are implemented as planned.

Surveillance data for HIV infection, viral hepatitis, STDs, or TB can be examined jointly so that health officials can analyze trends in disease prevalence and co-infection. Joint examination of surveillance data might include reviewing or publishing data on similar variables from the separate surveillance systems (443,444), collecting and analyzing data on a standardized set of variables, and integrating discrete surveillance systems into a single entity.

Sharing surveillance information across jurisdictions can be complicated by political, legislative, or regulatory issues. The sharing of combined data on multiple infectious diseases must be consistent with data confidentiality standards for each disease. For example, when HCV data are incorporated into an existing HIV data system (445), the data should be treated

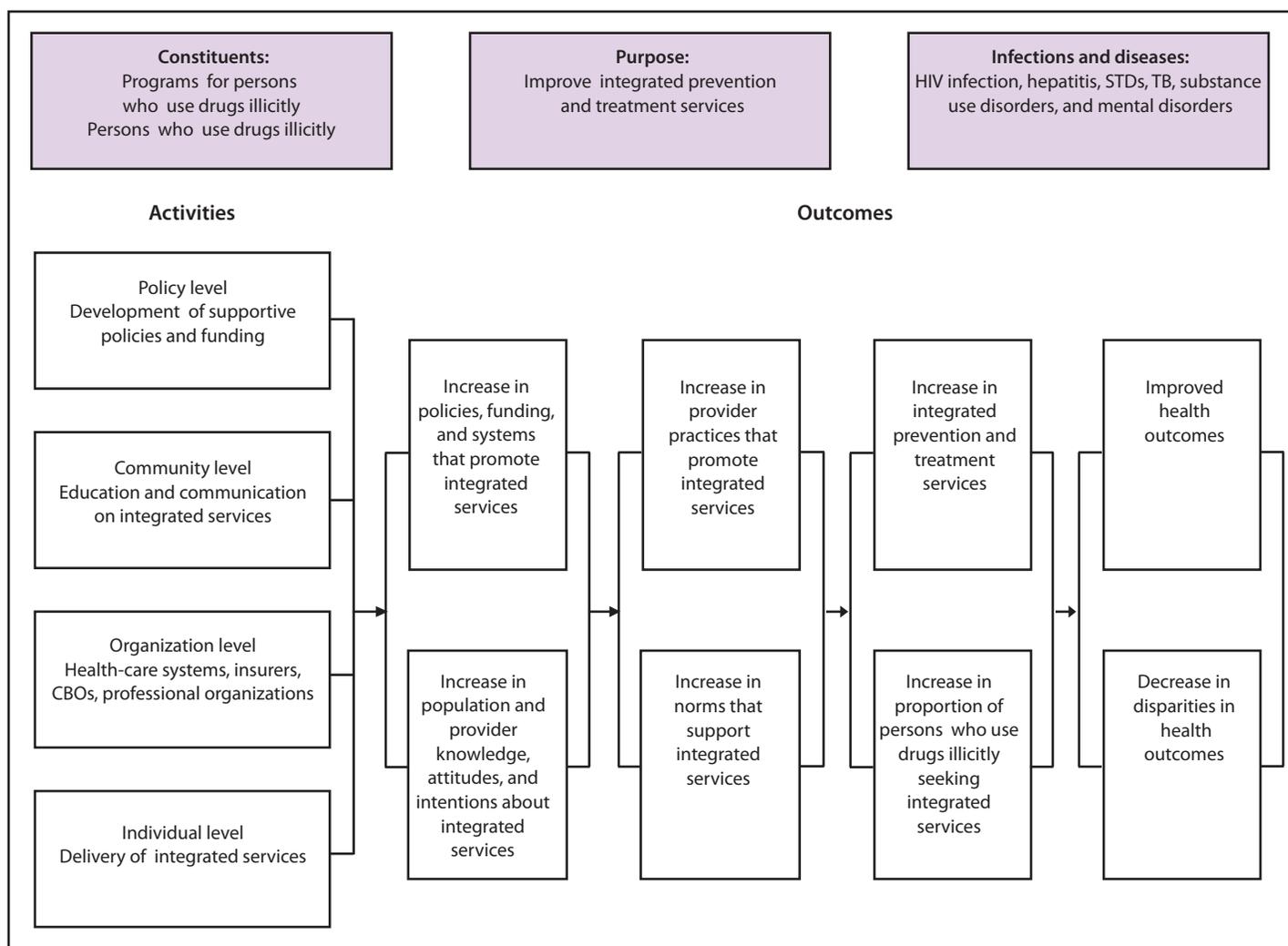
with the same strict security and confidentiality protections required for all U.S. HIV surveillance data (446,447).

Conclusion

This guidance is intended to support the efforts of agencies, programs, and providers to implement science-based public health strategies for integrated prevention services at venues that serve persons who use drugs illicitly. It summarizes multiple current (as of 2011) guidelines or recommendations for the prevention and control of HIV infection, viral hepatitis, STDs, and TB for persons who use drugs illicitly and provides a summary of published scientific and programmatic literature. An integrated approach to service delivery for persons who use drugs illicitly need to incorporate recommended science-based public health strategies. The 12 science-based public health strategies are as follows: 1) prevention and treatment of substance use and mental disorders; 2) outreach programs; 3) risk assessment for illicit use of drugs; 4) risk assessment for HIV infection, viral hepatitis, STDs, and TB; 5) screening, diagnosis, and counseling for HIV infection, viral hepatitis, STDs, and TB; 6) vaccination; 7) prevention of mother-to-child transmission of HIV infection, viral hepatitis, and STDs; 8) interventions for reduction of risk behaviors; 9) partner services and contact follow-up; 10) referrals and linkage to care; 11) medical treatment for HIV infection, viral hepatitis, STDs, and TB; and 12) delivery of integrated prevention services.

The integration of prevention services must make epidemiologic and programmatic sense, and it should be contextually appropriate and consistent with state and local laws and policies. All persons who use drugs illicitly are not at equal risk for HIV infection, viral hepatitis, STDs, or TB, and service integration is not feasible in all settings. However, opportunities exist to improve prevention services and eliminate duplication of health services. Program collaboration and service integration can provide persons who use drugs illicitly with increased access to services, improve the timeliness of service delivery, and increase the effectiveness of efforts to prevent infectious diseases that share common risk factors, behaviors, and social determinants. Collaborative planning at the local level with a coordinating body is needed to develop plans across programs to reduce operational barriers and to clarify delivery of integrated services. Feasibility studies and monitoring and evaluation studies can ensure the success of integrated services delivered to prevent and reduce HIV infection, viral hepatitis, STDs, and TB, as well as to prevent and treat substance use and mental disorders among persons who use drugs illicitly. Consolidated recommendations and guidelines of science-based public health strategies as summarized in this guidance can have synergistic effects in enhancing efforts of health-care providers and public health providers to optimize

FIGURE 2. Simplified logic model recommended to monitor and evaluate integrated services for persons who use drugs illicitly*



Abbreviations: HIV = human immunodeficiency virus; STDs = sexually transmitted diseases; TB = tuberculosis; CBOs = community-based organizations.
 * This figure summarizes the process recommended in this report.

prevention and treatment, use resources efficiently, and improve health outcomes in persons who use drugs illicitly.

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References

1. Buffington J, Jones TS. Integrating viral hepatitis prevention into public health programs serving people at high risk for infection: good public health. *Public Health Rep* 2007;122(Suppl 2):S1–5.
2. Garfein RS, Lozada R, Liu L, et al. High prevalence of latent tuberculosis infection among injection drug users in Tijuana, Mexico. *Int J Tuberc Lung Dis* 2009;13:626–32.
3. Deiss RG, Rodwell TC, Garfein RS. Tuberculosis and illicit drug use: review and update. *Clin Infect Dis* 2009;48:72–82.
4. Des Jarlais DC, Semaan S, Arasteh K. At 30 years: HIV/AIDS and other STDs among persons who use psychoactive drugs. In: Hall BJ, Hall JC, Cockerell CJ, eds. *HIV/AIDS in the post-HAART era: manifestations, treatment, and epidemiology*. Shelton, CT: People's Medical Publishing House; 2011:753–78.

5. Donoghoe MC, Verster A, Pervilhac C, Williams P. Setting targets for universal access to HIV prevention, treatment and care for injecting drug users (IDUs): towards consensus and improved guidance. *Int J Drug Pol* 2008;19(Suppl 5):S14.
6. CDC. Reducing tobacco use: a report of the Surgeon General. Atlanta, GA: US Department of Health and Human Services, CDC; 2000.
7. George WH, Stoner SA. Understanding acute alcohol effects on sexual behavior. *Ann Rev Sex Res* 2000;11:92–124.
8. Room R, Babor T, Rehm J. Alcohol and public health. *Lancet* 2005;365:519–30.
9. Altice FL, Kamarulzaman A, Soriano VV, Schechter M, Friedland GH. Treatment of medical, psychiatric, and substance-use comorbidities in people infected with HIV who use drugs. *Lancet* 2010;376(9738):367–87.
10. Rhodes T, Singer M, Bourgois P, Friedman SR, Strathdee SA. The social structural production of HIV risk among injection drug users. *Soc Sci Med* 2005;61:1026–44.
11. Latkin CA, Knowlton RA. Micro-social structural approaches to HIV prevention: a social ecological perspective. *AIDS Care* 2005;17(Suppl 1):S102–13.
12. Cottrell CA, Neuberg SL. Different emotional reactions to different groups: a sociofunctional threat-based approach to “prejudice.” *J Pers Soc Psychol* 2005;88:770–89.
13. Gebo KA, Keruly J, Moore RD. Association of social stress, illicit drug use, and health beliefs with nonadherence to antiretroviral therapy. *J Gen Intern Med* 2003;18:104–11.
14. Burris S, Strathdee SA. To serve and protect? Toward a better relationship between drug control policy and public health. *AIDS* 2006;20:117–8.
15. Chander G, Himelhoch S, Moore RD. Substance abuse and psychiatric disorders in HIV-positive patients: epidemiology and impact on antiretroviral therapy. *Drugs* 2006;66:769–89.
16. Regier DA, Farmer ME, Rae DS, et al. Comorbidity of mental disorders with alcohol and other drug abuse: Results from the epidemiologic catchment area (ECA) study. *JAMA* 1990;264:2511–8.
17. Friedland G. Infectious disease comorbidities adversely affecting substance users with HIV, hepatitis C, and tuberculosis. *J Acquir Immune Defic Syndr* 2010;55(Suppl 1):S37–42.
18. CDC. Program collaboration and service integration: enhancing the prevention and control of HIV/AIDS, viral hepatitis, sexually transmitted diseases, and tuberculosis in the United States. Available at http://www.cdc.gov/nchhstp/programintegration/docs/207181-C_NCHHSTP_PCSI%20WhitePaper-508c.pdf. Accessed September 18, 2012.
19. Ward JW, Fenton KA. CDC and progress toward integration of HIV, STD, and viral hepatitis prevention. *Public Health Rep* 2007;122(Suppl 2):99–101.
20. International AIDS Society, AIDS Research Program. Prevention and treatment of HIV/AIDS among drug using populations: a global perspective. Available at <http://nidahiv aids.seiservices.com/globalEng.pdf>. Accessed September 18, 2012.
21. Kresina TF, Hoffman K, Lubran R, Clark HW. Integrating hepatitis services into substance abuse treatment programs: new initiatives from SAMHSA. *Public Health Rep* 2007;122(Suppl 2):S96–8.
22. Substance Abuse and Mental Health Services Administration. Results from the 2009 National Survey on Drug Use and Health: volume 1. Summary of national findings. Rockville, MD: Office of Applied Studies, NSDUH Series H-38A; 2010. HHS publication No. SMA 10-4856.
23. Substance Abuse and Mental Health Services Administration. The NSDUH report: injection drug use and related risk behaviors. Rockville, MD: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration; 2009.
24. Brady JE, Friedman SR, Cooper HL, Flom PL, Tempalski B, Gostnell K. Estimating the prevalence of injection drug users in the U.S. and in large U.S. metropolitan areas from 1992 to 2002. *J Urban Health* 2008;85:323–51.
25. Armstrong GL. Injection drug users in the United States, 1979–2002: an aging population. *Arch Intern Med* 2007;167:166–73.
26. Substance Abuse and Mental Health Services Administration. Results from the 2008 National Survey on Drug Use and Health: national findings. Washington, DC: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration; 2009.
27. Friedman SR, Tempalski B, Cooper H, et al. Estimating numbers of injecting drug users in metropolitan areas for structural analyses of community vulnerability and for assessing relative degrees of service provision for injecting drug users. *J Urban Health* 2004;81:377–400.
28. National Institute on Drug Abuse. Drug facts: nationwide trends. Available at <http://www.drugabuse.gov/publications/drugfacts/nationwide-trends>. Accessed September 18, 2012.
29. Khalsa JH, Treisman G, McCance-Katz E, Tedaldi E. Medical consequences of drug abuse and co-occurring infections: research at the National Institute on Drug Abuse. *Subst Abuse* 2008;29:5–16.
30. Chen C, Lin KM. Health consequences of illegal drug use. *Curr Opin Psychiatry* 2009;22:287–92.
31. Arasteh K, Des Jarlais DC, Perlis TE. Alcohol and HIV sexual risk behaviors among injection drug users. *Drug Alcohol Depend* 2008;95:54–61.
32. Arasteh K, Des Jarlais DC. At-risk drinking and injection and sexual risk behaviors of HIV-positive injection drug users entering drug treatment in New York City. *AIDS Patient Care STDs* 2009;23:657–61.
33. Arasteh K, Des Jarlais DC. HIV testing and treatment among at-risk drinking injection drug users. *JIA PAC* 2009;8:196–201.
34. Arasteh K, Des Jarlais DC, WHO phase II drug injection collaborative study group. Hazardous drinking and HIV sexual risk behaviors among injection drug users in developing and transitional countries. *AIDS Behav* 2010;14:862–9.
35. McCool RM, Paschall RK. Why do so many drug users smoke? *J Subst Abuse Treat* 2003;25:43–9.
36. Haug NA, Stitzer ML, Svikis DS. Smoking during pregnancy and intention to quit: a profile of methadone-maintained women. *Nicotine Tob Res* 2001;3:333–9.
37. Semaan S, Fleming P, Worrell C, Stolp H, Baack B, Miller M. Potential role of safer injection facilities in reducing HIV and hepatitis C infections and overdose mortality in the United States. *Drug Alcohol Depend* 2011;118:100–10.
38. CDC. Unintentional drug poisoning in the United States. Available at <http://www.cdc.gov/HomeandRecreationalSafety/pdf/poison-issue-brief.pdf>. Accessed September 18, 2012.
39. Broadhead R, Kerr T, Grund JP, Altice F. Safer injection facilities in North America: their place in public policy and health initiatives. *J Drug Issues* 2002;31:329–56.
40. Latkin CA, Hua W, Tobin K. Social network correlates of self-reported non-fatal overdose. *Drug Alcohol Depend* 2004;73:61–7.
41. Sherman SG, Cheng Y, Kral AH. Prevalence and correlates of opiate over-dose among young injection drug users in a large U.S. city. *Drug Alcohol Depend* 2007;88:182–7.

42. CDC. Unintentional drug poisoning in the United States. *MMWR* 2010;50:300–1.
43. Warner M, Chen LH, Makuc DM. Increase in fatal poisonings involving opioid analgesics in the United States, 1996–2006. Hyattsville, MD: CDC, National Center for Health Statistics; 2009.
44. Hulse GK, English DR, Milne E, Holman CDJ. Quantification of mortality from the regular use of illicit opiates. *Addiction* 1999;94:221–9.
45. 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* 2010;106:32–51.
46. Degenhardt L, Singleton J, Calabria B. Mortality among cocaine users: a systematic review of cohort studies. *Drug Alcohol Depend* 2011; 113:88–95.
47. Bohnert ASB, Nandi A, Tracy M, et al. Policing and risk of overdose mortality in urban neighborhoods. *Drug Alcohol Depend* 2011; 113:62–8.
48. Cooper H, Moore L, Gruskin S, Krieger N. The impact of a police drug crackdown on drug injectors' ability to practice harm reduction: a qualitative study. *Soc Sci Med* 2005;61:673–84.
49. Murphy EL, DeVita D, Liu H, et al. Risk factors for skin and soft-tissue abscesses among injection drug users: a case-control study. *Clin Infect Dis* 2001;33:35–40.
50. Seal KH, Thawley R, Gee L, et al. Naloxone distribution and cardiopulmonary resuscitation training for injection drug users to prevent heroin overdose death: a pilot intervention study. *J Urban Health* 2005;82:303–11.
51. Maxwell S, Bigg D, Stanczykiewicz K, Carlberg-Racich S. Prescribing naloxone to actively injecting heroin users: a program to reduce overdose deaths. *J Addict Dis* 2006;25:89–96.
52. Galea S, Worthington N, Piper TM, Nandi VV, Curtis M, Rosenthal DM. Provision of naloxone to injection drug users as an overdose prevention strategy: early evidence from a pilot study in New York City. *Addict Behav* 2006;31:907–12.
53. Williams IT, Bell BP, Kuhnert W, Alter MJ. Incidence and transmission patterns of acute hepatitis C in the United States, 1982–2006. *Arch Intern Med* 2011;171:242–8.
54. Lansky A, Books JT, DiNenno E, Heffelfinger J, Hall HI, Mermin J. Epidemiology of HIV in the United States. *J Acquir Immune Defic Synd* 2010;55(Suppl 2):S64–8.
55. Nelson PK, Mathers BM, Cowie B, et al. Global epidemiology of hepatitis B and hepatitis C in people who inject drugs: results of systematic reviews. *Lancet* 2011;378(9791):571–83.
56. Cherubin CE, Sapira JD. The medical complications of drug addiction and the medical assessment of the intravenous drug user: 25 years later. *Ann Intern Med* 1993;119:1017–28.
57. Hall HI, Song R, Rhodes P, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300:520–9.
58. Prejean J, Song R, Hernandez A, et al. for the HIV incidence Surveillance Group. Estimated HIV incidence in the United States, 2006–2009. *PLoS One* 2011;6(8):e17502.
59. Daniels D, Grytdal S, Wasley. Surveillance for acute viral hepatitis—United States, 2007. *MMWR* 2009;58(No. SS-3).
60. CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices. *MMWR* 2006;55(No. RR-7).
61. Purcell DW, Johnson C, Lansky A, et al. Calculating disease rates for risk groups: estimating the national population size of men who have sex with men [Presentation]. Presented at the National STD Prevention Conference, Atlanta, Georgia; March 10, 2010.
62. CDC. HIV risk, prevention, and testing behaviors among men who have sex with men—National HIV Behavioral Surveillance System, 21 U.S. Cities, United States, 2008. *MMWR* 2011;60(No. SS-14).
63. Des Jarlais DC, Friedman SR, Sotharan JL, et al. Continuity and change within an HIV epidemic: injecting drug users in New York City, 1984 through 1992. *JAMA* 1994;271:121–7.
64. Hagan H, Pouget ER, Des Jarlais DC, Lelutiu-Weinberger C. Meta-regression of hepatitis C virus infection in relation to time since onset of illicit drug injection: the influence of time and place. *Am J Epidemiol* 2008;168:1099–109.
65. Lelutiu-Weinberger C, Pouget ER, et al. A meta-analysis of the hepatitis C virus distribution in diverse racial/ethnic drug injector groups. *Soc Sci Med* 2009;68:579–90.
66. Des Jarlais DC, Arasteh K, Hagan H, McKnight C, Perlman DC, Friedman SR. Persistence and change in disparities in HIV infection among injection drug users in New York City after large-scale syringe exchange programs. *Am J Public Health* 2009;99(Suppl 2):S445–51.
67. Plitt SS, Sherman SG, Strathdee SA, Taha TE. Herpes simplex virus 2 and syphilis among drug users in Baltimore, Maryland. *Sex Transm Infect* 2005;81:248–53.
68. Plitt SS, Sherman SG, Viscidi RP, Strathdee SA, Fuller CM, Taha TE. Human papillomavirus seroprevalence among young male and female drug users. *Sex Transm Dis* 2007;34:676–80.
69. Latka M, Ahern J, Garfien RS, et al. Prevalence, incidence, and correlates of chlamydia and gonorrhea among young adult injection drug users. *J Subst Abuse* 2001;13:73–88.
70. Semaan S, Des Jarlais DC, Malow RM. Sexually transmitted diseases among illicit drug users in the United States: The need for interventions. In: Aral SO, Douglas J, eds. Behavioral interventions for prevention and control of sexually transmitted diseases. New York, NY: Springer-SBM; 2007:397–430.
71. CDC. Racial/ethnic disparities in diagnoses of HIV/AIDS—33 states, 2001–2004. *MMWR* 2006;55:121–5.
72. Des Jarlais DC, Semaan S. HIV prevention and psychoactive drug use: a research agenda. *J Epidemiol Community Health* 2009;63:191–6.
73. Institute of Medicine. Hepatitis and liver cancer: a national strategy for prevention and control of hepatitis B and C. Washington, DC: Institute of Medicine; 2010.
74. Sharpe TT, Harrison KM, Dean HD. Summary of CDC consultation to address social determinants of health for prevention of disparities in HIV/AIDS, viral hepatitis, sexually transmitted diseases, and tuberculosis, December 9–10, 2008. *Public Health Rep* 2010;125(Suppl 4):1–5.
75. Riley E, Wu A, Junge B, Marx M, Strathdee SA, Vlahov D. Health services utilization by injection drug users participating in a needle exchange program. *Am J Drug Alcohol Abuse* 2002;28:497–511.
76. McCaul ME, Sviki DS, Moore RD. Predictors of outpatient treatment retention: patient versus substance use characteristics. *Drug Alcohol Depend* 2001;62:9–17.
77. Jacobson JO, Robinson PL, Bluthenthal RN. Racial disparities in completion rates from publicly funded alcohol treatment: economic resources explain more than demographics and addiction severity. *Health Serv Res* 2007;42:773–94.
78. Milligan CO, Nich C, Carroll K. Ethnic differences in substance abuse treatment retention, compliance, and outcome from two clinical trials. *Psychiatr Serv* 2004;55:167–73.

79. Riley ED, Safaeian M, Strathdee SA, et al. Comparing new participants of a mobile versus a pharmacy based needle exchange program. *J Acquir Immune Defic Syndr* 2000;24:57–61.
80. Deren S, Fuller CM, Pouget ER. Impact of expanding syringe access in New York on sources of syringes for IDUs in Harlem and the Bronx. *Int J Drug Pol* 2003;14:373–9.
81. Fuller CM, Ahern J, Vadnais L. Impact of increased syringe access: preliminary findings on injection drug user syringe source, disposal, and pharmacy sales in Harlem, New York. *J Am Pharm Assoc* 2002;42(Suppl):S77–82.
82. Fuller CM, Galea S, Blaney S, et al. Explaining the relationship between race/ethnicity and pharmacy purchased syringes among injection drug users in New York City. *Ethn Dis* 2004;14:589–96.
83. Fuller C, Galea S, Caceres W, et al. Multilevel community-based intervention to increase access to sterile syringes among injection drug users through pharmacy sales in New York City. *Am J Public Health* 2007;97:117–24.
84. Cooper HL, Bossak BH, Tempalski B, Friedman SR, Des Jarlais DC. Temporal trends in spatial access to pharmacies that sell over-the-counter syringes in New York City health districts: relationship to local racial/ethnic composition and need. *J Urban Health* 2009;86:929–45.
85. el-Bassel N, Terlikbaeva A, Pinkham S. HIV and women who use drugs: double neglect, double risk. *Lancet* 2010;376:312–4.
86. Des Jarlais DC, Semaan S. HIV and other sexually transmitted infections in injection drug users and crack cocaine smokers. In: Holmes KK, Sparling PF, Stamm WE, et al., eds. *Sexually transmitted diseases*. 4th ed. New York, NY: McGraw-Hill; 2008:237–55.
87. Des Jarlais DC, Semaan S. Interventions to reduce the sexual risk behavior of injecting drug users. *Int J Drug Pol* 2005;16(Suppl):S58–66.
88. Scheinmann R, Hagan H, Lelutiu-Weinberger C, et al. Non-injection drug use and hepatitis C virus: a systematic review. *Drug Alcohol Depend* 2007;89:1–12.
89. Des Jarlais DC, Arasteh K, Perlis T, et al. Convergence of HIV seroprevalence among injecting and non-injecting drug users in New York City. *AIDS* 2007;21:231–5.
90. Substance Abuse and Mental Health Services Administration. *The NSDUH report: methamphetamine use, abuse, and dependence: 2002, 2003, and 2004*. Washington, DC: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration; 2005.
91. Substance Abuse and Mental Health Services Administration. *The DASIS report: trends in methamphetamine or amphetamine admissions to treatment, 1993–2003*. Washington, DC: US Department of Health and Human Services, Substance Abuse and Mental Health Services Administration; 2006.
92. Rural Center for AIDS/STD Prevention. *Rural methamphetamine use and HIV/STD risk, 2006*. Indianapolis, IN: Rural Center for AIDS/STD Prevention; 2007.
93. US Drug Enforcement Administration. *Maps of methamphetamine laboratory incidents: calendar years 1999–2005*. Washington, DC: US Drug Enforcement Administration; 2007.
94. Plankey MW, Ostrow DG, Stall R, et al. The relationship between methamphetamine and popper use and risk of seroconversion in the multicenter AIDS cohort study. *J Acquir Immune Defic Syndr* 2007;45:85–92.
95. Mausbach BT, Semple SJ, Strathdee SA, Zians J, Patterson TL. Efficacy of a behavioral intervention for increasing safer sex behaviors in HIV-positive MSM methamphetamine users: results from the EDGE study. *Drug Alcohol Depend* 2007;87:249–57.
96. Shoptaw S, Reback CJ. Associations between methamphetamine use and HIV among men who have sex with men: a model for guiding public policy. *J Urban Health* 2006;83:1151–7.
97. Rondinelli AJ, Ouellet LJ, Strathdee SA, et al. Young adult injection drug users in the United States continue to practice HIV risk behaviors. *Drug Alcohol Depend* 2009;104:167–74.
98. Pevzner ES, Robison S, Donovan J, et al. Tuberculosis transmission and use of methamphetamine and other drugs in Snohomish County, WA, 1991–2006. *Am J Public Health* 2010;100:2481–6.
99. Semaan S, Des Jarlais DC, Malow R. Behavior change and health-related interventions for heterosexual risk reduction among drug users. *Subst Use Misuse* 2006;41:1349–78.
100. CDC. Sexually transmitted diseases. Available at <http://www.cdc.gov/std>. Accessed September 18, 2012.
101. Xu F, Sternberg MR, Kottiri BJ, et al. Trends in herpes simplex virus type 1 and type 2 seroprevalence in the United States. *JAMA* 2006;296:964–73.
102. Markowitz LE, Sternberg M, Dunne EF, McQuillan G, Unger ER. Seroprevalence of human papillomavirus types 6, 11, 16, and 18 in the United States: National Health and Nutrition Examination Survey, 2003–2004. *J Infect Dis* 2009;200:1059–67.
103. Oeltmann JE, Kammerer JS, Pevzner ES, Moonan PK. Tuberculosis and substance abuse in the United States, 1997–2006. *Arch Intern Med* 2009;169:189–97.
104. CDC. *Reported tuberculosis in the United States, 2008*. Atlanta, GA: US Department of Health and Human Services; 2009.
105. Sulkowski MS, Thomas DL. Epidemiology and natural history of hepatitis C virus infection in injection drug users: implications for treatment. *Clin Infect Dis* 2005;40(Suppl 5):S263–9.
106. Des Jarlais DC, Arasteh K, McKnight C, et al. Gender and age patterns in HSV-2 and HIV among non-injecting drug users in New York City. *Sex Transm Dis* 2010;37:637–43.
107. Des Jarlais DC, Arasteh K, McKnight C, Hagan H, Perlman DC, Semaan S. Associations between HSV-2 and HCV with HIV among injecting drug users in New York City: the current importance of sexual transmission. *Am J Public Health* 2011;101:1277–83.
108. Phelan DF, Gange SJ, Ahdieh-Grant L, et al. Determinants of newly detected human papillomavirus infection in HIV-infected and HIV-uninfected injection drug using women. *Sex Transm Dis* 2009;36:149–56.
109. Semaan S, Des Jarlais DC, Malinowska-Sempruch K, Kirby A, Sharpe TT. Human rights and HIV prevention among drug users. In: Beracochea E, Weinstein C, Evans D, eds. *Right-based approaches to public health*. New York, NY: Springer Publishing Company; 2010:201–20.
110. Hagan H, Pouget ER, Des Jarlais DC. A systematic review and meta-analysis of interventions to prevent hepatitis C virus infection in people who inject Drugs *J Infect Dis* 2011;204:74–83.
111. US Department of Health and Human Services. *Combating the silent epidemic of viral hepatitis: action plan for the prevention, care & treatment of viral hepatitis*. Available at <http://hepb.org/pdf/Viral-Hepatitis-Action-plan-2011.pdf>. Accessed September 18, 2012.
112. Des Jarlais DC. Prospects for a public health perspective on psychoactive drug use. *Am J Public Health* 2000;90:335–7.
113. Marshall BDL, Wood E. Toward a comprehensive approach to HIV prevention for people who use drugs. *J Acquir Immune Defic Syndr* 2010;55(Suppl 1):S23–6.

114. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, text revision (DSM-IV-TR). 4th ed. Washington, DC: American Psychiatric Association; 2000.
115. World Health Organization. Guidelines for the psychosocially assisted pharmacological treatment of opioid dependence. Available at http://www.who.int/substance_abuse/publications/opioid_dependence_guidelines.pdf. Accessed September 18, 2012.
116. Metzger DS, Zhang Y. Drug treatment as HIV prevention: expanding treatment options. *Curr HIV/AIDS Rep* 2010;7:220–5.
117. Knapp W, Soares B, Farrell M, Silva de Lima M. Psychosocial interventions for cocaine and psychostimulant amphetamines related disorders (Review). *The Cochrane Collaboration* 2008;3. DOI: 10.1002/14651858.CD003023.pub2.
118. White House Office of National Drug Control Policy. National drug control strategy: 2009 annual report. Available at <http://www.globalsecurity.org/security/library/policy/national/ndcs2009.pdf>. Accessed September 18, 2012.
119. White House Office of National Drug Control Policy. National drug control strategy: data supplement 2010. Available at <http://www.whitehouse.gov/sites/default/files/ondcp/policy-and-research/10datasupplement.pdf>. Accessed September 18, 2012.
120. Roberts ET, Friedman SR, Brady J, Pouget ER, Tempalski B, Galea S. Environmental conditions, political economy, and rates of injection drug use in large US metropolitan areas 1992–2002. *Drug Alcohol Depend* 2010;106:142–53.
121. Substance Abuse and Mental Health Services Administration. Screening, brief intervention, and referral to treatment (SBIRT) in behavioral healthcare. Available at <http://www.samhsa.gov/prevention/sbirt/SBIRTwhitepaper.pdf>. Accessed September 18, 2012.
122. Babor TF, McRee BG, Kassebaum PA, Grimaldi PL, Ahmed K, Bray J. Screening, brief intervention, and referral to treatment (SBIRT): toward a public health approach to the management of substance abuse. *Subst Abus* 2007;28:7–30.
123. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple health care sites: Comparison at intake and 6 months later. *Drug Alcohol Depend* 2009;99:280–95.
124. Prendergast M, Podus D, Finney J, Greenwell L, Roll J. Contingency management for treatment of substance use disorders: a meta-analysis. *Addiction* 2006;101:1546–60.
125. Lee NK, Rawson RA. A systematic review of cognitive and behavioral therapies for methamphetamine dependence. *Drug Alcohol Rev* 2008;27:309–17.
126. Meader N, Li R DJ, Pilling S. Psychosocial interventions for reducing injection and sexual risk behavior for preventing HIV in drug users. *Cochrane Collaboration Cochrane Reviews* 2010;1(CD007192): DOI:10.1002/14651858.CD007192.pub2.
127. Needle RH, Burrows D, Friedman SR, et al. Effectiveness of community-based outreach in preventing HIV/AIDS among injecting drug users. *Int J Drug Pol* 2005;16(Suppl):S45–57.
128. National Institute of Drug Abuse. Community-based outreach model. Available at <http://archives.drugabuse.gov/CBOM>. Accessed September 18, 2012.
129. Coyle SL, Needle RH, Normand J. Outreach-based HIV prevention for injecting drug users: a review of published outcome data. *Public Health Rep* 1998;113(Suppl 1):19–30.
130. Dickson-Gomez J, Knowlton A, Latkin C. Hoppers and old heads: qualitative evaluation of a volunteer AIDS outreach intervention. *AIDS Behav* 2003;7:303–15.
131. Dickson-Gomez JB, Knowlton A, Latkin C. Values and identity: the meaning of work for injection drug users involved in volunteer HIV prevention outreach. *Subst Use Misuse* 2004;39:1259–86.
132. Mitchell M, Christopher G, Oltean A. Integrating HIV prevention into substance user treatment: current practices and challenges. *Subst Use Misuse* 2007;42:2173–82.
133. Perlman DC, Perkins MP, Solomon N, Kochems L, Des Jarlais DC, Paone D. Tuberculosis screening at a syringe exchange program. *Am J Public Health* 1997;87:862–3.
134. Perlman DC, Gourevitch MN, Trinh C, Salomon N, Horn L, Des Jarlais DC. Cost-effectiveness of tuberculosis screening and observed preventive therapy for active drug injectors at a syringe-exchange program. *J Urban Health* 2001;78:550–67.
135. Bowser BP, Ryan L, Smith CD, Lockett G. Outreach-based drug treatment for sex trading women: the CAL-Pep risk reduction demonstration project. *Int J Drug Pol* 2008;19:492–5.
136. Appel PW, Oldak R. A preliminary comparison of major kinds of obstacles to enrolling in substance abuse treatment reported by injecting street outreach clients and other stakeholders. *Am J Drug Alcohol Abuse* 2007;33:699–705.
137. Des Jarlais DC, Hagan H, Friedman S. Preventing epidemics of HIV-1 among injecting drug users. In: Stimson G, Des Jarlais DC, Ball A, eds. *Drug injecting and HIV infection*. New York, NY: Routledge; 1998.
138. National Institute of Medicine. Preventing infection among injecting drug users in high-risk countries. Washington, DC: National Institute of Medicine; 2007.
139. Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>. Accessed September 18, 2012.
140. Alessi SM, Petry NM, Urso J. Contingency management promotes smoking reductions in residential substance abuse patients. *J Appl Behav Anal* 2008;41:617–22.
141. Frosch DL, Nahom D, Shoptaw S. Optimizing smoking cessation outcomes among the methadone maintained. *J Subst Abuse Treat* 2002;23:425–30.
142. Frosch DL, Stein JA, Shoptaw S. Using latent-variable models to analyze smoking cessation clinical trial data: an example among the methadone maintained. *Exp Clin Psycho Pharmacol* 2002;10:258–67.
143. World Health Organization. ASSIST working group. The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST): development, reliability and feasibility. *Addiction* 2002;97:1183–94.
144. World Health Organization. Management of substance abuse: the ASSIST project—Alcohol, Smoking, and Substance Involvement Screening Test. Available at http://www.who.int/substance_abuse/activities/assist/en/index.html. Accessed September 18, 2012.
145. US Preventive Services Task Force. Screening for illicit drug use. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspdrug.htm>. Accessed September 18, 2012.
146. CDC. Sexually transmitted diseases treatment guidelines, 2010. *MMWR* 2010;59(No. RR-12).
147. American Medical Association. Guidelines for adolescent preventive services: recommendations monograph. Available at <http://www.ama-assn.org/resources/doc/ad-hlth/gapsmono.pdf>. Accessed September 18, 2012.
148. World Health Organization, UNAIDS, UNODC. Policy guidelines for collaborative TB and HIV services for injecting drug users and other drug users: an integrated approach. Geneva, Switzerland: World Health Organization; 2008.

149. CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR* 2006;55(No. RR-14).
150. CDC. HIV/AIDS. Available at <http://www.cdc.gov/hiv>. Accessed September 18, 2012.
151. CDC. Viral hepatitis. Available at <http://www.cdc.gov/hepatitis>. Accessed September 18, 2012.
152. CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2006;55(No. RR-16).
153. Institute of Medicine. Hepatitis and liver cancer: a national strategy for prevention and control of hepatitis B and C. Washington, DC: National Academy Press; 2010.
154. CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC. *MMWR* 2005; 54(No-RR-15).
155. CDC. Tuberculosis. Available at <http://www.cdc.gov/tb>. Accessed September 18, 2012.
156. Chow JM, Riduan Joesoeff M, Kent C, Weinstock H, Fenton K. Responding to the burden of STD, HIV, and viral hepatitis in correctional populations through program collaboration and integration. *Sex Transm Dis* 2009;36(Suppl 2):S1–2.
157. US Preventive Services Task Force. Screening for chlamydial infection. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspshlm.htm>. Accessed September 18, 2012.
158. US Preventive Services Task Force. Screening for gonorrhea. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspsgono.htm>. Accessed September 18, 2012.
159. US Preventive Services Task Force. Screening for genital herpes: recommendation statement. Available at <http://www.uspreventiveservicestaskforce.org/uspstf05/herpes/herpesrs.htm>. Accessed September 18, 2012.
160. Douglas JM, Berman SM. Screening for HSV-2 infection in STD clinics and beyond: a few answers but more questions. *Sex Transm Dis* 2009;36:729–31.
161. Freeman EE, Weiss HA, Glynn JR, Cross PL, Whitworth JA, Hayes RJ. Herpes simplex virus 2 infection increases HIV acquisition in men and women: Systematic review and meta-analysis of longitudinal studies. *AIDS* 2006;20:73–83.
162. Watson-Jones D, Weiss H, Rusizoka M, et al. Effect of herpes simplex suppression on incidence of HIV among women in Tanzania. *N Engl J Med* 2008;358:1560–71.
163. Celum C, Wald A, Hughes J, et al. Effect of aciclovir on HIV-1 acquisition in herpes simplex virus 2 seropositive women and men who have sex with men: a randomized, double-blind, placebo-controlled trial. *Lancet* 2008;371:2109–19.
164. US Preventive Services Task Force. Screening for cervical cancer. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>. Accessed September 18, 2012.
165. CDC. Hepatitis B vaccine: what you need to know. Available at <http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-hep-b.pdf>. Accessed September 18, 2012.
166. CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). Part II: immunization of adults. *MMWR* 2006;55(No. RR-16).
167. CDC. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR* 2007;56(No. RR-2).
168. CDC. TB elimination: BCG vaccine fact sheet. Available at <http://www.cdc.gov/tb/publications/factsheets/prevention/BCG.htm>. Accessed September 18, 2012.
169. Crandall LA, Metsch LR, McCoy CB, Chitwood DD, Tobias H. Chronic drug use and reproductive health care among low-income women in Miami, Florida: a comparative study of access, need and utilization. *J Behav Health Serv Res* 2003;30:321–31.
170. Shieh C, Kravitz M. Severity of drug use, initiation of prenatal care, and maternal-fetal attachment in pregnant marijuana and cocaine/heroin users. *J Obstet Gynecol Neonatal Nurs* 2006;35:499–508.
171. Napravnik S, Royce R, Walter E, Lim W. HIV-1 infected women and prenatal care utilization: barriers and facilitators. *AIDS Patient Care STDs* 2000;14:411–20.
172. CDC. US Public Health Service Task Force recommendations for use of antiretroviral drugs in pregnant HIV-infected women for maternal health and interventions to reduce perinatal HIV transmission in the United States. *MMWR* 2002;51(No. RR-18).
173. CDC. Persons who use drugs. Available at <http://www.cdc.gov/pwud>. Accessed September 18, 2012.
174. National Institute on Drug Abuse. Drug facts: HIV/AIDS and drug abuse: intertwined epidemics. Available at <http://www.drugabuse.gov/publications/drugfacts/hiv-aids-drug-abuse-intertwined-epidemics>. Accessed September 18, 2012.
175. Strathdee S, Galai N, Safaean M, et al. Sex differences in risk factors for HIV seroconversion among injection drug users: a 10-year perspective. *Arch Intern Med* 2001;161:1281–8.
176. Kral AH, Bluthenthal RN, Lorvick J, Gee L, Bacchetti P, Edlin BR. Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: Risk-factor analysis. *Lancet* 2001;357(9266):1397–401.
177. Ksobiech K. A meta-analysis of needle sharing, lending, and borrowing behaviors of needle exchange program attenders. *AIDS Educ Prev* 2003;15:257–68.
178. Weinhardt LS, Carey MP, Johnson BT, Bickham NL. Effects of HIV counseling and testing on sexual risk behavior: a meta-analytic review of published research, 1985–1997. *Am J Public Health* 1999; 89:1397–405.
179. Semaan S, Des Jarlais DC, Sogolow E, et al. A meta-analysis of the effect of HIV prevention interventions on the sex behaviors of drug users in the United States. *J Acquir Immune Defic Syndr* 2002;30 (Suppl 1):S73–93.
180. Des Jarlais DC, Semaan S. HIV prevention research: cumulative knowledge or accumulating studies? *J Acquir Immune Defic Syndr* 2002;30(Suppl 1):S1–7.
181. Semaan S, Meader N, Des Jarlais DC, Halton M, Bhatti H, Chan M. A meta-analysis of the effect of world-wide psychosocial HIV interventions on the sex behaviors of persons who use drugs. KeyStone, CO: The Joint Colloquium of the Cochrane and Campbell Collaborations; 2010.
182. Copenhaver MM, Johnson BT, Lee IC, Harman JJ, Carey MP for the Sharp Research Team. Behavioral HIV risk reduction among people who inject drugs: meta-analytic evidence of efficacy. *J Subst Abuse Treat* 2006;31:163–71.
183. Semaan S, Neumann MS, Hutchins K, Hoyt D'Anna L, Kamb ML for the Project RESPECT Study Group. Brief counseling for reducing sexual risk and bacterial STIs among drug users: results from project RESPECT. *Drug Alcohol Depend* 2010;106:7–15.

184. Kamb ML, Fishbein M, Douglas, JM, et al. Efficacy of risk-reduction counseling to prevent human immunodeficiency virus and sexually transmitted diseases: randomized control trial. *JAMA* 1998;280:1161–7.
185. Celentano DD, Latimore AD, Mehta SH. Variations in sexual risks in drug users: emerging themes in a behavioral context. *Curr HIV/AIDS Rep* 2008;5:212–8.
186. Leigh BC, Ames SL, Stacy AW. Alcohol, drugs, and condom use among drug offenders: an event-based analysis. *Drug Alcohol Depend* 2008;93:38–42.
187. Strathdee SA, Stockman JK. Epidemiology of HIV among injecting and non-injecting drug users: current trends and implications for interventions. *Curr HIV/AIDS Rep* 2010;7:99–106.
188. Mansergh G, Purcell DW, Stall R, et al. CDC consultation on methamphetamine use and sexual risk behavior for HIV/STD infection: summary and suggestions. *Public Health Rep* 2006;121:127–32.
189. Booth RE, Kwiatkowski CF, Chitwood DD. Sex related HIV risk behaviors: differential risks among injection drug users, crack smokers, and injection drug users who smoke crack. *Drug Alcohol Depend* 2000;58:219–26.
190. Colfax G, Vittinghoff E, Husnik MJ, et al. Substance use and sexual risk: a participant- and episode-level analysis among a cohort of men who have sex with men. *Am J Epidemiol* 2004;159:1002–12.
191. Rich JD, Anderson BJ, Schwartzapfel B, Stein MD. Sexual risk for hepatitis B virus infection among hepatitis C virus-negative heroin and cocaine users. *Epidemiol Infect* 2005;30:1–7.
192. Bialek SR, Bower WA, Mottram K, et al. Risk factors for hepatitis B in an outbreak of hepatitis B and D among injection drug users. *J Urban Health* 2005;82:468–78.
193. Molitor F, Truax SR, Ruiz JD, Sun RK. Association of methamphetamine use during sex with risky sexual behaviors and HIV infection among non-injection drug users. *West J Med* 1998;168:93–7.
194. Purcell DW, Moss S, Remien RH, Woods WJ, Parsons JT. Illicit substance use, sexual risk, and HIV-positive gay and bisexual men: Differences by serostatus of casual partners. *AIDS* 2005;19 (Suppl 1):S37–47.
195. Frosch D, Shoptaw S, Huber A, Rawson RA, Ling W. Sexual HIV risk among gay and bisexual male methamphetamine abusers. *J Subst Abuse Treat* 1996;13:483–6.
196. Edlin BR, Irwin KL, Faruque S. Intersecting epidemics: crack cocaine use and HIV infection among inner-city young adults. *N Engl J Med* 1994;331:1422–7.
197. Semaan S, Kotranski L, Collier K, Lauby J, Halbert J, Feighan K. Temporal trends in HIV risk behaviors among out-of-treatment women crack users: the need for drug treatment. *Drugs Soc* 1998;13:13–33.
198. Semaan S, Kotranski L, Collier K, Lauby J, Halbert J, Feighan K. Temporal trends in HIV risk behaviors of out-of-treatment drug injectors and injectors who also smoke crack. *JAIDS* 1998; 19:274–81.
199. McMahan JM, Simm M, Milano D, Clatts M. Detection of hepatitis C virus in the nasal secretions of an intranasal drug-user. *Ann Clin Microbiol Antimicrob* 2004;3:6. DOI:10.1186/1476-0711-3-6.
200. Mehta SH, Galai N, Astemborski J, et al. HIV incidence among injection drug users in Baltimore, Maryland (1988–2004). *J Acquir Immune Defic Syndr* 2006;43:368–72.
201. Strathdee SA, Sherman SG. The role of sexual transmission of HIV injection and non-injection drug users. *J Urban Health* 2003;80 (4 Suppl 3):iii7–14.
202. Kuyper LM, Lampinen TM, Li K, et al. Factors associated with sex trade involvement among male participants in a prospective study of injection drug users. *Sex Transm Infect* 2004;80:531–5.
203. Des Jarlais DC, Semaan S. HIV prevention for injecting drug users: the first 25 years and counting. *Psychosom Med* 2008;70:606–11.
204. CDC. 2009 compendium of evidence-based interventions. Available at <http://www.cdc.gov/hiv/topics/research/prs/evidence-based-interventions.htm>. Accessed September 18, 2012.
205. McKelroy VS, Galbraith JS, Cummings B, et al. Adapting evidence-based behavioral interventions for new settings and target populations. *AIDS Educ Prev* 2006;18(Suppl A):59–73.
206. CDC. Compendium of HIV prevention interventions with evidence of effectiveness from CDC's HIV/AIDS prevention research synthesis project. Available at http://www.cdc.gov/hiv/resources/reports/hiv_compendium/pdf/HIVcompendium.pdf. Accessed September 18, 2012.
207. Rotheram-Borus MJ, Rhodes F, Desmond K, Weiss RE. Reducing HIV risks among active injection drug and crack users: the Safety Counts Program. *AIDS Behav* 2010;14:658–68.
208. Rhodes F, Humfleet GL. Using goal-oriented counseling and peer support to reduce HIV/AIDS risk among drug users not in treatment. *Drugs Soc* 1993;7:185–204.
209. Hershberger S, Wood M, Fisher D. A cognitive-behavioral intervention to reduce HIV risk behaviors in crack and injection drug users. *AIDS Behav* 2003;7:229–43.
210. CDC AIDS Community Demonstration Projects Research Group. Community-level HIV intervention in 5 cities: final outcome data from the CDC AIDS Community Demonstration Projects. *Am J Public Health* 1999;89:65–82.
211. Minozzi S, Amato L, Davoli M. Detoxification treatments for opiate dependent adolescents. *Cochrane Database Syst Rev* 2009;2(CD006749): DOI: 1.1002/14651858.CD006749.pub2.
212. Gowing L, Farrell M, Bornemann R, Sullivan L, Ali R. Substitution treatment of injecting opioid users for prevention of HIV infection. *Cochrane Database Syst Rev* 2008;2:CD004145.
213. Farrell M, Gowing L, Marsden J, Ling W, Ali R. Effectiveness of drug dependence treatment in HIV prevention. *Int J Drug Pol* 2005;16 (Suppl 1):67–75.
214. Sylla L, Bruce RD, Kamarulzaman A, Altice FL. Integration and co-location of HIV/AIDS, tuberculosis and drug treatment services. *Int J Drug Pol* 2007;18:306–12.
215. National Institute on Drug Abuse. Principles of drug addiction treatment: a research-based guide. Available at http://www.drugabuse.gov/sites/default/files/podat_0.pdf. Accessed September 18, 2012.
216. Kritz S, Brown LS, Goldsmith RJ, et al. States and substance abuse treatment programs: funding and guidelines for infection-related services. *Am J Public Health* 2008;98:824–6.
217. Rezza G, Sagliocca L, Zaccarelli M, et al. Incidence rate and risk factors for HCV seroconversion among injecting drug users in an area with low HIV seroprevalence. *Scand J Infect Dis* 1996;28:27–9.
218. Korthuis PT, Zephyrin LC, Fleishman JA, et al. Health-related quality of life in HIV-infected patients: the role of substance use. *AIDS Patient Care* 2008;22:859–67.
219. Wiessing L, Likatavicius G, Klempova D, Hedrich D, Nardone A, Griffiths P. Associations between availability and coverage of HIV-prevention measures and subsequent incidence of diagnosed HIV infection among injection drug users. *Am J Public Health* 2009;99:1049–52.
220. Hadland SE, Kerr T, Li K, Montaner JS, Wood E. Access to drug and alcohol treatment among a cohort of street-involved youth. *Drug Alcohol Depend* 2009;101:1–7.

221. Thiede H, Hagan H, Murrill CS. Methadone treatment and HIV and hepatitis B and C risk reduction among injectors in the Seattle area. *J Urban Health* 2000;77:331–45.
222. Calsyn DA, Meinecke C, Saxon AJ, Stanton V. Risk reduction in sexual behavior: a condom giveaway program in a drug abuse treatment clinic. *Am J Public Health* 1992;82:1536–8.
223. el-Bassel N, Schilling RF. 15-month followup of women methadone patients taught skills to reduce heterosexual HIV transmission. *Public Health Rep* 1992;107:500–4.
224. McCusker J, Stoddard AM, Zapka JG, Lewis BF. Behavioral outcomes of AIDS educational interventions for drug users in short-term treatment. *Am J Public Health* 1993;83:1463–6.
225. Malow RM, Corrigan SA, Cunningham SC, West JA, Pena JM. Psychosocial factors associated with condom use among African-American drug abusers in treatment. *AIDS Educ Prev* 1993;5:244–53.
226. Metzger DS, Navaline H. Human immunodeficiency virus prevention and the potential for drug abuse treatment. *Clin Infect Dis* 2003;37(Suppl 5):S451–6.
227. Mark HD, Nanda J, Davis-Vogel A, et al. Profiles of self-reported HIV-risk behaviors among injection drug users in methadone maintenance treatment, detoxification, and needle exchange programs. *Public Health Nurs* 2006;23:11–9.
228. Kapadia F, Vlahov D, Wu Y, et al. Impact of drug abuse treatment modalities on adherence to ART/HAART among a cohort of HIV seropositive women. *Am J Drug Alcohol Abuse* 2008;34:161–70.
229. Stein MD, Rich JD, Maksad J, et al. Adherence to antiretroviral therapy among HIV-infected methadone patients: effect of ongoing illicit drug use. *Am J Drug Alcohol Abuse* 2000;26:195–205.
230. Palepu A, Tyndall MW, Joy R, Kerr T, Wood E, Press N, et al. Antiretroviral adherence and HIV treatment outcomes among HIV/HCV co-infected injection drug users: the role of methadone maintenance therapy. *Drug Alcohol Depend* 2006;84:188–94.
231. Shoptaw S, Reback CJ, Frosch DL, Rawson RA. Stimulant abuse treatment as HIV prevention. *J Addict Dis* 1998;17:19–32.
232. Ingersoll KS, Farrell-Carnahan L, Cohen-Filipic J, et al. A pilot randomized clinical trial of two medication adherence and drug use interventions for HIV+ crack cocaine users. *Drug Alcohol Depend* 2011;116:177–87.
233. Montoya ID, Schroeder JR, Preston KL, et al. Influence of psychotherapy attendance on buprenorphine treatment outcome. *J Subst Abuse Treat* 2005;28:247–54.
234. Kresina TF, Eldred L, Bruce DR, Francis H. Integration of pharmacotherapy for opioid addiction into HIV primary care for HIV/hepatitis C virus-co-infected patients. *AIDS* 2005;19(Suppl):S221–6.
235. Mattick RP, Ali R, White JM, O'Brien S, Wolk S, Danz C. Buprenorphine versus methadone maintenance therapy: a randomized double-blind trial with 405 opioid-dependent patients. *Addiction* 2003;98:441–52.
236. Willner-Reid J, Belendiuk KA, Epstein DH, Schmittner J, Preston KL. Hepatitis C and human immunodeficiency virus risk behaviors in polydrug users on methadone maintenance. *J Subst Abuse Treat* 2008;35:78–86.
237. Gowing L, Farrell M, Bornemann R, Ali R. Substitution treatment of injecting opioid users for prevention of HIV infection. *Cochrane Database Syst Rev* 2004;CD004145.
238. Shoptaw S, Frosch D, Rawson RA, Ling W. Cocaine abuse counseling as HIV prevention. *AIDS Educ Prev* 1997;9:511–20.
239. Ross M, Williams ML, Bowen AM. Situational correlates of condom use in a sample of African-American drug users who are primarily crack cocaine users. *AIDS Behav* 2003;7:55–60.
240. Metsch LR, McCoy CB, Miles CC, Wohler B. Prevention myths and HIV risk reduction by active drug users. *AIDS Educ Prev* 2004;16:150–9.
241. Stanton B, Li X, Cottrell L, Kaljee L. Early initiation of sex, drug-related risk behaviors, and sensation-seeking among urban, low-income African American adolescents. *JAMA* 2001;93:129–38.
242. Substance Abuse and Mental Health Services Administration. Substance abuse treatment for persons with HIV/AIDS (Treatment Improvement Protocol [TIP] series 37). Available at <http://radar.boisestate.edu/pdfs/TIP37.pdf>. Accessed September 18, 2012.
243. Sylvestre DL, Clements BJ. Adherence to hepatitis C treatment in recovering heroin users maintained on methadone. *Eur J Gastroenterol Hepatol* 2007;19:741–7.
244. Moatti JP, Carrieri MP, Spire B, Gastaut JA, Cassuto JP, Moreau J, for the MANIF 200 Study Group. Adherence to HAART in French HIV-infected injecting drug users: the contribution of buprenorphine drug maintenance treatment. *AIDS* 2000;14:151–5.
245. Altice FL, Metzger JA, Hodges J, et al. Developing a directly administered antiretroviral therapy intervention for HIV-infected drug users: implications for program replication. *Clin Infect Dis* 2004;38(Suppl 5):S376–87.
246. Conway B, Prasad J, Reynolds R, et al. Directly observed therapy for the management of HIV-infected patients in a methadone program. *Clin Infect Dis* 2004;38(Suppl 5):S402–8.
247. Lucas GM, Weidle PJ, Hader S, Moore RD. Directly administered antiretroviral therapy in an urban methadone maintenance clinic: a randomized comparative study. *Clin Infect Dis* 2004;38(Suppl 5):S409–13.
248. Snyder DC, Paz EA, Mohle-Boetani JC, Fallstad R, Black RL, Chin DP. Tuberculosis prevention in methadone maintenance clinics: effectiveness and cost-effectiveness. *Am J Respir Crit Care Med* 1999;160:178–85.
249. Batki SL, Gruver VA, Bradley JM, Delucchi K. A controlled trial of methadone treatment combined with directly observed isoniazid for tuberculosis prevention in injection drug users. *Drug Alcohol Depend* 2002;66:283–93.
250. Santibanez SS, Garfein RS, Swartzendruber A, Purcell DW, Paxton LA, Greenberg AE. Update and overview of practical epidemiologic aspects of HIV/AIDS among injection drug users in the United States. *J Urban Health* 2006;83:86–100.
251. CDC, Health Resources and Services Administration, National Institute on Drug Abuse, National Institutes of Health, Substance Abuse and Mental Health Services Administration. Medical advice for persons who inject illicit drugs. Available at <http://cdcnpin.org/Reports/MedAdv.pdf>. Accessed September 18, 2012.
252. CDC. Syringe exchange programs—United States, 2005. *MMWR* 2007;56:1164–7.
253. Taussig JA, Weinstein B, Burris S, Jones TS. Syringe laws and pharmacy regulations are structural constraints on HIV prevention in the U.S. *AIDS* 2000;14(Suppl 1):S47–51.
254. Rich JD, Hogan JW, Wolf F, et al. Lower syringe sharing and re-use after syringe legalization in Rhode Island. *Drug Alcohol Depend* 2007;89:292–7.

255. US Department of Health and Human Services, Office of the Secretary. Determination that a demonstration needle exchange program would be effective in reducing drug abuse and the risk of acquired immune deficiency syndrome infection among intravenous drug users. Available at <http://www.federalregister.gov/articles/2011/02/23/2011-3990/determination-that-a-demonstration-needle-exchange-program-would-be-effective-in-reducing-drug-abuse>. Accessed September 18, 2012.
256. US Department of Health and Human Services. Implementation guidance for syringe services programs. Available at <http://www.cdc.gov/hiv/resources/guidelines/syringe.htm>. Accessed September 18, 2012.
257. Ouellet L, Huo D, Bailey SL. HIV risk practices among needle exchange users and nonusers in Chicago. *J Acquir Immune Defic Syndr* 2004;37:1187–96.
258. Gibson DR, Brand R, Anderson K, Kahn JG, Perales D, Guydish J. Two-to-sixfold decreased odds of HIV risk behavior associated with use of syringe exchange. *J Acquir Immune Defic Syndr* 2002; 31:237–42.
259. Marmor M, Shore RE, Titus S, Chen X, Des Jarlais DC. Drug injection rates and needle-exchange use in New York City, 1991–1996. *J Urban Health* 2000;77:359–68.
260. Lurie P, Reingold A, Bowser B, et al. The public health impact of needle exchange programs in the United States and abroad. San Francisco, CA: University of California at Berkeley School of Public Health; 1993.
261. Institute of Medicine. No time to lose: getting more from HIV prevention. Washington, DC: National Academy Press; 2001.
262. Gibson DR, Flynn NM, Perales D. Effectiveness of syringe exchange programs in reducing HIV risk behavior and HIV seroconversion among injecting drug users. *AIDS* 2001;15:1329–41.
263. Huo D, Ouellet LJ. Needle exchange and injection-related risk behaviors in Chicago: a longitudinal study. *J Acquir Immune Defic Syndr* 2007;45:108–14.
264. US General Accounting Office. Needle exchange programs: research suggests promise as an AIDS prevention strategy. Washington, DC: US General Accounting Office; 1993. Report No. GAO/HRD-93-60.
265. Des Jarlais DC, Marmor M, Paone D, et al. HIV incidence among injecting drug users in New York City syringe exchange programs. *Lancet* 1996;348:987–91.
266. Hagan H, Thiede H. Changes in injection risk behavior associated with participation in the Seattle needle-exchange program. *J Urban Health* 2000;77:369–82.
267. Taylor A, Goldberg D, Hutchinson S, et al. Prevalence of hepatitis C virus infection among injecting drug users in Glasgow 1990–1996: are current harm reduction strategies working? *J Infect* 2000;40:176–83.
268. Sarkar K, Mitra S, Bal B, Chakraborty S, Bhattacharya SK. Rapid spread of hepatitis C and needle exchange programme in Kolkata, India. *Lancet* 2003;361(9365):1301–2.
269. Holtzman D, Barry V, Ouellet LJ, et al. The influence of needle exchange programs on injection risk behaviors and infection with hepatitis C virus among young injection drug users in select cities in the United States, 1994–2004. *Prev Med* 2009;49:68–73.
270. Hagan H, Des Jarlais D, Friedman SR, Purchase D, Alter MJ. Reduced risk of Hepatitis B and Hepatitis C among injection drug users in the Tacoma syringe exchange program. *Am J Public Health* 1995;84:1531–7.
271. Des Jarlais DC, Perlis T, Arasteh K, et al. HIV incidence among injection drug users in New York City, 1990 to 2002: Use of serologic test algorithm to assess expansion of HIV prevention services. *Am J Public Health* 2005;95:1439–44.
272. Mateu-Gelabert P, Treloar C, Calatayud VA, et al. How can hepatitis C be prevented in the long term? *Int J Drug Pol* 2007;18:338–40.
273. Strathdee SA, Pollini RA. A 21st-century Lazarus: the role of safer injection sites in harm reduction and recovery. *Addiction* 2007;102:848–9.
274. Cohen DA, Farley TA, Bedimo-Etame JR, et al. Implementation of condom social marketing in Louisiana, 1993–1996. *Am J Public Health* 1999;89:204–8.
275. CDC. Syringe exchange programs—United States, 2008. *MMWR* 2010;59:1488–91.
276. Paone D, Perlman DC, Perkins MP, Kochems LM, Salomon N, Des J. Organizational issues in conducting tuberculosis screening at a syringe exchange program. *J Subst Abuse Treat* 1998;15:229–34.
277. Pratt CCNU, Paone D, Carter R, Layton MC. Hepatitis C screening and management practices: a survey of drug treatment and syringe exchange programs in New York City. *Am J Public Health* 2002;92:1254.
278. Chi-Chi N, Prat U, Paone D, Carter RJ, Layton MC. Hepatitis C screening and management practices: a survey of drug treatment and syringe exchange programs in NYC. *Am J Public Health* 2002;92:1254–6.
279. Charania MR, Crepez N, Guenther-Gray C, et al. Efficacy of structural-level condom distribution interventions: a meta-analysis of U.S. and international studies, 1998–2007. *AIDS Behav* 2011;15:1283–97.
280. Bedimo AL, Pinkerton SD, Cohen DA, Gray B, Farley TA. Condom distribution: a cost-analysis. *Int J STD AIDS* 2002;13:384–92.
281. Des Jarlais DC, Arasteh K, McKnight C, et al. HIV infection during limited versus combined HIV prevention programs for IDUs in New York City: the importance of transmission behaviors. *Drug Alcohol Depend* 2010;109:154–60.
282. CDC. Condoms and STDs: fact sheet for public health personnel. Available at <http://www.cdc.gov/condomeffectiveness/latex.htm>. Accessed September 18, 2012.
283. Feldbaum PJ, Fortney JA. Condoms, spermicides, and the transmission of human immunodeficiency virus: a review of the literature. *Am J Public Health* 1988;78:52–4.
284. CDC. Oral sex and HIV risk: CDC HIV/AIDS facts. Available at <http://www.cdc.gov/hiv/resources/factsheets/oralsex.htm>. Accessed September 18, 2012.
285. CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC. *MMWR* 2005;54(No. RR-15).
286. Preventing HIV transmission: the role of sterile needles and bleach. Washington, DC: National Academy Press; 1995.
287. CDC. Recommendations for partner services programs for HIV infection, syphilis, gonorrhea, and chlamydia infection. *MMWR* 2008;57(No. RR-9).
288. Pavia AT, Benyo M, Niler L, Risk I. Partner notification for control of HIV: results after 2 years of a statewide program in Utah. *Am J Public Health* 1993;83:1418–24.
289. Semaan S, Klovdahl A, Aral SO. Protecting the privacy, confidentiality, relationships, and medical safety of sex partners in partner notification and management studies. *J Research Admin* 2004;35:39–53.
290. Leonhardt KK, Gentile F, Gilbert BP, Aiken M. A cluster of tuberculosis among crack house contacts in San Mateo County, California. *Am J Public Health* 1994;84:1834–6.
291. Oeltmann JE, Oren E, Haddad MB, et al. Tuberculosis outbreak in marijuana users, Seattle, Washington, 2004. *Emerg Infect Dis* 2006;12:1156–9.
292. Fitzpatrick LK, Hardacker JA, Heirendt W, et al. A preventable outbreak of tuberculosis investigated through an intricate social network. *Clin Infect Dis* 2001;33:1801–6.

293. Asghar RJ, Patlan DE, Miner M, et al. Limited utility of name-based tuberculosis contact investigations among persons using illicit drugs: results of an outbreak investigation. *J Urban Health* 2009;86:776–80.
294. Substance Abuse and Mental Health Services Administration. Addressing viral hepatitis in people with substance use disorders. Available at <http://blog.samhsa.gov/2012/03/02/addressing-viral-hepatitis-in-people-with-substance-use-disorders>. Accessed September 18, 2012.
295. Metzger DS, Woody GE, O'Brien CP. Drug treatment as HIV prevention: a research update. *J Acquir Immune Defic Syndr* 2010;55(Suppl 1):S32–6.
296. Valverde EE, Purcell D, Waldrop-Valverde D, et al. Correlates of depression among HIV-positive women and men who inject drugs. *J Acquir Immune Defic Syndr* 2007;46(Suppl 2):S96–100.
297. DeLorenzo GN, Satre DD, Quesenberry CP, Tsai AL, Weisner CM. Mortality after diagnosis of psychiatric disorders and co-occurring substance use disorders among HIV-infected patients. *AIDS Patient Care STDs* 2010;24:705–12.
298. Craw JA, Gardner LI, Marks G, et al. Brief strengths-based case management promotes entry into HIV medical care: results of the antiretroviral treatment access study-II. *J Acquir Immune Defic Syndr* 2008;47:597–606.
299. Saleebey D. The strengths perspective in social work practice: extensions and cautions. *Soc Work* 1996;41:296–305.
300. Rich JD, Holmes L, Salas C, et al. Successful linkage of medical care and community services for HIV-positive offenders being released from prison. *J Urban Health* 2001;78:279–89.
301. CDC. Rapid HIV testing in emergency departments—three U.S. sites, January 2005–March 2006. *MMWR* 2007;56:597–601.
302. Klein SJ, Naizby BE. New linkages for tuberculosis prevention and control in New York City: innovative use of non-traditional providers to enhance completion of therapy. *J Community Health* 1995;20:5–13.
303. 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;19:423–31.
304. Kinlock TW, Gordon MS, Schwartz RP, Fitzgerald TT, O'Grady KE. A randomized clinical trial of methadone maintenance for prisoners: Results at 12 months post-release. *J Subst Abuse Treat* 2009;37:277–85.
305. Coviello DM, Zanis DA, Wesnoski SA, Alterman AL. The effectiveness of outreach case management in re-enrolling discharged methadone patients. *Drug Alcohol Depend* 2006;85:56–65.
306. Malotte CK, Hollingshead JR, Larro M. Incentives vs. outreach workers for latent tuberculosis treatment in drug users. *Am J Prev Med* 2001;20:103–7.
307. Lucas GM, Chaudhry A, Hsu J, et al. Clinic-based treatment of opioid-dependent HIV-infected patients versus referral to an opioid treatment program: a randomized trial. *Ann Intern Med* 2010;152:704–11.
308. Baillargeon J, Giordano TP, Rich JD, et al. Accessing antiretroviral therapy following release from prison. *JAMA* 2009;301:848–57.
309. Stephenson BL, Wohl DA, McKaig R, et al. Sexual behaviors of HIV-seropositive men and women following release from prison. *Int J STD AIDS* 2006;17:103–8.
310. Springer SA, Chen S, Altice FL. Improved HIV and substance abuse treatment outcomes for released HIV-infected prisoners: the impact of buprenorphine treatment. *J Urban Health* 2010;87:592–602.
311. Castro K, LoBue P. Bridging implementation, knowledge, and ambition gaps to eliminate tuberculosis in the United States and globally. *Emerg Infect Dis* 2011;17:337–42.
312. Lambert EY, Normand JL, Volkow ND. Prevention and treatment of HIV/AIDS among drug-using populations: a global perspective. *J Acquir Immune Defic Syndr* 2010;55(Suppl 1):S1–4.
313. Beckwith CG, Zaller ND, Fu JJ, Montague BT, Rich JD. Opportunities to diagnose, treat, and prevent HIV in the criminal justice system. *J Acquir Immune Defic Syndr* 2010;55(Suppl 1):S49–55.
314. Nunn A, Cornwall A, Fu J, Bazerman L, Lowenthal H, Beckwith C. Linking HIV-positive jail inmates to treatment, care, and social services after release: results from a qualitative assessment of the COMPASS program. *J Urban Health* 2010;87:954–68.
315. Wohl DA, Scheyett A, Golin CE, et al. Intensive case management before and after prison release is no more effective than comprehensive pre-release discharge planning in linking HIV-infected prisoners to care: a randomized trial. *AIDS Behav* 2011;15:356–64.
316. Beyrer C, Malinowska-Sempruch K, Kamarulzaman A, Strathdee SA. 12 myths about HIV/AIDS and people who use drugs. *Lancet* 2010;376:208–11.
317. Wood E, Kerr T, Marshall BDL, et al. Longitudinal community plasma HIV-1 RNA concentrations and incidence of HIV-1 among injecting drug users: prospective cohort study. *BMJ* 2009;338:b1649. DOI: 10.1136/bmj.b1649.
318. Malta M, Magnanini MM, Strathdee SA, Bastos FI. Adherence to antiretroviral therapy among HIV-infected drug users: a meta-analysis. *AIDS Behav* 2010;14:731–47.
319. Wood E, Hogg RS, Lima VD, et al. Highly active antiretroviral therapy and survival in HIV-infected injection drug users. *JAMA* 2008;300:550–4.
320. Cohen MS, Chen YQ, McCauley M, et al. Prevention of HIV-infection with early antiretroviral therapy. *N Engl J Med* 2011;365:493–505.
321. Gallant JE. Medical management of HIV infection. Hillsborough, NC: Knowledge Source Solutions; 2012.
322. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med* 2000;160:2101–7.
323. Gordillo V, del Amo J, Soriano V, Gonzalez-Lahoz J. Sociodemographic and psychological variables influencing adherence to antiretroviral therapy. *AIDS* 1999;13:1763–9.
324. Malotte CK. Monetary versus nonmonetary incentives for TB skin test reading among drug users. *Am J Prev Med* 1999;16:182–8.
325. Tulskey JP, Hahn JA, Long HL, et al. Can the poor adhere? Incentives for adherence to TB prevention in homeless adults. *Int J Tuberc Lung Dis* 2004;8:83–91.
326. Caminero JA, Pavon JM, Rodriguez de Castro F, et al. Evaluation of a directly observed six months fully intermittent treatment regimen for tuberculosis in patients suspected of poor compliance. *Thorax* 1996;51:1130–3.
327. Demaria PA. Methadone drug interactions. *J Mainten Addict* 2003;2:69–74.
328. McCance-Katz EF. Treatment of opioid dependence and coinfection with HIV and hepatitis C virus in opioid-dependent patients. *Clin Infect Dis* 2005;41(Suppl 1):89–95.
329. McCance-Katz EF, Sullivan LE, Nallani S. Drug interactions of clinical importance among the opioids, methadone and buprenorphine, and other frequently prescribed medications: a review. *Am J Addict* 2010;19:4–16.
330. CDC. Managing drug interactions in the treatment of HIV-related tuberculosis. Available at http://www.cdc.gov/tb/publications/guidelines/Tb_HIV_Drugs/PDF/tbhiv.pdf. Accessed September 18, 2012.

331. National Institutes of Health. Management of hepatitis C: 2002. Available at <http://consensus.nih.gov/2002/2002HepatitisC2002116.html.htm>. Accessed September 18, 2012.
332. Edlin BR, Kresina TF, Raymond DB, et al. Overcoming barriers to prevention, care, and treatment of hepatitis C in illicit drug users. *Clin Infect Dis* 2005;40(Suppl 5):S276–85.
333. Sylvestre DL. Treating hepatitis C virus infection in active substance users. *Clin Infect Dis* 2005;40(Suppl 5):S321–4.
334. Chainuvati S, Khalid SK, Kancir S, et al. Comparison of hepatitis C treatment patterns in patients with and without psychiatric and/or substance use disorders. *J Viral Hepat* 2006;13:235–41.
335. Sylvestre DL, Zweben JE. Integrating HCV services for drug users: a model to improve engagement and outcomes. *Int J Drug Pol* 2007;18:406–10.
336. Harris KA, Arnsten JH, Litwin AH. Successful integration of hepatitis C evaluation and treatment services with methadone maintenance. *J Addict Med* 2010;4:20–6.
337. Taylor LE. Delivering care to injection drug users coinfecting with HIV and hepatitis C virus. *Clin Infect Dis* 2005;15(Suppl 5):S355–61.
338. Ghany MG, Strader DB, Thomas DL, Seeff LB. Diagnosis, management, and treatment of hepatitis C: an update. *Hepatology* 2009;49:1335–74.
339. Merson MH, O'Malley J, Serwadda D, Apisuk C. The history and challenge of HIV prevention. *Lancet* 2008;372:475–88.
340. Kidorf M, King VL, Pierce J, Kolodner K, Brooner RK. Benefits of concurrent syringe exchange and substance abuse treatment participation. *J Subst Abuse Treat* 2011;40:265–71.
341. European Centre for Disease Prevention and Control, European Monitoring Centre for Drugs and Drug Addiction. Prevention and control of infectious diseases among people who inject drugs. Available at http://www.ecdc.europa.eu/en/publications/Publications/111012_Guidance_ECDC-EMCDDA.pdf. Accessed September 18, 2012.
342. Des Jarlais DC, McKnight C, Goldblatt C, Purchase D. Doing harm reduction better: syringe exchange in the United States. *Addiction* 2009;104:1441–6.
343. Birkhead GS, Klein SJ, Candelas AR, et al. Integrating multiple programme and policy approaches to hepatitis C prevention and care for injection drug users: a comprehensive approach. *Int J Drug Pol* 2007;18:417–25.
344. Clanon KA, Mueller J, Harank M. Integrating treatment for hepatitis C virus infection into an HIV clinic. *Clin Infect Dis* 2005;15(Suppl 5):S362–6.
345. Hennessy RR, Weisfuse IB, Schlanger K. Does integrating viral hepatitis services into a public STD clinic attract injection drug users for care? *Public Health Rep* 2007;122(Suppl 2):31–5.
346. Hoffman HL, Castro-Donlan CA, Johnson VM, Church DR. The Massachusetts HIV, hepatitis, addiction services integration (HHASI) experience: responding to the comprehensive needs of individuals with co-occurring risks and conditions. *Public Health Rep* 2004;119:25–31.
347. Gunn RA, Lee MA, Callahan DB, Gonzales P, Murray PJ, Margolis HS. Integrating hepatitis, STD, and HIV services into a drug rehabilitation program. *Am J Prev Med* 2005;29:27–33.
348. Beyrer C, Malinowska-Sempruch K, Kamarulzaman A, Kazatchkine M, Sidibe M, Strathdee SA. Time to act: a call for comprehensive responses to HIV in people who use drugs. *Lancet* 2010;108–20.
349. Meade CS. Sexual risk behavior among persons dually diagnosed with severe mental illness and substance use disorder. *J Subst Abuse Treat* 2006;30:147–57.
350. Metzger DS, Navaline H. HIV prevention among injection drug users: the need for integrated models. *J Urban Health* 2003;80(Suppl 3):iii59–66.
351. Solomon PL, Tennille JA, Lipsitt D, Plumb E, Metzger D, Blank MB. Rapid assessment of existing HIV prevention programming in a community mental health center. *J Prev Interv Community* 2007;33:137–51.
352. Tsiouris SJ, Gandhi NR, El-Sadr WM, Friedland G. Tuberculosis and HIV—needed: a new paradigm for the control and management of linked epidemics. *MedGenMed* 2007;9:62.
353. World Health Organization, United Nations Office on Drugs and Crime. Policy guidelines for collaborative TB and HIV services for injecting and other drug users: an integrated approach. Available at http://whqlibdoc.who.int/publications/2008/9789241596930_eng.pdf. Accessed September 18, 2012.
354. Substance Abuse and Mental Health Services Administration. Substance abuse and infectious disease: cross-training for collaborative systems of prevention, treatment, and care. Available at <http://tie.samhsa.gov/topics/infectious.html>. Accessed September 18, 2012.
355. Substance Abuse and Mental Health Services Administration. Systems integration: overview paper 7. Available at <http://store.samhsa.gov/shin/content/SMA07-4295/SMA07-4295.pdf>. Accessed September 18, 2012.
356. Berg KM, Litwin A, Li X, Heo M, Arnsten JH. Directly observed antiretroviral therapy improves adherence and viral load in drug users attending methadone maintenance clinics: a randomized controlled trial. *Drug Alcohol Depend* 2011;113:192–9.
357. Basu S, Smith-Rohrberg D, Bruce RD, Altice FL. Models for integrating buprenorphine therapy into the primary HIV care setting. *Clin Infect Dis* 2006;42:716–21.
358. Gilbert L, Bulger J, Scanlon K, Ford K, Bergmire-Sweet D, Weinbaum C. Integrating hepatitis B prevention into sexually transmitted disease services: U.S. sexually transmitted disease program and clinic trends—1997 and 2001. *Sex Transm Dis* 2005;32:346–50.
359. Gillis LM, Kenney RR. Spotlight on PATH practices and programs: integrating mental health and primary health care. Available at <http://pathprogram.samhsa.gov/ResourceFiles/np02ltpu.pdf>. Accessed September 18, 2012.
360. Litwin AH, Soloway I, Gourevitch MN. Integrating services for injection drug users infected with hepatitis C virus with methadone maintenance treatment: challenges and opportunities. *Clin Infect Dis* 2005;40(Suppl 5):S339–45.
361. Rothman J, Rudnick D, Slifer M, Agins B, Heiner K, Birkhead G. Co-located substance use treatment and HIV prevention and primary care services, New York State, 1990–2002: a model for effective service delivery to a high-risk population. *J Urban Health* 2007;84:226–42.
362. Strauss SM, Astone JM, Des Jarlais DC, Hagan H. Integrating hepatitis C services into existing HIV services: The experiences of a sample of U.S. drug treatment units. *AIDS Patient Care & STDs* 2005;19:78–88.
363. Schackman BR, Merrill JO, McCarty D, et al. Overcoming policy and financing barriers to integrated buprenorphine and HIV primary care. *Clin Infect Dis* 2006;43(Suppl 4):S247–53.
364. Weiss L, Egan JE, Botsko M, et al. The BHIVES collaborative: organization and evaluation of a multisite demonstration of integrated buprenorphine/naloxone and HIV treatment. *J Acquir Immune Defic Syndr* 2011;56(Suppl 1):S7–13.
365. Wilson TE, Vlahov D, Crystal S, et al. Integrating HIV prevention activities into the HIV medical care setting: a report from the NYC HIV centers consortium. *J Urban Health* 2006;83:18–30.
366. Chandler DW, Spicer G. Integrated treatment for jail recidivists with co-occurring psychiatric and substance use disorders. *Community Ment Health J* 2006;42:405–25.

367. Cunningham CO, Sohler NL, Cooperman NA, Berg KM, Litwin AH, Arnsten JH. Strategies to improve access to and utilization of health care services and adherence to antiretroviral therapy among HIV-infected drug users. *Substance Use Misuse* 2011;46:218–32.
368. Hagedorn H, Dieperink E, Dingmann D, et al. Integrating hepatitis prevention services into a substance use disorder clinic. *J Subst Abuse Treat* 2007;32:391–8.
369. Knott A, Dieperink E, Willenbring ML, et al. Integrated psychiatric/medical care in a chronic hepatitis C clinic: effect on antiviral treatment evaluation and outcomes. *Am J Gastroenterol* 2006;101:2254–62.
370. McCollister KE, French MT, Pyne JM, et al. The cost of treating addiction from the client's perspective: results from a multi-modality application of the Clinet DATCP. *Drug Alcohol Depend* 2009;104:241–8.
371. Schackman B, Leff JA, Botsko M, et al. The cost of integrated HIV care and buprenorphine/naloxone treatment: results of a cross-site evaluation. *J Acquir Immune Defic Syndr* 2011;56(Suppl 1):S76–82.
372. Weaver MR, Conover CJ, Proescholdbell RJ, et al. Cost-effectiveness analysis of integrated care for people with HIV, chronic mental illness and substance abuse disorders. *J Ment Health Policy Econ* 2009;12:33–46.
373. Bonell CP, Hargreaves J, Cousens S, et al. Alternatives to randomization in the evaluation of public health interventions: design challenges and solutions. *J Epidemiol Community Health* 2011;65:582–7.
374. West SG, Duan N, Pegugnat W, et al. Alternatives to the randomized controlled trial. *Am J Public Health* 2008;98:1359–66.
375. Amato L, Davoli M, Vecchi S, et al. Cochrane systematic reviews in the field of addiction: what's there and what should be. *Drug Alcohol Depend* 2011;113:96–113.
376. GRADE working group. Grading quality of evidence and strength of recommendation. *BMJ* 2004;328:1490–4.
377. Guyatt GH, Oxman AD, Vist GE, et al. GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ* 2008;336(7650):924–6.
378. GRADE working group. Grading of recommendations assessment, development and evaluation (GRADE). Available at <http://www.gradeworkinggroup.org>. Accessed September 18, 2012.
379. Hedges LV, Johnson WD, Semaan S, Sogolow W. Theoretical issues in the synthesis of HIV prevention research. *J Acquir Immune Defic Syndr* 2002;30(Suppl 1):S8–14.
380. Shrier I, Boivin JF, Steele RJ, et al. Should meta-analyses of interventions include observational studies in addition to randomized controlled trials? A critical examination of underlying principles. *Am J Epidemiol* 2007;166:1203–9.
381. Pals SL, Murray DM, Alfano CM, Shadish WR, Hannan PJ, Baker WL. Individually randomized group treatment trials: a critical appraisal of frequently used design and analytic approaches. *Am J Public Health* 2008;98:1418–24.
382. Meliker JR, Sloan CD. Spatio-temporal epidemiology: principles and opportunities. *Spatial and Spatio-temporal Epidemiology* 2011;2:1–9.
383. Stover J. HIV models to inform health policy. *Curr HIV/AIDS Rep* 2011;6:108–13.
384. Hill AB. The environment and disease: association or causation? *Proc R Soc Med* 1965;58:295–300.
385. CDC, National Center for HIV, Viral Hepatitis, STD, and TB Prevention. Program collaboration and service integration: enhancing the prevention and control of HIV/AIDS, viral hepatitis, sexually transmitted diseases, and tuberculosis in the United States, an NCHHSTP green paper. Atlanta, GA: US Department of Health and Human Services, CDC; 2007.
386. Malakmadze N, Gonzalez IM, Oemig T, et al. Unsuspected recent transmission of tuberculosis among high-risk groups: implications of universal tuberculosis genotyping in its detection. *Clin Infect Dis* 2005;40:366–73.
387. Chin DP, Crane CM, Diul MY, et al. Spread of *Mycobacterium tuberculosis* in a community implementing recommended elements of tuberculosis control. *JAMA* 2000;283:2968–74.
388. Latkin C, Weeks MR, Glasman L, Galletly C, Albarracin D. A dynamic social systems model for considering structural factors in HIV prevention and detection. *AIDS Behav* 2010;14(Suppl):S222–38.
389. Strathdee SA, Hallett TB, Bobrova N, et al. HIV and risk environment for injecting drug users: the past, present, and future. *Lancet* 2010;376(9737):268–84.
390. Rhodes T. Risk environments and drug harms: a social science for harm reduction approach. *Int J Drug Pol* 2009;20:193–201.
391. Latkin CA, Curry AD, Hua W, Davey MA. Direct and indirect associations of neighborhood disorder with drug use and high-risk sexual partners. *Am J Prev Med* 2007;32(6 Suppl):S234–41.
392. Tempalski B, McQuie H. Druggscapes and the role of place and space in injection drug use-related HIV risk environment. *Int J Drug Pol* 2009;20:4–13.
393. Ware NC, Wyatt MA, Tugenberg T. Adherence, stereotyping and unequal HIV treatment for active users of illegal drugs. *Soc Sci Med* 2005;61:565–76.
394. Clarke S, Delamere S, McCullough L, Hopkins S, Bergin C, Mulcahy F. Assessing limiting factors to the acceptance of antiretroviral therapy in a large cohort of injecting drug users. *HIV Med* 2003;4:33–7.
395. Sharpe TT. Behind the eight ball: sex for crack cocaine exchange and poor black women. Philadelphia, PA: The Haworth Press, Inc; 2005.
396. Loughlin A, Metsch L, Gardner L, Anderson-Mahoney P, Barrigan M, Strathdee S. Provider barriers to prescribing HAART to medically-eligible HIV-infected drug users. *AIDS Care* 2004;16:485–500.
397. Heptonstall J. Strategies to ensure delivery of hepatitis B vaccine to injecting drug users. *Commun Dis Public Health* 1999;2:154–6.
398. Des Jarlais DC, Fisher DG, Newman JC, et al. Providing hepatitis B vaccination to injection drug users: referral to health clinics vs. on-site vaccination at a syringe exchange program. *Am J Public Health* 2001;91:1791–2.
399. Lally MA, Montstream-Quas SA, Tanaka S, Tedeschi SK, Morrow KM. A qualitative study among injection drug using women in Rhode Island: attitudes toward testing, treatment, and vaccination for hepatitis and HIV. *AIDS Patient Care STDs* 2008;22:53–64.
400. Mehta SH, Thomas DL, Sulkowski MS, Safaein M, Vlahov D, Strathdee SA. A framework for understanding factors that affect access and utilization of treatment for hepatitis C virus infection among HCV-mono-infected and HIV/HCV-co-infected injection drug users. *AIDS* 2005;19 (Suppl 3):S179–89.
401. Spielberg F, Kurth A, Gorbach PM, Goldbaum G. Moving from apprehension to action: HIV counseling and testing preferences in three at-risk populations. *AIDS Educ Prev* 2001;13:524–40.
402. Oldfield EC III, Keeffe EB. The A's and B's of vaccine-preventable hepatitis: improving prevention in high-risk adults. *Rev Gastroenterol Disord* 2007;7:1–21.
403. Downing M, Knight K, Reiss TH, et al. Drug users talk about HIV testing: motivating and deterring factors. *AIDS Care* 2001;13:561–77.
404. Lorvick J, Thompson S, Edlin BR, Kral AH, Lifson AR, Watters JK. Incentives and accessibility: a pilot study to promote adherence to TB prophylaxis in a high-risk community. *J Urban Health* 1999;76:461–7.

405. Knowlton A, Arnsten JH, Eldred LJ, et al. Antiretroviral use among active injection-drug users: the role of patient-provider engagement and structural factors. *AIDS Patient Care STDs* 2010;24:421–8.
406. Harris KM, Edlund MJ. Self-medication of mental health problems: new evidence from a national survey. *Health Serv Res* 2005;40:117–34.
407. Khantzian EJ. The self-medication hypothesis of addictive disorders: focus on heroin and cocaine dependence. *Am J Psychol* 1985;142:1259–64.
408. Mizuno Y, Wilkinson JD, Santibanez S, et al. Correlates of health care utilization among HIV-seropositive injection drug users. *AIDS Care* 2006;18:417–25.
409. Golub ET, Latka M, Hagan H, et al. Screening for depressive symptoms among HCV-infected injection drug users: examination of the utility of the CES-D and the Beck Depression Inventory. *J Urban Health* 2004;81:278–90.
410. Khalsa JH, Elkashef A. Interventions for HIV and hepatitis C virus infections in recreational drug users. *Clin Infect Dis* 2010;50:1505–11.
411. Curtis R, Friedman SR, Neaigus A, Jose B, Goldstein M, Des J. Implications of directly observed therapy in tuberculosis control measures among IDUs. *Public Health Rep* 1994;109:319–27.
412. Rockwell R, Des Jarlais DC, Friedman SR, Perlis TE, Paone D. Geographic proximity, policy and utilization of syringe exchange programmes. *AIDS Care* 1999;11:437–42.
413. Pilowsky DJ, Hoover D, Hadden B, et al. Impact of social network characteristics on high-risk sexual behaviors among non-injection drug users. *Subst Use Misuse* 2007;42:1629–49.
414. Latkin CA, Mandell W, Vlahov D. The relationship between risk networks' patterns of crack cocaine and alcohol consumption and HIV-related sexual behaviors among adult injection drug users: a prospective study. *Drug Alcohol Depend* 1996;42:175–81.
415. Parsons JT, Van Ora J, Missildine W, Purcell DW, Gomez CA. Positive and negative consequences of HIV disclosure among seropositive injection drug users. *AIDS Educ Prev* 2004;16:459–75.
416. Martinez AN, Bluthenthal RN, Lorvick J, Anderson R, Flynn N, Kral AH. The impact of legalizing syringe exchange programs on arrests among injection drug users in California. *J Urban Health* 2007;84:423–35.
417. Spielberg F, Branson BM, Geller N, Montaner JS. Overcoming barriers to HIV testing: preferences for new strategies among clients of a needle exchange, a sexually transmitted disease clinic, and sex venues for men who have sex with men. *J Acquir Immune Defic Syndr* 2003;32:318–27.
418. Jurgens R, Csete J, Amon JJ, Beyrer C. People who use drugs, HIV, and human rights. *Lancet* 2010;376:475–85.
419. Gough E, Kempf MC, Graham L, et al. HIV and hepatitis B and C incidence rates in US correctional populations and high risk groups: a systematic review and meta-analysis. *BMC Public Health* 2010;10:777.
420. Springer SA, Azar MM, Altice FL. HIV, alcohol dependence, and the criminal justice system: a review and call for evidence-based treatment for released prisoners. *Am J Drug Alcohol Abuse* 2011;37:12–21.
421. Alfonso V, Bermbach N, Geller J, Montaner JS. Individual variability in barriers affecting people's decision to take HAART: a qualitative study identifying barriers to being on HAART. *AIDS Patient Care STDs* 2006;20:848–57.
422. Pach A III, Cerbone FG, Gerstein DR. A qualitative investigation of antiretroviral therapy among injection drug users. *AIDS Behav* 2003;7:87–100.
423. Macalino GE, Hogan JW, Mitty JA, et al. A randomized clinical trial of community-based directly observed therapy as an adherence intervention for HAART among substance users. *AIDS* 2007;21:1473–7.
424. Sumartojo E. When tuberculosis treatment fails. A social behavioral account of patient adherence. *Am Rev Respir Dis* 1993;147:1311–20.
425. Malotte CK, Rhodes F, Mais KE. Tuberculosis screening and compliance with return for skin test reading among active drug users. *Am J Public Health* 1998;88:792–6.
426. Brassard P, Bruneau J, Schwartzman K, Senecal M, Menzies D. Yield of tuberculin screening among injection drug users. *Int J Tuberc Lung Dis* 2004;8:988–93.
427. FitzGerald JM, Patrick DM, Strathdee S, et al. for the Vancouver Injection Drug Use Study Group. Use of incentives to increase compliance for TB screening in a population of intravenous drug users. *Int J Tuberc Lung Dis* 1999;3:153–5.
428. Edlin BR. Hepatitis C prevention and treatment for substance users in the United States: acknowledging the elephant in the living room. *Int J Drug Pol* 2004;15:81–91.
429. National Institute on Drug Abuse. Principles of HIV prevention in drug-using populations: a research-based guide. Available at [http://www.nhts.net/media/Principles%20of%20HIV%20Prevention%20\(17\).pdf](http://www.nhts.net/media/Principles%20of%20HIV%20Prevention%20(17).pdf). Accessed September 18, 2012.
430. Bayer R, Levine C, Wolf SM. HIV antibody screening: an ethical framework for evaluating proposed programs. *JAMA* 1986;256:1768–74.
431. Lally MA, Macnevin R, Sergie Z, et al. A model to provide comprehensive testing for HIV, viral hepatitis, and sexually transmitted infections at a short-term drug treatment center. *AIDS Patient Care STDs* 2005;19:298–305.
432. Rossi PH, Lipsey MW, Freeman HE. Evaluation: a systematic approach. 7th ed. Thousand Oaks, CA: Sage; 2004.
433. Weiss CH. Evaluation. Upper Saddle River, NJ: Prentice Hall; 1997.
434. Milstein B, Wetterhall S, CDC Evaluation Group. A framework featuring steps and standards for program evaluation. *Health Promot Pract* 2000;1:221–8.
435. CDC. Framework for program evaluation in public health MMWR 1999;48(No. RR-11).
436. Rugg D, Peersman G, Carael M, eds. Global advances in HIV/AIDS monitoring and evaluation: new directions for evaluation. 3rd ed. San Francisco, CA: Jossey-Bass; 2004.
437. CDC. Practical use of program evaluation among sexually transmitted disease (STD) programs. Available at <http://www.cdc.gov/std/program/pupestd.htm>. Accessed September 18, 2012.
438. Haddix AC, Teutsch SM, Corso PS. Prevention effectiveness: a guide to decision analysis and economic evaluation. New York, NY: Oxford University Press; 2002.
439. Gold MR, Siegel JE, Russell LB, Weinstein MC, eds. Cost-effectiveness in health and medicine. New York, NY: Oxford University Press; 1996.
440. Braithwaite RS, Meltzer DO, King JT, Leslie D, Roberts MS. What does the value of modern medicine say about the \$50,000 per quality-adjusted life-year decision rule? *Med Care* 2008;46:349–56.
441. Drummond MF, O'Brien B, Stoddart GL, Torrance GW. Methods for the economic evaluation of health care programmes. 2nd ed. New York, NY: Oxford University Press; 1996.
442. Tengs TO, Adams ME. Five-hundred life-saving interventions and their cost-effectiveness. *Risk Anal* 1995;15:369–90.
443. CDC, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. 2007 disease profile. Atlanta, GA: US Department of Health and Human Services, CDC; 2009.
444. Sullivan PS, McKenna MT, Janssen RS. Progress toward implementation of integrated systems for surveillance of HIV infection and morbidity in the United States. *Public Health Rep* 2007;122(Suppl 1):1–3.
445. Heseltine G, McFarlane J. Texas statewide hepatitis C counseling and testing, 2000–2005. *Public Health Rep* 2007;122(Suppl 2):S6–11.

446. CDC. Technical guidance for HIV/AIDS surveillance programs. Volume III: security and confidentiality guidelines. Available at <https://www.globalhivmeinfo.org/HIS/Annotated%20Bibliography/Article%2023b.pdf>. Accessed September 18, 2012.
447. CDC. Data security and confidentiality guidelines for HIV, viral hepatitis, sexually transmitted disease, and tuberculosis programs. Available at <http://www.cdc.gov/nchstp/programintegration/docs/PCSIDataSecurityGuidelines.pdf>. Accessed September 18, 2012.

Appendix A

Search and Evidence Acquisition for the Guidance

The National Guideline Clearinghouse database was searched for current recommendations and guidelines using the keyword combinations:

- (substance abusers OR drug users) AND (HIV prevention)
- (substance abusers OR drug users) AND (Tuberculosis prevention OR TB prevention)
- (substance abusers OR drug users) AND (sexually transmitted diseases prevention OR STDs prevention)
- (substance abusers OR drug users) AND (Hepatitis C prevention OR viral hepatitis prevention)
- (substance abusers OR drug users) AND (mental disorders prevention)

The MEDLINE_OVID search for the literature on integration was broken down into three sections each with MeSH and key words: disease or treatment (HIV, STD, TB, substance abuse, and mental disorder), drug use, integration (index term delivery of health care, integrated)

Disease or treatment

1. HIV Infections/
2. HIV infection\$.ti,ab
3. HIV infected.ti,ab
4. Sexually Transmitted Diseases/
5. Sexually Transmitted Diseases, Bacterial/
6. Sexually Transmitted Diseases, Viral/
7. Std\$.ti,ab
8. Sexually transmitted disease\$.ti,ab
9. Hepatitis, Viral, Human/
10. Hepatitis C/
11. Hepatitis B/
12. HVC.ti,ab
13. Hepatitis.ti,ab
14. Tuberculosis/
15. TB.ti,ab
16. Substance abuse Treatment Centers/
17. (Substance or drug\$) adj2 (treat\$).ti,ab
18. OR/1–17

Drug use

19. Substance Abuse, Intravenous/
20. Heroin Dependence/
21. Cocaine Related Disorders/
22. Opioid-Related Disorders/
23. Substance Related Disorders/
24. Drug User/
25. ((cocaine or heroin or crack or meth or opioid or inject\$ methamphetamine or drug or substance) adj2 (abus\$ OR addict\$ OR use\$ or dependence)).ti,ab
26. (idu or idus or ivdu or ivdus).ti,ab.
27. OR/19–26

Integration

28. Delivery of Health Care, Integrated/
29. Integrat\$.ti,ab
30. OR/28–29
31. 18, 27, and 30
32. Limit to 2000–2011

NOTE: No other limits applied.

Abbreviations: / = index term; ti = title; ab = abstract.

Appendix B

Recommendations and Guidelines

- CDC. Program collaboration and service integration: enhancing the prevention and control of HIV/AIDS, viral hepatitis, sexually transmitted diseases, and tuberculosis in the United States. Atlanta, GA: US Department of Health and Human Services, CDC; 2009. Available at http://www.cdc.gov/nchhstp/programintegration/docs/207181-C_NCHHSTP_PCSI%20WhitePaper-508c.pdf.
- National Institute on Drug Abuse. Drug facts: nationwide trends. Available at <http://www.drugabuse.gov/publications/drugfacts/nationwide-trends>.
- CDC. Unintentional drug poisoning in the United States. Available at <http://www.cdc.gov/HomeandRecreationalSafety/pdf/poison-issue-brief.pdf>.
- CDC. Unintentional drug poisoning in the United States. MMWR 2010;50:300–1.
- CDC. Prevention of hepatitis A through active or passive immunization: recommendations of the Advisory Committee on Immunization Practices. MMWR 2006;55(No. RR-7).
- US Department of Health and Human Services. Combating the silent epidemic of viral hepatitis: action plan for the prevention, care and treatment of viral hepatitis. Available at <http://hepb.org/pdf/Viral-Hepatitis-Action-plan-2011.pdf>.
- White House Office of National Drug Control Policy. National drug control strategy: 2009 annual report. Available at <http://www.globalsecurity.org/security/library/policy/national/ndcs2009.pdf>.
- White House Office of National Drug Control Policy. National drug control strategy: 2010. Available at http://www.whitehouse.gov/sites/default/files/ondcp/policy-and-research/ndcs2010_0.pdf.
- Substance Abuse and Mental Health Services Administration. Screening, brief intervention, and referral to treatment. Available at <http://www.samhsa.gov/prevention/sbirt/SBIRTwhitepaper.pdf>.
- National Institute on Drug Abuse. Community-based outreach model. Available at <http://archives.drugabuse.gov/CBOM/CBOM.html>.
- Agency for Healthcare Research and Quality. Guide to clinical preventive services, 2010–2011, section 2, infectious diseases. Available at <http://www.ahrq.gov/clinic/pocketgd1011/gcp10s2b.htm>.
- US Preventive Services Task Force. Screening for illicit drug use. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspdrug.htm>.
- CDC. Sexually transmitted diseases treatment guidelines, 2010. MMWR 2010;59(No. RR-12).
- American Medical Association. Guidelines for adolescent preventive services: recommendations monograph. Available at <http://www.ama-assn.org/resources/doc/ad-hlth/gapsmono.pdf>.
- CDC. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR 2006;55(No. RR-14).
- CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices (ACIP). Part I: immunization of infants, children, and adolescents. MMWR 2005;54(No. RR-16).
- CDC. A comprehensive immunization strategy to eliminate transmission of hepatitis B virus infection in the United States: recommendations of the Advisory Committee on Immunization Practices. Part II: immunization of adults. MMWR 2006;55(No. RR-16).
- CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC. MMWR 2005;54(No. RR-15).
- US Preventive Services Task Force. Screening for chlamydial infection. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspchlsm.htm>.
- US Preventive Services Task Force. Screening for gonorrhea. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspsono.htm>.
- US Preventive Services Task Force. Screening for genital herpes: recommendation statement. Available at <http://www.uspreventiveservicestaskforce.org/uspstf05/herpes/herpesr.htm>.
- US Preventive Services Task Force. Screening for cervical cancer. Available at <http://www.uspreventiveservicestaskforce.org/uspstf/uspscerv.htm>.
- CDC. Hepatitis B vaccine: what you need to know. Available at <http://www.cdc.gov/vaccines/pubs/vis/downloads/vis-hep-b.pdf>.
- CDC. Quadrivalent human papillomavirus vaccine: recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 2007;56(No. RR-2).
- CDC. US Public Health Service Task Force recommendations for use of antiretroviral drugs in pregnant HIV-infected women for maternal health and interventions to reduce perinatal HIV transmission in the United States. MMWR 2002;51(No. RR-18).
- National Institute on Drug Abuse. Drug facts: HIV/AIDS and drug abuse: intertwined epidemics. Available at <http://www.drugabuse.gov/publications/infacts/drug-abuse-link-to-hiv-aids-other-infectious-diseases>.
- CDC. 2009 compendium of evidence-based HIV prevention interventions. Available at <http://www.cdc.gov/hiv/topics/research/prs/evidence-based-interventions.htm>.
- National Institute on Drug Abuse. Principles of drug addiction treatment: a research-based guide. Bethesda, MD: US Department of Health and Human Services; 1999. NIH Publication No. 99-4180. Available at http://www.drugabuse.gov/sites/default/files/podat_0.pdf.
- Substance Abuse and Mental Health Services Administration. Substance abuse treatment for persons with HIV/AIDS (Treatment Improvement Protocol Series (TIP) 37). Available at <http://radar.boisestate.edu/pdfs/TIP37.pdf>.
- CDC, Health Resources and Services Administration, National Institute on Drug Abuse, National Institutes of Health, Substance Abuse and Mental Health Services Administration. Medical advice for persons who inject illicit drugs. Available at <http://cdncpin.org/Reports/MedAdv.pdf>.
- CDC. Guidelines for the investigation of contacts of persons with infectious tuberculosis: recommendations from the National Tuberculosis Controllers Association and CDC. MMWR 2005;54(No. RR-15).
- CDC. Recommendations for partner services programs for HIV infection, syphilis, gonorrhea, and chlamydia infection. MMWR 2008;57(No. RR-9).
- Substance Abuse and Mental Health Services Administration. Addressing viral hepatitis in people with substance use disorders. Available at <http://blog.samhsa.gov/2012/03/02/addressing-viral-hepatitis-in-people-with-substance-use-disorder>.
- National Institutes of Health. Management of hepatitis C, 2002. Available at <http://consensus.nih.gov/2002/2002hepatitisC2002116html.htm>.
- Substance Abuse and Mental Health Services Administration. Substance abuse and infectious disease: cross-training for collaborative systems of prevention, treatment, and care. Available at <http://tie.samhsa.gov/topics/infectious.html>.
- Substance Abuse and Mental Health Services Administration. Systems integration: overview paper 7. Available at <http://store.samhsa.gov/shin/content/SMA07-4295/SMA07-4295.pdf>.

Recommendations and Reports

- CDC, National Center for HIV, Viral Hepatitis, STD, and TB Prevention. Program collaboration and service integration: enhancing the prevention and control of HIV/AIDS, viral hepatitis, sexually transmitted diseases, and tuberculosis in the United States, an NCHHSTP green paper. Atlanta, GA: US Department of Health and Human Services, CDC; 2007.
- National Institute on Drug Abuse. Principles of HIV prevention in drug-using populations: a research-based guide. Publication number 02-4733. Rockville, MD: National Institutes of Health; 2002. Available at [http://www.nhts.net/media/Principles%20of%20HIV%20Prevention%20\(17\).pdf](http://www.nhts.net/media/Principles%20of%20HIV%20Prevention%20(17).pdf).
- CDC. Framework for program evaluation in public health. MMWR 1999;48(No. RR-11).
- CDC. Practical use of program evaluation among sexually transmitted disease (STD) programs. Available at <http://www.cdc.gov/std/program/pupestd.htm>.
- CDC. Data security and confidentiality guidelines for HIV, viral hepatitis, sexually transmitted disease, and tuberculosis programs: Standards to facilitate sharing and use of surveillance data for public health action. Available at <http://www.cdc.gov/nchhstp/programintegration/docs/PCSIDataSecurityGuidelines.pdf>.
- CDC. Recommendations on the use of quadrivalent human papillomavirus vaccine in males—Advisory Committee on Immunization Practices (ACIP), 2011. MMWR 2011;60:1705–8.
- CDC. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. MMWR 1998; 47(No. RR-19).
- CDC. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945–1965. MMWR 2012; 61(No. RR-4).

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