

Context of Clinical Care: The Case of Hepatitis C in Underserved Communities—A Report from the Primary Care Multiethnic Network (PRIME Net) Consortium

Robert R. Leverence, MD, Robert L. Williams, MD, MPH, Wilson Pace, MD, Bennett Parnes, MD, Yvonne Fry-Johnson, MD, Dorothy R. Pathak, PhD, MS, Betty Skipper, PhD, Elvan Daniels, MD, and Philip Kroth, MD, MS, for the PRIME Net Consortium

Background: The importance of Hepatitis C (HCV) as a public and individual health concern is well established. However, national groups differ in their recommendations to primary care clinicians about screening people at high risk for HCV. The purpose of this study was to explore the context of care within which primary care clinicians decide to detect and initially manage HCV.

Methods: The Primary Care Multiethnic Network conducted a web- and paper-based survey of primary care clinicians who largely practice in low-income, medically underserved communities in 3 regions across the country.

Results: A total of 494 clinicians participated, for a response rate of 61%. Most (68%) clinicians view HCV as an important problem; more than half (59%) consider screening for HCV to be important when compared with other conditions they screen for in practice. With regard to reported screening habits for risk factors, 54% of clinicians routinely ask new patients whether they have used intravenous drugs and 28% inquire about blood transfusions before 1992. Sixty-one percent order an alanine aminotransferase test when patients present with other risk factors for HCV. The majority of clinicians (54%) refer 75% or fewer of their patients with HCV for treatment; nearly one-fifth (18%) provide antiviral treatment themselves. Key factors influencing clinician HCV decision making are patient comorbidities (74% reported this as a factor), access to treatment (55% reported this as a factor), and tolerance (44% reported this as a factor) of treatment.

Conclusions: In the face of conflicting national guideline recommendations about screening people at high risk for HCV, clinicians have varied views and practice habits influenced by multiple patient, access, and treatment issues. (J Am Board Fam Med 2009;22:638–646.)

Hepatitis C (HCV) is the most common blood-borne infection in the United States, the leading

cause of liver transplantation, and is responsible for 8000 to 10,000 deaths annually.^{1,2} Prevalence esti-

This article was externally peer reviewed.

Submitted 1 February 2009; revised 7 May 2009; accepted 12 May 2009.

From the Department of Medicine (RRL, PK), the Department of Family and Community Medicine (RLW, DRP, BS), and the Health Science Library and Informatics Center (PK), University of New Mexico; Albuquerque; the Department of Family Medicine, University of Colorado; Denver (WP, BP); the National Center for Primary Care, Morehouse School of Medicine, Atlanta, GA (YF-J, ED); and the Departments of Family Medicine and Epidemiology, Michigan State University, East Lansing (DRP).

Funding: This project has been funded in whole or in part with Federal funds from the National Institutes of Health, under contract no. HHSN268200425211C, "Re-Engineering the Clinical Research Enterprise" and from grant no. D54HP00032-07-00 from the Health Resources and Services Administration.

Conflict of interest: Drs. Williams and Leverence state that they are in discussions with the leadership of the hepatitis C treatment program referred to in references 20 and 29, a program operated within Dr. Leverence's academic department. These discussions could lead to a collaborative research project aimed at investigating the facilitators and barriers for primary care clinicians for participating in the program. Although there will be no personal gain to either Dr. Leverence or Dr. Williams, the referenced program may in the future provide some salary support to staff of RIOS Net (of which Drs. Leverence and Williams are both leaders). While we believe this does not present a real conflict of interest, we bring this to your attention should there be a perceived potential conflict of interest.

Corresponding author: Robert L. Williams, MD, MPH, Department of Family and Community Medicine, MSC 09-5040, 1 University of New Mexico, Albuquerque, NM 87131-0001 (E-mail: rlwilliams@salud.unm.edu).

Table 1. National Guidelines for Screening Those at High Risk for Hepatitis C

Organization	Recommendation	Year of Latest Publication	References
National Institutes of Health Consensus Conference	Promote the establishment of screening tests for all groups at high risk of HCV infection	2002	7
US Preventive Services Task Force	Insufficient evidence to recommend for or against routine screening for HCV infection in adults at high risk for infection ("I" recommendation)	2004	9–11
Centers for Disease Control and Prevention	Testing should be offered routinely to persons most likely to be infected with HCV who might require medical management, and testing should be accompanied by appropriate counseling and medical follow-up	1996, 2004	5, 6
American College of Preventive Medicine	Individuals at high risk for hepatitis C infection should be screened for anti-HCV	2005	8

HCV, hepatitis C.

mates in the United States indicate that 1.6% of the population have chronic HCV infection, with disadvantaged and stigmatized populations having a disproportionately increased prevalence.^{3,4}

Despite the clear public and individual health implications of HCV infection, controversy exists over what actions primary care clinicians should take with regard to screening for the disease (Table 1). The Centers for Disease Control and Prevention (CDC),^{5,6} the National Institutes of Health (NIH),⁷ and the American College of Preventive Medicine (ACPM)⁸ all advocate screening of individuals at high risk for having HCV infection. At the same time, the US Preventive Services Task Force (USPSTF) finds insufficient evidence to recommend for or against routine screening of people at high risk ("I" recommendation).^{9–11} In its recommendation statement, the USPSTF notes the lack of information about long-term outcomes of antiviral treatment after screening, as well as insufficient information about the natural history of HCV infection and potential harms from screening. In response to and in support of screening of high-risk groups, representatives of the CDC and others have pointed out that (1) definitive evidence of benefit from treatment of HCV would require longitudinal clinical trials of more than 20 to 30 years, considering the protracted nature of the disease; (2) studies of up to 10 years have shown persistent virological response and improved hepatic measures after treatment; and (3) additional benefits beyond antiviral treatment can result from

screening of high-risk groups (immunization, counseling about transmission, and risk reduction).^{4,6}

In the face of inconsistent guidance from these major scientific bodies, it is likely that primary care clinicians will vary in their approach to screening and management of patients at high risk for HCV. Clinicians may choose their approach based on the NIH, CDC, ACPM, or USPSTF recommendations; heuristics related to the treatment experience of their patients; competing demands for care within the patient encounter; or other factors that may vary across clinicians.^{12,13}

Several studies have shown that screening and initial management by primary care clinicians of patients at high risk for HCV varies widely.^{14–20} Under the assumption that low levels of screening and referral for HCV management are primarily because of insufficient understanding of the problem by primary care clinicians, recommendations of the authors of some of these studies and of national panels have focused on providing increased education about HCV to primary care clinicians.^{14,16,17} The underlying expectation is that reversing a knowledge deficit can lead to higher rates of HCV identification and entry into treatment.

We conducted this study to gather a more in-depth understanding about primary care clinicians' perspectives on the context within which HCV screening and initial management takes place. The goal was to gain a greater understanding of the multiple factors that impact clinicians' decisions

related to HCV detection and management. The primary aims were to (1) describe views about HCV among a sample of primary care clinicians caring mainly for medically underserved populations; (2) characterize these clinicians' reported HCV screening and management practices; and (3) describe primary care clinicians' perceptions of the context of care for HCV. The study was focused among clinicians working in medically underserved communities in part because HCV is a particular concern in these communities, where HCV prevalence may often be higher than in the general population.

Methods

Study Design

A survey was conducted among primary care clinicians mostly practicing in low-income, medically underserved communities.

Sample

All clinicians from 3 primary care practice-based research networks were surveyed. These 3 networks are part of the Primary Care Multiethnic Network (PRIME Net),²¹ a consortium of 8 primary care practice-based research networks (Research Involving Outpatient Settings Network: RIOS Net; the Colorado Research Network: CaReNet; the Southeast Regional Clinicians' Network: SERCN; the Southern Primary Care Urban Research Network: SPUR-Net; the Collaborative Research Network: CRN; the Southwestern Ohio Ambulatory Research Network: SOARnet; MetroNet; and LA Net). Clinicians in RIOS Net, CaReNet, and SERCN participated in this study. The majority of clinicians in these 3 networks practice in community health centers, Indian Health Service clinics, or academic practices serving low-income/underserved communities. Recruited clinicians are located in urban, suburban, and rural settings and the patient populations seen in these practices present with patterns of diagnoses typical of primary care.²² In addition, primary care clinicians from a fourth, nonresearch network—the University of New Mexico School of Medicine Preceptorship Network—were surveyed. This latter group consists of 160 practicing primary care clinicians throughout the state of New Mexico who precept University of New Mexico medical students. This group was included in the survey sample to provide perspectives of clinicians not in a

research network; many also work in underserved communities.

Survey Instrument

The questionnaire focused on contextual factors that might influence clinician approaches to screening and initial management of HCV. It was developed through a review of the existing literature, consultation with the lead author of a previous HCV clinician survey, and iterative discussions with PRIME Net clinicians.¹⁸ The survey contained 30 branching questions, with the opportunity for the clinician to provide additional narrative comments for several of the questions. The questionnaire was piloted among a sample of clinicians at a RIOS Net Annual Meeting and among University of New Mexico Family Medicine and Internal Medicine residents, resulting in minor revisions. Copies of the final survey instrument are available online.²³

Data Collection

The HCV Clinician Survey was administered electronically by an initial email solicitation directing the clinician to a web-based questionnaire.²⁴ This was followed by 4 additional email solicitations with links to the questionnaire sent to nonresponders at 7- to 10-day intervals. Additional reminder emails were sent between solicitations. After 5 e-mail solicitations, paper questionnaires were mailed to nonresponders. These were followed 2 weeks later by reminder postcards and then, another 2 weeks later, by another postal mailing of the questionnaire. Solicitations offered drawings for gift certificates as response incentives. The questionnaire took approximately 7 minutes to complete and respondents earned 0.5 unit of continuing medical education credit. The questionnaire included links (or references on paper-based questionnaires) to HCV educational activities as well.

Participant anonymity was assured through separation of the questionnaire distribution and data collection processes. The CaReNet team maintained identifying participant log-on codes, and used these to guide solicitations. The RIOS Net team collected and analyzed the data without access to respondent identifiers. Each of the 3 network institutional review boards approved this study.

Data Analysis

Responses from clinicians who used the web-based questionnaire were stored in a Microsoft SQL Server database. Paper-based responses were entered by RIOS Net staff into the web-based database. Analysis of all data was done using SAS software (version 9.1.3, SAS, Inc., Cary, NC). χ^2 tests were used to test for differences in distribution of responses for categorical variables across demographic characteristics, attitudes, and behavior patterns. Results were considered statistically significant if $P < .05$.

Results

Sample

Four hundred and ninety four clinicians participated for a response rate of 61%. Table 2 presents data about these clinicians. Nearly half of the respondents were family medicine physicians. There was a wide range of practice experience: clinicians came from rural and small-town practices as well as urban, inner-city, and suburban settings. Reflecting the nature of the PRIME Net consortium, most of the clinicians were in academic, community health center, or Indian Health Service practices. There were no significant differences in reported attitudes toward importance, screening, or practice habits among clinicians in the 4 networks (data not shown). Likewise, there were no significant differences in attitudes by clinician specialty after controlling for number of HCV patients in the practice.

General Views about HCV

Ninety percent of the clinicians agreed that the long-term consequences of untreated HCV can be serious for most people. As shown in Table 3, 68% reported that, compared with other conditions they encounter in their daily practice, HCV is important/more important, although when they were asked to compare with other conditions they routinely screen for, the percentage reporting important/more important dropped off to 59%.

Current Approaches to Detection of HCV and Initial Management

Almost all clinicians indicated that primary care providers should be involved in the screening, diagnosis, and comanagement of patients with HCV (Table 3). When clinicians were presented with a menu of common clinical circumstances, such as new or established patient visits or visits with pa-

tients who have other suspected HCV risk factors, inquiry about HCV risk factors varied by circumstance. For instance, just more than half of clinicians (54%) routinely ask new patients whether they have used intravenous drugs ("I ask new patients when the time is not consumed by other issues"); 28% ask new patients about blood transfusions before 1992 ("If they have surgeries or history of severe injuries, I ask about blood transfusion"); and 61% of clinicians reported they would order an alanine aminotransferase test when patients presented with risk factors for hepatitis ("[When both] risk factors and nonspecific symptoms [are present]") (Table 3). Similarly, diagnostic evaluation with an HCV antibody test after identification of an HCV risk factor varied by risk factor (Table 3).

With regard to initial management of patients with HCV, 94% of clinicians advise their HCV patients to avoid alcohol, 79% advise acetaminophen avoidance, 90% recommend hepatitis B testing/vaccination, 84% recommend hepatitis A testing/vaccination, and 82% do testing for the human immunodeficiency virus (Table 3). In their narrative comments, many clinicians also reported counseling about methods to reduce transmission to others, referring for substance abuse counseling, and focusing on management of comorbidities (eg, depression).

Slightly more than half (54%) of the clinicians who have HCV patients in their practices refer three quarters or fewer of their patients, including 24% of the clinicians who refer less than one quarter of their HCV patients. There was a trend in the difference between rural clinicians (less likely to refer) and urban clinicians (more likely to refer) that did not reach statistical significance ($P = .08$) ("My practice population is remote from specialist care"; "Closest hep C program is 100-mile travel for my patients") (data not shown). Nearly one fifth (18%) of these primary care clinicians have themselves prescribed antiviral therapy for HCV (Table 2). Compared with nonprescribers, these treating clinicians were more likely to practice in communities of $\leq 100,000$ (28% vs 13%; $P < .001$).

Factors That Influence the Approach to Detection and Initial Management of HCV

To further explore the dynamics affecting hepatitis C detection and initial management in these primary care practices in medically underserved communities, clinicians were asked about a variety of factors that might influence their decision making

Table 2. Clinician Demographics and Practice Characteristics

Variable	n (%)
Network affiliation (N = 494)	
CaReNet	217 (43.9)
RIOS Net	150 (30.4)
SERCN	31 (6.3)
UNM Preceptor	93 (18.8)
Other	3 (0.6)
Practice type (N = 484)	
Community health center	184 (38.0)
Indian Health Service	53 (11.0)
University faculty	122 (25.2)
Veterans Administration	4 (0.8)
Solo practitioner	16 (3.3)
Other group practice	105 (21.7)
Specialty (N = 485)	
Family medicine	216 (44.5)
Pediatrics	71 (14.6)
Internal medicine	81 (16.7)
Nurse practitioners/physician assistants	43 (8.9)
Family medicine resident	64 (13.2)
Other resident	10 (2.1)
Years since completing primary care residency* (N = 368)	
<10	139 (37.8)
10–20	115 (31.2)
>20	101 (27.4)
Not applicable	13 (3.5)
Community Size (N = 491)	
Town ≤25,000 people	109 (22.2)
Town >25,000 but <100,000 people	60 (12.2)
City of 100,000 to 500,000 people	88 (17.9)
Urban or suburban area in city of >500,000 people (not inner city)	138 (28.1)
Inner city, >500,000 people	96 (19.6)
HCV patients currently in practice (N = 491)	
0	94 (19.1)
1–5	180 (36.7)
6–20	139 (28.3)
>20	78 (15.9)
New diagnoses of HCV during the past year† (N = 395)	
0	103 (26.1)
1–5	246 (62.3)
6–15	34 (8.6)
>15	12 (3.0)
Prescribed antiviral therapy for HCV patients† (N = 393)	
Yes	72 (18.3)

*Among physicians not currently in residency.

†Among clinicians with HCV patients in their practice.
HCV, hepatitis C; CaReNet, Colorado Research Network; RIOS Net, Research Involving Outpatient Settings Network; SERCN, Southeast Regional Clinicians' Network; UNM, University of New Mexico.

(Table 4). Almost three quarters (74%) reported that the presence of comorbidities in the patient influenced their approach to screening (“Don’t refer those actively using alcohol or illicit drugs”; “Alcohol and depression comorbidities keep me from referring more patients”; “Most of my hepatitis C patients are medically noncompliant, drink alcohol, or have serious psychiatric issues”). More than half of the clinicians (55%) reported treatment availability and 39% reported financial barriers influenced their decisions about HCV assessment (“Very difficult to get referrals for uninsured”; “Lack of insurance/funds/transportation”; “Lack of specialist accepting Medicaid and the uninsured”; “Lack of specialists and lack of funds”). In addition to these access barriers, 44% reported competing clinical issues in the patient influenced their approach (ie, multiple clinical problems to be addressed within the limited time of the patient encounter), and 44% reported that HCV antiviral treatment intolerance influenced their decision making (“Low effectiveness and tolerance of treatment”; “Treatment intolerance”). Although 75% reported that clinical guidelines also impacted their approaches to HCV, 50% felt that antiviral treatment effectiveness influenced their approaches (“If treatment likely ineffective, I do not refer”). Many of these same reasons were endorsed when we asked the clinicians why their patients who had not undergone treatment had not done so (Table 5). We also asked the clinicians about their confidence in their knowledge about HCV confirmatory/diagnostic tests and about current antiviral therapy for HCV. With regard to diagnostic testing, most clinicians (79%) expressed some level of confidence in their understanding, although fewer (53%) were confident of their knowledge about current antiviral therapy.

Discussion

Summary of Findings

Although national scientific groups differ in their recommendations to primary care clinicians about HCV screening in people at high risk for HCV, it is clear that in clinical practice in medically underserved communities a complex set of factors influences decisions regarding the detection and initial management of patients with HCV. We found some support for the need for increased clinician education in the clinicians’ reports of their confi-

Table 3. Clinician Perspectives Regarding the Detection and Management of Hepatitis C

Survey Question	% (n)
Compared with the common problems you face in practice, how important would you consider hepatitis C to be? (percent responding more important/important; N = 491)	67.8 (333)
Compared with the common medical problems you screen for in practice, how important would you consider screening for HCV to be? (percent responding more important/important; N = 490)	58.8 (288)
The extent to which you agree or disagree about whether primary care providers should be doing the following with respect to hepatitis C (percent responding strongly agree/agree; N = 494*)	
Screening	87.5 (428)
Diagnosis	93.0 (456)
Treatment with antiviral therapy	29.6 (144)
Monitoring and follow-up	66.9 (327)
Referral for consultation and comanagement of hepatitis C	94.9 (463)
Referral for all hepatitis C management	50.6 (247)
How do you assess patients for these concerns (N = 490–494):	
Intravenous drug use	
Routinely ask new patients	53.8 (266)
Ask patients who give a history of other illicit drug use	54.0 (267)
Blood transfusion or solid organ transplant before July 1992	
Routinely ask new patients	28.4 (139)
Ask patients who have abnormal liver function tests	42.7 (209)
Under what circumstances do you order serum ALT levels? (N = 487)	
Routine screen for new patients	25.3 (123)
Patients with other risk factors for hepatitis C	60.6 (295)
Patients with a history of hepatitis C	56.3 (274)
How often do you order a hepatitis C antibody test? (percent responding always/frequently; N = 494*)	
Patient history of intravenous drug use	75.9 (375)
Patient history of blood transfusion/organ transplant before 1992	52.8 (261)
Patient with an abnormal serum ALT	79.6 (393)
What percent of patients in your practice with hepatitis C have you referred for treatment? (N = 394) [†]	
<25	23.6 (93)
25–75	30.2 (119)
>75	46.2 (182)
Do you routinely offer to patients with hepatitis C (N = 397) [†]	
Counseling about alcohol avoidance	93.7 (371)
Counseling about acetaminophen avoidance	78.6 (312)
Hepatitis A vaccination/testing	84.4 (335)
Hepatitis B vaccination/testing	89.7 (356)
HIV testing	82.4 (327)

*Minor differences in item responses (range, 487–490).

[†]Clinicians with hepatitis C patients in their practices.

ALT, alanine aminotransferase; HIV, human immunodeficiency virus.

dence in their knowledge about treatment of HCV. However, the larger picture suggests that several key factors play a greater role in clinician decision making about HCV. These factors include:

1) Comorbidities that limit eligibility for antiviral treatment, that are a higher treatment priority, or that make adherence to chronic antiviral treatment problematic;

2) Lack of access to treatment, including the lack of financial access to antivirals, the lack of access to

treating consultants, and the lack of geographic access to care; and

3) Intolerance to and inconsistent effectiveness of antiviral therapy.

Viewed together, these factors make clear that, from the perspective of primary care clinicians in these high-prevalence communities, if there are to be future efforts to increase detection and treatment of HCV the multiple barriers cited above must be addressed comprehensively.

Table 4. Factors That Influence the Approach to Screening for Hepatitis C Risk Factors (N = 494*)

	Yes (% [n])	No (% [n])	Not Applicable (% [n])
Consequences of untreated hepatitis C can be serious for most people	89.5 (437)	7.0 (34)	3.5 (17)
Guideline recommendations	75.0 (366)	25.0 (122)	—
Presence of comorbidities in patient	73.5 (358)	26.5 (129)	—
Treatment availability	54.8 (268)	45.2 (221)	—
Treatment effectiveness (ability to improve outcome)	50.0 (243)	38.1 (185)	11.9 (58)
Other competing issues	44.5 (216)	55.5 (269)	—
High prevalence of hepatitis C among my patients	44.5 (217)	25.0 (122)	30.5 (149)
Treatment intolerance	44.4 (216)	55.6 (270)	—
Financial barriers	39.3 (190)	60.7 (294)	—

*Minor differences in item responses (range, 484–9).

Historically, comorbid mental health diagnoses, particularly depression and substance use disorders, have been considered to be relative contraindications for treatment of HCV as a result of both mental health side effects and the challenges of adherence with interferon treatment. More recently, studies have shown that, with appropriate monitoring and treatment of these comorbidities, many patients can enter and complete HCV treatment with comparable treatment outcomes.^{25–29} However, the picture painted by the clinicians in this survey seems to both endorse and go beyond this issue of side effects and adherence to also describe the place of HCV and its treatment among multiple comorbidities competing for the attention of both the patient and clinician. Furthermore, we found that the high cost of current treatments for HCV and the limited options for referral for treatment (if the primary care clinician does not treat) act to limit screening for HCV for a substantial portion of the clinicians in these communities.

Table 5. Primary Reason(s) Patients Have Not Undergone Treatment for Hepatitis C* (N = 354)

	n
Alcohol use, psychiatric morbidity, or other contraindication	267
Lack of patient interest in treatment	227
Lack of insurance	209
Poor tolerance of treatment (recent or in past)	197
Poor access to treatment services or staff	187
Insurance companies will not cover treatment	136
My personal views of treatment	78

*As reported by clinicians with hepatitis C patients currently in their practices. Clinicians could report more than one reason.

Comparison with Previously Published Studies

Previous studies have shown similar patterns of primary care clinicians' familiarity with established risk factors for HCV infection and of routine inquiry for HCV risk factors.^{16–18} Prior studies have also shown that rates of referrals of HCV patients are variable, similar to what clinicians said in this sample report, and at least one study has noted high rates of ineligibility for treatment at HCV referral centers based on continued substance use and serious comorbid medical or psychiatric conditions.^{14,16,18,30–32} In general, however, these studies have focused on measures of clinician behavior rather than exploring in depth the reasons for that behavior or the context of care under which clinicians' decisions are made. Our study focuses on the broader complexity of care for HCV patients, such as the multifaceted access issues, problematic treatment adherence, and the higher prioritization given treatment for comorbidities.

Limitations

This study focuses on care of patients with HCV in medically underserved communities and therefore may not be broadly generalizable to communities in which access to care is more readily available. However, these low-income and minority communities, which often have higher rates of HCV than the general population, are precisely the communities for which issues related to screening and treatment of HCV may be most relevant. At the same time, we found that overall responses were similar across 3 geographically distinct regions; such consistency suggests the findings were indeed generalizable more broadly. Furthermore, our cli-

nicians' reports of the frequencies at which they undertake selected behaviors related to HCV are consistent with those reported in other studies (as above), further supporting generalizability.

Conclusions

National scientific groups differ in their recommendations about screening for HCV among persons at high risk for HCV infection. The composite picture painted by the results of this study is that, for clinicians practicing in communities where HCV prevalence is likely to be higher than in the general population, decisions about screening and initial management of HCV reflect the complex context of the illness and the health care environment. Competing demands in the primary care environment, patient comorbidities, lack of access to care, and difficulties with the antiviral treatments available all influence clinicians' approaches to screening and referral for treatment for HCV. These factors would need to be addressed if there were any future efforts toward increasing HCV screening and treatment.

The authors express their appreciation to the clinicians of the PRIME Net networks, who willingly gave their time to share their perspectives on the challenges of HCV management. The authors also appreciate the key contributions to the study made by Laurie McPherson, MSCIS; Anthony Adams; and Sherry Holcomb.

References

1. Department of Veterans Affairs Hepatitis C Resource Center, Yee HS, Currie SL, Darling JM, Wright TL. Management and treatment of hepatitis C viral infection: recommendations from the Department of Veterans Affairs Hepatitis C Resource Center program and the National Hepatitis C Program office. *Am J Gastroenterol* 2006;101:2360–78.
2. Centers for Disease Control and Prevention. Viral hepatitis. Statistics and surveillance. Available at: <http://www.cdc.gov/hepatitis/Statistics.htm#section1>. Accessed 21 April 2009.
3. National Institute of Diabetes and Digestive Kidney Diseases, National Institutes of Health. Chronic hepatitis C: current disease management. Available at: <http://digestive.niddk.nih.gov/ddiseases/pubs/chronichepc/>. Accessed 21 April 2009.
4. Geppert CM, Arora S. Ethical issues in the treatment of hepatitis C. *Clin Gastroenterol Hepatol* 2005;3:937–44.
5. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. Centers for Disease Control and Prevention. *MMWR* 1998;47(RR-19):1–39.
6. Alter MJ, Seeff LB, Bacon BR, Thomas DL, Rigsby MO, Di Bisceglie AM. Testing for hepatitis C virus infection should be routine for persons at increased risk for infection. *Ann Intern Med* 2004;141:715–7.
7. NIH Consensus Statement on Management of Hepatitis C: 2002. NIH Consensus State Sci Statements. 2002;19:1–46.
8. Hill L, Henry B, Schweikert S, Prevention Practice Committee, American College of Preventive Medicine. Screening for chronic hepatitis C: American College of Preventive Medicine practice policy statement. *Am J Prev Med* 2005;28:327–30.
9. US Preventive Services Task Force. Screening for hepatitis C virus infection in adults: recommendation statement. *Ann Intern Med* 2004;140:462–4.
10. Chou R, Clark EC, Helfand M, US Preventive Services Task Force. Screening for hepatitis C virus infection: a review of the evidence for the US Preventive Services Task Force. *Ann Intern Med* 2004;140:465–79.
11. Calonge N, Randhawa G, US Preventive Services Task Force. The meaning of the US Preventive Services Task Force grade I recommendation: screening for hepatitis C virus infection. *Ann Intern Med* 2004;141:718–9.
12. Sussman AL, Williams RL, Leverence R, Gloyd PW Jr, Crabtree BF. The art and complexity of primary care clinicians' preventive counseling decisions: obesity as a case study. *Ann Fam Med* 2006;4:327–33.
13. Jaen CR, Stange KC, Nutting PA. Competing demands of primary care: a model for the delivery of clinical preventive services. *J Fam Pract* 1994;38:166–71.
14. Zickmund SL, Brown KE, Bielefeldt K. A systematic review of provider knowledge of hepatitis C: is it enough for a complex disease? *Dig Dis Sci* 2007;52:2550–6.
15. Shehab TM, Orrego M, Chunduri R, Lok AS. Identification and management of hepatitis C patients in primary care clinics. *Am J Gastroenterol* 2003;98:639–44.
16. Shehab TM, Sonnad SS, Lok AS. Management of hepatitis C patients by primary care physicians in the USA: results of a national survey. *J Viral Hepat* 2001;8:377–83.
17. Navarro VJ, St Louis TE, Bell BP. Identification of patients with hepatitis C virus infection in New Haven County primary care practices. *J Clin Gastroenterol* 2003;36:431–5.
18. Clark EC, Yawn BP, Galliher JM, Temte JL, Hickner J. Hepatitis C identification and management by family physicians. *Fam Med* 2005;37:644–9.
19. Morrill JA, Shrestha M, Grant RW. Barriers to the treatment of hepatitis C. Patient, provider, and system factors. *J Gen Intern Med* 2005;20:754–8.
20. Ferrante JM, Winston DG, Chen PH, de la Torre

- AN. Family physicians' knowledge and screening of chronic hepatitis and liver cancer. *Fam Med* 2008; 40:345–51.
21. University of New Mexico Health Sciences Center. PRIME Net: A primary care multiethnic network. [Homepage.] Available at: <http://hsc.unm.edu/som/primenet/>. Accessed 17 September 2009.
22. Binns HJ, Lanier D, Pace WD, et al. Describing primary care encounters: the Primary Care Network Survey and the National Ambulatory Medical Care Survey. *Ann Fam Med* 2007;5:39–47.
23. University of New Mexico. Primary Care Multi-Ethnic Network (PRIME Net). Hepatitis C clinician survey. Available at: <https://repository.unm.edu/dspace/bitstream/1928/3620/1/PRIME%20Net%20Hepatitis-C%20PDF%20Survey.pdf>. Accessed 17 September 2009.
24. Kroth PJ, McPherson L, Leverence RR, et al. Combining web based and mail surveys improves response rates: a PBRN study from PRIME Net. *Ann Fam Med* 2009;7:245–8.
25. Knott A, Dieperink E, Willenbring ML, et al. Integrated psychiatric/medical care in a chronic hepatitis C clinic: effect on antiviral treatment evaluation and outcomes. *Am J Gastroenterol* 2006;101:2254–62.
26. John-Baptiste A, Varenbut M, Lingley M, et al. Treatment of hepatitis C infection for current or former substance abusers in a community setting. *J Viral Hepat* 2009;16:557–67.
27. Yawn BP, Rocca LG, Wollan PC. 10-year trends in the diagnosis and treatment of hepatitis C and concomitant mental health disorders: 1995 to 2005. *Prim Care Companion J Clin Psychiatry* 2008;10: 349–54.
28. Sylvestre DL, Loftis JM, Hauser P, et al. Co-occurring hepatitis C, substance use, and psychiatric illness: treatment issues and developing integrated models of care. *J Urban Health* 2004;81:719–34.
29. Geppert CM, Arora S. Widening the door: the evolution of hepatitis C treatment in patients with psychiatric disorders. *Hepatology* 2007;46:957–9.
30. Nicklin DE, Schultz C, Brensinger CM, Wilson JP. Current care of hepatitis C-positive patients by primary care physicians in an integrated delivery system. *J Am Board Fam Pract* 1999;12:427–35.
31. Falck-Ytter Y, Kale H, Mullen KD, Sarbah SA, Sorrescu L, McCullough AJ. Surprisingly small effect of antiviral treatment in patients with hepatitis C. *Ann Intern Med* 2002;136:288–92.
32. Rocca LG, Yawn BP, Wollan P, Kim WR. Management of patients with hepatitis C in a community population: diagnosis, discussions, and decisions to treat. *Ann Fam Med* 2004;2:116–24.