



Brief article

Hepatitis B virus and hepatitis C virus services offered by substance abuse treatment programs in the United States

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Abstract

Although substance abuse treatment programs are important contact points for providing health services for hepatitis B virus (HBV) and hepatitis C virus (HCV) infections, availability of services in these programs has not been well characterized. This study evaluated the spectrum of HBV and HCV services offered by substance abuse treatment programs within the National Drug Abuse Treatment Clinical Trials Network. Our survey of substance abuse treatment program administrators covered availability of testing for HBV and HCV; hepatitis A virus (HAV) and HBV immunization; and HCV medical and nonmedical services. There were also questions covering clarity of guidelines for HBV and HCV testing and HAV and HBV immunization. Differences between methadone and nonmethadone programs were examined. Despite the importance of substance abuse in sustaining the hepatitis epidemics, few programs offer comprehensive HBV and HCV testing or HCV health care services. Interventions to improve access to hepatitis services for substance-abusing patients are needed. © 2012 Elsevier Inc. All rights reserved.

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1. Introduction
1.1. Prevalence of HBV and HCV in the United States

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are major public health problems in the United States and

worldwide, and these infections are the leading causes of chronic liver disease, cirrhosis, and hepatocellular carcinoma and the most frequent indication for liver transplantation (Custer et al., 2004; Donato, Boffetta, & Puoti, 1998; Global Burden of Hepatitis C Working Group, 2004; Lai, Ratziu, Yuen, & Poynard, 2003; Lok & McMahon, 2007; National Institutes of Health, 2002; Sharma & Lok, 2006; Shepard, Finelli, & Alter, 2005; Shi, Zhu, Liu, & Xie, 2005; Strader, Wright, Thomas, & Seeff, 2004). In the United States, the Centers for Disease Control and Prevention (CDC) estimates that there are 1.25 million persons with HBV infection and more than 4

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million with HCV infection (Armstrong et al., 2006; McQuillan et al., 1999).

1.2. Substance abuse treatment programs can reduce HBV and HCV transmission

Substance-abusing individuals are disproportionately affected by HBV and HCV and are largely responsible for sustaining the epidemics of viral hepatitis in the United States (CDC, 1998; Garfein et al., 2004; Goldstein et al., 2002; Koblin, Factor, Wu, & Vlahov, 2003; Murrill et al., 2002; Quaglio et al., 2003; Shepard et al., 2005; Sulkowski, & Thomas, 2005; Tortu, McMahon, Pouget, Hamid, 2004; Tortu, Neaigus, McMahon, & Hagen, 2001). Substance abuse treatment programs are effective in reducing the use and abuse of illicit substances (Hubbard, Craddock, & Anderson, 2003) and can also be effective in reducing transmission of viral hepatitis. These programs provide an opportunity to offer testing and treatment for HBV and HCV, as well as vaccination against hepatitis A virus (HAV) and HBV. However, despite the large number of substance abuse treatment programs in the United States, substance use disorders continue to remain an important mode of transmission of viral hepatitis.

1.3. HBV and HCV services in substance abuse programs and study aims

Surprisingly, little is known about HBV and HCV health services offered by substance abuse treatment programs in the United States. The primary aim of this portion of the Infections and Substance Abuse Study (National Institute on Drug Abuse [NIDA] Critical Trials Network [CTN]-0012) was to determine the availability and comprehensiveness of HBV and HCV testing, HAV and HBV vaccinations, and other health care services for hepatitis within substance abuse treatment programs in the United States.

2. Methods

2.1. Study population

Survey responses for this report were provided by treatment program administrators (program directors or managers) from substance abuse treatment programs within the NIDA CTN in the United States. The NIDA CTN mission is to improve the quality of drug abuse treatment throughout the country using evidence-based medicine and science as the vehicle.

All 319 substance abuse treatment program administrators within the NIDA CTN were provided with an information sheet and a definitions sheet prior to participation that described the objectives of the study and defined terms covered by the survey. Individuals were only excluded if they refused to complete the survey.

2.2. Study design

The Infections and Substance Abuse Study was a cross-sectional, descriptive, and exploratory survey examination of the range of available services associated with three infection groups in substance abuse treatment settings within the CTN. The study began in March 2003 and ended in January 2005. A comprehensive description of the design of this study has been published previously (Brown et al., 2006). Data for this report came from surveys returned by program administrators. The administrator survey had sections entitled Structure and Service Setting, Patient Characteristics, Staff Characteristics, Reimbursement Issues, Practices, Program Guidelines, Barriers, and Opinions.

For this report, which looked specifically at HBV and HCV, we assessed the availability and types of hepatitis tests offered at each facility. We also assessed the availability of HAV and HBV vaccinations. In addition, we evaluated the availability of seven health care services (offered either on-site or via contractual agreement with another provider), including four medical services (medical history/physical examination, biological testing, medical treatment, and medical monitoring) and three nonmedical services (patient education, patient risk assessment, and patient counseling). Finally, we asked about availability of written guidelines for HBV and HCV testing and HAV and HBV vaccinations. Specifically, we asked whether written guidelines for each of these items were 1 = *clear*; 2 = *somewhat clear*; 3 = *unclear*; 4 = *don't know if guidelines exist*; 5 = *no guidelines exist*; 6 = *program/service not offered*.

Approval of this study was obtained from each institutional review board with jurisdiction over the participating substance abuse treatment programs.

2.3. Outcome measures

The primary focus of this report is the availability of HBV and HCV testing in participating substance abuse treatment programs. The specific types of HBV tests assessed in this study included HBV surface antigen (HBsAg), HBV surface antibody (HBsAb), HBV core antibody (HBcAb), HBV e antigen (HBeAg), HBV e antibody (HBeAb), and HBV DNA testing. For HCV, we assessed the availability of HCV antibody, HCV recombinant immunoblot assay (RIBA), HCV qualitative polymerase chain reaction (PCR), HCV quantitative PCR, and HCV genotype testing. In addition, we also assessed the availability of other blood testing (complete blood count, serum chemistries, and hepatic panel).

The secondary outcome measures of this report included the proportion of substance abuse treatment programs that offered each of the seven health care services for HCV and whether the availability of these services differed between methadone and nonmethadone programs.

Other secondary outcomes included the proportion of substance abuse treatment programs that offered vaccinations for HAV and HBV and whether the proportion of

programs that offered HBV and HCV testing and HAV and HBV vaccinations differed between programs that did and did not have clear or somewhat clear written guidelines regarding hepatitis testing.

2.4. Statistical analysis

The survey sections used for this report consisted of yes/no and multiple-choice questions. The proportion of respondents providing a given answer was used to summarize each question. For the multiple-choice questions, the categories of responses were collapsed into a broader set of categories (e.g., service offered either on-site or by contractual agreement with another provider, clear or somewhat clear guidelines). Methadone and nonmethadone programs were compared on the provision of services measures of interest because previous research indicates that methadone programs are more likely to employ medical providers than nonmethadone programs (Brown, et al., 2007).

Categorical variables were expressed as proportions and compared using the chi-square test or Fisher's exact test. To minimize the possibility of Type 1 error, Bonferroni's corrections were applied. The *p* value was set at .003 (.05/16) for the comparison between methadone and nonmethadone programs for HBV/HCV testing and HAV/HBV vaccination services offered. The *p* value was set at .003 (.05/16) for the comparison between methadone and nonmethadone programs for HCV-related health care services offered. The *p* value was set at .004 (.05/14) for the comparison between existence/nonexistence of clear or somewhat clear guidelines for HBV/HCV testing and HAV/HBV vaccination services. Statistical analyses were performed using SAS software version 9.1 for Windows.

3. Results

3.1. Characteristics of the substance abuse treatment programs surveyed

Of the 319 treatment program administrators surveyed, 269 individuals (84.3%) from geographically diverse locations in the United States returned surveys. Most of the substance abuse treatment programs were private not-for-profit, freestanding facilities. A substantial number of programs offered outpatient, outreach, and other support services, but far fewer offered inpatient/residential services or outpatient pharmacotherapy, such as methadone. In addition, program size and medical and nonmedical staffing patterns varied considerably.

3.2. Availability of HBV and HCV testing and HAV and HBV vaccinations in substance abuse treatment programs

As shown in Table 1, basic testing, consisting of complete blood count, serum chemistries, and liver function tests either on-site or by contractual agreement with another provider, was done at about one third of all substance abuse treatment programs.

Testing to determine past or present infection with HBV or HCV either on-site or by contractual agreement with another provider ranged from 2.7% (other hepatitis testing) to 28.2% (HCV antibody testing) with most rates less than 10% (Table 1). HBV and HCV testing was significantly more likely to be offered at methadone maintenance programs than nonmethadone maintenance programs; however, the rate was less than half in almost all cases (Table 1).

Also shown in Table 1, HAV and HBV vaccination was offered either on-site or by contractual agreement

Table 1
HBV and HCV testing and HAV and HBV vaccination services offered by substance abuse treatment programs

Test/vaccination ^a	All programs (%) N = 269	Methadone programs (%) n = 89	Nonmethadone programs (%) n = 180	<i>p</i>
Complete blood count ordered on all new patients	34.5	58.6	22.2	<.001
Serum chemistries ordered on all new patients	33.1	58.1	20.5	<.001
Liver function tests ordered on all new patients	34.5	60.1	21.5	<.001
HBsAg testing	20.5	41.2	10.4	<.001
HBsAb testing	20.5	36.5	12.8	<.001
HBcAb testing	16.3	31.8	8.8	<.001
HBeAg testing	8.9	14.1	6.4	.024
HBeAb testing	8.1	11.8	6.4	.077
HBV viral DNA testing	3.9	7.4	2.3	<.036
HCV antibody testing	28.2	54.7	15.0	<.001
HCV RIBA testing	4.7	9.6	2.3	.036
HCV qualitative PCR testing	4.7	9.5	2.3	.026
HCV quantitative PCR testing	3.9	8.5	1.7	<.011
HCV genotype testing	6.2	14.1	2.3	<.001
Other hepatitis testing	2.7	4.7	1.9	.072
HAV and HBV vaccination for HCV-infected patients	68.3	73.3	65.9	.258

Note. Bolded *p* values are statistically significant with Bonferroni's correction.

^a Refers to the service being offered either on-site or by contractual agreement with another provider.

Table 2
HCV services offered by substance abuse treatment programs

Health care service ^a	All programs (%) N = 269	Methadone programs (%) n = 89	Nonmethadone programs (%) n = 180	p
Patient medical history and physical examination	50.0	83.3	38.0	<.001
Patient biological testing	34.4	63.4	24.0	<.001
Patient treatment	28.9	48.2	22.4	<.001
Patient monitoring	35.2	63.1	24.9	<.001
Patient education	74.1	88.1	73.7	.009
Patient risk assessment	71.9	88.1	69.8	.001
Patient counseling	58.9	82.1	52.6	<.001

Note. Bolded *p* values are statistically significant with Bonferroni's correction.

^a Refers to the service being offered either on-site or by contractual agreement with another provider.

with another provider at 68.3% of all substance abuse treatment programs.

3.3. Availability of HCV health care services in substance abuse treatment programs

For all patients in substance abuse treatment programs, HCV-related medical services (medical history and physical examination, biological testing, treatment, and monitoring) were offered either on-site or by contractual agreement with another provider at 50.0%, 34.4%, 28.9%, and 35.2% of all programs, respectively. HCV-related nonmedical services (patient education, risk assessment, and counseling) were offered either on-site or by contractual agreement with another provider at 74.1%, 71.9%, and 58.9% of all programs, respectively (Table 2).

Because previous studies have shown that the provision of medical and nonmedical services differs between methadone and nonmethadone programs, we evaluated whether the availability of HCV services also differed between these two groups of programs. As shown in Table 2, there was greater availability of all seven HCV services at methadone versus nonmethadone programs, which was statistically significant; although for patient education, the statistical significance was lost with Bonferroni's correction.

For HCV-infected patients, medical history and physical examination, counseling, treatment, and monitoring were offered either on-site or by contractual agreement with another provider at 37.6%, 43.4%, 18.2%, and 23.8% of programs, respectively (Table 3).

3.4. Guidelines and HBV and HCV testing and HAV and HBV vaccination services

As shown in Table 4, offering liver function, HBV and HCV testing, and HAV and HBV vaccination either on-site or by contractual agreement with another provider ranged from 18.0% to 88.7% of substance abuse treatment programs with clear or somewhat clear regulatory guidelines. In substance abuse treatment programs where clear or somewhat clear regulatory guidelines did not exist, offers for

testing and vaccination either on-site or by contractual agreement with another provider ranged from 1.9% to 59.8%. All 14 comparisons of testing/vaccination were statistically significant ($p = .017$ to $p \leq .001$); although for 5 of the 14 comparisons, the statistical significance was lost with Bonferroni's correction (Table 4).

4. Discussion

4.1. Summary of our findings

In this study of 269 substance abuse treatment programs in the United States, we found that a substantial proportion of all programs do not offer HBV or HCV testing either on-site or by referral to another facility. This includes methadone maintenance programs in most instances. Although the presence of program guidelines significantly improved the availability of HBV and HCV testing, a substantial majority of most of these services were not

Table 3
HCV services offered to HCV-infected patients by substance abuse treatment programs (N = 269)

Medical histories and physical examination for HCV-infected patients	
Offered within substance abuse treatment program	34.1%
Offered by contractual agreement with another provider	3.5%
Offered by referral to community resource	48.8%
Not offered	13.6%
HCV counseling for HCV-infected patients	
Offered within substance abuse treatment program	41.9%
Offered by contractual agreement with another provider	1.5%
Offered by referral to community resource	42.7%
Not offered	13.9%
HCV treatment for HCV-infected patients	
Offered within substance abuse treatment program	14.7%
Offered by contractual agreement with another provider	3.5%
Offered by referral to community resource	67.2%
Not offered	14.7%
HCV treatment monitoring for HCV-infected patients	
Offered within substance abuse treatment program	21.1%
Offered by contractual agreement with another provider	2.7%
Offered by referral to community resource	58.5%
Not offered	17.7%

Table 4

Proportion of substance abuse programs offering HBV and HCV testing and HAV and HBV vaccination according to presence or absence of clear or somewhat clear guidelines for hepatitis testing ($n = 248$)

Test/vaccination	Proportion of programs offering testing ^a		<i>p</i>
	Clear or somewhat clear guidelines for hepatitis testing exist (%)	Clear or somewhat clear guidelines for hepatitis testing do not exist (%)	
Liver function tests ordered on all new patients	53.5	11.0	<.001
HBsAg testing	75.0	16.4	<.001
HBsAb testing	72.7	18.2	<.001
HBcAb testing	59.5	14.8	<.001
HBeAg testing	33.3	5.7	<.001
HBeAb testing	32.0	3.8	<.001
HBV viral DNA testing	18.0	1.9	.005
HCV antibody testing	88.7	21.8	<.001
HCV RIBA testing	27.4	7.4	.004
HCV qualitative PCR testing	24.7	5.7	.007
HCV quantitative PCR testing	22.5	3.8	.004
HCV genotype testing	24.7	5.6	.007
Other hepatitis testing	19.2	2.0	.008
HAV and HBV vaccination to HCV-infected patients	74.8	59.8	.017

Note. Bolded *p* values are statistically significant with Bonferroni's correction.

^a Refers to the service being offered either on-site or by contractual agreement with another provider.

available in substance abuse treatment programs, whether they offered methadone maintenance or not. Considering the fact that our study only included programs within the NIDA CTN, where evidence-based practices would more likely be implemented than in other substance abuse treatment programs, the results are sobering. In view of the fact that treatment for chronic HBV and HCV infection has improved considerably over the past few years, these findings have important implications for the estimated 19.1 million current illicit substance users in the United States (Substance Abuse & Mental Health Services Administration NSDUH, 2005) and represent missed public health opportunities to diagnose, treat, and prevent further transmission of these infections, as has been the case with HIV disease (Farrell, Gowing, Marsden, Ling, & Ali 2005; Hubbard, Marsden, Cavanaugh, Rachal, & Ginzburg, 1988; Metzger, Navaline, & Woody, 1998; Sorensen & Copeland, 2000).

4.2. Previous studies of HBV and HCV services in substance abuse treatment programs

Despite the major public health importance of the HBV and HCV epidemics among substance-abusing patients, few studies have comprehensively evaluated the range of health services offered for these infections in substance abuse treatment programs in the United States. Although estimates vary widely, these studies showed that a disappointingly high proportion of substance abuse treatment programs did not offer any testing for HCV (22.7%–76.7%; Strauss, Astone, Des Jarlais, & Hagen, 2004; Substance Abuse & Mental Health Services Administration NSDUH, 2005; Substance Abuse & Mental Health Services Administration N-SSATS, 2005). In our study, which covered a larger

number of services, these findings were confirmed and extended to testing and services not previously reported.

4.3. Low rates of HAV and HBV vaccination services

Another interesting and important finding was the relatively low proportion of substance abuse treatment programs offering vaccinations against HAV and HBV, given that injection and noninjection drug users are at high risk of HAV and HBV infection, and these infections can be effectively prevented by immunization (CDC, 1999; CDC, 2006; Craig, & Schaffner, 2004; Garfein et al., 2004; Goldstein et al., 2002; O'Donovan et al., 2001; Spada et al., 2005).

Currently, the CDC and others recommend that all substance-abusing individuals receive the HAV and HBV vaccine if they have not already been exposed or immunized (CDC, 1999; Craig & Schaffner, 2004; Crowcroft, Walsh, Davison, & Gungabissoon, 2001; Hershey, Schowalter, & Bailey, 2005; Poland, & Jacobson, 2004; Poland, 2005; Quaglio, Lugoboni, Mezzelani, Des Jarlais, & Lechi, 2006). A substantial proportion of substance-abusing patients have underlying chronic liver disease due to HCV infection and are at increased risk of acute liver failure and death if they were to become superinfected with HAV or HBV (Akriviadis, & Redeker, 1989; Cooksley, 2004; Keeffe, 2005; Koff, 2001; Reiss, & Keeffe, 2004; Vento et al., 1998). The presence of chronic liver disease due to HCV infection is also a clinical indication for HAV and HBV vaccination (Almasio, & Amoroso, 2003; CDC, 1999, 2006; Cooksley, 2004; Gaslightwala, & Bini, 2006; Keeffe, 2005; Koff, 2001; Reiss, & Keeffe, 2004), and therefore, many substance-abusing patients have a dual indication for both

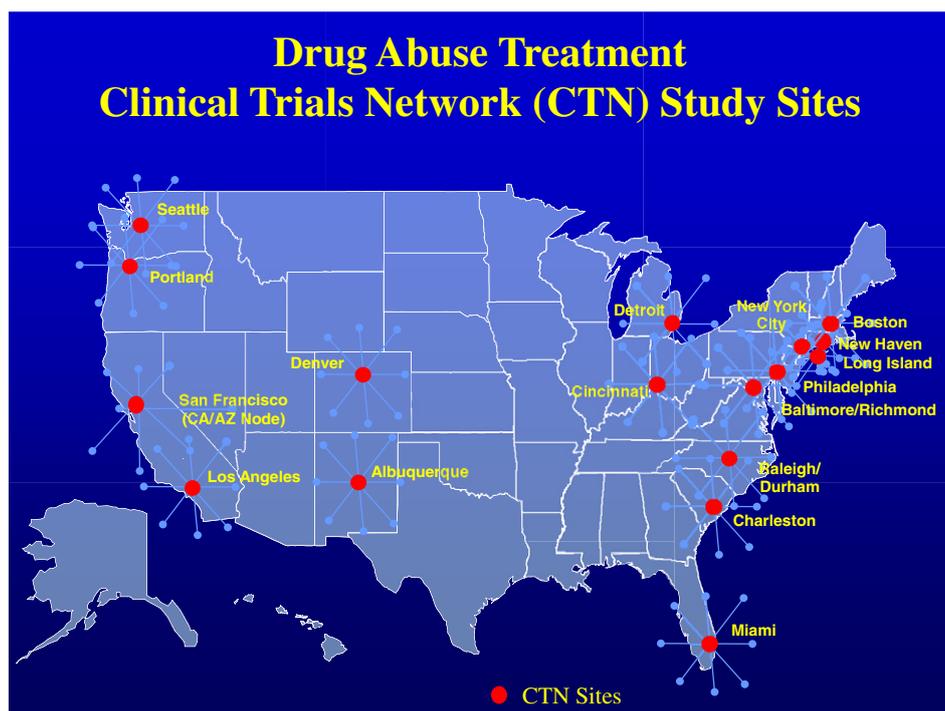


Fig. 1. Geographic distribution of substance abuse program study participants.

HAV and HBV vaccination. Failure to vaccinate these individuals against HAV and HBV represent missed opportunities for prevention.

4.4. Strengths and weaknesses

The strengths of this study include the large number of substance abuse treatment programs surveyed, the geographic diversity of these programs (Fig. 1), the high response rates from treatment program administrators (84.3%), and the collection of comprehensive information about health services offered for HBV and HCV. In addition, our study is unique because we are unaware of any prior studies that have as comprehensively evaluated availability of testing and health care services for HIV, HCV, and sexually transmitted infections (STI) in substance abuse treatment programs across the United States. The finding that a number of HBV and HCV testing and HCV health care services are more readily available at methadone maintenance programs than nonmethadone maintenance programs is consistent with a previous report from this study, demonstrating that methadone maintenance programs have significantly more medical staff than non-methadone maintenance programs (Brown et al., 2007).

Nonetheless, there are several limitations of this study to consider when interpreting our findings. First, we surveyed only substance abuse treatment programs within the CTN, and the services provided by these programs may differ from those associated with substance abuse treatment programs that do not participate in this network. However, this is unlikely because the distribution of the size and structure of the programs in our study was similar to the distribution of

the 13,454 programs in the National Survey of Substance Abuse Treatment Services study (Substance Abuse & Mental Health Services Administration N-SSATS, 2005). Although there are some differences between CTN and non-CTN programs, there are also many similarities (Institute for Behavioral Research, 2005).

The self-report nature of the study survey did not allow us to verify the accuracy of administrator responses. Some administrators may be more knowledgeable about their programs and/or have more access to hard data regarding survey questions than other administrators. To the extent that accuracy of responses was impacted, it represents a limitation.

5. Conclusions

We found that there was a lack of widespread availability of comprehensive testing and other health services for HBV and HCV both on-site or by referral to another facility in substance abuse treatment programs, whether offering methadone maintenance or not, in the United States. Because substance abuse treatment programs are an important point of contact to provide risk-reduction counseling, testing, and treatment for these infections, these identified shortcomings provide opportunities for public health intervention.

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