

## HEPATITIS C SCREENING IN THE BEHAVIORAL HEALTHCARE SETTING

Hepatitis C virus (HCV) infection is a significant risk for people with histories of injection drug use. Chronic HCV infection can cause liver disease and other adverse long-term health consequences. Tests are available to screen for the presence or absence of antibodies to HCV in an individual's blood; a positive screen indicates that the individual has been exposed to the virus and may be chronically infected. This *Advisory* explains why behavioral health services programs should consider screening clients for HCV if clients have known risk factors for HCV infection or if they have signs and symptoms of liver disease. The *Advisory* explains how onsite screening, or referral to screening, can be incorporated into existing intake and monitoring procedures. It also offers guidance on providing clients with viral hepatitis prevention education, counseling, and referral to follow-up evaluation and medical treatment as needed.

### What Is Hepatitis C?

Hepatitis C is a blood-borne virus that causes liver disease. It is the most common form of viral

hepatitis in the United States. Hepatitis C begins as an acute infection, but it often develops into a chronic infection. In 15 to 25 percent of people infected with HCV, the immune system clears the virus on its own; in the remaining 75 to 85 percent, chronic hepatitis develops.<sup>1</sup>

Chronic HCV infection is often asymptomatic for years. As a result, people with the disease may not realize they are infected until complications develop years or decades later. Long-term infection can lead to liver cancer and cirrhosis. Cirrhosis caused by chronic HCV infection is the leading cause of liver transplantation.<sup>2</sup>

### How Prevalent Is HCV Infection?

According to data from the National Health and Nutrition Examination Survey (NHANES, data from 2003 to 2010), some 3.6 million individuals in the United States have antibodies to HCV in their blood; for 2.7 million of them, the infection has become chronic.<sup>3</sup> The actual number of people in the United States who are HCV antibody

### Hepatitis A and B

Although HCV infection is the most common type of viral hepatitis infection in the United States, hepatitis A and B are also public health concerns. The hepatitis A virus (HAV) is transmitted via the fecal-oral route. Most people recover within 6 months; however, the disease can be serious for people who are older or who have liver disease, other forms of hepatitis, or HIV.

The hepatitis B virus (HBV) is transmitted through blood and other body fluids (e.g., semen). The most common modes of infection are injection drug use, sexual contact with an infected person, and transmission of the virus from an infected mother to her baby during childbirth. The acute infection usually lasts less than 6 months, but chronic hepatitis B develops in up to 10 percent of infected adults.<sup>1</sup> Chronic hepatitis B is more likely to develop in people with weakened immune systems, such as those who are infected with HIV.

Both HAV and HBV infection can be prevented by vaccine. By contrast, a vaccine is not available against HCV infection.

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positive may actually be significantly higher than this estimate, because NHANES does not include people who are homeless or incarcerated.<sup>4</sup>

## How Is HCV Transmitted?

HCV is most often transmitted through penetration of the skin by instruments contaminated with infected blood. The most common risk factor for new infection is sharing injection drug equipment. Experiments have demonstrated that the virus can survive up to several days or even weeks inside a syringe<sup>5</sup> and on inanimate surfaces or objects<sup>6,7</sup> such as cookers or other drug preparation equipment. The virus can also remain in water for several weeks, and virus-infected water can potentially contaminate drug preparation filters and water containers.<sup>8</sup> Prevalence of HCV infection among people who inject drugs is estimated by most studies to be between 40 and 70 percent.<sup>9</sup>

Other risk factors for HCV infection include long-term hemodialysis, receipt of clotting factor concentrates produced before 1987, and receipt of blood transfusions or donated organs before July 1992.<sup>10</sup> Less frequent sources of HCV infection

include tattooing or piercing in unregulated settings, intranasal drug use, and perinatal transmission of the virus to a fetus from an infected mother. Sexual transmission of HCV is infrequent but does occur. For example, risk of HCV infection among men who have sex with men is higher among those who have unprotected receptive anal intercourse with multiple partners.<sup>11</sup>

Data show that people born during 1945–1965 account for 75 percent of all HCV infections in the United States; prevalence of HCV antibodies is five times greater in this population compared with people born in other years.<sup>12</sup> The majority of these baby boomers likely acquired their infections between the late 1960s and the early 1980s, through blood product transfusions prior to the implementation of screening procedures to eliminate infectious agents in donated blood or through injection drug use. Infection rates at the end of that period peaked at somewhere between 250,000 and 500,000 new cases per year.<sup>13</sup> New infections continue to occur, at a substantially lower rate: an estimated 21,870 new infections occurred in 2012.<sup>12</sup>

### Preventing HCV Infection Among People Who Use Drugs Illicitly

The Institute of Medicine (IOM)<sup>14</sup> advocates for the provision of comprehensive hepatitis C prevention programs to people who use drugs illicitly. The institute further recommends that, as part of such programs, access to sterile needles, syringes, and drug-preparation equipment be provided to people who inject drugs, as a means of preventing their exposure to HCV. (A ban on use of federal funds for syringe services programs was in effect from 1988 to 2009 and was reinstated in 2011; current syringe services programs are supported by state and local funds and private donations.) People who inject drugs illicitly should continue to receive viral hepatitis education and screening along with treatment for their substance use.

According to IOM, viral hepatitis prevention programs should also incorporate strategies to prevent people who use drugs illicitly via noninjection means from transitioning to injection drug use. Results of a 2011 systematic review and meta-analysis of interventions to reduce unsafe drug injection support the IOM position.<sup>15</sup> The study found that combinations of prevention strategies—such as medication-assisted treatment with prevention counseling or medication-assisted treatment with supports for safe injection practices—reduced the incidence of HCV infection by 75 percent for people who had ever injected drugs.

The historic decline in new infections may be attributed to two main factors. The first is healthcare changes that have dramatically reduced the transmission of infected blood through donor organs, blood transfusions, blood-based products, and unintended needle sticks. (Despite improvements in blood handling procedures, occasional reports of HCV transmission via therapeutic blood product transfusions and other healthcare interventions still appear.)<sup>16</sup> The second factor associated with the decline in new cases of HCV infection is promotion of injection-drug-use harm reduction strategies (see the text box on page 2, Preventing HCV Infection Among People Who Use Drugs Illicitly).

Although the rate of new HCV infection has declined, morbidity and mortality from the disease are increasing as people infected with the virus decades ago develop complications. In the United States, the number of deaths per year from HCV infection was 15,106 in 2007 and increased steadily upward to 17,721 in 2011.<sup>12</sup> In the United States, the number of deaths per year from HCV infection now surpasses the yearly number of HIV-related deaths.<sup>17</sup> Further, the new-infection rate has begun to increase again. In 2012, the number of reported cases of acute hepatitis was 1,778, more than doubling since 2010.<sup>12</sup>

Two risk factors for accelerated progression of HCV-related liver disease are alcohol use disorder (AUD) and HIV infection. Alcohol use is prevalent in people who have been infected by HCV, especially in those who inject drugs.<sup>18</sup> From a study of a U.S. veteran cohort, patients with AUD (including current and past use) were less than half as likely to spontaneously clear the virus than those without AUD.<sup>19</sup> In people affected by AUD, HCV infection positively correlates with clinical severity of liver disease.<sup>20</sup> HCV infection and heavy alcohol use synergistically accelerate the progression of the most severe liver diseases, cirrhosis,<sup>21</sup> and liver cancer.<sup>22,23</sup>

Because of immune suppression, people with HIV are at increased risk for chronic HCV infection; about 25 percent of people with HIV are HCV coinfecting.<sup>24</sup> People who are coinfecting with HIV and viral hepatitis face more rapid progression of hepatitis.<sup>24</sup> Liver disease is a leading cause of death among people living with HIV.<sup>25</sup>

## Why Is Early Detection of HCV Infection Important?

A benefit of early identification of HCV infection is that early treatment can improve an individual's chances of clearing the virus through treatment and avoiding long-term liver damage. Another benefit is that identified individuals can receive timely counseling on how to minimize other threats to their liver health, for example, by reducing or ceasing alcohol intake, maintaining or achieving a healthy weight, and avoiding certain over-the-counter medications that are hard on the liver.

Knowledge of infection status is associated with decreases in high-risk behaviors; evidence suggests that individuals who know their HCV status reduce sharing of injection drug equipment with individuals who do not have the same status.<sup>26</sup> Another benefit of early identification is that it can help reduce the spread of the virus, because infectiousness is generally highest in the period immediately following infection.<sup>27</sup> In addition, individuals who undergo successful treatment to achieve *sustained virologic response* (persistent clearance of the virus, considered a cure of the HCV infection)<sup>28</sup> can no longer transmit the virus to others.

## What Does Screening Detect?

An HCV screening test determines the presence or absence of HCV antibodies in the blood, signifying whether exposure to the virus has occurred. The

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outcome of the screening test is reported as reactive (positive), nonreactive (negative), or invalid:

- A reactive result indicates that the individual is currently infected or was once infected but the infection has resolved (either naturally or because of prior treatment).
- A nonreactive result indicates that the individual has not been infected or that the infection is so new (within 6 months) that HCV antibodies have not yet developed.
- An invalid result indicates that the test must be repeated to obtain accurate results.

## What Tests Are Used for Screening?

Several Food and Drug Administration (FDA)-approved HCV antibody tests are available that require a blood draw (e.g., enzyme immunoassay), with the blood sample sent to a laboratory for analysis.<sup>29</sup> Specimens are typically processed in batches, and results are available within hours or days, depending on the laboratory's turnaround schedule. In addition, a rapid HCV antibody test has been approved by FDA that makes use of a blood sample obtained by either fingerstick or blood draw. Results are obtained by test strip analysis and are available in approximately 20 minutes.<sup>30</sup> The HCV antibody tests have high sensitivity and specificity.<sup>31</sup>

As occurred with HIV testing, the availability of a rapid HCV antibody test is enabling screening to be provided in outreach settings without laboratory access. Cost-benefit considerations of laboratory-processed tests versus rapid screening must be made on a program-by-program basis. Screening products continue to evolve. An oral swab HCV antibody test has been developed,<sup>32</sup> as have tests that integrate screening for HIV, HBV, and HCV.<sup>33</sup> At time of publication, no tests of these types have been approved by FDA.

## What Happens After a Positive Screen?

Individuals who receive positive results to the antibody test should be provided with HCV RNA (ribonucleic acid) testing, which will determine whether the virus remains present in the blood. Individuals whose test results are negative but who engage in high-risk behavior, such as injection drug use, should be rescreened every 6 to 12 months.<sup>34</sup>

Individuals with a positive HCV RNA test should receive a full medical evaluation for prognosis and treatment.<sup>34</sup> The medical evaluation may include a genotype test to identify the HCV strain infecting the patient. The evaluation may also include liver function tests, serum fibrosis marker tests, ultrasound, or, less commonly, biopsy. These tests provide information on the extent of infection and whether and how severely the liver has been affected. At the evaluation, vaccination against HAV and HBV may also be recommended.

## How Is Screening Conducted?

Screening can be conducted at intake and in periodic assessments as needed. Multiple separate screens, such as for HIV and HBV as well as HCV, can feasibly be conducted in one encounter. Programs must determine whether to offer opt-in screening (the test is performed only if the patient actively chooses it) or opt-out screening (the test is performed unless the patient chooses against it).

The behavioral health program that has staff who can perform phlebotomy services can conduct HCV screening that requires a blood-draw onsite, with the specimens processed in-house or sent to a laboratory facility. Alternatively, clients can be referred to medical facilities for screening. Nonclinical facilities may choose to offer screening onsite using the rapid test (obtaining a blood sample via fingerstick

does not require staff trained in phlebotomy). To use the rapid test, a facility that is not Clinical Laboratory Improvement Amendments (CLIA) certified must obtain a certificate of waiver and pay the certification fee. The waiver, obtained from the Centers for Medicare and Medicaid Services, is for the use of simple point-of-care tests (that is, tests performed outside the physical facilities of the clinical laboratory) that have a low risk of error, as defined by CLIA standards. No specific training or qualifications are required of personnel who perform waived tests, and facilities are not subject to routine regulatory oversight of such testing. Facilities are, however, required to follow the manufacturer's test instructions and to comply with any pertinent state and local regulations. They are also advised to follow good testing practices. (See Screening Resources.)

## Which Clients at the Behavioral Health Program Should Be Screened for HCV Infection?

Despite the availability of curative treatment for hepatitis C, only a fraction of people who have risk factors have been tested for presence of the virus. Similarly, only a small percentage of those infected have been treated. For these reasons, the Centers for Disease Control and Prevention (CDC) recommends one-time screening of all people born between 1945 and 1965.<sup>10</sup> CDC also recommends routine screening of people with known risk factors. (See Exhibit 1.)

Like CDC, the U.S. Preventive Services Task Force also recommends screening people at high risk for infection and one-time screening for adults born between 1945 and 1965.<sup>35</sup> The Substance Abuse and Mental Health Services Administration (SAMHSA) also supports these recommendations.<sup>36</sup>

### Exhibit 1. HCV Testing Recommendations<sup>10,37,38</sup>

#### Identification of Chronic HCV Infection Among People Born During 1945–1965

- Adults born during 1945–1965 should receive one-time testing for HCV without prior ascertainment of HCV risk.
- All people with identified HCV infection should receive brief alcohol screening and intervention as clinically indicated, followed by referral to appropriate care and treatment services for HCV infection and related conditions.

#### Prevention and Control of HCV Infection and HCV-Related Chronic Disease

Routine HCV testing is recommended for:

- People who ever injected drugs illicitly, including those who injected once or a few times many years ago and do not consider themselves users of drugs.
- People with selected medical conditions (including people who received clotting factor concentrates produced before 1987; who were ever on chronic [long-term] hemodialysis; or who have persistently abnormal alanine aminotransferase levels [evidence of liver inflammation]).
- Prior recipients of transfusions or organ transplants.

#### Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents

- HIV-infected patients should be routinely tested for evidence of chronic HCV infection.
- Initial testing for HCV should be performed using the most sensitive immunoassays licensed for detection of antibody to HCV in blood.

Statements were taken from a longer list of recommendations. For full exhibit, see CDC's "Recommendations for the Identification of Chronic Hepatitis C Virus Infection Among Persons Born During 1945–1965."<sup>10</sup>

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## What Staff Training Is Needed?

IOM reports that healthcare providers and social services providers—including staff of substance use treatment and needle exchange programs—generally have inadequate knowledge about hepatitis C.<sup>14</sup> A substantial proportion of people at high risk for HCV infection are likewise uninformed or confused about viral hepatitis facts, such as modes of transmission, the meaning of antibody test results, and complications of chronic infection.<sup>14</sup> Therefore, before launching HCV screening at a behavioral health services program, administrators should arrange for staff training about the disease and develop appropriate counseling messages. Staff who will administer tests must be trained in both testing protocol (e.g., how to conduct test controls, collect specimens, and dispose of biohazardous materials) and universal precautions (how to use infection control procedures with all patients to prevent transmission of blood-borne pathogens).

In addition to training staff, other tasks for administrators include:

- Selecting a type of screening test.
- Adopting a quality control plan for storage and management of the testing products and specimens and disposal of biohazardous material.
- Establishing a private environment for specimen collection and for pretest and posttest counseling.
- Developing policies and procedures for screening that cover confidentiality, hepatitis counseling, recordkeeping, appropriate referral, and referral tracking.
- Negotiating memoranda of understanding with providers of follow-up evaluation and care, as needed.

A Viral Hepatitis Prevention Coordinator is available in most states and in several cities, as part of a CDC-

### Rapid Hepatitis C Virus Screening and Referral Program

In 2013, SAMHSA launched the Rapid Hepatitis C Virus Screening and Referral Program to encourage the provision of hepatitis services in opioid treatment programs. Nine institutions were awarded grants to integrate rapid screening for individuals who are at high risk for HCV exposure and to make referrals for confirmation of positive screens and for appropriate care as needed.

funded initiative to stop the spread of viral hepatitis. These specialists can provide technical assistance to program administrators establishing HCV screening services. (See Hepatitis Resources.)

## How Can Hepatitis Education Be Promoted Via Screening?

The period between initial screening and providing results presents an opportunity to educate clients about viral hepatitis and its effects on health. This is particularly true with rapid testing, because clients can be encouraged to remain onsite while waiting for test results. Key prevention messages to reinforce at this time include:

- Abstinence from injection drug use is an important way to reduce risk for HCV infection.
- If abstinence cannot be obtained, aim for reduction in drug use; do not share injection drug equipment, and use sterile needles.
- A reason not to use alcohol is that drinking can cause liver damage, and this damage can occur faster in someone infected with viral hepatitis.
- No vaccine exists against HCV infection; however, there are vaccines to protect against HAV and HBV infection.

## How Many Behavioral Health Programs Offer Hepatitis-Related Services?

HCV screening is offered at 23.8 percent of U.S. facilities that provide substance abuse treatment services<sup>39</sup> (Exhibit 2). Viral hepatitis education, counseling, or support is offered at 45.9 percent of these facilities. Viral hepatitis services are far more likely to be offered at facilities with a primary focus on general health care compared with facilities that primarily provide substance abuse treatment or mental health services.<sup>39</sup> Testing for infectious diseases in general is more likely to be offered at substance abuse treatment facilities operating in urban locations compared with those located in suburban or rural areas.<sup>40</sup>

## How Is Hepatitis C Treated?

Medication is available that can cure chronic HCV infection. The objective of treatment is to eliminate HCV from the bloodstream and reduce symptoms and complications resulting from infection. Specific treatment is based on the particular genetic variant of the virus, plus clinical and other patient factors.<sup>29</sup>

New antiviral medications have been approved in recent years, and more are expected to be approved in the coming years.<sup>41,42</sup> Some of the new treatments are used in combination with older medications used to treat HCV infection, but most are all-new combinations of pills. The new treatments are more effective than previously available medications, meaning that they cure more people of their HCV infection.

The older medications—pegylated interferon (injected) and ribavirin (pills)—can cause flu-like and psychiatric (e.g., depression, irritability, insomnia) side effects, so they were often not given to people with mental illness or those with a history of substance use. They had to be taken for up to 48 weeks and cured approximately half the people who completed the treatment. The new treatments are usually given in combinations of two to five different medications. The new antiviral medications have fewer side effects, can cure up to 90 percent of people who complete the treatment, and are given for 8 weeks or 24 weeks. These medications have been developed specifically for HCV, so they are often called “direct acting agents” (DAAs). The newest

**Exhibit 2. Percentage of Substance Abuse Treatment Facilities That Offer Hepatitis C Services: N-SSATS\* Data<sup>39</sup>**

Primary focus of facility	Number of facilities	Percentage offering screening for hepatitis C (%)	Percentage offering hepatitis education, counseling, or support (%)
Substance abuse treatment services	7,990	24.4	51.0
Mental health services	997	20.3	25.7
Mix of mental health and substance abuse treatment services	4,732	20.5	40.5
General health care	228	87.7	74.1
Other/unknown	364	22.8	42.9
All facilities	14,311	23.8	45.9

\*The *National Survey of Substance Abuse Treatment Services (N-SSATS)* is an annual census of facilities providing substance abuse treatment throughout the 50 states, the District of Columbia, and other U.S. jurisdictions.

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DAAAs have also been shown to be effective in people who already have some scarring or damage in the liver.

Because the treatments are changing, if a client has hepatitis C, it is important to learn if he or she may be able to take one of the new DAAs and be cured of his or her infection. Treatment can be expensive, takes several months to complete, and requires that all the medications be taken as recommended; some clients may choose to defer treatment until they have stabilized other aspects of their lives. As clients gain access to the newer medications that allow for shorter and less complicated treatment regimens with fewer side effects, the need to defer may be obviated.

For people with very severe liver damage or end-stage liver disease, liver transplantation surgery may be needed. However, waiting lists can be long, and many people who need a liver transplant cannot get one. For this reason, helping clients get tested and diagnosed, providing the counseling messages below, and helping them access health care where they may be able to get treated and cured are very important to help clients with hepatitis C remain as healthy as possible.

## What HCV-Related Support Can Counselors Provide to Clients?

Counselors can help clients understand their screening results. Clients who test HCV antibody negative can be advised on how to avoid infection. Clients who test positive can be urged to follow up with HCV RNA testing; currently, only about half of all people newly reported as HCV antibody positive receive the HCV RNA test.<sup>43</sup> Clients with a hepatitis C diagnosis can be supported as they consider the treatment options presented to them by their hepatitis care providers. Such clients can also be counseled on how to avoid infecting others and the importance of doing so. They may also benefit from being directed to a support group for people with the disease.

Counselors may also support clients by referring them to help in finding resources to pay for their hepatitis care and treatment. Depending on the client,

options may include obtaining coverage through a health insurance plan, applying for Medicare or Medicaid, enrolling in a federally funded AIDS Drug Assistance Program (for patients coinfecting with HIV), or obtaining prescription subsidies from the drug manufacturers. State Viral Hepatitis Prevention Coordinators can provide guidance on resource questions (see Hepatitis Resources).

Clients with chronic hepatitis C may need counselors' and administrators' advocacy and support to ensure that they are not unreasonably excluded from antiviral treatment. Such discrimination has been experienced by people with substance use disorders, including those in treatment for their disorder; receiving medication-assisted treatment; in relapse; or actively using substances.<sup>34</sup> Similarly, antiviral treatment has sometimes been withheld from clients affected by mental illness, to prevent their exposure to potential neuropsychiatric side effects.<sup>44</sup> Current guidelines for treating hepatitis C indicate that co-occurring mental and substance use disorders can be addressed through counseling and education, referral to services (e.g., psychiatry, medication-assisted treatment), and optimization of treatment "with simpler and less toxic regimens."<sup>45</sup>

A 2012 study confirmed that for people with a substance use disorder, treatment of that disorder during hepatitis C therapy results in higher hepatitis treatment completion rates.<sup>46</sup> Practice guidelines from the American Association for the Study of Liver Diseases recommend against routine denial of antiviral treatment for patients who inject drugs or experience mental illness.<sup>44</sup> According to the guidelines, treatment for HCV infection can be considered for people who wish to have the treatment, even if they use drugs illicitly, are receiving medication-assisted treatment, or have a mental disorder. The guidelines further indicate that when treatment is provided to such people, these patients should be supported by continued behavioral health counseling services.

Clients should be counseled that treatment for hepatitis C does not provide immunity to other forms of viral hepatitis, liver disease, or reinfection with HCV. Self-care messages counselors can provide include the following:<sup>34</sup>

- Obtain sufficient rest.
- Avoid alcohol and discontinue drug use; minimize use if abstinence is not achievable; do not share injection drug equipment.
- Avoid other substances that can harm the liver, including acetaminophen (Tylenol) in large doses.
- Eat nutritious, well-balanced meals.
- Get vaccinated against HAV and HBV.

More guidance on counseling clients who are affected by hepatitis C is presented in SAMHSA's Treatment Improvement Protocol (TIP) 53, *Addressing Viral Hepatitis in People With Substance Use Disorders*.<sup>34</sup>

## What More Can Administrators Do?

Diagnosis of HCV infection and treatment of hepatitis C are rapidly evolving. New diagnostic tests, treatment medications, and combinations of approved medications are anticipated. To ensure that HCV screening programs provide the optimum level of care, behavioral health program administrators are advised to regularly check with their state's Viral Hepatitis Prevention Coordinator and to regularly monitor the CDC Web site for updated information (see Hepatitis Resources).

## Resources

### Relevant Publications From SAMHSA

(see back page for electronic access and ordering information)

*Advisory: Rapid HIV Testing in Substance Abuse Treatment Facilities*

Treatment Improvement Protocol (TIP) 53:  
*Addressing Viral Hepatitis in People With Substance Use Disorders*

## Hepatitis Resources

### Hepatitis C Information for Health Professionals

[www.cdc.gov/hepatitis/hcv/hcvfaq.htm](http://www.cdc.gov/hepatitis/hcv/hcvfaq.htm)

### Hepatitis C Information for the Public

[www.cdc.gov/hepatitis/hcv/cfaq.htm](http://www.cdc.gov/hepatitis/hcv/cfaq.htm)

### Hepatitis B and C: What's New at FDA in Hepatitis

[www.fda.gov/ForPatients/Illness/HepatitisBC/default.htm](http://www.fda.gov/ForPatients/Illness/HepatitisBC/default.htm)

### Viral Hepatitis Prevention Coordinators

[www.cdc.gov/hepatitis/partners/hepatitiscoordslist.htm](http://www.cdc.gov/hepatitis/partners/hepatitiscoordslist.htm)

*Please refer to TIP 53, Appendix C, for a comprehensive list of viral hepatitis resources.*

## Screening Resources

*Good Laboratory Practices for Waived Testing Sites: Survey Findings From Testing Sites Holding a Certificate of Waiver Under the Clinical Laboratory Improvement Amendments of 1988 and Recommendations for Promoting Quality Testing*  
[www.cdc.gov/mmwr/preview/mmwrhtml/rr5413a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5413a1.htm)

*How To Apply for a CLIA Certificate, Including International Laboratories*  
[www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/How\\_to\\_Apply\\_for\\_a\\_CLIA\\_Certificate\\_International\\_Laboratories.html](http://www.cms.gov/Regulations-and-Guidance/Legislation/CLIA/How_to_Apply_for_a_CLIA_Certificate_International_Laboratories.html)

*Integrated Prevention Services for HIV Infection, Viral Hepatitis, Sexually Transmitted Diseases, and Tuberculosis for Persons Who Use Drugs Illicitly: Summary Guidance From CDC and the U.S. Department of Health and Human Services*  
[www.cdc.gov/mmwr/preview/mmwrhtml/rr6105a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/rr6105a1.htm)

## Notes

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- <sup>2</sup> National Digestive Diseases Information Clearinghouse. (2010). *Liver transplantation*. NIH Publication No. 10-4637. Retrieved July 14, 2015, from [www.niddk.nih.gov/health-information/health-topics/liver-disease/liver-transplant/Pages/facts.aspx](http://www.niddk.nih.gov/health-information/health-topics/liver-disease/liver-transplant/Pages/facts.aspx)
- <sup>3</sup> Denniston, M. M., Jiles, R. B., Drobeniuc, J., Klevens, R. M., Ward, J. W., McQuillan, G. M., & Holmberg, S. D. (2014). Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010. *Annals of Internal Medicine*, *160*(5), 293–300.
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