JOHNS HOPKINS MEDICINE
eLITERATURE REVIEW™
eViralHepatitis Review

Jointly presented by the Johns Hopkins University School of Medicine and the Institute for Johns Hopkins Nursing

Supported by educational grants from Bristol-Myers Squibb, Gilead Sciences, Inc., and Merck & Co, Inc.

eViralHepatitis Review
VOLUME 4, ISSUE 4

HEPATITIS: THE NEED TO SCREEN NOW

In this Issue...

Hepatitis C virus (HCV) and hepatitis B virus (HBV) are significant public health issues and are major contributors to morbidity and mortality. The consequences of these viruses may be prevented with early detection, counseling, evaluation, and antiviral treatment. Given the usually long period when patients exhibit minimal to no symptoms, they are ideal candidates for screening.

In this issue, we review recent literature describing:

- Early findings reporting on HCV screening for baby boomers (those born between 1945 and 1965) as recommended by the USPSTF and CDC
- HCV screening of high-risk populations such as prisoners and HIV positive men who have sex with men
- Successful HBV screening and linkage to care projects

LEARNING OBJECTIVES

After participating in this activity, the participant will demonstrate the ability to:

- Summarize the rationale for screening baby boomers born between 1945 and 1965.
- Define populations at greatest risk for HCV and HBV infections in the United States.
- Describe settings in which HCV and HBV screening may be successfully implemented.

The Johns Hopkins University School of Medicine takes responsibility for the content, quality, and scientific integrity of this CME activity.

IN THIS ISSUE

Program Directors

Mark S. Sulkowski, MD
Professor of Medicine
Medical Director, Viral Hepatitis Center
Divisions of Infectious Diseases and Gastroenterology/Hepatology
Johns Hopkins University School of Medicine
Baltimore, Maryland

Program Information
CME Info
Accreditation
Credit Designations
Intended Audience
Learning Objectives
Planners Disclosures
Disclaimer Statement

Length of Activity
1.0 hour Physicians
1.0 contact hour Nurses

Launch Date
January 28, 2016

Expiration Date
January 27, 2018

COMPLETE THE POST-TEST

PHYSICIAN POST-TEST

NURSE POST-TEST

Raymond T. Chung, MD
Director of Hepatology and Liver Center
Vice Chief, Gastroenterology
Kevin and Polly Maroni Research Scholar
Massachusetts General Hospital
Associate Professor of Medicine
Harvard Medical School
Boston, Massachusetts

Julie McArthur, MS, CRNP
Adult Nurse Practitioner
Division of Infectious Disease
Johns Hopkins University School of Medicine
Baltimore, Maryland

GUEST AUTHOR OF THE MONTH

Commentary:

Arthur Y. Kim, MD
Assistant Professor of Medicine
Harvard Medical School
Director, Viral Hepatitis Clinic
Massachusetts General Hospital
Boston, Massachusetts

Guest Faculty Disclosures

Arthur Y. Kim, MD has indicated that his institution has received funding for a clinical trial from Gilead Sciences, Inc.

Unlabeled/Unapproved Uses

Arthur Y. Kim has indicated that there will no references to the unlabeled/unapproved uses of drugs or products.

Program Directors' Disclosures

COMMENTARY

Chronic hepatitis C virus (HCV) and hepatitis B virus (HBV) infection are conditions that require screening. They are important public health problems as leading causes of chronic liver disease, and patients are asymptomatic for long periods of time before these serious consequences develop. Testing for either virus is relatively straightforward and inexpensive, and identification before serious liver disease presents is critical to maximize the benefit of antiviral therapies. Particularly for HCV, treatments with direct-acting antivirals (DAA) have markedly improved in both safety and efficacy in recent years, further increasing the benefits of screening.

In a prior issue of eViralHepatitis Review, new screening recommendations for HCV were reviewed.[1] To recap: in 2012, the Centers for Disease Control (CDC) recommended that all persons born between 1945 and 1965 — or baby boomers — receive an HCV antibody test, as they carry the highest risk of morbidity and mortality from HCV infection.[2] This approach removes the risk-based approach from the equation for this age group. Risk-based screening continues to be recommended for people outside that age group, as well as for those with ongoing risk factors, regardless of age.

Since this recommendation, studies have been published that provide real-world data informing the efficacy of this novel, age-based approach to screening. As reviewed in this issue, Turner et al presented the experience of implementing baby boomer screening to hospitalized patients at a safety net hospital, while Galbraith et al implemented baby boomer screening in an urban emergency room. The common features in both investigations included using electronic health records to identify patients not previously screened, opt-out testing to enhance acceptance, and a system to link those identified with

RECOMMEND TO A COLLEAGUE

NEWSLETTER ARCHIVE

COMPLETE THE POST-TEST

PHYSICIAN POST-TEST

NURSE POST-TEST

infection to specialty care. These early studies show that the prevalence of HCV in the screened population was actually higher than that found in the NHANES analyses that had prompted the age-based screening recommendations.[2] These screening projects are counted as successes, with the caveat that if antiviral treatment cannot be applied, the efficacy of screening is diminished.

What about persons born outside of the baby boomer age group? For those people, risk-based screening for HCV must not be forgotten. As risk-based approaches were generally insufficient for the baby boomer birth cohort, it is important to improve their implementation in the current era. The highest risk for incident HCV in the US is found in people who inject drugs (PWID) and HIV positive men who have sex with men (MSM). For those with recent acquisition, there are added benefits for earlier identification because those people are also at risk for further transmission and can be targeted for education and public health interventions.

For HIV positive persons, the article reviewed herein by Freiman et al examined screening rates among those already linked to care. These authors found excellent rates of initial screening for HCV, but there were gaps in implementing repeat screening. Because people living with HIV are generally already linked to care, this gap in identifying incident HCV is concerning and demonstrates that we could do better for this high-risk population. For PWID, medical care is often fragmented. Moreover, there is concern that the burden of HCV is significant, especially given the massive epidemic of opioid abuse in the US that includes transition from oral opioid abuse to injection heroin.[3]

One approach could be screening for HCV in prison settings, as PWID-related behaviors are often found in this population. He et al examined the potential cost burden and effectiveness of universal opt-out screening and treatment in prisoners to reduce the morbidity and mortality associated with HCV, importantly also taking into account potential transmission benefits. Consistent with other models of applying treatment among high-risk populations,[4] the benefits of transmission and reducing prevalent infection were found to outweigh the risk of reinfections. Real-world data are needed to examine whether the inputs that inform this model are correct. Importantly, these models show that there is need for a societal perspective to absorb the significant cost of antiviral treatment, especially as costs incurred by one segment of the health care system may realize benefits within another segment.

In the excitement over novel HCV therapies that drive increased efficacy of screening for that virus, one should not forget that highly effective therapies that support the importance of HBV screening are also present for hepatitis B virus (HBV). The reviews in this issue report on recent successful programs that identified chronic HBV infection and linked patients to care.

Both HCV and HBV represent silent infections with significant disease burden. Screening is necessary because of the asymptomatic nature of chronic infection and the latent period before significant symptoms present. Effective therapies enhance the utility of screening, but ultimately people identified as living with these viruses should be linked to evaluation and care to provide access to these therapies. Ideally, systems that implement screening would fulfill each step of this "cascade of care" and move toward the goal of preventing and controlling the significant consequences of these epidemics.

References

1. http://www.eviralhepatitisreview.org/newsletters/2014/0414.html
2. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945-1965. *MMWR Recomm Rep*. 2012;61(RR-4):1-32.
3. Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. Results from the 2013 National Survey on Drug Use and Health: Summary of National Findings. Retrieved from: samhsa.gov
4. Martin NK, Vickerman P, Grebely J, et al. Hepatitis C virus treatment for prevention among people who inject drugs: Modeling treatment scale-up in the age of direct-acting antivirals. *Hepatology*. 2013 Nov;58(5):1598-1609.

back to top

BABY BOOMER SCREENING IN HOSPITALIZED PATIENTS

Turner BJ, Taylor BS, Hanson J, et al. High priority for hepatitis C screening in safety net hospitals: Results from a prospective cohort of 4582 hospitalized baby boomers. Hepatology. 2015 Nov;62(5):1388-95.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View journal abstract View full article

The highest risk of morbidity and mortality from HCV infection is in people who have been infected for decades; therefore, the cornerstone strategy for identifying those with silent yet potentially deadly infection is so-called baby boomer screening, or testing people born from 1945 through 1965.[1] The recommendation is stated here:

"The CDC recommends that adults born during 1945-1965 should receive one-time testing for HCV without prior ascertainment of HCV risk."

For this birth cohort, this one-time testing recommendation replaced risk-factor based screening, which had proved unsuccessful in identifying the majority of infections. The one-time test eliminates the need for repeat testing, unless there are ongoing risks such as injection drug use. This strategy is projected to save hundreds of thousands of lives if testing is followed by appropriate linkage to care and access to curative antiviral treatments.[2]

While modeling data can inspire those on the front line of primary care to engage in baby-boomer HCV screening, others may have chosen to await evidence from real-world screening. Investigators in San Antonio, Texas have provided insight by reporting results from their implementation project. In a large safety net hospital serving a poorer segment of our population in South Texas, the authors implemented a large-scale effort of screening hospitalized patients. By automated algorithms based in their electronic medical record (EMR), they added HCV antibody screening to admission order sets if the patient born in this age cohort had no prior record of testing. Excluded were patients who elected to opt out, those admitted to psychiatry, and those with poor prognoses who were not likely to benefit from HCV screening. Fibrosis status was captured by examination of laboratory values that comprise the FIB-4, a noninvasive approach that correlates well with histologic findings.[3] Importantly, they also provided support in both Spanish and English to deliver results and provide linkage to care.

At this hospital, the results from 9037 admissions among baby-boomers over a 21-month period revealed that almost one-third of individuals were either previously screened or already had documented HCV. The systematic approach was able to deliver anti-HCV testing to 90% of 5087 eligible persons. Of these tests, 6.9% were anti-HCV positive, more than double the prevalence of baby boomers from NHANES (3.2% prevalence).[4] HCV RNA testing was performed in over 90% of those testing anti-HCV positive and demonstrated a clearance rate of 39%. Overall, the authors identified 175 individuals with chronic HCV infection; 40 of whom had evidence of cirrhosis by FIB-4, and another 10 with intermediate results suggesting advanced fibrosis.

This article demonstrates the feasibility of implementing large-scale, baby boomer HCV screening across a hospital system and suggests that the prevalence of infection may be higher in certain settings than the prevalence reported by NHANES. In particular, the linkages to HCV RNA testing and downstream care were excellent in this study. What is not reported is how successfully antiviral treatment was obtained for patients with these new diagnoses; unfortunately, restrictions by insurers that disallow access to curative treatments remain an impediment to achieving full efficacy of baby boomer screening.[5]

References
1. Recommendations for the identification of chronic hepatitis C virus infection among persons born during 1945-1965. *MMWR Recomm Rep*. 2012;61(RR-4):1-32.
2. Rein DB, Wittenborn JS, Smith BD, Liffmann DK, Ward JW. The cost-effectiveness, health benefits, and financial costs of new antiviral treatments for hepatitis C virus. *Clin Infect Dis*. 2015;61:157-168.
3. Gordon SC, Lamerato LE, Rupp LB, et al. Prevalence of cirrhosis in hepatitis C patients in the Chronic Hepatitis Cohort Study (CHeCS): a retrospective and prospective observational study. *Am J Gastroenterol*. 2015 Aug;110(8):1169-1177
4. Denniston MM, Jiles RB, Drobeniuc J, et al. Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010. *Ann Intern Med*. 2014 Mar 4;160(5):293-300. doi: 10.7326/M13-1133.
5. Barua S, Greenwald R, Grebely J, Dore GJ, Swan T, Taylor LE. Restrictions for Medicaid Reimbursement of Sofosbuvir for the Treatment of Hepatitis C Virus Infection in the United States. *Ann Intern Med*. 2015 Aug 4;163(3):215-223.

back to top

BABY BOOMER SCREENING IN AN URBAN EMERGENCY DEPARTMENT

Galbraith JW, Franco RA, Donnelly JP, et al. Unrecognized chronic hepatitis C virus infection among baby boomers in the emergency department. *Hepatology*. 2015 Mar;61(3):776-82. doi: 10.1002/hep.27410.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View journal abstract View full article

Baby boomer screening for HCV can be implemented in a variety of settings. While primary care settings are at the forefront of implementation of many screening strategies, they may not capture patients with poorer access to primary care who are likely to have disproportionately high prevalence of HCV. In this single-center, cross-sectional study in an urban emergency room department in Alabama, Galbraith and colleagues implemented opt-out anti-HCV screening to consecutive patients born between 1945 and 1965. First, they excluded patients with evidence of testing by self-report, an approach that allows focused screening for new diagnoses among those never tested (a protocol previously used in other settings, including prisons).[1] Then, automated orders resulted in on-demand HCV antibody being performed, with results returned within the same timeframe as other laboratories sent from the emergency department. Because of the rapid turnaround, immediate follow-up to PCR-based testing to confirm viremia could be provided, along with linkage to care by a specific coordinator who would communicate results and referral to treating physicians.

Among the 3170 prescreening questionnaires completed, the authors found that almost one-quarter of respondents had already been screened, with 5% reporting HCV positivity. Of those eligible, 12.7% specifically opted out, with others who were either not offered screening or were unable to complete antibody testing. In total, the authors were able to screen about 50% of all the baby boomers who received a prescreening questionnaire. Interestingly, 11.1% of respondents tested were antibody-positive, with the majority of those confirmed as having HCV infection.

Despite testing only 50% of those eligible, this effort can be described as a success. For those finally undergoing the actual screening, one in nine were positive, a ratio significantly higher than the HCV prevalence found in baby boomers from NHANES.[2] Part of this high prevalence is attributable to the population tested, which included more African-Americans and people with either public insurance or no insurance. Of the new diagnoses, 70.4% confirmed an appointment during follow-up, showing that linkage to care from such a program is also possible. Thus, the authors provide evidence that the CDC-recommended baby-boomer screening leads directly to new diagnoses, and efforts are feasible and effective in settings such as emergency rooms, including linkage to care following positive tests.

References
1. 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 Mar;57(3):944-952.
2. Denniston MM, Jiles RB, Drobeniuc J, et al. Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010. *Ann Intern Med*. 2014 Mar 4;160(5):293-300.

back to top

SCREENING HIGH-RISK INDIVIDUALS IN PRIMARY CARE

Freiman JM, Huang W, White LF, et al. Current practices of screening for incident hepatitis C virus (HCV) infection among HIV-infected, HCV-uninfected individuals in primary care. *Clin Infect Dis*. 2014 Dec 15;59(12):1686-1693.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View journal abstract View Full Text

The recommendation to screen all people born from 1945 through 1965 was in part based on the fact that previous risk-factor based screening was unable to detect the majority of those infected.[1] For those outside the baby boomer generation, risk-factor based screening must therefore be applied even more completely to capture both prevalent and incident infections. In addition to a baseline anti-HCV antibody testing, yearly repeat testing of those with ongoing risk using the same assay is recommended.[2] This is especially important, as the natural history of acute infection suggests that only a fraction of individuals with new infections would be symptomatic enough to present to medical care.[3] Two groups at highest risk include people who inject drugs (PWID) and those living with HIV, especially men who have sex with men (MSM).[4,5]

With improvement in the cure rates exceeding 95% for people with chronic HCV infection, HCV screening and linkage of patients to curative treatments are paramount. While it remains controversial whether there is hyperaccelerated progression to end-stage liver disease in HIV positive MSM, some case reports document those who did progress within short time frames.[6,7] Earlier identification would not only allow access to curative treatments but would also be vital to informing patients about their danger of infecting others. Application of curative treatments is a likely part of strategies to reduce transmission in the population at risk.[8]

Freiman et al present a study examining the anti-HCV testing practices among people with HIV, a unique opportunity to examine risk-factor based screening in a population already linked to medical care. Anti-HCV screening has long been recommended at baseline on entry to HIV care; with increasing recognition that incident infection is common, ongoing screening is also recommended. Also, alanine aminotransferase (ALT) levels are repeated regularly in people living with HIV, allowing the opportunity to examine whether clinicians look for acute HCV among those with new unexplained elevations. The investigators therefore, in a retrospective cohort study design, harnessed data from the Center for AIDS Research Network of Integrated Clinical Systems (CNICS) to investigate trends in screening for incident HCV infection between 2000 and 2011 among patients infected with HIV.

By focusing on those without HCV infection at enrollment, the authors could then examine incident cases and missed opportunities to identify HCV. Among 17,090 adult patients registered at eight sites between 2000 and 2011, the vast majority received HCV antibody screening within three months of enrolling in care. By focusing on 9077 patients who were HCV seronegative at baseline, the investigators found that only 55.6% ever received additional HCV screening, despite a mean follow-up time of almost five years per patient. The authors did find that HCV screening increased over time, but with substantial site

variation. Finally, only a fraction (26.7%) of new ALT elevations (with cutoff > 100 IU/L) were followed up in the subsequent 12 months by either HCV antibody or HCV RNA testing.

Regarding the authors' finding of substantial site variation in screening rates, it is unclear whether this variation is due to local provider awareness, care improvement projects, or other reasons. A limitation of this study is that investigators could not capture repeat HCV screening that may have occurred at other sites. Overall, these findings among populations that are well linked to medical care highlight the need to provide clear recommendations for screening, as well as the potential for improvement in their implementation in clinical practice.

References

1. Denniston MM, Klevens RM, McQuillan GM, Jiles RB. Awareness of infection, knowledge of hepatitis C, and medical follow-up among individuals testing positive for hepatitis C: National Health and Nutrition Examination Survey 2001-2008. *Hepatology*. 2012 Jun;55(6):1652-1661.
2. AASLD/IDSA HCV Guidance Panel. Hepatitis C guidance: AASLD-IDSA recommendations for testing, managing, and treating adults infected with hepatitis C virus. *Hepatology*. 2015 Sep;62(3):932-954.
3. Cox AL, Netski DM, Mosbruger T, et al. Prospective evaluation of community-acquired acute-phase hepatitis C virus infection. *Clin Infect Dis*. 2005 Apr 1;40(7):951-958.
4. Wandeler G, Gsponer T, Bregenzer A, et al; Swiss HIV Cohort Study. Hepatitis C virus infections in the Swiss HIV Cohort Study: a rapidly evolving epidemic. *Clin Infect Dis*. 2012 Nov 15;55(10):1408-1416.
5. Garg S, Taylor LE, Grasso C, Mayer KH. Prevalent and incident hepatitis C virus infection among HIV-infected men who have sex with men engaged in primary care in a Boston community health center. *Clin Infect Dis*. 2013 May;56(10):1480-1487.
6. Vogel M, Page E, Boesecke C, et al; European AIDS Treatment Network (NEAT) Study Group. Liver fibrosis progression after acute hepatitis C virus infection in HIV-positive individuals. *Clin Infect Dis*. 2012 Feb 15;54(4):556-559.
7. Fierer DS, Dieterich DT, Fiel MI, et al. Rapid progression to decompensated cirrhosis, liver transplant, and death in HIV-infected men after primary hepatitis C virus infection. *Clin Infect Dis*. 2013 Apr;56(7):1038-1043. doi: 10.1093/cid/cis1206. Epub 2012 Dec 21.
8. Martin NK, Vickerman P, Dore GJ, Hickman M. The hepatitis C virus epidemics in key populations (including people who inject drugs, prisoners and MSM): the use of direct-acting antivirals as treatment for prevention. *Curr Opin HIV AIDS*. 2015 Sep;10(5):374-380.

back to top

HCV SCREENING AND TREATMENT IN US PRISONS

He T, Li K, Roberts MS, et al. Prevention of Hepatitis C by Screening and Treatment in U.S. Prisons. Ann Intern Med. 2015 Nov 24.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View journal abstract

National prevalence of HCV is estimated from the National Health and Nutrition Examination Survey (NHANES), where antibody testing suggests that at least 2.7 million persons (or 1%) are infected with chronic HCV, with the majority of people unaware of their status.[1] This calculation is based on a relatively small number of identified cases (n = 273), and recruitment is based on living in a household; it would therefore systematically exclude those who are institutionalized or homeless, groups known to carry significantly higher prevalence of HCV. If these sources of underestimation are accounted for, one group of investigators estimates the range of those chronically infected with HCV may be closer to 3.5 million (range 2.5 - 4.7 million).[2] Since a significant proportion of people infected with HCV pass through prison settings in a given year,[3] prisons may be particularly attractive sites for screening programs to identify cases and curative treatments. Public health benefits could be substantial in at least two ways: 1) to reduce liver-related morbidity and mortality and 2) to reduce prevalence in those who can transmit

to others, especially people who inject drugs (PWID), who have the highest risk of transmission and are more likely to be incarcerated. A prior study noted the feasibility and potential yield of screening and treatment more specifically for acute HCV cases in a US prison setting.[4] Medical care of PWID is often fragmented across multiple settings, making implementation of HCV screening more difficult for this population. Prison settings may therefore be ideal for immediate linkage to evaluation and treatment with direct acting antivirals (DAAs).

Given the potential benefits of these interventions if systematically implemented across the US, investigators applied a microsimulation model of HCV transmission and HCV progression to determine the potential costs and benefits of instituting hepatitis C screening followed by treatment. They examined from a societal perspective both risk-based and universal opt-out approaches in prisons and incorporated various pieces of evidence from the literature, including the prevalence of chronic HCV (an estimated 17.3%)[3] transmission in the community and current treatment with direct-acting antivirals.

The model predicted that risk-based screening of entering and currently incarcerated active or former PWIDs would identify 41,900 new cases. Universal screening (assuming 10% of subjects opt out), while more costly, would identify 81,100 cases if implemented for one year, increasing to 122,700 cases if implemented over a 10 year time frame.

Using an agent-based model for transmission, including both injection drug use (IDU) and non-IDU modes, they specifically found a substantial potential benefit in reducing transmission in the community by instituting screening and treatment in prison settings. The benefit varies from 5500 cases for one year of risk-based screening to 12,700 cases for 10 years of opt-out screening. A frequently cited argument against treatment of people at high risk such as PWID has been the potential for reinfection; however, this potential is apparently outweighed by reduction of transmission, as also suggested by other modeling studies.[5]

The model by He and colleagues also allowed for calculation of cost burden and cost-effectiveness. The cost of such programs would be substantial, especially in the first year ($1.15 billion in the first year) but declining over time. Ultimately, application of screening and treatment would be cost-effective from a societal perspective, as reduction of HCV disease burden would be substantial (for 10-year opt-out screening, almost $800 million). The programs would easily result in incremental cost-effectiveness ratios well under the usual willingness-to-pay thresholds, especially if discounts from the wholesale cost of DAAs were negotiated.

Limitations of this study include assumptions about certain parameters, including the incidence of HCV within prisons, future trends in incarceration rates, and risk behaviors. In addition, the assumptions about transmission of HCV and social network structures in the community must be further investigated. Further, more real-world data are required to refine this model, especially of reinfection rates among PWID in the DAA era.

This report is timely, given the increase in cases of HCV among youth in many parts of this country, linked to an expansive epidemic of opioid use and abuse, with eventual transition to intravenous heroin.[6-9] Many of these young people will pass through the prison system, making this setting an extremely attractive locale to maximize the public health benefit of newly available curative therapies.

References

1. Denniston MM, Jiles RB, Drobeniuc J, et al. Chronic hepatitis C virus infection in the United States, National Health and Nutrition Examination Survey 2003 to 2010. *Ann Intern Med*. 2014 Mar 4;160(5):293-300.
2. Edlin BR, Eckhardt BJ, Shu MA, Holmberg SD, Swan T. Toward a more accurate estimate of the prevalence of hepatitis C in the United States. *Hepatology*. 2015 Nov;62(5):1353-1363.
3. Varan AK, Mercer DW, Stein MS, Spaulding AC. Hepatitis C seroprevalence among prison inmates since 2001: still high but declining. *Public Health Rep*. 2014 Mar-Apr;129(2):187-195.
4. 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;57:944-952. [PMID: 23111904]

5. Martin NK, Vickerman P, Grebely J, et al. Hepatitis C virus treatment for prevention among people who inject drugs: Modeling treatment scale-up in the age of direct-acting antivirals. *Hepatology*. 2013 Nov;58(5):1598-1609. doi: 10.1002/hep.26431. Epub 2013 Aug 26.
6. Centers for Disease Control and Prevention (CDC). Hepatitis C virus infection among adolescents and young adults: Massachusetts, 2002–2009. *MMWR Morb Mortal Wkly Rep*. 2011;60:537-541. [PMID: 21544042]
7. Centers for Disease Control and Prevention (CDC). Notes from the field : hepatitis C virus infections among young adults---rural Wisconsin, 2010. *MMWR Morb Mortal Wkly Rep*. 2012;61:358. [PMID: 22592276]
8. Suryaprasad AG, White JZ, Xu F, et al. Emerging epidemic of hepatitis C virus infections among young nonurban persons who inject drugs in the United States, 2006–2012. *Clin Infect Dis*. 2014;59:1411-9.
9. Onofrey S, Aneja J, Haney GA, et al. Underascertainment of acute hepatitis C virus infections in the U.S. surveillance system: a case series and chart review. *Ann Intern Med*. 2015 Aug 18;163(4):254-61.

back to top

HBV INFECTION: IDENTIFICATION AND LINKAGE TO CARE

Beckett GA, Ramirez G, Vanderhoff A, et al; Centers for Disease Control and Prevention (CDC). Early identification and linkage to care of persons with chronic hepatitis B virus infection—three US sites, 2012-2014. *MMWR Morb Mortal Wkly Rep*. 2014 May 9;63(18):399-401.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View full article

Scott KC, Taylor EM, Mamo B, et al; Centers for Disease Control and Prevention (CDC). Hepatitis B screening and prevalence among resettled refugees - United States, 2006-2011. *MMWR Morb Mortal Wkly Rep*. 2015 Jun 5;64(21):570-573.

(For non-subscribers to this journal, an additional fee may apply to obtain full-text articles.)

View full article

The CDC estimates that the majority of people with chronic HBV infection who live in the US are foreign born, particularly from countries in Asia, Africa, or other regions where HBV is endemic. In these countries, most people with the HBV virus were infected perinatally or during childhood, with onset of symptoms and liver disease only manifesting decades later. Thus, screening for HBV infection is recommended for all foreign-born persons from areas with expected prevalence > 2%.[1]

The report by Beckett et al compiles data from October 2012-2014 from three programs at three sites, with representation from the northeast (New York City, New York), midwest (Minneapolis-St. Paul, Minnesota), and the southwest (San Diego, California) that targeted foreign-born people for screening using hepatitis B surface antigen (HBSAg) testing. The three sites tested 4,727 persons for HBV infection, finding that 310 (6.6%) were positive for HBSAg. Clinicians informed 94% of those found to be positive of their results, counseled 90%, and referred 86% for care; of those referred, 66% attended their first scheduled visit with a provider.

In particular, individualized and intensive patient navigator efforts were able to accomplish linkage to medical care, which can otherwise be challenging for this population. Study limitations included an incomplete resourcing to accomplish large-scale screenings for HBV, as described in this report. In parallel with other local and national efforts, practical strategies can be successful in delivering screening, education, and linkage to care in foreign-born communities,[2] and these will be key components of the national plan to prevent and control HBV infection.[3]

Resettled refugees are universally screened for HBV. In a separate report for the CDC, Scott et al provide data from four sites, including two that provided data on hepatitis B core antibody, a marker of exposure. Here the prevalence of HBV infection varied depending on country of origin, with the highest rate among Burmese compared to Bhutanese or Iraqi refugees. This illustrates that rates of exposure for HBV vary greatly depending on the country of origin, recently illustrated by another report showing low rates among US adults of Hispanic extraction[4] and lower than expected rates among Korean Americans.[5] The CDC refugee study also provides data about hepatitis B core antibody screening (HBcAb), which is not always universally applied for this population. While detecting active infection is the main goal of screening for HBV, HBV may be detected as a latent infection by HBcAb screening. In this situation, HBV may reactivate in the setting of chemotherapy/immunosuppression, which in turn may lead to liver failure.[6] Thus, screening markers of HBV immunity are recommended before initiating many immunosuppressive therapies.[7]

References

1. CDC. Recommendations for identification and public health management of persons with chronic hepatitis B virus infection. *MMWR Recomm Rep*. 2008 Sep 19;57(RR-8):1-20.
2. Perumalswami PV, Factor SH, Kapelusznik L, et al. Hepatitis Outreach Network: a practical strategy for hepatitis screening with linkage to care in foreign-born communities. *J Hepatol*. 2013 May;58(5):890-897.
3. Colvin HM, Mitchell AE, ed; Committee on the Prevention and Control of Viral Hepatitis Infections; Institute of Medicine. Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C. Washington, DC: National Academies Pr; 2010.
4. Jung M, Kuniholm MH, Ho GY, et al. The distribution of Hepatitis B virus exposure and infection in a population-based sample of US Hispanic adults. *Hepatology*. 2015 Nov 2.
5. Navarro N, Lim N, Kim J, et al. Lower than expected hepatitis B virus infection prevalence among first generation Koreans in the U.S.: results of HBV screening in the Southern California Inland Empire. *BMC Infect Dis*. 2014 May 17;14:269.
6. Patel A, Yapali S, Lok AS. Admissions for hepatitis B reactivation in patients receiving immunosuppressive therapy remain unchanged from 1999 to 2014. *Hepatol Int*. 2015 Aug 14.
7. Reddy KR, Beavers KL, Hammond SP, Lim JK, Falck-Ytter YT; American Gastroenterological Association Institute. American Gastroenterological Association Institute guideline on the prevention and treatment of hepatitis B virus reactivation during immunosuppressive drug therapy. *Gastroenterology*. 2015;148:215-219.

back to top

KEY TAKEAWAYS

• Programs that institute baby boomer screening of people born between 1945 and 1965 have been successful in identifying new diagnoses of HCV.
• Barriers remain for implementing risk-factor based screening for HCV and HBV.
• Populations at greatest risk for HCV (aside from baby boomers) include patients with HIV, PWID, and prisoners; for HBV, in foreign-born individuals from areas where HBV is endemic, including refugees who have spent time in transit through these areas.
• Successful screening programs link patients to proper evaluation to determine candidacy for oral antivirals.

back to top

IMPORTANT CME/CE INFORMATION

Program Begins Below

ACCREDITATION STATEMENTS

Physicians

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the Johns Hopkins University School of Medicine and The Institute for Johns Hopkins Nursing. The Johns Hopkins University School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

Nurses

The Institute for Johns Hopkins Nursing is accredited as a provider of continuing nursing education by the American Nurses Credentialing Center's Commission on Accreditation.

CREDIT DESIGNATIONS

Physicians

eNewsletter: The Johns Hopkins University School of Medicine designates this enduring material for a maximum of *1.0 AMA PRA Category 1 Credit(s)*™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Nurses

eNewsletter: This 1 contact hour Educational Activity is provided by the Institute for Johns Hopkins Nursing. Each Newsletter carries a maximum of 1 contact hour, or a total of 8 contact hours for the 8 newsletters in this program.

back to top

This activity was developed in collaboration with DKBmed.

RECOMMEND TO A COLLEAGUE

NEWSLETTER ARCHIVE

COMPLETE THE POST-TEST

PHYSICIAN POST-TEST

NURSE POST-TEST

RECOMMEND TO A COLLEAGUE

NEWSLETTER ARCHIVE

COMPLETE THE POST-TEST

Step 1.
Click on link to download instructions for the post-test and evaluation

PHYSICIAN POST-TEST

NURSE POST-TEST