Published in final edited form as:

Addict Behav. 2015 August ; 47: 33–37. doi:10.1016/j.addbeh.2015.03.019.

Gender Differences in Planning Ability and Hepatitis C Virus among People who Inject Drugs

Joy D. Scheidell, MPH^{a,1}, Maria R. Khan, PhD^{a,1}, Lisa M. Clifford, PhD^b, Eugene M. Dunne, MS^b, Larry D. Keen II, PhD^b, and William W. Latimer, PhD^{b,2}

^aDepartment of Epidemiology, College of Public Health & Health Professions, College of Medicine, University of Florida, 2004 Mowry Road, PO Box 100231, Gainesville, Florida 32610

^bDepartment of Clinical and Health Psychology, College of Public Health & Health Professions, University of Florida, 1225 Center Drive, PO Box 100165, Gainesville, Florida 32610

Abstract

Hepatitis C virus (HCV) is primarily spread through risky injection practices, including sharing needles, cookers, cottons, rinse water, and the practice of backloading. An important aspect of harm reduction for people who inject drugs (PWID) is to identify factors that contribute to safer injection. Planning ability may influence risky injection practices and gender differences in factors that drive injection practices indicate a need to examine associations between planning and injection behaviors in men versus women. Data from the NEURO-HIV Epidemiologic Study was restricted to those who had ever injected in their lifetime (n=456). Impaired planning ability was assessed with the Tower of London and defined as a standardized total excess moves score below the 10th percentile. We used logistic regression to estimate the gender-specific adjusted odds ratios (AOR) and 95% confidence intervals (CI) for associations between impaired planning, each injection practice, and biologically-confirmed HCV. Impaired planning ability was associated with sharing needles (AOR=2.93, 95% CI: 1.33, 6.47), cookers (AOR=3.13, 95% CI: 1.22, 8.02), cottons (AOR=2.89, 95% CI: 1.23, 6.78), rinse water (AOR=2.43, 95% CI: 1.15, 5.14), and backloading (AOR=2.68, 95% CI: 1.26, 5.70) and HCV (AOR=3.42, 95% CI: 1.03, 11.38) among men. Planning ability was not significantly associated with the injection behaviors or HCV among women, suggesting other factors likely contribute to risky injection practices. Interventions to

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Contact information for corresponding author: Joy.Scheidell@nyumc.org Phone: +1-239-699-7433.

¹Division of Comparative Effectiveness and Decision Science, Department of Population Health, New York University School of Medicine

²School of Health Sciences, Human Services, and Nursing, Lehman College

Contributors

WW Latimer designed the parent study and wrote the protocol. JD Scheidell and MR Khan conceptualized the analysis. LM Clifford, EM Dunne, and LD Keen assisted in literature reviews and operationalizing variables included in the analysis. JD Scheidell conducted statistical analyses and wrote the first draft of the manuscript. All authors contributed to and approved the final manuscript.

Conflicts of Interest

All authors declare they have no conflicts of interest.

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promote harm reduction among PWID should ascertain and strengthen planning ability. Women may have additional barriers to practicing safe injection beyond impaired planning abilities, which should also be addressed.

Keywords

Injection drug use; hepatitis C virus; gender differences

Introduction

Over three million individuals in the US have Hepatitis C virus (HCV) infection. Approximately 72% of new HCV infections in 2007–2008 were ascribed to injection drug use (IDU).¹ HCV is a leading cause of liver cirrhosis and cancer,² which are attributed to over 15,000 deaths per year.³ HCV is a blood-borne pathogen spread primarily through sharing injection equipment and backloading, which is using one syringe to mix drugs that are then injected into another syringe.⁴ In a nationally-representative sample of people who inject drugs (PWID), many reported not cleaning their syringes with bleach (69%), lending their syringe to others (21%); or injecting with a used syringe (17%).⁵

Preventing initiation of IDU and addressing the addiction that drives continued use are important public health goals. In addition to prevention, a concurrent harm reduction effort to identify factors that enable safer injection practices to reduce disease transmission risk remains a priority. Some PWID have remained uninfected despite their frequent and decades-long injection histories.^{6,7} Emerging evidence suggests underlying neurocognitive executive functions associated with one's capacity to successfully engage in self-directed and purposeful behavior⁸ influence PWID's vulnerability to high-risk injection practices and infection. PWID who remain uninfected are more likely to implement strategies to facilitate safe injection practices including maintaining social support resources and ensuring access to sterile syringes.⁹ However, this evidence is based on qualitative interviews and self-reported descriptions of planning rather than validated neuropsychological assessments.

In a study conducted by members of our group, frequency of IDU was positively associated with sharing of injection equipment among PWID with impaired planning abilities – as measured by the validated neuropsychological assessment the Tower of London (TOL) – but not among PWID with intact planning abilities.¹⁰

These extant studies informed the current assessment of intersections among planning, injection risk, and HCV among PWID. The current study extended work by Severtson et al. (2009), by using a neuropsychological test to assess the association between planning and risky behaviors as well as biologically-confirmed HCV infection, and examining the role of gender in these relationships.

A gap in existing research on planning ability, injection practices, and infectious disease is lack of assessment of potential gender differences in associations. Factors that drive injection practices and infectious disease risk may differ by gender.^{11,12} For example,

women injectors' risk behaviors are often complicated by survival sex trade and requiring assistance to inject.^{12,13} Research focused on the role of planning in injection practices and infectious disease risk should evaluate if associations differ by gender.

The purpose of this study was to use the NEURO-HIV Epidemiologic Study to examine associations among planning abilities, risky injection practices, and biologically-confirmed infection with HCV. We hypothesized impaired planning ability, as measured by the TOL, would be an independent correlate of risky injection practices, HCV, and that the associations would differ for men and women.

Methods

Study Population

We used baseline data from the NEURO-HIV Epidemiologic Study, a National Institute on Drug Abuse-funded longitudinal study in Baltimore City, Maryland (DA14498). The study investigates the neuropsychological, social, and behavioral risk factors for infectious diseases among individuals who use non-injection and injection drugs. Participants were recruited using community outreach methods, such as newspaper advertisements and referrals. Informed consent was obtained prior to enrollment. Individuals between the ages of 18–50 years who reported any illicit drug use in the past six months were enrolled. Participants received \$45 for completion of the baseline assessment. The study has been fully IRB approved since its initiation with annual and ongoing protocol reviews.

In this analysis, data were restricted to participants who reported any lifetime IDU, had complete results for HCV diagnosis, and were not missing data on TOL assessment (n=456).

Measures

Planning Abilities—This analysis used the neuropsychological assessment the Tower of London (TOL), a measure of planning ability.^{8,14} The TOL is administered using two sets of peg boards, each with three pegs and three different colored balls. The examiner arranges the colored balls in a pattern on the pegs and then instructs the participant to recreate the pattern in the fewest number of moves while moving only one ball at a time. Each pattern has a pre-determined minimum number of moves. A Total Move Score, which is the number of moves made in excess of the minimum, is computed.

For this analysis, the standard Total Move Score was dichotomized, where individuals who performed below the 10th percentile were considered impaired. This cut point was chosen as it is considered indicative of borderline to clinical impairment and has been utilized in previous research using this data.¹⁰

Injection Drug Use and Hepatitis C Virus—In the HIV-Risk Behavior Interview administered at baseline, participants that reported IDU were asked if they ever shared needles, cookers, cotton, rinse water, or engaged in backloading. Each injection practice was treated separately and dichotomously.

Blood samples were drawn by phlebotomists and tested with Ortho-Clinical Diagnostics Inc. HCV Version 3.0 ELISA Test System, an enzyme-linked immunosorbent assay for the detection of antibodies to Hepatitis C Virus (Anti-HCV) in human serum and plasma samples. The Ortho® HCV V 3.0 ELISA Test System used recombinant antigens provided by Chiron Corporation.

Covariates—Gender and race/ethnicity were dichotomous (male and female; white and non-white, respectively). Marital status was defined as having ever been married. Education was dichotomized to completed high school/GED.

Birth year was included as a continuous indicator. The cohort effect on the high prevalence of HCV for those born from 1945–1965 is well established and attributed to exposures such as IDU and blood transfusions during the 1970s and 1980s.^{15–17}

The Shipley-2 is used to estimate intellectual functioning with a verbal and abstraction component. The total standard score, used in previous studies, was nonlinear in the log odds of the association with HCV. Therefore, to estimate pre-morbid intellect in this analysis, the standardized total verbal score was dichotomized at the median. The verbal score was chosen because it was least correlated with the TOL, thereby minimizing the risk of multicollinearity.

Statistical Analysis

Analyses were conducted with SAS 9.3 (SAS Institute, Cary NC). We used bivariable analyses to calculate the prevalence, odds ratios (OR), and 95% confidence intervals (CI) of HCV by the covariates (race/ethnicity, marital status, education levels, birth year, and Shipley-2 verbal score) and investigated gender as an effect modifier in the relationship between impaired planning ability and the outcomes.

We estimated ORs and 95% CI for associations between impaired planning ability and each risky injection practice (ever having shared needles, cookers, cotton, rinse water, or backloading) and HCV. Because preliminary analyses indicated associations between TOL and outcomes differed by gender, we included a product-interaction term between gender and TOL to obtain gender-specific associations. Adjusted models included all the covariates.

Results

Sample Characteristics

Among the 456 individuals who had ever injected in his/her lifetime, 41% were female and 59% were male (Table 1). For men, most respondents were white (57%) with sizeable percentages of non-white respondents (43%) included. Most women were non-white (57%). Approximately half of respondents completed high school (men: 47%; women: 55%).

About one-third of participants were born from 1945–1965 (men: 38%, women: 34%). Birth during this period was associated with HCV among women (OR=2.75, 95% CI: 1.24, 6.13).

Among men, education and low Shipely-2 score were associated with HCV (education OR=1.90, 95% CI: 1.08, 3.36; Shipley-2 OR=1.89, 95% CI: 1.07, 3.31). Neither measure was associated with HCV among women.

Impaired Planning Abilities, Risky Injection Practices, and Hepatitis C Virus

Associations in Men—Among men, impaired planning ability was significantly associated with each risky injection practice (Table 2). After adjustment, impaired planning ability was associated with increased odds of ever sharing needles (AOR=2.93, 95% CI: 1.33, 6.47), cookers (AOR=3.13, 95% CI: 1.22, 8.02), cottons (AOR=2.89, 95% CI: 1.23, 6.78), rinse water (AOR=2.43, 95% CI: 1.15, 5.14), and backloading (AOR=2.68, 95% CI: 1.26, 5.70). Impaired planning was also associated with HCV (AOR= 3.42, 95% CI: 1.03, 11.38).

Associations in Women—Among women, planning ability was not associated with risky injection practices or HCV in unadjusted or adjusted models. Levels of risky injection practices and HCV infection were high regardless of planning ability.

Discussion

In this sample of PWID in Baltimore City, Maryland, impaired planning ability was a strong and consistent correlate of risky injection practices and HCV among men. In adjusted analyses, impaired planning was associated with over three times the odds of HCV among men and increased odds of behavioral determinants of HCV. Intact planning did not appear to protect women against risky injection practices and HCV. Even women with intact planning ability faced high risk of behaviors and infection. These findings highlight the importance of considering gender when examining IDU and risk factors for infectious disease among PWID..

An important study strength was measurement of planning based on neuropsychological assessment and use of biologically-confirmed HCV status versus reliance on self-reported measures, and the examination of gender as a potentially moderating factor. Results suggest cognitive behavioral interventions that strengthen planning ability to improve access to safe injection equipment and environments may help men who inject drugs stay safe.

Our findings support prior studies highlighting the potential importance of planning ability in reducing risky injection. In a sample of PWID in New York City, reporting that one frequently planned to have access to sterile injection equipment was associated with engaging in protective behaviors such as storing sterile syringes.⁹ Severtson et al. (2009) had used this Baltimore City sample to illustrate the importance of impaired planning, in tandem with frequency of injection, to exacerbate risky IDU. They found that increasing frequency of injection was associated with increased risk of injection with used syringes among those with impaired planning only, while injection frequency was not associated with unsafe injection among those with intact planning ability.

In qualitative interviews with individuals who have injected drugs for extended periods yet remained uninfected, planning and organizing one's life to facilitate safe injection were

prevalent themes. Plans included injecting with known uninfected partners or paying for a private room in a shooting gallery to avoid interference from other injectors.¹⁸ Planning to avoid withdrawal symptoms, such as by ensuring one has drugs available upon waking, is used to avoid the desperation to alleviate symptoms that may influence risky behaviors.^{6,18}

In our study, planning ability did not predict risky injection or HCV among women, suggesting other factors likely drive injection-related risk. Even among women with skills in planning for safe injection practices, gendered power dynamics may limit women's ability to negotiate harm reduction strategies if male partners control the drug supply and injection equipment.^{19–21} Furthermore, women are more likely to require assistance injecting.^{12,22,23} Needing help increases the likelihood of sharing syringes¹² and is an independent correlate for HIV acquisition among women.²² Lack of power may override planning ability as a factor for risky injection among women who inject drugs. Our findings must be considered within the context of limitations. The cross-sectional data limits the ability to assess causation in the relationship between planning and risky injection. Additional limitations include the non-representative sample and potential for selection, recall, and social desirability biases. Specifically, PWID in Baltimore City may differ from other PWID populations; those who participated in the study may differ from non-responders; and difficulties remembering or reporting truthfully due to perceived stigma could have influenced outcome measurement. However, an important offsetting strength is measurement of planning ability based on neuropsychological assessment and use of biologically-confirmed HCV infection versus measurement based on self-report.

We found planning ability was associated with risky injection behaviors and HCV among men and may be an important target for intervention. Interventions designed to reduce risky injection behaviors among PWID should ascertain and strengthen executive function, including planning ability. Current interventions in populations including adolescents and those with brain injuries use methods including computerized training, role-playing, and goal-management training to strengthen domains of executive function.^{24–26} These interventions could be adapted for PWID. Women who inject drugs may have additional barriers to practicing safe injection. These factors, such as power and gender dynamics within relationships, should also be addressed.

Acknowledgments

Role of Funding Sources

Financial support for the conduct of this research was provided by NIDA Grant R01DA14498. NIDA had no role in the study design, data collection, analysis or interpretation, writing the manuscript, or in the decision to submit the manuscript for publication.

References

1. CDC. [Accessed November, 2013] Hepatitis C Information for the Public. 2012. <http://www.cdc.gov/hepatitis/c/cFAQ.htm#statistics>
2. Kanwal F, Hoang T, Kramer JR, et al. Increasing Prevalence of HCC and Cirrhosis in Patients With Chronic Hepatitis C Virus Infection. *Gastroenterology*. Apr.2011 140(4):1182. [PubMed: 21184757]

3. Ly KN, Xing J, Klevens RM, Jiles RB, Ward JW, Holmberg SD. The Increasing Burden of Mortality From Viral Hepatitis in the United States Between 1999 and 2007. *Ann Intern Med.* Feb 21; 2012 156(4):271–U233. [PubMed: 22351712]
4. Jose B, Friedman SR, Neaigus A, et al. Syringe-Mediated Drug-Sharing (Backloading) - a New Risk Factor for Hiv among Injecting Drug-Users (Vol 7, Pg 1653, 1993). *Aids.* Jan; 1994 8(1):U30–U30.
5. Ropelewski LR, Mancha BE, Hulbert A, Rudolph AE, Martins SS. Correlates of risky injection practices among past-year injection drug users among the US general population. *Drug and alcohol dependence.* Jul 1; 2011 116(1–3):64–71. [PubMed: 21227602]
6. Friedman SR, Mateu-Gelabert P, Sandoval M, Hagan H, Des Jarlais DC. Positive deviance control-case life history: a method to develop grounded hypotheses about successful long-term avoidance of infection. *BMC public health.* 2008; 8:94. [PubMed: 18366699]
7. Friedman SR, Sandoval M, Mateu-Gelabert P, Meylakhs P, Des Jarlais DC. Symbiotic goals and the prevention of blood-borne viruses among injection drug users. *Substance use & misuse.* 2011; 46(2–3):307–315. [PubMed: 21303250]
8. Lezak, MD.; Howieson, DB.; Bigler, ED.; Tranel, D. *Neuropsychological Assessment.* 5. Oxford University Press; 2012.
9. Sirikantraporn S, Mateu-Gelabert P, Friedman SR, Sandoval M, Torruella RA. Resilience among IDUs: planning strategies to help injection drug users to protect themselves and others from HIV/HCV infections. *Substance use & misuse.* Aug; 2012 47(10):1125–1133. [PubMed: 22574849]
10. Severtson SG, Mitchell MM, Mancha BE, Latimer WW. The association between planning abilities and sharing injection drug use equipment among injection drug users in Baltimore, MD. *Journal of Substance Use.* 2009; 14(5):325–333.
11. Unger JB, Kipke MD, De Rosa CJ, Hyde J, Ritt-Olson A, Montgomery S. Needle-sharing among young IV drug users and their social network members: The influence of the injection partner's characteristics on HIV risk behavior. *Addictive behaviors.* Sep; 2006 31(9):1607–1618. [PubMed: 16459023]
12. O'Connell JM, Kerr T, Li K, et al. Requiring help injecting independently predicts incident HIV infection among injection drug users. *Journal of acquired immune deficiency syndromes.* Sep 1; 2005 40(1):83–88. [PubMed: 16123687]
13. Shannon K, Kerr T, Bright V, Gibson K, Tyndall MW. Drug sharing with clients as a risk marker for increased violence and sexual and drug-related harms among survival sex workers. *AIDS care.* Feb; 2008 20(2):228–234. [PubMed: 18293134]
14. Shallice T. Specific Impairments of Planning. *Philos T Roy Soc B.* 1982; 298(1089):199–209.
15. Alter MJ, Kruszon-Moran D, Nainan OV, et al. The prevalence of hepatitis C virus infection in the United States, 1988 through 1994. *N Engl J Med.* Aug; 1999 341(8):556–562. [PubMed: 10451460]
16. Armstrong GL, Wasley A, Simard EP, McQuillan GM, Kuhnert WL, Alter MJ. The prevalence of hepatitis C virus infection in the United States, 1999 through 2002. *Ann Intern Med.* May; 2006 144(10):705–714. [PubMed: 16702586]
17. Smith BD, Beckett GA, Yartel A, Holtzman D, Patel N, Ward JW. Previous exposure to HCV among persons born during 1945–1965: prevalence and predictors, United States, 1999–2008. *Am J Public Health.* Mar; 2014 104(3):474–481. [PubMed: 24432883]
18. Mateu-Gelabert P, Friedman S, Sandoval M. Injecting without getting infected: injectors' strategies to prevent HIV and HCV. *Trastornos adictivos.* Oct 1; 2007 9(4):260–268. [PubMed: 21915175]
19. Shannon K, Kerr T, Allinott S, Chettiar J, Shoveller J, Tyndall MW. Social and structural violence and power relations in mitigating HIV risk of drug-using women in survival sex work. *Social science & medicine.* Feb; 2008 66(4):911–921. [PubMed: 18155336]
20. Pulerwitz J, Amaro H, De Jong W, Gortmaker SL, Rudd R. Relationship power, condom use and HIV risk among women in the USA. *AIDS care.* Dec; 2002 14(6):789–800. [PubMed: 12511212]
21. Wagner KD, Bloom JJ, Hathazi SD, Sanders B, Lankenau SE. Control over drug acquisition, preparation and injection: Implications for HIV and HCV risk among young female injection drug users. *ISRN Addiction.* May 12.2013 2013

22. Spittal PM, Craib KJ, Wood E, et al. Risk factors for elevated HIV incidence rates among female injection drug users in Vancouver. *CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne*. Apr 2; 2002 166(7):894–899.
23. Evans JL, Hahn JA, Page-Shafer K, et al. Gender differences in sexual and injection risk behavior among active young injection drug users in San Francisco (the UFO Study). *Journal of urban health : bulletin of the New York Academy of Medicine*. Mar; 2003 80(1):137–146. [PubMed: 12612103]
24. Cicerone K, Levin H, Malec J, Stuss D, Whyte J. Cognitive rehabilitation interventions for executive function: Moving from bench to bedside in patients with traumatic brain injury. *J Cognitive Neurosci*. Jul; 2006 18(7):1212–1222.
25. Diamond A. Executive Functions. *Annu Rev Psychol*. 2013; 64:135–168. [PubMed: 23020641]
26. Levine B, Robertson IH, Clare L, et al. Rehabilitation of executive functioning: An experimental-clinical validation of Goal Management Training. *J Int Neuropsych Soc*. Mar; 2000 6(3):299–312.

Highlights

- Associations between planning ability and risky injection practices vary by gender
- Men with impaired planning ability had increased odds of risky injection and HCV
- Planning ability was not associated with injection practices or HCV for women
- Interventions promoting harm reduction should strengthen planning ability
- Women may have additional barriers to safe injection beyond impaired planning

Table 1

Associations between Demographic Characteristics, General Intellectual Functioning, and Hepatitis C Virus (HCV) among 456 Adult People Who Inject Drugs (PWID) in Baltimore City, Maryland, 2002–2011

Measure	Men (n=269)				Women (n=187)			
	Number ^a	Percent (%)	% with HCV	Unadjusted OR (95% CI)	Number ^a	Percent (%)	% with HCV	Unadjusted OR (95% CI)
Race/Ethnicity								
Non-white	115	42.8	79.1	1.47 (0.83, 2.60)	106	56.7	76.4	1.29 (0.67, 2.48)
White	154	57.3	72.1	1 (referent)	89	43.3	71.6	1 (referent)
Birth Year								
1945–1965	101	37.6	81.2	1.73 (0.95, 3.15)	63	33.7	85.7	2.75 (1.24, 6.13)
1966–1986	168	62.5	71.4	1 (referent)	124	66.3	68.6	1 (referent)
Ever Married								
Yes	83	30.9	77.1	1.18 (0.64, 2.17)	64	34.2	81.3	1.79 (0.86, 3.75)
No	185	68.8	74.1	1 (referent)	123	65.8	70.7	1 (referent)
Completed High School								
Yes	141	52.4	69.5	1 (referent)	83	44.4	68.7	1 (referent)
No	128	47.6	81.3	1.90 (1.08, 3.36)	104	55.6	78.9	1.70 (0.88, 3.29)
Shipley-2 Verbal Score								
High	133	49.4	69.2	1 (referent)	69	36.9	73.9	1 (referent)
Low	136	50.6	80.9	1.89 (1.07, 3.31)	118	63.1	74.6	1.04 (0.53, 2.04)

^aTotals may not sum to 456 due to missing values

Table 2

Odds Ratios (OR) and 95% Confidence Intervals (CI) for the Associations between Impairment on the Tower of London (TOL) and Risky Injection Practices and Hepatitis C Virus (HCV) by Gender among 456 Adults who Inject Drugs in Baltimore City, Maryland, 2002–2011

Outcome	Men (n=269)					Women (n=187)				
	No. ^a	% with Outcome	Unadjusted OR (95%CI)	Adjusted OR (95%CI) ^b	No. ^a	% with Outcome	Unadjusted OR (95%CI)	Adjusted OR (95%CI) ^b		
Ever Shared Needles										
Non-impaired	112	48.1	1 (referent)	1 (referent)	68	48.9	1 (referent)	1 (referent)		
Impaired	24	68.6	2.33 (1.11, 4.90)	2.93 (1.33, 6.47)	21	44.7	0.86 (0.46, 1.59)	1.21 (0.64, 2.31)		
Ever Shared Cooker										
Non-impaired	138	59.5	1 (referent)	1 (referent)	88	62.9	1 (referent)	1 (referent)		
Impaired	29	82.9	3.12 (1.26, 7.72)	3.13 (1.22, 8.02)	33	70.2	1.52 (0.78, 2.95)	1.72 (0.87, 3.40)		
Ever Shared Cotton										
Non-impaired	116	50.7	1 (referent)	1 (referent)	81	58.7	1 (referent)	1 (referent)		
Impaired	26	76.5	2.80 (1.23, 6.38)	2.89 (1.23, 6.78)	30	63.8	1.52 (0.81, 2.86)	1.77 (0.93, 3.37)		
Ever Shared Rinse Water										
Non-impaired	108	46.6	1 (referent)	1 (referent)	77	55.0	1 (referent)	1 (referent)		
Impaired	24	68.6	2.25 (1.05, 4.64)	2.43 (1.15, 5.14)	24	51.1	1.05 (0.57, 1.94)	1.22 (0.66, 2.27)		
Ever Backloaded										
Non-impaired	55	23.7	1 (referent)	1 (referent)	33	23.6	1 (referent)	1 (referent)		
Impaired	14	41.2	2.26 (1.09, 4.67)	2.68 (1.26, 5.70)	14	29.8	1.36 (0.70, 2.68)	1.56 (0.77, 3.14)		
HCV										
Non-impaired	170	72.7	1 (referent)	1 (referent)	102	72.9	1 (referent)	1 (referent)		
Impaired	32	91.4	4.00 (1.19, 13.40)	3.42 (1.03, 11.38)	37	78.7	1.39 (0.66, 2.90)	1.24 (0.57, 2.71)		

^aTotals may not sum to 456 due to missing values

^bAdjusted for race/ethnicity (white vs non-white), birth year (continuous), marital status (ever married vs never married), education level (completed high school vs did not complete high school), and Shipley-2 Verbal score (high vs low)