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# Mobile Outreach Strategies for Screening Hepatitis and HIV in High-Risk Populations

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**ABSTRACT** ***Objectives:*** To screen, counsel and offer hepatitis A and B vaccination for subjects at high risk for hepatitis C virus (HCV) and HIV, and determine any relationship between risk factors and HCV positivity. ***Design and Sample:*** A descriptive correlational design. We correlated risk factors and HCV positivity and measured vaccination completion rates. Two hundred and two unduplicated subjects in 4 locations in Western Massachusetts: a walk in substance abuse clinic, a homeless shelter, a county jail, and a community corrections facility. ***Measures:*** Demographic data and a standard HCV risk screening survey were used. ***Results:*** Significantly higher rates of HCV were found in subjects who were currently using injection drugs (83.3% HCV positive, $\chi^2(1) = 20.85$, $p < .001$), who had a history of sharing needles for drug use (75% HCV positive $\chi^2(1) = 83.20$, $p < .001$), or a history of receiving treatment for drug abuse/alcoholism (38.4% HCV positive $\chi^2(1) = 12.14$, $p < .001$). Vaccination completion ranged by setting between 18% and 38%. ***Conclusions:*** Targeted outreach to hard to reach groups is effective in providing access for those at high risk for HIV and HCV infection. A mobile outreach strategy can focus needed resources for a variety of groups in a community.

Key words: hepatitis, HIV, mobile strategies, risk factors.

## *Background*

Chronic hepatitis infection has severe consequences for individual health and financial burden for the community. By 2015 the hepatitis C virus (HCV) will be responsible for nearly 20,000 deaths annually in the United States (Wong, 1999). In the United States mandatory vaccination against hepatitis B has done much to reduce this virus since the mid-1980s never the less, there are countless under- or unvaccinated citizens as well as immigrants in our communities with unknown vaccination coverage. Our nation's success in decreasing the incidence of hepatitis is uneven and the Institute of Medicine (IOM) has recently issued a report emphasizing the need for improved hepatitis B and C surveillance strategies (IOM, 2010).

Overall there were 2,435 confirmed cases of hepatitis C viral infection (HCV) reported in Massachusetts in 2007. The highest concentrations of cases were in the urban areas of Boston (eastern), Springfield (western), and Worcester (central) (Massachusetts Department of Public Health [MA DPH], 2007b). The estimated rate (per 100,000 population) of confirmed cases in Hampden County, MA for 2004 was 549, well above the state average of 299 (MA DPH, 2007a), and it is well known that rates are disproportionately higher in minority populations. Primary care, specialty care, and clinic offices see a fair number of cases but it is also known that the largest numbers of at-risk and infected persons are not receiving health care

or are not yet diagnosed. For example Tapestry Health (2009) an accessible, nonprofit public health care clinic system in Western Massachusetts, saw nearly 1,000 unduplicated patients in 2005 for needle exchange services, of which 100% were considered to be at high risk for HCV.

While flexible office hours are scheduled these times are not sufficient, and many patients may not have transportation to get to the clinic. When developing this mobile outreach project we identified two important priorities: the development of effective educational resources for counseling, and the design of a mobile protocol to be used in this innovation to teach an often inaccessible at-risk population.

Previous research conducted in various geographic locations has demonstrated high rates of HCV found in injection drug using (IDU) populations. Research conducted in El Paso, TX found that the strongest significant independent risk factor for HCV was IDU (OR 17.4, 95% CI 10.6–28.25; Hand & Vasquez, 2005). This finding was confirmed by research in California conducted on people at the point of entry into prison (Fox et al., 2005). On an international level, similar findings in studies conducted in Northern Iran (OR 8.1, 95% CI 3.6–18.2; Amiri, Rezvani, Shakib, & Shakib, 2007), and Australia (OR 32.85, 95% CI 14.86–72.60; Butler et al., 2007), confirmed that IDU was the risk factor with the strongest association with HCV. Based on these findings, the intention of this research was to determine whether similar risk factors would be found to be significant in a sample of high risk and hard to reach subjects from Western Massachusetts.

In order to better understand the motives that underlie behavior change in this population The Health Belief Model (HBM) served as a heuristic for this study. According to model developers (Rosenstock, Stecher, & Becker, 1988) health is valued and a threat to health serves as motivation for taking health promoting action. This is not born out in studies of at-risk homeless and impoverished adults. In one study health attitudes, social learning, and physiological determinants of sexual behavior were studied in an attempt to measure why people do or do not engage in healthful behaviors (Otto-Salaj, Heckman, Stevenson, & Kelly, 1998). Low perceived risk of HIV and high barriers to engage in prevention were among study findings. St. Lawrence and Brasfield (1995) found 69% of their sample of homeless persons who frequented a walk in medical clinic, had multiple risk factors for HIV. In this study two HBM concepts are of interest in efforts to understand avoidance of risky behavior (1) fear of susceptibility to acquiring infection(s), and (2) the threat to life of acquiring chronic hepatitis and HIV. Our study focused on embedding cues to action including education and consciousness raising. Our health care team utilized strategies such as health messaging, diagnostic and treatment counseling, and rapport building. Four follow-up appointments served to assist subjects in weighing the pros and cons of the health promoting behavior. An emphasis on modifying variables such as developing rapport is an important component of this project, especially when reporting positive lab values that require referral for follow-up testing. The objectives of this study are congruent with the HBM constructs.

Our research questions for this study were: (1) What is the relationship between HCV positivity and demographic and risk factors? (2) What is the frequency of vaccination series completion? Answers may provide insights into the needs of the participants and provide potential strategies for health professionals to design meaningful interventions for this population.

## Method

### *Design and sample*

This study used a descriptive correlational design. A sample of 202 subjects were recruited on a voluntary basis from four different screening locations in Western Massachusetts and included a county jail, a community corrections program, a homeless shelter, and a harm-reduction outreach center for IDU. Subjects were considered to have completed the research if they attended four visits with study staff over 6 months. The University of Massachusetts Human Subjects approval was granted to proceed with this study. The four screening locations did not have Institutional Review Boards so human subjects approval was given by the appropriate facility administrator (e.g., Sheriff or Director). All team members completed training for the protection of human subjects. Oral and written consent were obtained from each subject. All written materials were prepared in both English and Spanish. Translators were available for project description and to obtain consent as needed.

### *Measures*

Each unique encounter was summed for a total number of subjects served by this study. Measures included demographic information, screening and risk assessment, and sums of those who received vaccines. The screening tool was developed based on best practices at both the Connecticut and Massachusetts Viral Hepatitis Division (see Appendix A).

Protocol development began with consulting the Massachusetts and Connecticut Departments of Public Health Immunization Centers. A procedural manual was completed based on best practices from both states and research team members for the School of Nursing met to review all protocols and viewed the Department of Public Health films on proper immunization practices. See Appendices A and B for policies and procedures, and a model for client services management. This project began in the spring of 2007 with a team consisting of school of nursing faculty, DNP students, undergraduate students, and local certified phlebotomists. A mobile lab was outfitted based on CDC best practices with guidance from MA DPH Department of Immunizations, the clinical laboratory of a local hospital and the university health service.

Subjects were recruited between 2007 and 2008 by using flyers that were posted at the screening locations and through word of mouth from facility staff. Interested subjects were given further information about the program, and if they wished to proceed they gave informed consent to participate after discussing the study with a research assistant. Those who agreed to participate were asked to complete a screening survey that included demographic information (age, gender, residence location, ethnicity, language spoken, and whether they have any health insurance), and a health and risk factor history (history of substance use, incarcerations, tattoos and piercings, sexual contact, and exposure to workplace blood). Translators were available and surveys were available in both English and Spanish. Subjects could either report their answers independently in writing or receive assistance from student volunteers so that those with difficulty reading or writing could participate. All subjects received CDC and MA DPH information and educational brochures at the first visit, and were offered services including anti HIV, anti-HBs, and anti-HCV testing completed at the MA State Laboratory, as well as vaccinations for hepatitis A (two-dose series) and hepatitis B (three-dose series). Serum testing was completed at the State Laboratory. Upon return for blood test results, participants received a US$15.00 grocery store gift card. For those incarcerated, gift cards were held in the Inmate's Family Fund for dispersal upon release.

### *Analytic strategy*

Survey information was collected on 202 subjects and was analyzed to determine any relationship between client risk factors and rates of HCV positivity, and frequency of vaccination completion. Statistical analyses were performed using SPSS v.17. Chi-square statistics were used to examine the relationship between the variables, and significance was determined by $\alpha < 0.05$. Correlations were performed to determine any relationship between HCV and specific risk factors (age, IDU, history of incarceration, and having unprofessional tattoos).

## Results

### *Demographic data*

Analysis of demographic data (Table 1) showed that of the 202 unduplicated subjects, 77% were male, between the ages of 20 and 50, mainly Hispanic, either currently incarcerated or frequenting a harm-reduction outreach center and evenly distributed between two Western Massachusetts counties. The majority (Table 2) had a history of nasal inhalation of substances, using shared straws, had body tattoos or piercings, and had a history of incarceration. At one study visit, 1 subject reported HCV positivity and 1 reported HIV positivity.

### *Serum testing*

Anti-HIV, HBs, and HCV serum testing was offered to all subjects on day 1 and results were available in approximately 2 weeks. For those tested more subjects were not immune to HBV (57%) than were immune thus needing vaccination. Of those tested for HCV (176) 29% were antibody positive needing confirmatory testing, follow-up and counseling. Seventy-four percent of all who were tested returned in 2 weeks for their test results. None of the serum samples collected were positive for HIV, although only 108 of 202 (53%) opted to be HIV tested.

TABLE 1. *Descriptive Statistics for Subject Demographic Variables*

| | (*N* = 202) | | | | | |
|---|---|---|---|---|---|---|
| Variable | *n* (%) | *n* (%) | *n* (%) | *n* (%) | *n* (%) | *n* (%) |
| Age | 18–29 years | 30–39 years | 40–49 years | 50–59 years | 60 to > 70 years | No answer |
| | 57 (28.2%) | 47 (23.3%) | 47 (23.3%) | 31 (15.3%) | 4 (2.0%) | 16 (7.9%) |
| Gender | Male | Female | No answer | | | |
| | 156 (77.2%) | 29 (14.4%) | 17 (8.4%) | | | |
| Ethnicity | Hispanic/Latino | Non-Hispanic/ Latino | African American | Caucasian | Other | No answer |
| | 93 (46%) | 1 (0.5%) | 10 (5.0%) | 68 (33.7%) | 12 (5.9%) | 18 (8.9%) |
| Residence | County A | County B | County B Jail | Other | No answer | |
| | 81 (40.1%) | 17 (8.4%) | 74 (36.6%) | 5 (2.5%) | 25 (12.4%) | |
| Screening location | Outreach center | County BJail | Community corrections | Homeless shelter | | |
| | 74 (36.6%) | 82 (40.6%) | 21 (10.4%) | 25 (12.4%) | | |

TABLE 2. *Descriptive Statistics for Subject HCV/HIV Risk Factors*

| | (*N* = 202) | | |
|---|---|---|---|
| | Yes, *n* (%) | No, *n* (%) | No answer, *n* (%) |
| Share needles | 65 (32.2%) | 130 (64.4%) | 7 (3.5%) |
| Snort drugs | Shared straw: 118 (58.4%)<br>Own straw: 2 (1.0%) | 74 (36.6%) | 8 (4.0%) |
| Tattoos or body piercings | Home made: 49 (24.3%)<br>Professional: 4 (22.3%)<br>Nonspecified: 42 (73.3%) | 59 (29.2%) | 7 (3.5%) |
| Ever been in jail/prison | 152 (75.2%) | 43 (21.3%) | 7 (3.5%) |
| History of STD | Herpes: 2 (1%)<br>HPV: 1 (0.5%)<br>Gonorrhea: 3 (1.5%)<br>Chlamydia: 1 (0.5%)<br>Hepatitis C: 1 (0.5%)<br>HIV: 1 (0.5%)<br>Nonspecified: 34 (16.8%) | 151 (74.8%) | 8 (4.0%) |

### *Age*

There was found to be a significant relationship between age group and HCV test results ($\chi^2(2) = 8.086$, $p < .018$). 35.8% of subjects between 30 and 49 years of age tested HCV positive, which was higher than the percentage in subjects who were between 18 and 29 years of age (13.5% HCV positive), or over 50 years of age (31.3% HCV positive).

### *Current injection drug users*

There was a significant relationship found between subjects who were currently using injection drugs and HCV test results ($\chi^2(2) = 20.845$, $p < .001$). 83.3% of subjects currently using injection drugs tested HCV positive, which was higher than the percent who tested HCV positive either using other drugs (43.8% HCV positive) or currently not using drugs at all (23.4%).

### *Treatment history for drug abuse or alcoholism*

A significant relationship was found between those subjects who had previously received treatment for substance abuse or alcoholism and HCV test results ($\chi^2(1) = 12.14$, $p < .001$). 38.4% of subjects with a history of receiving treatment for drug abuse or alcoholism tested HCV positive, which was higher than the percentage of those with no history of receiving treatment for drug abuse or alcoholism (13.1%).

### *Screening location*

There was a significant relationship found between the location where subjects were screened and HCV test results ($\chi^2(3) = 26.01$, $p < .001$). 50.7% of subjects who were recruited from a harm-reduction outreach center for IDU tested HCV positive, which was higher than the percentages from a county jail (18.4%), a homeless shelter (11.8%), and a community corrections program (6.3%).

### *Completion of vaccine series in various locations*

The HBV and HAV vaccines are administered as a series of three-part or two-part vaccines, respectively; they were administered over a time span of 6 months, so clients needed to return to the facility to complete these vaccinations. In an analysis of the vaccination completion rates, results showed that at three of the four locations, the percentage of subjects who completed at least one full vaccine series (of either HAV, HBV, or both) ranged between 31.6% and 38.6%. The harm-reduction outreach center for IDU was an exception, wherein results showed that 18% of subjects completed at least one vaccine series. One reason for this low completion rate was that a high percentage of the subjects from this location (41%) were still in the process of receiving a vaccine series.

## Discussion

A large disparity exists between those infected with hepatitis and those unaware of their diagnosis. "Between 2.7 and 3.9 million Americans are infected with HCV, with 75 percent of those individuals unaware of their diagnosis" (Webb, 2010, p. 1). Targeting the populations most at-risk for contracting HCV in Western Massachusetts, these findings suggest that attention should be directed toward those who are currently using injection drugs, or have previous IDU history and/or a history of sharing needles. The high percentage of HCV that was found in people who had previously received drug abuse treatment suggests that drug abuse treatment centers might be used as effective locations for early intervention, screening, and education. Targeting IDU in the 1–29-year-old age bracket may help to prevent HCV infection that would become manifest later in life.

Transient populations often have difficulty in completing vaccine series. Buck and members of the Project START Study Group (2006) determined a variety of barriers exist in completing vaccine series in prison including lack of education and postrelease access. Data suggest that having a nurse on the education team to educate and inspire trust can boost completion rates in the recovering community (Nyamathie, Sinha, Greengold, Cohen, & Marifsee, 2010) and in persons living in homeless shelters (Nyamathie et al., 2009).

Some study limitations were noted. One factor to consider is the sample size (202 subjects). Although this population is difficult to engage in research spanning 6 months, subsequent studies should consider larger regional approaches to increase sample size. Another challenge was having student volunteers assist clients with answering questions that may have impacted the accuracy of answers and completeness of the surveys. Reasons for this may reflect the nature of this high-risk population, novice role of student nurses and a lack of sensitivity to the values of this population. This may include surveying subjects who may have been under the influence of drugs while completing surveys, who have varying levels of literacy, or subjects who may have been reluctant about disclosing information about illegal activities. Missing data were excluded from the analysis, and may have had an impact on the research findings.

It is expected that individuals at high risk for blood-born infectious diseases will have higher rates of HCV than is expected in the general population. Although these high rates of infection may be an indication of the participant risk status, this points to the critical need for intervention and services. Such information is essential for clinicians and providers in understanding the breadth of the clinical challenges these clients present, and is important for the distribution of resources for funding more comprehensive services for this population. The contemporary literature on health beliefs and intention to change behavior has revealed that increased self-efficacy and increased fear have impacted HIV risk behaviors (Merchant et al., 2009). And that while the addition of motivational interviewing has been a useful adjunct to care, there is a lack of evidence that it actually works (Nahom, 2005). Despite efforts to convey knowledge about risks and the impact on health and mortality, this population continues to have high rates of infectivity. Health beliefs must continue to be explored as possible barriers to behavior change. Cues and messaging require health provider innovations to enhance existing health care

strategies. Subject satisfaction with providers in this study was high, focusing attention on the relationship that is formed between the provider and the client. This offers insight to providers when considering innovations in caring for this population.

The pattern of growth in the rates of HCV will likely receive significant attention from health officials in the coming years, and research about high-risk populations will be the key to designing and implementing effective evidence-based interventions for controlling the growth in HCV in the future. Approaches will need to include knowledge as well as efforts to improve self-care using innovative strategies.

## Appendix A. Mobile Outreach Project—Screening Survey

**Ethnicity**: □ Hispanic/Latino(a), (Country of Origin: _____) □ non-Hispanic/Latino(a)
□ African American □ Caucasian □ Asian □ Other: _____
**Language(s) spoken**: □ English □ Spanish □ Other: _____
**Gender:** □Male □ Female
**Age group**: □ 18-19 □ 20-29 □ 30-39 □ 40-49 □ 50-59 □ 60-69□ ≥70
**Insurance:** □ SAGA □ Title 19 (Medicaid) □ Private □ None

| A. Risk factor assessment. | Yes/No/Comments |
|---|---|
| 1. Have you had a blood transfusion before 1992 and blood products before 1987? | |
| 2. Are or were you a healthcare/public safety worker or member of the military exposed to blood? | |
| 3. Were you born to an infected mother? | |
| 4. Have you shared needles, cookers or cotton—even once? | |
| 5. Have you snorted drugs (using a shared straw or rolled bill)? | |
| 6. Do you have tattoos or body piercings? Did you get these done by a professional? | |
| 7. Did you have sexual contact with infected individuals? | |
| 8. Do you have a history of any sexually transmitted disease? | |
| 9. Have you shared razor or toothbrush with an infected person? | |
| 10. Have you ever been in jail or prison? | |

| B. Past medical history assessment. | Yes/No/Comments |
|---|---|
| 1. Have you ever been told you have had Hepatitis A, B or C? | |
| If yes when were you tested? | |
| 2. Have you ever been told you have HIV? | |
| If yes when were you tested? | |
| 3. Do you have hemophilia? | |
| 4. Have you ever received hemodialysis? | |
| 5. Have you ever had an elevated blood test for liver enzymes? | |
| If yes when were you tested? | |
| | |

| B. Past medical history assessment. | Yes/No/Comments |
|---|---|
| 6. Are you allergic to any medication? Latex? | |
| 7. Have you had a vaccine for Hepatitis A or B? | |
| If yes when? | |
| 8. Have you ever been treated for substance abuse? | |
| Alcoholism? | |
| 9. Are you currently using illegal drugs? (injectable, recreational) If yes which drugs? How long? | |
| 10. Do you have any disease of the liver or any chronic illness? | |
| 11. Women only: Are you pregnant or do you think you might be pregnant? | |

| C. Screener recommendation | Yes/No/Comments |
|---|---|
| 1. Recommend for testing/vaccination today | |
| 2. Do not recommend for testing/vaccination today | |

| D. Action Plan | Yes/No/Comments |
|---|---|
| 1. Will proceed with testing/vaccination on recommendation of screener. | |
| 2. Will not get tested/vaccinated on recommendation of screener. | |
| 3. Will proceed with testing even though the screener does not recommend it. | |
| 4. Will not get tested/vaccinated even though the screener recommends it. | |

## Appendix B. Mobile Outreach Project—Policies and Procedures

***Screening procedure***

A. Step One: Preparing for Screening

1. See Model for Management of Client Services (timeline)
2. Visit 1: Welcome each new client. Confirm the reason for their visit.
3. Establish their basic understanding of Hepatitis C and HIV and review common risk factors.
4. Give them a HCV Risk Sheet for their own information. If they wish to participate in this screening, the client must know that we will ask them to answer some sensitive questions about their risk for getting hepatitis C. If they are tested they will have to return three more times.

B. Screening

1. If the client wishes to proceed you must get written informed consent. Please read it to them if they like. They will also be asked to fill in a registration and authorization to release medical records form. There are two services being offered: vaccination for Hepatitis A and Hepatitis B and blood testing for Hepatitis C and HIV. *Place ID# on the consent forms and use this same number on all subsequent forms.
2. As you begin the Hepatitis C screening questions, tell them the questions are sensitive. Probe any positive answers. Remind them that a positive blood test will be followed by a confirmatory blood test but all positive results must be reported by code number, to the state.
3. Answer their questions as they come up (keep this visit to 15 min or less.)

C. Recommendations Based on Screening

1. At the end of the survey let them know your recommendation for blood testing and vaccination.
2. Indicate whether they accept, or decline your recommendations.

D. Vaccination

1. Depending on the recommendation, the screener will send client to the next station for vaccination, or the client will proceed directly to the phlebotomist or they will leave the center.
2. The nurse administering the vaccine will follow all Massachusetts DPH guidelines and fill out the Vaccination Administration Record. The client will stay in the center for 15 min following the vaccination.
3. The client will be given a shot card and a date for return for next shot in the series. Review with tem the timeline for each vaccination series.

E. Lab Testing

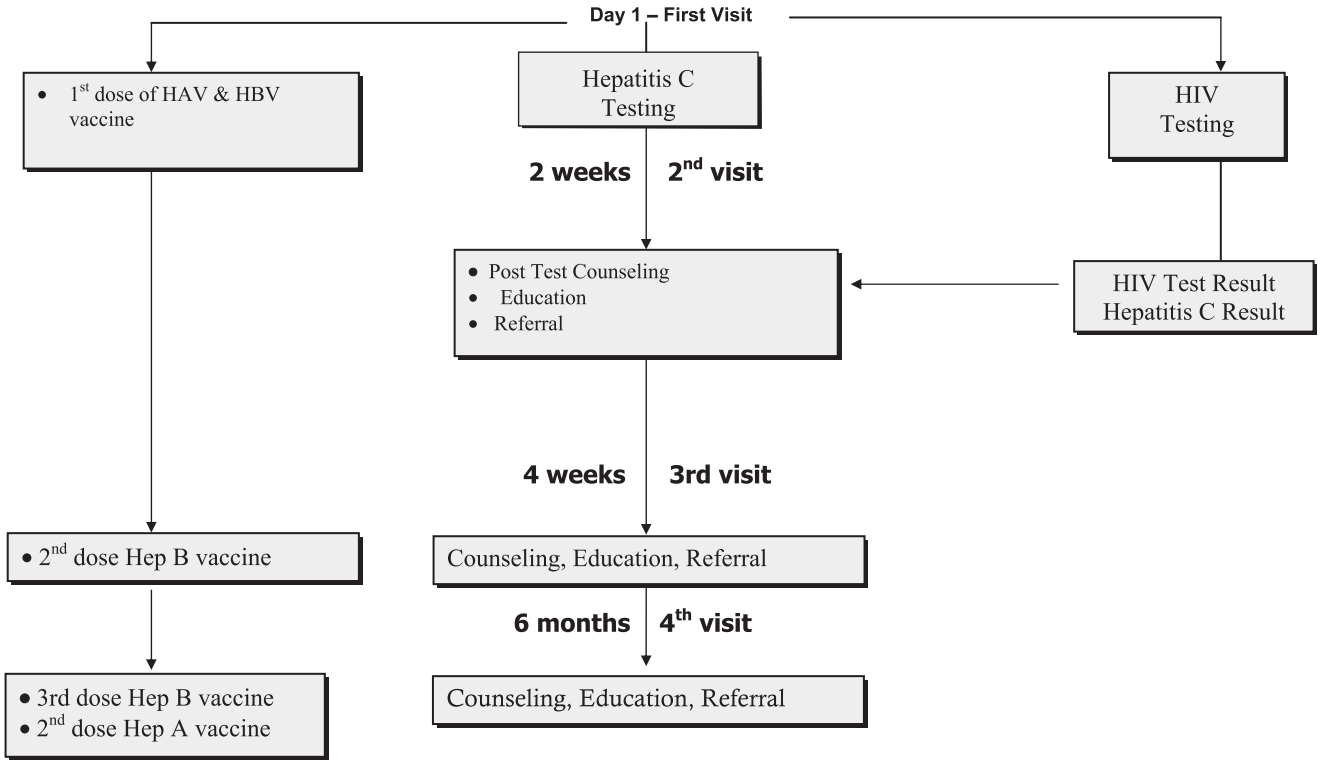
1. The client will proceed to the phlebotomist for blood testing.
2. The bar code on the lab form will match the barcode tags for blood tubes.
3. Recheck all identifying information and put in today's date.
4. Remind the client they must return in two weeks to receive their results. At that time the $15.00 gift card will be given.

F. Exist Counseling

1. Review the materials the client has been given so far (HCV fact sheet, VIS for vaccinations, return appointment for vaccination series, copies of their consent form and authorization to release medical information.
2. Answer any questions they may have.
3. Review the timeline for return visits (two weeks for blood test result, 4 weeks second does of Hep B vaccine and 6 months final doses of Hep A and Hep B vaccine.

## Appendix C. A Model for Management of Client Services

***Mobile outreach project***



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