

# HCV Testing and Treatment in Correctional Settings

## Prevalence of HCV infection in Correctional Settings

HCV infection disproportionately affects individuals in correctional institutions, which include jails (short-stay facilities that typically house persons for sentences of up to 1 year) and prisons (long-term facilities for persons with a felony conviction). A 2003 Centers for Disease Control and Prevention (CDC) survey based on data derived from 8 states estimated that 16% to 41% of US inmates had serological evidence of prior HCV exposure and 12% to 35% had chronic infection ([Allen, 2003](#)); ([Weinbaum, 2003](#)). More recent analyses suggest that the seroprevalence of HCV infection in incarcerated populations ranges from 17.4% to 23.1% ([Varan, 2014](#)); ([Edlin, 2015](#)). However, HCV prevalence in correctional populations is not geographically uniform and can vary by state and region ([Varan, 2014](#)). These estimates far exceed the 1.0% HCV prevalence in the general population ([Denniston, 2014](#)). Injection drug use is the most common risk factor for HCV transmission in correctional settings ([Ruiz, 1999](#)); ([Spaulding, 2006](#)). HCV-associated liver disease is a frequent cause of death in inmates and has recently surpassed death from HIV ([Spaulding, 2011](#)); ([Spaulding, 2015](#)).

Approximately 30% of all persons with HCV infection in the US spend at least part of the year in a correctional institution ([Hammett, 2002](#)); ([Varan, 2014](#)). Unfortunately, most HCV-infected individuals in correctional facilities are unaware of their infection ([Spaulding, 2012](#)). Given the high prevalence of HCV infection in correctional settings coupled with the fact that more than 10 million individuals pass through jails and prisons each year, as many as 1 million persons with undiagnosed HCV infection might come into contact with the correctional system each year ([Spaulding, 2012](#)); ([Rich, 2014](#)). More than 90% of these individuals are eventually released and re-enter the general population, where they can contribute to HCV spread in the community ([Macalino, 2004](#)); ([Rich, 2014](#)) and may have little contact with the healthcare system ([Fox, 2005](#)); ([Bushway, 2006](#)); ([Rich, 2014b](#)); ([Neate, 2016](#)). Moreover, 68% of prisoners are reincarcerated for a new crime within 3 years of their release from prison ([Durose, 2014](#)). Recidivism can further promote the spread of HCV within correctional settings.

Both the US Preventive Services Task Force and the World Health Organization recommend that all incarcerated persons undergo HCV testing ([WHO, 2016](#)); ([Moyer, 2013b](#)). Despite these recommendations and the high prevalence of HCV infection in correctional institutions, HCV testing is not universally performed in this setting.

## Current Approaches to HCV Testing and Treatment in Jails

HCV testing and treatment have been historically uncommon in jails, primarily because of the short duration of incarceration and lack of available resources ([Maurer, 2015](#)). With approximately 11 million jail admissions annually ([Minton, 2016](#)), jails represent an important public health setting in which to test for HCV infection and treat persons with chronic HCV.

Jails have also not had the resources and systems to enable continuation of community-initiated HCV therapy. If detainees are unable to continue HCV treatment while incarcerated in jail, the interruption in therapy will adversely affect the likelihood of achieving a cure and could promote development of viral resistance. Without systems to facilitate continuation of HCV therapy, jails may interfere with community HCV treatment efforts and societal payers will suffer losses on investments.

## Current Approaches to HCV Testing and Treatment in Prisons

The bulk of the evidence on current HCV testing and treatment in the prison setting is based on a 2015 national survey conducted by the American Correctional Association and the Coalition of Correctional Health Authorities research and health outcomes working group ([Maurer, 2015](#)). According to this survey, some type of HCV testing is performed in the majority of prisons but routine opt-out testing is generally not conducted across the prison system. Additionally, there are major differences in approaches to HCV testing and prevention counseling. The most common triggers for HCV testing in a prison setting were physician request, identified risk factors, and inmate request. Only 16% of prison facilities tested all inmates with an HCV-antibody test upon entry. Selection of patients for antiviral therapy also varied across prison systems. The survey found that antiviral therapy for chronic HCV was available in 90% of prisons. However, few inmates actually received treatment, primarily due to antiviral therapy expense and lack of availability of trained staff. Moreover,


despite the fact that injection drug use was the major risk factor for HCV transmission in this population, only half of the prison facilities combined substance use disorder treatment with HCV therapy.

More recently, investigators at Yale University administered a survey to the directors of the departments of corrections in all 50 US states that inquired about current HCV practices within state correctional facilities (Beckman, 2016). This survey included questions about the number of inmates in the state’s prisons known to be HCV-infected on or about December 31, 2014; the number of prisoners receiving any form of HCV treatment at that time; and the availability of relevant resources for inmates with known HCV infection. Representatives from 41 states completed the questions on the number of inmates with chronic HCV infection and the proportion receiving antiviral treatment. The overall number of inmates who were reported to have chronic HCV in the 41 reporting states was 106,266 prisoners, corresponding to 10% of the overall prison population in these states. Among these inmates, only 0.89% (n=949) received any form of HCV treatment on or about December 31, 2014. States used a variety of factors to prioritize HCV treatment among inmates, particularly cirrhosis, sentence length, likelihood of recidivism, potential for antiviral adherence, and chance of HCV reinfection. States with a relatively high proportion of inmates reported to have HCV infection did not treat a greater number of patients than states with a low proportion of infections.


Representatives from 49 of the state departments of corrections completed the questions on resources related to HCV infection. Seventeen states reported offering routine opt-out HCV testing of inmates. Among the 32 states without routine opt-out HCV testing, the main indications for HCV testing were abnormal results from other tests, HIV infection, or a substance use disorder. Medication-assisted treatment programs for substance use disorders were available through 14 state departments of corrections. Four states reported that they followed all of the Federal Bureau of Prisons guidelines (FBP, 2016).

**Increased HCV Testing and Treatment in Correctional Institutions Will Aid HCV Elimination**


Given the high prevalence of HCV among persons in the US correctional system, the success of the national HCV elimination effort will depend on identifying chronically infected individuals in jails and prisons, linking these persons to medical care for management, and providing access to antiviral treatment (NAS, 2017). Diagnosis of chronic HCV in correctional settings followed by linkage to care and successful antiviral treatment can ultimately reduce the risk of liver-related and extrahepatic complications, and has the potential to decrease HCV transmission in correctional facilities and the community after release (van der Meer, 2012); (Harris, 2016); (He, 2016).

Recommendations for Screening and Treatment of HCV Infection in Jails	
RECOMMENDED	RATING 
<p>Jails should implement opt-out HCV testing consisting of HCV-antibody testing followed by confirmatory HCV-RNA testing if antibody-positive.</p> <ul style="list-style-type: none"> <li>• Chronically infected individuals should receive counseling about HCV infection and be provided linkage to follow-up community healthcare for evaluation of liver disease and treatment upon release.</li> <li>• Chronically infected individuals whose jail sentence is sufficiently long to complete a recommended course of antiviral therapy should receive treatment for chronic HCV infection according to AASLD/IDSA guidance while incarcerated. Upon release, patients should be provided linkage to community healthcare for surveillance for HCV-related complications.</li> </ul>	Ila, C

## Recommendations for Screening and Treatment of HCV Infection in Prisons

RECOMMENDED	RATING 
Prisons should implement opt-out HCV testing. Chronically infected individuals should receive antiviral therapy according to AASLD/IDSA guidance while incarcerated. Upon release, patients should be provided linkage to community healthcare for surveillance for HCV-related complications.	IIa, C
To prevent HCV reinfection and reduce the risk of progression of HCV-associated liver disease, prisons should provide harm reduction and evidence-based treatment for underlying substance use disorders.	IIa, C

## Recommendation for Continuation of HCV Treatment in Jail and Prison Settings

RECOMMENDED	RATING 
Jails and prisons should facilitate continuation of HCV therapy for individuals on treatment at the time of incarceration.	IIa, C

### Opt-Out Testing for HCV Infection in Jails and Prisons

Interventions to reduce HCV transmission and HCV-related liver disease can only be implemented if infected patients are diagnosed. Given the variable approaches to HCV testing across correctional facilities ([Maurer, 2015](#)), patients with chronic HCV in these settings may not have the opportunity to be diagnosed ([Varan, 2014](#)). Universal opt-out testing of inmates for chronic HCV is highly cost-effective and has been shown to reduce ongoing HCV transmission and the incidence of advanced liver disease ([He, 2016](#)). Based on a microsimulation model of HCV transmission and disease progression, this approach would enable diagnosis of 122,700 new HCV infections in prisons in the next 30 years; prevent 12,700 new HCV infections caused by release of infected inmates; and avert 11,700 liver-related deaths ([He, 2016](#)).

In October 2016, the Federal Bureau of Prisons recommended an opt-out strategy of testing for HCV infection for all sentenced inmates ([FBP, 2016](#)). With this approach, an inmate is informed of the indications and plan for HCV testing, and the test is ordered and performed unless the inmate declines it. However, the Federal Bureau of Prisons clinical guidelines state that HCV testing is not required by policy or law. Thus, it is unclear if prisons are conforming to these recommendations.

HCV-infected individuals in jails frequently cycle in and out of this setting, are unaware of their infection, and can contribute to HCV transmission in the community ([Rich, 2014](#)). Therefore, providing opt-out HCV testing in jails followed by linkage to community healthcare providers for those found to be infected is an advantageous approach to HCV case finding in these settings. A recent prospective cohort study evaluated an HCV testing and linkage-to-care program implemented in selected jails in North Carolina and South Carolina from December 2012 to March 2014 ([Schoenbachler, 2016](#)). HCV testing and linkage-to-care services were conducted by noncorrectional staff in parallel with correctional healthcare staff. Forty-eight percent of detainees with chronic HCV who were referred for management after release attended a follow-up appointment. Similar programs have been established in New York ([Akiyama, 2016](#)), Texas ([de la Flor, 2017](#)), and Rhode Island ([Beckwith, 2016](#)) with the latter using rapid, point-of-care HCV-antibody testing. These studies demonstrate the feasibility of HCV testing in jails followed by linkage to medical care after release for those who

are chronically infected.

## HCV DAA Treatment in Jails

A recent observational cohort study demonstrated the feasibility of initiating and completing direct-acting antiviral (DAA) HCV treatment in a jail setting ([MacDonald, 2017](#)). In this study, 104 detainees in the New York City jail system received DAA treatment between January 1, 2014 and June 30, 2016, of whom 60% (n=62) entered the jail on DAA therapy and 40% (n=42) initiated DAA treatment in jail. HCV viral loads were undetectable in 94% of community-initiated patients and 97% of jail-initiated patients. This study provides evidence that jail-based initiation of HCV treatment is feasible and prompt access to DAAs in jail can preserve the effectiveness of community-initiated HCV regimens.

## HCV DAA Treatment in Prisons

HCV DAA therapy for chronic HCV is now logistically feasible within the prison setting and would aid the HCV elimination effort ([Spaulding, 2013](#)). The availability of all-oral DAA regimens that commonly require no more than 12 weeks of therapy and cause few adverse effects overcomes many of the logistical challenges associated with interferon-based HCV treatment ([Spaulding, 2013](#)). Directly observed therapy is the norm in prison settings, and the risk of drug diversion is low. Returning inmates to their communities cured of chronic HCV would be an invaluable step toward HCV elimination. In addition to these clinical benefits, treating chronic HCV in incarcerated persons is cost-effective. A recent analysis found that sofosbuvir-based treatment for HCV genotype 1 mono-infection met the benchmark for cost-effectiveness in terms of the benefits gained ([Liu, 2014](#)).

## Treatment of Substance Abuse Disorders

Given that injection drug use is the major risk factor for initial HCV infection and reinfection, and because alcohol abuse/dependence is a major cofactor in HCV-related liver disease progression, treatment of concomitant substance use disorders along with HCV therapy is of major importance in the incarcerated population. The most effective way to prevent HCV transmission in people who inject drugs is to combine harm reduction strategies that improve the safety of injection (ie, needle/syringe exchange) with interventions that treat the underlying addiction, particularly medication-assisted treatment ([MacNeil, 2011](#)); ([Volkow, 2014](#)) (see [Identification and Management of HCV in People Who Inject Drugs](#)). Alcohol prevention and treatment programs have not been given the same priority as those for drug addiction in correctional settings, and access to treatment for alcohol abuse/dependence after release is often limited. Addressing hazardous alcohol use among inmates with chronic HCV could help slow liver disease progression, decrease HCV transmission, and might reduce recidivism. However, according to the 2015 survey by the American Corrections Association ([Maurer, 2015](#)), slightly more than half of correctional systems treat the fundamental substance use disorders among patients receiving HCV antiviral therapy.

## Overcoming Barriers to HCV Testing and Treatment in Correctional Settings

To expand HCV testing and prevention counseling and increase access to HCV therapy in correctional institutions, it will be necessary to overcome several important barriers. First, appropriately trained staff are needed to screen inmates for HCV infection and, depending on the result, provide counseling on HCV prevention, linkage to care, and access to antiviral treatment. Offsite providers can assist in these endeavors but add expense and logistical complications. The use of telemedicine to link inmates to specialists has been shown to be effective for the evaluation and treatment of chronic HCV in underserved settings ([Arora, 2011](#)). The National Commission on Correctional Health Care supports telemedicine in corrections. However, only 30 of the 45 states responding to the 2016 National Survey of Prison Health Care reported using telemedicine ([Maruschak, 2016](#)).

Second, unplanned transfers and releases could disrupt ongoing HCV treatment ([Spaulding, 2013](#)). Most state correctional facilities do not have a process in place to smoothly transition a patient receiving DAA treatment in a prison setting to continuing community-based care without a lapse in antiviral therapy. However, the New York State Hepatitis C Continuity Program demonstrated that it is possible to establish a network of community-based providers to facilitate continuation of HCV treatment without interruption after release ([Klein, 2007](#)). In this program, inmates who initiated HCV treatment in prison were transitioned to a community-based provider for completion of therapy after release. Inmates diagnosed with chronic HCV who remained untreated while incarcerated were referred to a community provider for

treatment evaluation after release.

Finally, the costs of HCV testing and antiviral treatment in correctional facilities are also formidable barriers. Strategies for financing HCV treatment have been put forward by the National Academy of Medicine's Committee for a National Strategy for the Elimination of Hepatitis B and C ([NAS, 2017](#)). These strategies might help to overcome cost barriers to HCV testing and treatment in correctional settings.

Addressing these barriers will help ensure that persons residing in jails and prisons can undergo HCV testing and be diagnosed; have access to HCV prevention counseling; and receive treatment for chronic HCV and underlying substance use disorders. Improving the diagnosis and management of HCV infection in correctional settings will greatly facilitate efforts to eliminate HCV infection in the US.

**Last update:** May 24, 2018

## Related References

Akiyama MJ, Kaba F, Rosner Z, Alper H, Holzman RS, MacDonald R. [Hepatitis C Screening of the "Birth Cohort" \(Born 1945-1965\) and Younger Inmates of New York City Jails](#). American Journal of Public Health. 2016;106(7):1276-1277.

Allen SA, Spaulding AC, Osei AM, Taylor LE, Cabral AM, Rich JD. [Treatment of chronic hepatitis C in a state correctional facility](#). Annals of Internal Medicine. 2003;138(3):187-190.

Arora S, Thornton K, Murata G, Deming P, Kalishman S, Dion D, et al. [Outcomes of treatment for hepatitis C virus infection by primary care providers](#). N Engl J Med. 2011;364(23):2199-2207.

Beckman AL, Bilinski A, Boyko R, Camp GM, Wall AT, Lim JK, et al. [New Hepatitis C Drugs Are Very Costly And Unavailable To Many State Prisoners](#). Health Affairs. 2016;35(10):1893-1901.

Beckwith CG, Kurth AE, Bazerman LB, Patry EJ, Cates A, Tran L, et al. [A pilot study of rapid hepatitis C virus testing in the Rhode Island Department of Corrections](#). Journal of Public Health (Oxford, England). 2016;38(1):130-137.

Bushway SD. [The Problem of Prisoner \(Re\)Entry](#). Contemporary Sociology. 2006;35(6):562-565.

de la Flor C, Porsa E, Nijhawan AE. [Opt-out HIV and Hepatitis C Testing at the Dallas County Jail: Uptake, Prevalence, and Demographic Characteristics of Testers](#). Public Health Reports (Washington, D.C.: 1974). 2017;132(6):617-621.

Denniston MM, Jiles RB, Drobeniuc J, Klevens RM, Ward JW, McQuillan GM, et al. [Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010](#). Ann Intern Med. 2014;160(5):293-300.

Durose MR, Cooper AD, Snyder HN. [Bureau of Justice Statistics \(BJS\) - Recidivism of Prisoners Released in 30 States in 2005: Patterns from 2005 to 2010](#). Washington, D.C.: BJS; 2014 .

Edlin BR, Eckhardt BJ, Shu MA, Shu MA. [Toward a more accurate estimate of the prevalence of hepatitis C in the United States](#). Hepatology. 2015;62(5):1353-63.

[Federal Bureau of Prisons. Evaluation and Management of Chronic Hepatitis C Virus \(HCV\) Infection](#). 2016 .

Fox RK, Currie SL, Evans J, Wright TL, Tobler L, Phelps B, et al. [Hepatitis C Virus Infection among Prisoners in the California State Correctional System](#). Clinical Infectious Diseases. 2005;41(2):177-186.

Hammett TM, Harmon MPatricia, Rhodes W. [The burden of infectious disease among inmates of and releasees from US correctional facilities, 1997](#). American Journal of Public Health. 2002;92(11):1789-1794.



- Harris RJ, Martin NK, Rand E, Mandal S, Mutimer D, Vickerman P, et al. [New treatments for hepatitis C virus \(HCV\): scope for preventing liver disease and HCV transmission in England](#). Journal of Viral Hepatitis. 2016;23(8):631-643.
- He T, Li K, Roberts MS, Spaulding AC, Ayer T, Grefenstette JJ, et al. [Prevention of Hepatitis C by Screening and Treatment in U.S. Prisons](#). Ann Intern Med. 2016;164(2):84-92.
- Klein SJ, Wright LN, Birkhead GS, Mojica BA, Klopf LC, Klein LA, et al. [Promoting HCV Treatment Completion for Prison Inmates: New York State's Hepatitis C Continuity Program](#). Public Health Reports. 2007;122(2 suppl):83-88.
- Liu S, Watcha D, Holodniy M, Goldhaber-Fiebert JD. [Sofosbuvir-Based Treatment Regimens for Chronic, Genotype 1 Hepatitis C Virus Infection in U.S. Incarcerated Populations: A Cost-Effectiveness Analysis](#). Annals of Internal Medicine. 2014;161(8):546.
- Macalino GE, Vlahov D, Sanford-Colby S, Patel S, Sabin K, Salas C, et al. [Prevalence and incidence of HIV, hepatitis B virus, and hepatitis C virus infections among males in Rhode Island prisons](#). American Journal of Public Health. 2004;94(7):1218-1223.
- MacDonald R, Akiyama MJ, Kopolow A, Rosner Z, McGahee W, Joseph R, et al. [Feasibility of Treating Hepatitis C in a Transient Jail Population](#). Open Forum Infectious Diseases. 2017;4(3).
- Macneil J, Pauly B. [Needle exchange as a safe haven in an unsafe world: Needle exchange as a safe haven](#). Drug and Alcohol Review. 2011;30(1):26-32.
- Maruschak L, Chari KA, Simon AE, DeFrances CJ. [National Survey of Prison Health Care: Selected Findings](#). National Health Statistics Reports. 2016;(96):1-23.
- Maurer K, Gondles EF. [Coalition of Correctional Health Authorities and American Correctional Association: Hepatitis C in Correctional Settings: Challenges and Opportunities](#). 2015;2(1):1-15.
- Minton TD, Zeng Z. [Bureau of Justice Statistics. Jail inmates in 2015](#). 2016.
- Moyer VA. [Screening for Hepatitis C Virus Infection in Adults: U.S. Preventive Services Task Force Recommendation Statement](#). Annals of Internal Medicine. 2013;159(5):349.
- [National Academies of Sciences, Committee on a National Strategy for the Elimination of Hepatitis B and C, Board on Population Health and Public Health Practice: A National Strategy for the Elimination of Hepatitis B and C: Phase Two Report](#). Washington, D.C.: National Academies Press; 2017.
- Neate R. [Welcome to Jail Inc: how private companies make money off US prisons](#). The Guardian. 2016;.
- Rich JD, Allen SA, Williams BA. [Responding to Hepatitis C through the Criminal Justice System](#). New England Journal of Medicine. 2014;370(20):1871-1874.
- Rich JD, Chandler R, Williams BA, Dumont D, Wang EA, Taxman FS, et al. [How Health Care Reform Can Transform The Health Of Criminal Justice-Involved Individuals](#). Health Affairs. 2014;33(3):462-467.
- Ruiz JD, Molitor F, Sun RK, Mikanda J, Facer M, Colford JM, et al. [Prevalence and correlates of hepatitis C virus infection among inmates entering the California correctional system](#). The Western Journal of Medicine. 1999;170(3):156-160.
- Schoenbachler BT, Smith BD, Sena AC, Hilton A, Bachman S, Lunda M, et al. [Hepatitis C Virus Testing and Linkage to Care in North Carolina and South Carolina Jails, 2012-2014](#). Public Health Reports. 2016;131(2\_suppl):98-104.
- Spaulding AC, Weinbaum CM, Lau DT, Sterling RK, Seeff LB, Margolis HS, et al. [A framework for management of hepatitis C in prisons](#). Ann Intern Med. 2006;144(10):762-769.

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](#). American Journal of Epidemiology. 2011;173(5):479-487.

Spaulding AC, Thomas DL. [Screening for HCV Infection in Jails](#). JAMA. 2012;307(12):1259.

Spaulding AS, Kim AY, Harzke AJo, Sullivan JC, Linas BP, Brewer A, et al. [Impact of new therapeutics for hepatitis C virus infection in incarcerated populations](#). Topics in Antiviral Medicine. 2013;21(1):27-35.

Spaulding AC, Sharma A, Messina LC, Zlotorzynska M, Miller L, Binswanger IA. [A Comparison of Liver Disease Mortality With HIV and Overdose Mortality Among Georgia Prisoners and Releasees: A 2-Decade Cohort Study of Prisoners Incarcerated in 1991](#). American Journal of Public Health. 2015;105(5):e51-e57.

van der Meer AJ, Veldt BJ, Feld JJ, Wedemeyer H, Dufour JF, Lammert F, et al. [Association between sustained virological response and all-cause mortality among patients with chronic hepatitis C and advanced hepatic fibrosis](#). JAMA. 2012;308(24):2584-2593.

Varan AK, Mercer DW, Stein MS, Spaulding AC. [Hepatitis C Seroprevalence among Prison Inmates since 2001: Still High but Declining](#). Public Health Reports. 2014;129(2):187-195.

Volkow ND, Frieden TR, Hyde PS, Cha SS. [Medication-Assisted Therapies--Tackling the Opioid-Overdose Epidemic](#). New England Journal of Medicine. 2014;370(22):2063-2066.

Weinbaum C, Lyerla R, Margolis HS, Margolis HS. [Prevention and control of infections with hepatitis viruses in correctional settings](#). Centers for Disease Control and Prevention. MMWR. Recommendations and reports: Morbidity and mortality weekly report. Recommendations and reports. 2003;52(RR-1):1-36.

[WHO Guidelines for the screening, care and treatment of persons with chronic hepatitis C infection](#). 2016 p. 138.