

# Treatment of Hepatitis C in a Correctional Setting

This is a PDF version of the following document:

Module 6: [Treatment of Special Populations and Special Situations](#)

Lesson 6: [Treatment of Hepatitis C in a Correctional Setting](#)

You can always find the most up to date version of this document at

<https://www.hepatitisc.uw.edu/go/special-populations-situations/treatment-corrections/core-concept/all>.

---

## Epidemiology of Hepatitis C in Corrections

The burden of hepatitis C is much higher in corrections compared to the general community. In the late 1990's, the Centers for Disease Control and Prevention (CDC) estimated that 16% to 40% of prison inmates were seropositive for hepatitis C, with extrapolated rates of chronic hepatitis C infection ranging from 12 to 35%. More recent estimates are slightly lower with an average seroprevalence of 17.4%, but this estimate is based on data that is available from only 12 states. Seroprevalence rates, however, can vary considerably among different regions and are still as high as 40% in some correctional systems ([Figure 1](#)). Seroprevalence data only account for the numbers of individuals incarcerated on any given day and do not account for the movement in and out of correctional facilities. Approximately 30% of individuals with hepatitis C infection in the United States pass through the correctional system in a given year.

## Management of Hepatitis C in Jails versus Prisons

**Understanding the Difference between Jails and Prisons:** A person is jailed upon arrest for allegedly committing a crime. Most individuals placed in jail are pre-adjudication and thus, jails house innocent people as well as people who have committed misdemeanors and felonies. Once sentenced, the length of the sentence is the predominant factor that determines if a person transfers to prison. Most states hold individuals in jail for sentences up to 1 year, but some states extend this time period to include longer sentences. Typically jails are operated and funded by local cities or counties, whereas prisons are part of either a state or federal system. Since prisons generally house persons who have received a sentence of at least one year, prison inmates are all convicted felons. A few states have created a unified system that integrates the state correctional system and local jail network.

**Management of Hepatitis C in Jails:** The CDC recommends universal hepatitis C screening for all incarcerated persons. Some jails screen incoming offenders for hepatitis C and others attempt to link individuals to care upon release. Jails are an ideal setting for identifying individuals with hepatitis C infection, but there has been a reluctance to systematically perform hepatitis C testing if treatment for hepatitis C cannot be offered in the jail system. Since the average length of incarceration in a jail is usually only days to weeks, most jail systems currently do not offer treatment for hepatitis C. As treatment options for hepatitis C expand and include shorter courses with newer combinations of direct-acting antiviral agents, it will become more feasible to treat some individuals in the jail system, especially if they have advanced liver disease. Nevertheless, given the extremely high cost of newer therapies and the limited budgets of most jails, for treatment to become available in jails there may need to be a modification of how healthcare is funded in this complex system.

**Management of Hepatitis C in Prisons:** In contrast with the situation in jails, the average prison sentence is usually a couple of years, and treatment for hepatitis C is thus more easily completed during incarceration. In addition, prison systems are larger in size than jails and usually have larger budgets to provide health services. Most prisons offer treatment for hepatitis C, but only a small fraction of the inmates with chronic infection often receive the treatment. In a study performed at the Connecticut Department of Corrections during 2002 to 2006, investigators characterized major reasons for deferral of therapy, and inability to complete therapy before inmate release was the most common reason for deferral; other major reasons included lack of indication for treatment, patient refusal, and unstable clinical conditions ([Figure 2](#)). Many other barriers to treatment are similar to those faced in the community—cost of therapy, treatment contraindications, poor side effect profile, and provider workload—they are just magnified by the size of the hepatitis C infected population in need of treatment in the prison setting.

## Treatment Prioritization in Corrections

**Impact of Cost of Therapy:** Given the high prevalence of hepatitis C in corrections, the cumulative cost of hepatitis C treatment can be astronomical for correctional systems. The high cost of hepatitis C therapy has forced most facilities to prioritize treatment for those individuals in whom it is most medically necessary. The prioritization of treatment for the patients with advanced liver disease has been ongoing for years, but this issue has increased in emphasis with the advent of newer extremely expensive medications. Despite the costs, correctional systems have a constitutional obligation to provide adequate healthcare based on a United States Supreme Court decision [*Estelle v Gamble*]. It has been difficult to precisely define what this means in regards to hepatitis C infection.

**Prioritization Based on Medical Necessity:** Different correctional systems vary in how they decide who and when to treat for hepatitis C infection. Similar to the decision process for hepatitis C-infected persons in the community, medical necessity typically dictates whom to treat in the correctional setting, with medical necessity usually determined by the degree of liver fibrosis or by the presence of significant HCV-related extra-hepatic manifestations. Methods used to estimate the degree of liver fibrosis, whether by AST to platelet ratio index (APRI) score, FibroSure, transient elastography (FibroScan), liver biopsy, or a combination of these tests, are highly variable as are the cut-offs used for determining treatment eligibility. Many state prison systems have used the protocols from the Federal Bureau of Prisons ([Interim Guidance for the Management of Chronic Hepatitis C Infection](#)) as a guide in developing their own protocols.

**Release Date:** Correctional systems usually take a patient's release date into account when deciding whether to treat them for hepatitis C while they are incarcerated. The slow progression of disease that occurs with chronic hepatitis C infection has allowed for the deferral of treatment for many inmates until they are released to the community given the lack of urgency in the short-term inmate. In the states that have expanded Medicaid programs, most inmates will have good access to hepatitis C care in the community through their medical insurance plan upon release. Although a short delay in initiating hepatitis C treatment until an inmate is released will likely have no significant clinical consequences, prolonged treatment postponement can eventually lead to worse outcomes, especially if the inmate has already developed cirrhosis. As the hepatitis C treatment course becomes increasingly shorter, significantly more prisoners could start and complete a treatment course prior to release from prison. For example, a prisoner with genotype 1 chronic hepatitis C infection scheduled for release in 6 months could not have completed the older 48-week treatment course, but with newer 8- or 12-week regimens, the course could be completed well within a scheduled 6-month release.

**Impact of New Therapies:** Many, but not all, of the barriers to treatment in corrections will soon be eliminated or at least minimized with newer, shorter-course treatments. New interferon-free regimens have fewer side effects and require less intense monitoring, which will significantly decrease the highly demanding medical staff workload traditionally needed with hepatitis C treatment that logistically limited the number of inmates who could be treated. Compared with the patient population of HCV-infected persons in the community, a greater percentage of incarcerated hepatitis C-infected individuals have an absolute or relative contraindication to the use of interferon, most often due to underlying serious mental illness. This has historically limited the number of inmates eligible for hepatitis C treatment. As multiple interferon-free regimens become available, patients will have more treatment options available. Similarly, patients who failed older treatment regimens now have alternatives with good efficacy. In addition, as noted, future shorter-course treatment will allow more inmates to complete treatment prior to their release date. Therefore, for all of the reasons outlined, new highly effective, well-tolerated, short-course all-oral regimens will markedly increase the number of inmates eligible for hepatitis C treatment. Unfortunately, the extremely high cost of new all-oral regimens will make it increasingly difficult to garner the financial resources to actually treat the much broader number of inmates eligible for hepatitis C treatment. This changing landscape means that cost of therapy for hepatitis C in corrections will become an even greater barrier and challenge in the coming years.



## Providing Treatment in Corrections

**Treatment Models:** In the correctional setting, a variety of different types of treatment models have been utilized to provide specialty care for hepatitis C treatment. Some systems evaluate the patient for hepatitis C treatment eligibility using on-site protocols or guidelines, with those patients considered appropriate treatment candidates then sent to a community hepatitis C specialist for treatment. Other systems contract with a community hepatitis C specialist to provide consultation at the corrections facility and the hepatitis C specialist participates in the entire evaluation and treatment process. Some systems provide their own hepatitis C evaluation and treatment on-site with the assistance of consultation and mentoring, such as that provided by the Project ECHO (Extension of Community Health Outcomes) model. Project ECHO utilizes regular teleconferencing sessions to link non-expert on-site medical care providers with hepatitis C specialists who help co-manage hepatitis C evaluation and treatment with the on-site medical provider. In some instances, correctional facilities have a medical provider working within the system who has hepatitis C expertise and this individual can supervise evaluation and treatment plans carried out by primary medical providers within the correctional system.

**Treatment Outcomes:** The correctional setting can be the ideal environment to provide hepatitis C treatment. Medication adherence levels within corrections are often much better than in the community for several reasons. First, incarcerated persons have limited access to drugs and alcohol that could derail or diminish the effectiveness of a treatment course. Second, nurses working together with medical practitioners are able to frequently monitor patients during treatment for side effects and support patients throughout the treatment course. Third, the structure of the daily routine in corrections usually leads to improved adherence. Whether medications are dispensed for patient self-administration or by staff distributed individual doses, it is easier to monitor adherence to the treatment protocol and quickly address issues that arise in a timely manner. This high level of structure and oversight has resulted in high treatment completion rates and rates of sustained viral response that match or exceed those achieved in the community ([Figure 3](#)).

**Treatment Challenges:** There are some challenges treating hepatitis C that are unique to corrections. This was particularly true when the first generation of direct-acting antivirals, boceprevir and telaprevir, became available. The frequency of dosing and food requirements of these medications led to many logistical problems. To conquer these barriers, some prison systems decided to admit patients receiving hepatitis C treatment to the infirmary for their entire course of treatment. Other systems found more efficient ways to address the challenge of accommodating medications that needed to be taken every 7 to 9 hours with certain foods. As more treatment regimens that have simple dosing schedules become available, many of these logistical issues will disappear.

**Treatment Completion Prior to Release:** One of the reasons most correctional facilities have taken release date into account when deciding to start hepatitis C treatment is to ensure treatment can be completed prior to release. Although most states do not have a process in place to smoothly transition a patient receiving hepatitis C treatment within a correctional facility to treatment in the community without a lapse in medication therapy, it is possible to establish a network of providers to allow for treatment to continue without a break. The [New York State Hepatitis C Continuity Program](#) is an important model to assist with the transition of inmates with hepatitis C upon release to the community: inmates who have initiated hepatitis C treatment are transitioned to a community-based provider for completion of treatment and inmates who have not yet been started on treatment are given a referral to a community-based provider in order to be evaluated in a timely manner upon release.

## Ongoing Care after Hepatitis C Treatment

**Preventing Reinfection:** Patients who achieve an SVR with hepatitis C therapy can potentially become reinfected with HCV.

- **Risk of Reinfection:** Persons achieving a sustained viral response to treatment for hepatitis C while incarcerated remain at risk for reinfection, particularly upon release when there is higher risk for relapse of intravenous drug use. Some correctional systems deny inmates treatment based on their drug use history or risk of future relapse. In general, limited data exist regarding hepatitis C reinfection rates and these data are often biased as surveys and studies frequently only follow those individuals who become reincarcerated, which often serves as a marker for ongoing high-risk behaviors and inherent higher risk for reinfection. Although the risk for hepatitis C reinfection clearly exists, the number of reported cases remains low and the relative risk of reinfection is probably lower than initial infection, likely due to partial immunity in those previously treated. Nevertheless, the relative risk for hepatitis C reinfection will vary depending on the prevalence of chronic hepatitis C in the community of release, the injecting behavior after release, the availability of needle exchange programs in the community and personal sexual practices.
- **Reinfection during Incarceration:** The risk of reinfection also exists during incarceration. A cohort of 119 inmates in Spain were followed for an average of 1.4 years after successful treatment while they remained in prisons that had needle exchange and/or methadone programs and found overall reinfection rate of 5.27 cases per 100 person-years. Among 53 inmates with an SVR in Australia, 5 patients were re-infected and 5 had late relapse. Comparable data from the United States does not exist, but presumably some risk for reinfection during incarceration exists after successful treatment, especially considering the high prevalence of hepatitis C among inmates. Between 1998 and 2000 at Rhode Island Adult Correctional Institute the incidence of hepatitis C among 446 treatment-naïve inmates incarcerated for a year or more was only 0.4 per 100 person-years. The prevalence of hepatitis C was 23.1% at the time.
- **Patient Education Related to Reinfection:** The risk for reinfection, even if low, highlights the importance of providing hepatitis education and prevention services during and after incarceration, including adequate chemical dependency treatment and harm reduction strategies. Several correctional facilities have implemented effective peer-led programs, such as [Centerforce's Peer Health Education Program](#), which is used at 3 facilities in California. Education and prevention services should ideally be part of any hepatitis C treatment program and should continue long after an SVR has been achieved. Unfortunately, most correctional systems in the United States have chosen not to adopt effective harm reduction strategies that have been utilized in other countries during incarceration and upon release, such as mechanisms for safe tattooing, needle exchange programs, medication-assisted therapy, and access to condoms.

**Management of Cirrhosis:** Although the risk of developing complications of end-stage liver disease and hepatocellular carcinoma decrease after successful HCV treatment, these risks are not eliminated. Unfortunately, clearance of the hepatitis C virus does not always reverse the amount of pre-existing scarring present in the liver. Accordingly, all patients with hepatitis C-related cirrhosis, even those who have successful treatment for HCV, need ongoing medical care. Specifically, those patients who have cirrhosis at the time of HCV treatment should have routine medical follow-up every 6 months for evaluation of symptoms and to monitor laboratory values. In addition, the AASLD guidelines also recommend that cirrhotic patients successfully treated for hepatitis C continue regular surveillance for hepatocellular carcinoma by ultrasound and esophageal varices by esophagoduodenoscopy.

## Public Health Opportunity

Given the high prevalence of hepatitis C in correctional settings, corrections can be considered a public health opportunity to combat this disease and its complications. More than 90% of persons who are incarcerated release back out into the community. These individuals often do not engage in medical care when not incarcerated due to many competing priorities. Effectively screening and treating inmates with hepatitis C has individual benefit, but it also has societal advantages. To achieve a goal of hepatitis C eradication in the United States, prison populations will need to be included as a primary target group for treatment. Therefore, it will become increasingly important for correctional systems to partner with public health systems when determining standards of medical treatment and prevention of hepatitis C as we move into an age where the end of the epidemic comes within reach.

## Summary Points

- The prevalence of hepatitis C is much higher in corrections than in the general community.
- Jails are an ideal setting for identifying individuals with hepatitis C infection.
- The correctional setting can be the ideal environment to provide hepatitis C treatment since the high level of structure and oversight has resulted in high treatment completion rates and rates of sustained viral response that match or exceed those achieved in the community.
- The astronomical cost of hepatitis C therapy has forced most correctional facilities to prioritize treatment for those individuals in whom it is most medically necessary.
- Compared with the patient population of HCV-infected persons in the community, a greater percentage of incarcerated hepatitis C-infected individuals have an absolute or relative contraindication to use interferon, but the extremely high cost of new all-oral regimens will make it increasingly difficult to garner the financial resources to actually treat the much broader number of inmates eligible for hepatitis C treatment.
- Given the risk for reinfection exists, education and prevention services should ideally be part of any hepatitis C treatment program and should continue long after an SVR has been achieved. The services include effective harm reduction strategies, such as mechanisms for safe tattooing, needle exchange programs, medication-assisted therapy, and access to condoms.
- All patient with hepatitis C-related cirrhosis, even those who have successful treatment for HCV, need ongoing medical care.
- To achieve a goal of hepatitis C eradication in the United States, prison populations will need to be included as a primary target group for treatment and as such it will become increasingly important for correctional systems to partner with public health systems.



## References

- Allen SA, Spaulding AC, Osei AM, Taylor LE, Cabral AM, Rich JD. Treatment of chronic hepatitis C in a state correctional facility. *Ann Intern Med.* 2003;138:187-90.  
[\[PubMed Abstract\]](#) -
- Arora S, Thornton K, Murata G, et al. Outcomes of treatment for hepatitis C virus infection by primary care providers. *N Engl J Med.* 2011;364:2199-207.  
[\[PubMed Abstract\]](#) -
- Bate JP, Colman AJ, Frost PJ, Shaw DR, Harley HA. High prevalence of late relapse and reinfection in prisoners treated for chronic hepatitis C. *J Gastroenterol Hepatol.* 2010;25:1276-80.  
[\[PubMed Abstract\]](#) -
- Bruix J, Sherman M; American Association for the Study of Liver Diseases. Management of hepatocellular carcinoma: an update. *Hepatology.* 2011;53:1020-2.  
[\[AASLD Practice Guidelines\]](#) -
- Chew KW, Allen SA, Taylor LE, Rich JD, Feller E. Treatment outcomes with pegylated interferon and ribavirin for male prisoners with chronic hepatitis C. *J Clin Gastroenterol.* 2009;43:686-91.  
[\[PubMed Abstract\]](#) -
- Garcia-Tsao G, Sanyal AJ, Grace ND, Carey W; Practice Guidelines Committee of the American Association for the Study of Liver Diseases; Practice Parameters Committee of the American College of Gastroenterology. Prevention and management of gastroesophageal varices and variceal hemorrhage in cirrhosis. *Hepatology* 2007;46:922-38.  
[\[AASLD Practice Guidelines\]](#) -
- Grady BP, Schinkel J, Thomas XV, Dalgard O. Hepatitis C virus reinfection following treatment among people who use drugs. *Clin Infect Dis.* 2013;57 Suppl 2:S105-10.  
[\[PubMed Abstract\]](#) -
- 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;92:1789-94.  
[\[PubMed Abstract\]](#) -
- Interim Guidance for the Management of Chronic Hepatitis C Infection. Federal Bureau of Prisons Clinical Guidelines. June, 2014.  
[\[Federal Bureau of Prisons Clinical Guidelines.\]](#) -
- Kim AY, Nagami EH, Birch CE, Bowen MJ, Lauer GM, McGovern BH. A simple strategy to identify acute hepatitis C virus infection among newly incarcerated injection drug users. *Hepatology.* 2013;57:944-52.  
[\[PubMed Abstract\]](#) -
- Klein SJ, Wright LN, Birkhead GS, et al. Promoting HCV treatment completion for prison inmates: New York State's hepatitis C continuity program. *Public Health Rep.* 2007;122 Suppl 2:83-8.  
[\[PubMed Abstract\]](#) -
- 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. *Ann Intern Med.* 2014;161:546-53.

[\[PubMed Abstract\]](#) -

- Macalino GE, Vlahov D, Sanford-Colby S, et al. Prevalence and incidence of HIV, hepatitis B virus, and hepatitis C virus infections among males in Rhode Island prisons. *Am J Public Health.* 2004;94:1218-23.  
[\[PubMed Abstract\]](#) -
- Marco A, Esteban JI, Solé C, et al. Hepatitis C virus reinfection among prisoners with sustained virological response after treatment for chronic hepatitis C. *J Hepatol.* 2013;59:45-51.  
[\[PubMed Abstract\]](#) -
- Maru DS, Bruce RD, Basu S, Altice FL. Clinical outcomes of hepatitis C treatment in a prison setting: feasibility and effectiveness for challenging treatment populations. *Clin Infect Dis.* 2008;47:952-61.  
[\[PubMed Abstract\]](#) -
- McGovern BH, Wurcel A, Kim AY, et al. Acute hepatitis C virus infection in incarcerated injection drug users. *Clin Infect Dis.* 2006;42:1663-70.  
[\[PubMed Abstract\]](#) -
- Rice JP, Burnett D, Tsotsis H, et al. Comparison of hepatitis C virus treatment between incarcerated and community patients. *Hepatology.* 2012;56:1252-60.  
[\[PubMed Abstract\]](#) -
- Rich JD, Allen SA, Williams BA. Responding to hepatitis C through the criminal justice system. *N Engl J Med.* 2014;370:1871-4.  
[\[PubMed Abstract\]](#) -
- Ruiz JD, Molitor F, Sun RK, et al. Prevalence and correlates of hepatitis C virus infection among inmates entering the California correctional system. *West J Med.* 1999;170:156-60.  
[\[PubMed Abstract\]](#) -
- Spaulding A, Greene C, Davidson K, Schneidermann M, Rich J. Hepatitis C in state correctional facilities. *Prev Med.* 1999;28:92-100.  
[\[PubMed Abstract\]](#) -
- Spaulding AC, Thomas DL. Screening for HCV infection in jails. *JAMA.* 2012;307:1259-60.  
[\[PubMed Abstract\]](#) -
- Spaulding AC, Weinbaum CM, Lau DT, et al. A framework for management of hepatitis C in prisons. *Ann Intern Med.* 2006;144:762-9.  
[\[PubMed Abstract\]](#) -
- Spaulding AS, Kim AY, Harzke AJ, et al. Impact of new therapeutics for hepatitis C virus infection in incarcerated populations. *Top Antivir Med.* 2013;21:27-35.  
[\[PubMed Abstract\]](#) -
- Tan JA, Joseph TA, Saab S. Treating hepatitis C in the prison population is cost-saving. *Hepatology.* 2008;48:1387-95.  
[\[PubMed Abstract\]](#) -
- Varan AK, Mercer DW, Stein MS, Spaulding AC. Hepatitis C seroprevalence among prison inmates since 2001: still high but declining. *Public Health Rep.* 2014;129:187-95.  
[\[PubMed Abstract\]](#) -

- Weinbaum C, Lyerla R, Margolis HS. Prevention and control of infections with hepatitis viruses in correctional settings. Centers for Disease Control and Prevention. MMWR Recomm Rep. 2003;52:1-36.  
[\[PubMed Abstract\]](#) -

## Figures

**Figure 1 Hepatitis C Prevalence among Prison Inmates, 2001-2012**

This table shows HCV-antibody positive rates among inmates from State Correctional Departments in 12 states.

Source: Varan AK, Mercer DW, Stein MS, Spaulding AC. Hepatitis C seroprevalence among prison inmates since 2001: still high but declining. Public Health Rep. 2014;129:187-95.

Hepatitis C Seroprevalence Among Prison Inmates in 12 States, 2001-2012		
State Correctional Department	Year of Estimate	HCV Antibody Positive (%)
Indiana	2003	15.2
Iowa	2001	23.6
Maryland	2002	29.7
Michigan	2004	13.7
Montana	2012	13.9
Nebraska	2011	9.6
New Mexico	2010	41.1
New York	2005	11.1
North Dakota	2008	13.0
Oregon	2005	23.3
Pennsylvania	2006	18.9
Washington	2008	20.9

**Figure 2 Reasons for Deferring Hepatitis C Treatment in Corrections Setting, 2002-2006**

This table shows the major reasons for deferring hepatitis C treatment at the Connecticut Department of Corrections during the years 2002 to 2006.

Source: Maru DS, Bruce RD, Basu S, Altice FL. Clinical outcomes of hepatitis C treatment in a prison setting: feasibility and effectiveness for challenging treatment populations. Clin Infect Dis. 2008;47:952-61.

<b>Reasons for Deferral for Hepatitis C in a Prison Setting, 2002-2006</b>	
<b>Reason for Deferral</b>	<b>No. (%) of Patients (n = 70)</b>
Patient's release was too soon	40 (57.1)
Normal liver function test results	8 (11.4)
Normal biopsy findings	7 (10.0)
Patient refused consent/change of facilities	2 (2.9)
Patient refused consent/other	5 (7.1)
Hepatic decompensation	2 (2.9)
Patient deemed to be noncompliant	1 (1.4)
Patient had uncontrolled HIV disease	3 (4.3)
Patient had uncontrolled diabetes	1 (1.4)
Unclear	1 (1.4)

**Figure 3 Comparison of HCV SVR Treatment Rates in Community and Incarcerated Patients**

Source: Rice JP, Burnett D, Tsotsis H, et al. Comparison of hepatitis C virus treatment between incarcerated and community patients. Hepatology. 2012;56:1252-60.

**SVR12 Rates in Community and Incarcerated Patients, by Genotype**

