Published in final edited form as:
Curr Opin Infect Dis. 2013 February ; 26(1): 10–16. doi:10.1097/QCO.0b013e32835c1dd0.

HIV among persons incarcerated in the US: a review of evolving concepts in testing, treatment and linkage to community care

Ryan P. Westergaard, MD, MPH[1], **Anne C. Spaulding, MD, MPH**[2], and **Timothy P. Flanigan, MD**[3,*]

[1]Departments of Medicine and Population Health Sciences, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin, USA

[2]Rollins School of Public Health, Emory University, Atlanta, Georgia, USA

[3]Department of Medicine, Alpert Medical School of Brown University, Providence, RI

Abstract

Purpose of review—People who are incarcerated have a disproportionately high risk of HIV infection. They also tend to have risk factors associated with under-utilization of antiretroviral therapy such as substance abuse, mental illness, and poor access to care. In this review, we describe how incarceration is a marker of vulnerability for suboptimal HIV care, but also how criminal justice settings may be leveraged as a platform for promoting testing, linkage and retention in HIV care for a high-risk, marginalized population.

Recent findings—In both prisons and jails, routine, opt-out HIV testing strategies are more appropriate for screening correctional populations than traditional, risk-based strategies. Rapid HIV testing is feasible and acceptable in busy, urban jail settings. While antiretroviral therapy is successfully administered in many prison settings, release to the community is strongly associated with inconsistent access to medications and other structural factors leading to loss of viral suppression.

Summary—Collaborations among HIV clinicians, criminal justice personnel and public health practitioners represent an important strategy for turning the tide on the HIV epidemic. Success will depend upon scaled-up efforts to seek individuals with undiagnosed infection and bring those who are out-of-care into long-term treatment.

Keywords

HIV/AIDS; criminal justice system; jail; prison; HIV testing; transitional case management; substance abuse

Introduction

A generalized epidemic of HIV persists among the incarcerated U.S. population. Overall, the HIV seroprevalence among incarcerated individuals is 1.5%, approximately 3 times greater than among the general U.S. population.(1) Although the prevalence of HIV in prisons has decreased since the late 1990s, concomitant increases in the size of the incarcerated population have led to a constant number of HIV cases in correctional facilities.

[*]Corresponding Author Information: 1125 N. Main Street, Providence. RI 02906, P# 401-793-7152, F# 401-793-4779, tflanigan@lifespan.org.

Conflicts of interest:
All authors have no conflicts to declare

(2) The HIV prevalence in the state prisons of Florida, Maryland and New York exceeds 3%, a rate higher than the national prevalence of any country outside of sub-Saharan Africa. (3)

The disproportionate prevalence of HIV in jails and prisons highlights the socioeconomic and racial disparities that characterize both the “epidemic” of incarceration and the current state of HIV/AIDS in the U.S.(4) Similar to people living with HIV/AIDS in the U.S., individuals involved with the criminal justice system are more likely to be poor and non-white.(5, 6) In both contexts there are relatively high rates of major mental illness,(7, 8) substance abuse(9, 10) and poor access to outpatient primary care.(11) Over the past decade there has been increasing recognition that because a substantial number of individuals with undiagnosed or untreated HIV regularly interact with the criminal justice system,(2, 12) criminal justice settings ought to be high-priority for HIV testing and linking infected individuals to care. The potential value of this approach is acknowledged through recent funding initiatives by the National Institutes of Health (NIH)(13) and Health Resources and Services Administration (HRSA).(14) In this review, we describe recent developments in the area of HIV testing and treatment in U.S. correctional settings and provide a framework for ongoing and future initiatives to better meet the health needs of the high-risk, marginalized populations most affected by incarceration.

HIV testing in jails and prisons

Since 2006 the U.S. Centers for Disease Control and Prevention (CDC) has recommended routine HIV testing for adults in all clinical settings, including correctional facilities.(15, 16) As described in previous reviews, numerous logistical challenges have resulted in missed opportunities to conduct testing among people who are incarcerated, but experience in some jurisdictions demonstrates how testing can be feasibly and efficiently expanded.(17, 18) A national survey of prison and jail systems suggested 39% of prisons do mandatory or routine HIV testing and only 36% of jails offer any HIV testing.(19) A study of individual jail detainees found that fewer than 1 in 4 had been tested for HIV at any time during their current detention.(20)

It is clear that pre-trial detention in jails presents unique challenges to HIV testing and treatment when compared to the relatively stable and predictable environments in state and federal prisons. Jails are characterized by rapid turnover, having a median length of stay of only 2–5 days.(21) The median length of stay is only 2–5 days. Caring for acute medical and mental health conditions may be prioritized over screening for infectious diseases and other preventive health care. The Bureau of Justice Statistics reported that 32% of prisoners were under the influence of an illegal drug at their time of arrest, and 56% reported use of any illicit substance in the month before arrest.(22) Several recent studies have nonetheless demonstrated that rapid HIV testing assays can be feasibly used to screen for HIV in busy, urban jail settings. From 2003–06, a project in 4 states provided rapid HIV testing to 33,211 individuals, 35% of whom had never been tested previously. Virtually all inmates received their test results, including 409 newly-diagnosed with HIV.(23) A pilot program in Rhode Island jails found that a rapid HIV testing program was highly acceptable & feasible,(24) delivered results to 100% of inmates tested(25) and provided an opportunity to evaluate and address HIV transmission risk behaviors.(26) Prospective trials comparing strategies for rapid voluntary testing in Connecticut jails showed that 44% of men(27) and 59% of women(28) accepted testing. Inmates of both genders in these studies were significantly more likely to accept testing if it was available within the first 24 hours of incarceration, suggesting the timing of HIV testing programs should account for the unpredictable lengths of stay by jail inmates. Similarly, a retrospective analysis of testing in Rhode Island jails

showed that 72 of 169 cases of HIV diagnosed over 8 years would have been missed if testing was delayed until day 7.(29)

In prisons, where slower turnover makes testing more feasible, low rates of HIV testing may result from lack of institutional policies or protocols that guide providers' decisions to offer testing in a standardized way. In prisons as well as jails, an "opt-out" strategy to HIV testing has numerous advantages to traditional approaches that rely upon the discretion of providers or the initiative of patients. A review of prison-based testing in North Carolina demonstrated that 60% of individuals with HIV risk factors were never tested.(30) After that prison system implemented a routine, opt-out testing strategy, the proportion of inmates tested and the number of new diagnoses promptly and dramatically increased.(31) The Washington Department of Corrections found that inmate request led to 5% of incoming male prisoners tested.(32) An opt-in testing policy resulted in 72% of incoming inmates receiving testing; a further change to opt-out testing led to 90% of entrants tested. Because a prison system is responsible for providing healthcare to its entrants for a period of years, aggressive opt out testing for HIV is important, so that appropriate medical care can be delivered.

Opt-out HIV testing in jails represents a public health opportunity to reach those who may not have been offered testing in other venues. Testing that relies on self-identified risk behaviors within jails often misses a large proportion of infections.(33, 34) Among women entering a Connecticut jail, risk-based testing resulted in testing of only 62% of HIV-infected women who were identified using blinded serosurveillance.(35) Using a similar serosurvey in New York jails, investigators estimated that 28.1% of HIV-infected inmates were not diagnosed at the time of admission.(36) The majority (70%) of these undiagnosed individuals did not consent to routine HIV testing at intake, and very few (11%) ever received their HIV diagnosis via routine jail testing. Stigma within criminal justice settings is often a significant barrier to self-identification of risk behaviors(37) as well as to disclosure of known HIV status.(38) National data suggest that as many as 30–40% of incarcerated individuals who test positive for HIV infection report no traditional HIV risk factors.(23, 39) Testing in jail venues can find early infections and prevent delays in diagnosis.(40)

The evidence reviewed above makes a strong case for universal, opt-out testing in the jails of cities with high HIV prevalence. Universal testing may not be cost-effective or appropriate in all jurisdictions, however, and it is reasonable to consider tailoring jail screening practices based on prevalence in the catchment area or among cohorts entering the institution in the recent past. The appropriate threshold below which routine testing can be deferred has not been defined, although CDC suggests it ought to be very low, recommending that "correctional facilities should provide detainees with routine opt-out HIV testing, unless the prevalence of previously undiagnosed HIV infection has been documented to be less than 0.1%."(39)

Antiretroviral therapy: access, adherence & avoidance of treatment interruption

By case law, antiretroviral therapy (ART) is available to HIV-infected individuals who are incarcerated in the U.S. In 2005, a national survey of correctional facilities found that all systems surveyed reported providing ART to at least some incarcerated patients,(19) and a 2007 study estimated that nationwide, 33% of HIV-infected inmates were receiving ART.(41) Early studies suggested that in some correctional systems, ART was under-prescribed and not uniformly administered in accordance with accepted guidelines.(42, 43) However, more recent studies from prison systems with well-organized HIV treatment programs and relationships with academic medical centers have documented appropriate ART utilization

and high rates of successful viral suppression.(44–46) A retrospective review showed that >99% of HIV-infected inmates in Connecticut state prisons were prescribed ART in accordance with DHHS guidelines.(46) Internationally, prisoners' access to ART is too heterogeneous to summarize here, but a recent study from a South African prison system showed high rates for viral suppression (>70%), suggesting that successful delivery of ART in prisons is possible outside of the wealthiest countries.(47)

Measurement of adherence to ART among incarcerated individuals has varied widely across studies. Using MEMS caps, only 32% of subjects in North Carolina prisons had adherence greater than 90%,(48) whereas in Connecticut, 84% of inmates appeared to take more than 80% of doses.(49) Some prison systems favor directly observed therapy (DOT) in order to track adherence of medications as costly as ART, although available data suggest there is limited benefit over self-administered ART.(48, 49) Some research suggests that stigma and confidentiality concerns may limit ART utilization and adherence.(50–52) Administration of ART using "pill lines" where daily doses are administered by staff may compromise confidentiality unless safeguards are in place.(19) "Keep on person" policies, although used by a minority (18%) of U.S. prison systems allow self-administration of ART in a more private setting.(51)

It is now well-accepted that receiving maximum clinical benefit from ART is contingent upon consistent engagement in HIV care and high levels of adherence that are sustained over decades. While prison-based delivery of ART is associated with high rates of successful viral suppression(44–47) and improved quality of life,(53) these beneficial effects frequently are not sustained after release to the community. Several investigators have shown that for individuals who return to prison after a previous stay, average HIV viral load tends to significantly increase between the time of release to the community and upon re-incarceration.(46, 54, 55) A retrospective review of ART-treated individuals being released from Texas prisons showed that an astonishingly large majority failed to fill their prescription for ART in time to avoid an interruption in therapy.(45) In this study, only 5% of recent-inmates obtained a refill within the 10-day window following release for which they received a free supply of medications. Those who received pre-release discharge planning had significantly less interruption in care.

For people living with HIV who receive care in the community, incarceration, by virtue of its inherent disruption of social networks and patient-provider relationships, is a major impediment to effective, longitudinal HIV care. Among injection drug users, incarceration is a major reason for discontinuation of ART,(56) decreased adherence to ART,(52, 57) and is associated with decreased likelihood of viral suppression among ART initiators.(58, 59) Furthermore, among individuals successfully achieving viral suppression in the community, incarceration is strongly associated with plasma HIV RNA rebound.(60, 61)

Transitions from correctional to community-based HIV care

The weeks immediately following release from prison are a particularly vulnerable period for former inmates. Increased all-cause mortality,(62, 63) high rates of drug overdose,(62, 64) as well as increases in HIV transmission-risk behavior (65–68) have been demonstrated during this period. Health care utilization is low following release, as most inmates lack health insurance (most lose their insurance benefits while incarcerated)(69) or ties to a regular source of care in the community.(70) This combination of factors leads to a hazardous situation in which inadequately-treated individuals who are increasingly infectious due to unchecked HIV replication place others at risk for HIV transmission through high-risk behavior. Resisting drug relapse is another tremendous challenge for

released prisoners. 85% of prisoners with opioid or alcohol dependence relapse upon release to the community, regardless of the duration of incarceration.(71)

In view of these daunting challenges, robust programs for linking individuals to post-incarceration HIV care are essential for sustaining the clinical and public health benefits of antiretroviral treatment programs. Strategies to facilitate continuity of care must address diverse social, medical and economic challenges, including housing and employment, entitlements including medical insurance, and coping with psychiatric and substance use disorders.(72–75) Multi-disciplinary case management approaches designed to facilitate connections between corrections-based and community-based resources have been developed in numerous settings and appear to be emerging as a standard of care.(76–79) A 10-site study of jail interventions to enhance linkage to care showed those who had post jail HIV management addressed had significantly better linkage to care; overall 25.7% of individuals receiving services had viral suppression six months post jail discharge,(80) a rate close to the national average.(81) Project Bridge has provided intensive case management to HIV-infected inmates leaving the Rhode Island state prison since 1996, aiming to improve continuity of medical care through social stabilization and co-location of medical and social service providers.(82, 83) A prospective trial comparing a similar bridging case management approach to standard pre-release discharge planning demonstrated high rates of clinic attendance and social service utilization in both study arms, suggesting that numerous strategies can effectively support individuals release from prison if the relevant unmet needs are appropriately addressed.(84) A recent review highlighted 5 items that are a priority for HIV infected inmates being released: (1) case management services to facilitate linkage to care; (2) continuity of ART; (3) treatment of substance use disorders; (4) continuity of mental illness treatment; and (5) reducing HIV-associated risk-taking behaviors as part of secondary prevention.(85)

Ethical considerations regarding HIV/AIDS clinical research among inmates

Clinical research involving inmates in jails or prisons is fraught with ethical challenges. Since inmates bear a disproportionate burden of HIV infection, it is important and justifiable that researchers investigate issues related to HIV care and prevention in as they relate to incarcerated persons. Yet the barriers to conducting ethical research in correctional settings are daunting. Because inmates are by nature in a coercive environment, the autonomy to provide voluntary consent may be limited. Coercion may be actual or may be perceived.(86) Incarceration by its nature, limits choices. Inmates may feel that may not receive needed care if they decline to participate in clinical studies. For these reasons, federal regulations provide safeguards that federally funded clinical research among inmates must follow. These are found in 45 CFR 46, Subpart C, and apply to all research involving any individual who is or becomes a prisoner while participating in a study. (Table 1) The intent of these regulations is laudable, but the practical effect has been to discourage clinical research that could be of great benefit. Even when clinical research is approved, numerous challenges remain. Confidentiality and privacy are in short supply in prisons and jails.(86) Both the physical environment and policies and procedures may limit privacy.(87) Attitudinal and structural barriers to research are frequently encountered. For example, correctional officers may not perceive the value of clinical research, and hence may put up “roadblocks”. Structural barriers such as the “count” of inmates each shift may limit the time for interviews. Clinical research within corrections requires enormous personal effort and time to fulfill ethical and regulatory requirements. Yet it is very worthwhile because of the huge benefit that may accrue from such research. Improved diagnosis, treatment, or even prevention of substance abuse, mental illness, and infectious diseases such as HIV that disproportionately impact incarcerated communities would be of great value.

Conclusion

When people living with HIV/AIDS become incarcerated, they continue to deserve the highest quality of medical care available. Criminal justice systems in the United States are fortunate to have sufficient resources to deliver appropriate ART to all in their custody who need it, yet significant progress needs to be made to ensure individuals continue to receive optimal HIV care as they transition back to the community. Comprehensive strategies to identify people with undiagnosed or untreated HIV infection, to expand the number of patients receiving antiretroviral therapy and ultimately, to reduce the rate of new infections must acknowledge and address the role the criminal justice system plays in the ongoing HIV epidemic.

Acknowledgments

This manuscript was supported by NIH grant K23DA032306 to RPW.

The authors thank Cody Rissman and Beau Batty for valuable research assistance.

References

1. Maruschak, L. HIV in Prisons, 2001–2010. Washington, D.C: US Department of Justice, Bureau of Justice Statistics; Report No: NCJ 238877; http://bjs.ojp.usdoj.gov/content/pub/pdf/hivp10.pdf [accessed 9/18/12, 2012.]
2. Spaulding AC, Seals RM, Page MJ, Brzozowski AK, Rhodes W, Hammett TM. HIV/AIDS among inmates of and releasees from US correctional facilities, 2006: declining share of epidemic but persistent public health opportunity. PLoS One. 2009; 4(11):e7558. Epub 2009/11/13. [PubMed: 19907649]
3. UNAIDS. Global report: UNAIDS report on the global AIDS epidemic 2010. Geneva: Joint United Nations Programme on HIV/AIDS; http://www.unaids.org/globalreport/documents/20101123_GlobalReport_full_en.pdf [accessed 9/18/12, 2010.]
4. Rich JD, Wakeman SE, Dickman SL. Medicine and the epidemic of incarceration in the United States. N Engl J Med. 2011; 364(22):2081–3. Epub 2011/06/03. [PubMed: 21631319]
5. Sabol, WJ.; Minton, TD.; Harrison, PM. Prison and Jail Inmates at Midyear, 2006. US Department of Justice; 2007. Document NCJ 217675
6. Petitt W, Western B. Mass imprisonment and the life course: race and class inequality in U.S. incarceration. Am Soc Rev. 2004; 69:151–69.
7. Greenberg GA, Rosenheck RA. Jail incarceration, homelessness, and mental health: a national study. Psychiatric services. 2008; 59(2):170–7. Epub 2008/02/05. [PubMed: 18245159]
8. Scheyett A, Parker S, Golin C, White B, Davis CP, Wohl D. HIV-Infected Prison Inmates: Depression and Implications for Release Back to Communities. AIDS Behav. 2008 Epub 2008/08/19.
9. Mumola, CJ.; Karberg, JC. Drug Use and Dependence, State and Federal Prisons, 2004. US Department of Justice; 2006. Document NCJ 213530
10. Karberg, J.; James, D. Substance Dependence, Abuse, and Treatment of Jail Inmates, 2002. Washington, D.C: 2005. Contract No.: Report No.: NCJ 209588
11. Culbert GJ. Understanding the health needs of incarcerated men living with HIV/AIDS: a primary health care approach. Journal of the American Psychiatric Nurses Association. 2011; 17(2):158–70. Epub 2011/06/11. [PubMed: 21659306]
12. Hammett TM, Harmon MP, Rhodes W. The burden of infectious disease among inmates of and releasees from US correctional facilities, 1997. Am J Public Health. 2002; 92(11):1789–94. Epub 2002/10/31. [PubMed: 12406810]
13. National Institute on Drug Abuse. [accessed on 7/30/12].] Unprecedented effort to seek, test, and treat inmates with HIV. 2010. [cited http://www.drugabuse.gov/news-events/news-releases/2010/09/unprecedented-effort-to-seek-test-treat-inmates-hiv

14. Draine J, Ahuja D, Altice FL, Arriola KJ, Avery AK, Beckwith CG, et al. Strategies to enhance linkages between care for HIV/AIDS in jail and community settings. AIDS Care. 2011; 23(3): 366–77. Epub 2011/02/25. [PubMed: 21347900]
15. Branson BM, Handsfield HH, Lampe MA, Janssen RS, Taylor AW, Lyss SB, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep. 2006; 55(RR-14):1–17. quiz CE1-4. Epub 2006/09/22. [PubMed: 16988643]
16. Centers for Disease Control and Prevention. HIV testing implementation guidance for correctional settings. 2009. [September 5, 2012]; Available from: http://www.cdc.gov/hiv/topics/testing/guideline.htm
17. Flanigan TP, Zaller N, Beckwith CG, Bazerman LB, Rana A, Gardner A, et al. Testing for HIV, sexually transmitted infections, and viral hepatitis in jails: still a missed opportunity for public health and HIV prevention. J Acquir Immune Defic Syndr. 2010; 55(Suppl 2):S78–83. Epub 2011/03/26. [PubMed: 21406992]
18. 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. Epub 2010/11/10. [PubMed: 21045600]
19. Hammett, TM.; Kennedy, S.; Kuck, S. Unpublished data. US Department of Justice; 2006. National Survey of Infectious Diseases in Correctional Facilities: HIV and Sexually Transmitted Diseases. Report No. NCJ 217736[September 5, 2012]; Available from: https://www.ncjrs.gov/pdffiles1/nij/grants/217736.pdf
20. Maruschak, L. Medical problems of jail inmates. Bureau of Justice Statistics Bulletin. Washington, DC: Office of Justice Programs, US Department of Justice; 2006.
21. Spaulding AC, Perez SD, Seals RM, Hallman MA, Kavasery R, Weiss PS. Diversity of release patterns for jail detainees: implications for public health interventions. Am J Public Health. 2011; 101(Suppl 1):S347–52. Epub 2011/11/01. [PubMed: 22039042]
22. Mumola, CJ.; Karberg, JC. Justice USDo. Drug Use and Dependence, State and Federal Prisoners 2004. Washington, D.C: Bureau of Justice Statistics; 2006.
23. Macgowan R, Margolis A, Richardson-Moore A, Wang T, Lalota M, French PT, et al. Voluntary rapid human immunodeficiency virus (HIV) testing in jails. Sex Transm Dis. 2009; 36(2 Suppl):S9–13. Epub 2007/08/29. [PubMed: 17724428]
24. Beckwith CG, Bazerman L, Cornwall AH, Patry E, Poshkus M, Fu J, et al. An evaluation of a routine opt-out rapid HIV testing program in a Rhode Island jail. AIDS Educ Prev. 2011; 23(3 Suppl):96–109. Epub 2011/06/28. [PubMed: 21689040]
25. Beckwith CG, Atunah-Jay S, Cohen J, Macalino G, Poshkus M, Rich JD, et al. Feasibility and acceptability of rapid HIV testing in jail. AIDS Patient Care STDS. 2007; 21(1):41–7. Epub 2007/02/01. [PubMed: 17263656]
26. Beckwith CG, Liu T, Bazerman LB, DeLong AK, Desjardins SF, Poshkus MM, et al. HIV risk behavior before and after HIV counseling and testing in jail: a pilot study. J Acquir Immune Defic Syndr. 2009; 53(4):485–90. Epub 2009/12/26. [PubMed: 20035232]
27. Kavasery R, Maru DS, Sylla LN, Smith D, Altice FL. A prospective controlled trial of routine opt-out HIV testing in a men's jail. PLoS One. 2009; 4(11):e8056. Epub 2009/12/01. [PubMed: 19946371]
28. Kavasery R, Maru DS, Cornman-Homonoff J, Sylla LN, Smith D, Altice FL. Routine opt-out HIV testing strategies in a female jail setting: a prospective controlled trial. PLoS One. 2009; 4(11):e7648. Epub 2009/12/01. [PubMed: 19946370]
29. Centers for Disease C. Prevention Routine jail-based HIV testing - Rhode Island, 2000–2007. MMWR Morb Mortal Wkly Rep. 2010; 59(24):742–5. Epub 2010/06/26. [PubMed: 20577155]
30. Rosen DL, Schoenbach VJ, Wohl DA, White BL, Stewart PW, Golin CE. An evaluation of HIV testing among inmates in the North Carolina prison system. Am J Public Health. 2009; 99(Suppl 2):S452–9. Epub 2009/10/08. [PubMed: 19797758]
31. Wohl, D.; Smith, P.; Green, K. Opt-out HIV testing on prison entry increases the proportion of individuals screened for HIV and the number testing seropositive. Abstract W-197. 17th Conference on Retroviruses and Opportunistic Infections (CROI); San Francisco. p. CA2010

32. Centers for Disease Control and Prevention. HIV Screening of Male Inmates During Prison Intake Medical Evaluation — Washington, 2006–2010. MMWR Morb Mortal Wkly Rep. 2011; 60:811–13. [PubMed: 21697805]
33. Mason D, Birmingham L, Grubin D. Substance use in remand prisoners: a consecutive case study. BMJ. 1997; 315(7099):18–21. Epub 1997/07/05. [PubMed: 9233320]
34. Behrendt C, Kendig N, Dambita C, Horman J, Lawlor J, Vlahov D. Voluntary testing for human immunodeficiency virus (HIV) in a prison population with a high prevalence of HIV. Am J Epidemiol. 1994; 139(9):918–26. Epub 1994/05/01. [PubMed: 8166142]
35. Altice FL, Marinovich A, Khoshnood K, Blankenship KM, Springer SA, Selwyn PA. Correlates of HIV infection among incarcerated women: implications for improving detection of HIV infection. J Urban Health. 2005; 82(2):312–26. Epub 2005/05/06. [PubMed: 15872190]
36. Begier EM, Bennani Y, Forgione L, Punsalang A, Hanna DB, Herrera J, et al. Undiagnosed HIV infection among New York City jail entrants, 2006: results of a blinded serosurvey. J Acquir Immune Defic Syndr. 2010; 54(1):93–101. Epub 2010/01/01. [PubMed: 20042868]
37. Derlega VJ, Winstead BA, Brockington JE Jr. AIDS stigma among inmates and staff in a USA state prison. Int J STD AIDS. 2008; 19(4):259–63. Epub 2008/05/17. [PubMed: 18482946]
38. Derlega VJ, Winstead BA, Gamble KA, Kelkar K, Khuanghlawn P. Inmates with HIV, stigma, and disclosure decision-making. J Health Psychol. 2010; 15(2):258–68. Epub 2010/03/09. [PubMed: 20207669]
39. VanHandel M, Beltrami JF, MacGowan RJ, Borkowf CB, Margolis AD. Newly identified HIV infections in correctional facilities, United States, 2007. Am J Public Health. 2012; 102(Suppl 2):S201–4. Epub 2012/03/10. [PubMed: 22401522]
40. de Voux A, Spaulding AC, Beckwith C, Avery A, Williams C, Messina LC, et al. Early identification of HIV: empirical support for jail-based screening. PLoS One. 2012; 7(5):e37603. Epub 2012/06/05. [PubMed: 22662177]
41. Zaller N, Thurmond P, Rich JD. Limited spending: an analysis of correctional expenditures on antiretrovirals for HIV-infected prisoners. Public Health Rep. 2007; 122(1):49–54. Epub 2007/01/24. [PubMed: 17236608]
42. Baillargeon J, Borucki M, Zepeda S, Jenson H, Leach C. Antiretroviral prescribing patterns in the texas prison system. Ann Epidemiol. 2000; 10(7):474. Epub 2000/10/06. [PubMed: 11018410]
43. Gajewski-Verbanac, L.; Lewis, SM.; Chrisman, C. Retrospective analysis of antiretroviral treatment guidelines in a national correctional base. Program and abstracts of the 39th Interscience Conference on Antimicrobial Agents and Chemotherapy; September 26–29, 1999; San Francisco. p. Abstract 600.1999
44. Springer SA, Friedland GH, Doros G, Pesanti E, Altice FL. Antiretroviral treatment regimen outcomes among HIV-infected prisoners. HIV Clin Trials. 2007; 8(4):205–12. Epub 2007/08/28. [PubMed: 17720660]
45. Baillargeon J, Giordano TP, Rich JD, Wu ZH, Wells K, Pollock BH, et al. Accessing antiretroviral therapy following release from prison. JAMA. 2009; 301(8):848–57. Epub 2009/02/27. [PubMed: 19244192]
46. Springer SA, Pesanti E, Hodges J, Macura T, Doros G, Altice FL. Effectiveness of antiretroviral therapy among HIV-infected prisoners: reincarceration and the lack of sustained benefit after release to the community. Clin Infect Dis. 2004; 38(12):1754–60. Epub 2004/07/01. [PubMed: 15227623]
47. Davies NE, Karstaedt AS. Antiretroviral outcomes in South African prisoners: a retrospective cohort analysis. PLoS One. 2012; 7(3):e33309. Epub 2012/04/04. [PubMed: 22470448]
48. Wohl DA, Stephenson BL, Golin CE, Kiziah CN, Rosen D, Ngo B, et al. Adherence to directly observed antiretroviral therapy among human immunodeficiency virus-infected prison inmates. Clin Infect Dis. 2003; 36(12):1572–6. Epub 2003/06/13. [PubMed: 12802758]
49. Altice FL, Mostashari F, Friedland GH. Trust and the acceptance of and adherence to antiretroviral therapy. J Acquir Immune Defic Syndr. 2001; 28(1):47–58. Epub 2001/10/02. [PubMed: 11579277]
50. Rosen DL, Golin CE, Schoenbach VJ, Stephenson BL, Wohl DA, Gurkin B, et al. Availability of and access to medical services among HIV-infected inmates incarcerated in North Carolina county

jails. J Health Care Poor Underserved. 2004; 15(3):413–25. Epub 2004/09/30. [PubMed: 15453178]

51. Pontali E. Antiretroviral treatment in correctional facilities. HIV Clin Trials. 2005; 6(1):25–37. Epub 2005/03/15. [PubMed: 15765308]
52. Small W, Wood E, Betteridge G, Montaner J, Kerr T. The impact of incarceration upon adherence to HIV treatment among HIV-positive injection drug users: a qualitative study. AIDS Care. 2009; 21(6):708–14. Epub 2009/10/07. [PubMed: 19806487]
53. del Castillo LS, Ruiz-Perez I, de Labry-Lima AO, Soto-Blanco JM, Girela-Lopez E, Castro-Recio JM, et al. Influence of antiretroviral treatment on quality of life in seropositive inmates. Int J STD AIDS. 2008; 19(3):172–7. Epub 2008/04/10. [PubMed: 18397557]
54. Stephenson BL, Wohl DA, Golin CE, Tien HC, Stewart P, Kaplan AH. Effect of release from prison and re-incarceration on the viral loads of HIV-infected individuals. Public Health Rep. 2005; 120(1):84–8. Epub 2005/03/02. [PubMed: 15736336]
55. Thomas-Gosain, N.; Westergaard, RP.; Safdar, N.; Garvens, B.; Sosman, J. Treatment interruption following release from prison is associated with development of antiretroviral resistance mutations among HIV-infected inmates. 19th Conference on Retroviruses and Opportunistic Infections; March 19, 2012; Seattle, WA. 2012.
56. Kerr T, Marshall A, Walsh J, Palepu A, Tyndall M, Montaner J, et al. Determinants of HAART discontinuation among injection drug users. AIDS Care. 2005; 17(5):539–49. Epub 2005/07/23. [PubMed: 16036240]
57. Milloy MJ, Kerr T, Buxton J, Rhodes T, Guillemi S, Hogg R, et al. Dose-response Effect of Incarceration Events on Nonadherence to HIV Antiretroviral Therapy Among Injection Drug Users. Journal of Infectious Diseases. 2011; 203(9):1215–21. [PubMed: 21459814]
58. Mehta SH, Lucas G, Astemborski J, Kirk GD, Vlahov D, Galai N. Early immunologic and virologic responses to highly active antiretroviral therapy and subsequent disease progression among HIV-infected injection drug users. AIDS Care. 2007; 19(5):637–45. Epub 2007/05/17. [PubMed: 17505924]
59. Palepu A, Tyndall MW, Chan K, Wood E, Montaner JS, Hogg RS. Initiating highly active antiretroviral therapy and continuity of HIV care: the impact of incarceration and prison release on adherence and HIV treatment outcomes. Antivir Ther. 2004; 9(5):713–9. Epub 2004/11/13. [PubMed: 15535408]
60. Milloy MJ, Kerr T, Buxton J, Rhodes T, Krusi A, Guillemi S, et al. Social and environmental predictors of plasma HIV RNA rebound among injection drug users treated with antiretroviral therapy. J Acquir Immune Defic Syndr. 2012; 59(4):393–9. Epub 2011/12/03. [PubMed: 22134149]
61. Westergaard RP, Kirk GD, Richesson DR, Galai N, Mehta SH. Incarceration predicts virologic failure for HIV-infected injection drug users receiving antiretroviral therapy. Clin Infect Dis. 2011; 53(7):725–31. Epub 2011/09/06. [PubMed: 21890777]
62. Binswanger IA, Stern MF, Deyo RA, Heagerty PJ, Cheadle A, Elmore JG, et al. Release from prison--a high risk of death for former inmates. N Engl J Med. 2007; 356(2):157–65. Epub 2007/01/12. [PubMed: 17215533]
63. Spaulding AC, Seals RM, McCallum VA, Perez SD, Brzozowski AK, Steenland NK. Prisoner survival inside and outside of the institution: implications for health-care planning. Am J Epidemiol. 2011; 173(5):479–87. Epub 2011/01/18. [PubMed: 21239522]
64. Seaman SR, Brettle RP, Gore SM. Mortality from overdose among injecting drug users recently released from prison: database linkage study. BMJ. 1998; 316(7129):426–8. Epub 1998/03/11. [PubMed: 9492665]
65. Wood E, Li K, Small W, Montaner JS, Schechter MT, Kerr T. Recent incarceration independently associated with syringe sharing by injection drug users. Public Health Rep. 2005; 120(2):150–6. Epub 2005/04/22. [PubMed: 15842116]
66. Milloy MJ, Buxton J, Wood E, Li K, Montaner JS, Kerr T. Elevated HIV risk behaviour among recently incarcerated injection drug users in a Canadian setting: a longitudinal analysis. BMC Public Health. 2009; 9:156. Epub 2009/05/29. [PubMed: 19473508]

67. Stephenson BL, Wohl DA, McKaig R, Golin CE, Shain L, Adamian M, et al. Sexual behaviours of HIV-seropositive men and women following release from prison. Int J STD AIDS. 2006; 17(2): 103–8. Epub 2006/02/09. [PubMed: 16464271]
68. MacGowan RJ, Margolis A, Gaiter J, Morrow K, Zack B, Askew J, et al. Predictors of risky sex of young men after release from prison. Int J STD AIDS. 2003; 14(8):519–23. Epub 2003/08/26. [PubMed: 12935380]
69. Wakeman SE, McKinney ME, Rich JD. Filling the gap: the importance of Medicaid continuity for former inmates. J Gen Intern Med. 2009; 24(7):860–2. Epub 2009/04/22. [PubMed: 19381728]
70. Harzke AJ, Ross MW, Scott DP. Predictors of post-release primary care utilization among HIV-positive prison inmates: a pilot study. AIDS Care. 2006; 18(4):290–301. Epub 2006/07/01. [PubMed: 16809106]
71. Saber-Tehrani AS, Springer SA, Qiu J, Herme M, Wickersham J, Altice FL. Rationale, study design and sample characteristics of a randomized controlled trial of directly administered antiretroviral therapy for HIV-infected prisoners transitioning to the community - a potential conduit to improved HIV treatment outcomes. Contemporary clinical trials. 2012; 33(2):436–44. Epub 2011/11/22. [PubMed: 22101218]
72. Baillargeon J, Penn JV, Thomas CR, Temple JR, Baillargeon G, Murray OJ. Psychiatric disorders and suicide in the nation's largest state prison system. J Am Acad Psychiatry Law. 2009; 37(2): 188–93. Epub 2009/06/19. [PubMed: 19535556]
73. Altice, FL. Special Considerations and Clinical Management of HIV-Infected Drug Users. Eron, JJ.; Smith, KY.; Squires, KE., editors. 2009.
74. Springer SA, Altice FL. Managing HIV/AIDS in correctional settings. Curr HIV/AIDS Rep. 2005; 2(4):165–70. Epub 2005/12/14. [PubMed: 16343373]
75. Nunn A, Cornwall A, Fu J, Bazerman L, Loewenthal 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. Journal of Urban Health. 2010; 87(6):954–68. [PubMed: 21046470]
76. Laufer FN, Arriola KRJ, Dawson-Rose CS, Kumaravelu K, Rapposelli KK. From jail to community: Innovative strategies to enhance continuity of HIV/AIDS care. Prison J. 2002; 82(1): 84–100.
77. Richie BE, Freudenberg N, Page J. Reintegrating women leaving jail into urban communities: a description of a model program. J Urban Health. 2001; 78(2):290–303. Epub 2001/06/23. [PubMed: 11419582]
78. Conklin TJ, Lincoln T, Flanigan TP. A public health model to connect correctional health care with communities. Am J Public Health. 1998; 88(8):1249–50. Epub 1998/08/14. [PubMed: 9702163]
79. Lincoln T, Kennedy S, Tuthill R, Roberts C, Conklin TJ, Hammett TM. Facilitators and barriers to continuing healthcare after jail: a community-integrated program. The Journal of ambulatory care management. 2006; 29(1):2–16. Epub 2005/12/13. [PubMed: 16340615]
80. Spaulding AC, Messina LC, Kim BI, Chung K, Lincoln T, Teixeira P, et al. Planning for Success Predicts Virus Suppressed: Results of a Non-Controlled, Observational Study of Factors Associated with Viral Suppression among HIV-positive Persons Following Jail Release. AIDS and Behavior. in press.
81. Gardner EM, McLees MP, Steiner JF, Del Rio C, Burman WJ. The Spectrum of Engagement in HIV Care and its Relevance to Test-and-Treat Strategies for Prevention of HIV Infection. Clin Infect Dis. 2011; 52(6):793–800. Epub 2011/03/04. [PubMed: 21367734]
82. Rich JD, Holmes L, Salas C, Macalino G, Davis D, Ryczek J, et al. Successful linkage of medical care and community services for HIV-positive offenders being released from prison. J Urban Health. 2001; 78(2):279–89. Epub 2001/06/23. [PubMed: 11419581]
83. Zaller ND, Holmes L, Dyl AC, Mitty JA, Beckwith CG, Flanigan TP, et al. Linkage to treatment and supportive services among HIV-positive ex-offenders in Project Bridge. J Health Care Poor Underserved. 2008; 19(2):522–31. Epub 2008/05/13. [PubMed: 18469423]
84. Wohl DA, Scheyett A, Golin CE, White B, Matuszewski J, Bowling M, 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(2):356–64. Epub 2010/11/03. [PubMed: 21042930]

85. Springer SA, Spaulding AC, Meyer JP, Altice FL. Public health implications for adequate transitional care for HIV-infected prisoners: five essential components. Clin Infect Dis. 2011; 53(5):469–79. Epub 2011/08/17. [PubMed: 21844030]
86. Eldridge GD, Robinson RV, Corey S, Brems C, Johnson ME. Ethical Challenges in Conducting HIV/AIDS Research in Correctional Settings. Journal of correctional health care : the official journal of the National Commission on Correctional Health Care. 2012 Epub 2012/09/07.
87. Seal DW, Eldridge GD, Zack B, Sosman J. HIV testing and treatment with correctional populations: people, not prisoners. J Health Care Poor Underserved. 2010; 21(3):977–85. Epub 2010/08/10. [PubMed: 20693739]

Key points

1. People living with HIV/AIDS are disproportionately involved in the criminal justice system, and often have complex medical, mental health, and substance abuse needs.
2. The prevalence of HIV infection is high in correctional facilities, and many infected inmates are undiagnosed or have been out of care prior to incarceration. Routine, voluntary, or “opt out” HIV testing should therefore be offered in all correctional facilities.
3. Arrest and incarceration are major barriers to continuity of longitudinal HIV care. Systems should be in place to ensure that patients have continuous access to antiretroviral therapy from when they enter custody, through the time they are released back to the community.

Table 1

Regulatory requirements for research involving prisoners found in 45 CFR 46, Subpart C

Subpart C dictates that biomedical or behavioral research may involve prisoners as subjects only if:

1 The institution responsible for the conduct of the research has certified to the Secretary that the Institutional Review Board (IRB) has approved the research under Federal regulation that specifically specify IRB processes (46.305)

2 In the judgment of the Secretary the proposed research involves solely the following:

- **i.** Study of the possible causes, effects, and processes of incarceration, and of criminal behavior, provided that the study presents no more than minimal risk and no more than inconvenience to the subjects;
- **ii.** Study of prisons as institutional structures or of prisoners as incarcerated persons, provided that the study presents no more than minimal risk and no more than inconvenience to the subjects;
- **iii.** Research on conditions particularly affecting prisoners as a class (for example, vaccine trials and other research on hepatitis which is much more prevalent in prisons than elsewhere; and research on social and psychological problems such as alcoholism, drug addiction, and sexual assaults) provided that the study may proceed only after the Secretary has consulted with appropriate experts including experts in penology, medicine, and ethics, and published notice, in the FEDERAL REGISTER, of his intent to approve such research; or
- **iv.** Research on practices, both innovative and accepted, which have the intent and reasonable probability of improving the health or well-being of the subject. In cases in which those studies require the assignment of prisoners in a manner consistent with protocols approved by the IRB to control groups which may not benefit from the research, the study may proceed only after the Secretary has consulted with appropriate experts, including experts in penology, medicine, and ethics, and published notice, in the FEDERAL REGISTER, of the intent to approve such research.