

***Grant Final Report***

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**Project ECHO Hepatitis C Ambulatory Care Quality Improvement in New Mexico through Health Information Technology**

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## Structured Abstract

**Purpose:** The purpose of this grant was to improve the treatment of Hepatitis C (HCV) by primary care clinicians partnering with Project ECHO. Specifically the goal was to enhance the utility of the disease management tool iHealth. In addition, our aim was to promote the adoption of iHealth by identifying user needs, soliciting feedback and providing enhanced training and to explore feasibility of an HCV patient portal.

**Scope:** HCV is a significant public health problem. Treatment of HCV and eradication of the virus prevents future complications. Very few patients receive treatment outside of the urban academic setting. Through partnering with Project ECHO primary care clinicians are able to safely and effectively treat HCV. Regular use of iHealth by these clinicians enhances the educational experience and allows for the standardized collection of data and improved data management.

**Methods:** The evaluation portion of this grant focused on the implementation and adoption of iHealth by clinicians and the feasibility of a patient portal. A needs assessment was conducted to demonstrate that iHealth is a useful tool in the treatment of HCV and participants were willing to use it.

**Results:** Project ECHO has designed and implemented an effective disease management tool called iHealth to assist in the treatment of HCV. ECHO has demonstrated that iHealth is a useful tool in the treatment of HCV and participants were willing to use it.

**Key Words:** Hepatitis C; HCV; telehealth; health information technology; integrated data; electronic medical record; primary care; disease management tool; patient portal

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# Final Report

## Purpose

Project ECHO (Extension for Community Healthcare Outcomes) is an innovative model for treating complex chronic diseases in rural and underserved areas of New Mexico. ECHO trains rural healthcare professionals to provide the same level of care to rural patients as they would receive at an academic medical center. The approach is based upon case-based learning delivered through a telemedicine infrastructure and internet-based technologies to co-manage patients in community-based practices. With the support of the AHRQ (1 UC1 HS015135, PI: S. Arora, MD), Project ECHO has successfully bridged the gap in access to and outcomes of treatment for Hepatitis C virus (HCV) between urban and rural settings, thus paving the way for an ongoing State-funded program. As part of this effort, Project ECHO has deployed a prototype of an internet-based disease management tool called iHealth that is used to collect data and generate reports. The current grant allowed ECHO to enhance iHealth with additional features as outlined in the specific aims and to promote further adoption of iHealth as a disease management tool.

**Specific Aim 1:** Develop a disease management tool (DMT) that will standardize data collection, provide practice support, create a central data repository, and allow authorized personnel to view individual patient records.

**Specific Aim 2:** Develop a web portal that creates a central identity for the HCV program and provides a single access point for its resources.

**Specific Aim 3:** Create search tools that program personnel can use to extract data for monitoring data quality, profiling, quality improvement, and research.

**Specific Aim 4:** Develop a system that automatically uploads laboratory data from TriCore Reference Laboratories (TriCore).

**Specific Aim 5:** Promote adoption of iHealth clinical management system.

## Scope

HCV infection is a significant public health problem. The World Health Organization (WHO) and United States Centers for Disease Control and Prevention (CDC) estimate that 170 million people or 3% of the world's population and 3.9 million people in the United States are infected with HCV and are at risk of developing liver cirrhosis and/or liver cancer. In New Mexico, according to the NM Department of Health there are 32,000 reported cases of HCV of whom less than 15% have been treated. Thirty-two of the state's 33 counties are designated as Medically

Underserved Areas by the Department of Health and Human Services. In addition, 14 counties are designated as Health Professional Shortage Areas for primary care clinicians. These designations reflect the ongoing challenge of providing adequate health services to rural areas in New Mexico.

Treatment permanently cures HCV in 45% to 70% of patients and prevents future complications such as cirrhosis, need for liver transplantation, and liver cancer. Eradication of infection also reduces the reservoir for transmission to other patients in correctional institutions and communities. Current treatment entails weekly injections of interferon plus oral ribavirin for a 6-18 month period and the intensive management of side effects including: moderate to severe depression, anemia, and neutropenia. Treatment is usually provided by highly trained specialists in urban areas and not readily available in remote areas.

Project ECHO is a disruptive innovation that dramatically improves both capacity and access to specialty care for rural and underserved populations. This low-cost, high-impact intervention is accomplished by linking expert inter-disciplinary specialist teams with primary care clinicians through teleECHO clinics, in which the experts co-manage patient cases and share their expertise via mentoring, guidance, feedback and didactic education. This enables primary care clinicians to develop the skills and knowledge to treat patients with common, complex diseases in their own communities which reduces travel costs, wait times, and avoidable complications. Technology is used to leverage scarce healthcare resources, and the specialists at academic medical centers are better able to attend the most complex, high-risk patients. The ECHO model is not “telemedicine” where the specialist assumes the care of the patient, but instead a guided practice model where the primary care clinician retains responsibility for managing the patient, operating with increasing independence as their skills and self-efficacy grow

The key strength of Project ECHO is that it develops specialty care capacity in rural and underserved communities, reduces wait times and unnecessary travel costs for patients while facilitating coordinated simultaneous multi-disciplinary consultations. The ECHO model develops knowledge and capacity among community clinicians through a) case-based learning, b) knowledge networks, and c) learning loops. The knowledge network consists of regularly scheduled teleECHO clinics that bring together expert inter-disciplinary specialists and community-based partners. These partners learn best practices through learning loops in which they co-manage diverse patients in real world situations and practice. Over time, these learning loops create deep knowledge, skills and self-efficacy.

The Project ECHO HIT initiative has vast potential for enhancements that will further serve the primary mission of improving healthcare quality and safety for rural and underserved populations. By leveraging the existing application already implemented, iHealth has the further potential to: 1) Allow for the standardized collection of data; 2) Improve practice efficiency; 3) Generate practice profiles; 4) Support educational activities; 5) Provide on-line references for patients and practitioners; 6) Contain a library of forms related to HCV treatment, and 8) Provide a portal to allow patient access to appropriate information, links, and on-line support groups that will serve as a means to invite patients to more actively participate in their own disease treatment.

At the time of the launch for this initiative Project ECHO had HCV partners in 21 locations across the state. Partners included:

- Federally Qualified Health Centers in New Mexico (Community clinics participating in Project ECHO) include: Albuquerque, Farmington, Las Vegas, Las Cruces, Silver City, Portales, Espanola, Gallup, Hobbs, Roswell, Lovington, Pecos, Edgewood and Carlsbad

- New Mexico Department of Health Region 5: Las Cruces
- Indian Health Services: Shiprock, Santa Fe
- Department of Corrections (NM DOC): Santa Fe, Los Lunas, Las Cruces, Roswell, Grants, Santa Rosa, and Hobbs

Participants for the Project ECHO's HIT initiative were: 1) Clinicians (physician and healthcare clinicians, specialty/professional organizations); 2) Clinical organizations (tertiary care hospitals, ambulatory clinics, managed care organizations, correctional institutions); 3) Government policymakers (international, national, state, local), including AHRQ, and 4) Educational institutions (medical schools, continuing professional education programs).

## **Methods**

The evaluation portion of this grant focused on the implementation and adoption of iHealth by clinicians and the feasibility of a patient portal. A needs assessment was conducted to demonstrate that iHealth is a useful tool in the treatment of HCV and participants were willing to use it. This was achieved through a series of patient and clinician focus groups throughout the course of the project. The focus groups allowed for the identification of barriers in adopting iHealth and for the development of better training tools. This qualitative information provided Project ECHO with useful feedback that will be used to improve iHealth and increase its usage.

The analysis of focus group content identified themes and related sub-themes that focused on clinician, staff and patient: attitudes, needs, barriers, usefulness and willingness of HCV infected patients to use a patient portal. The focus group interviews were transcribed verbatim for analysis and a complete report, including a summary of results, was produced for each focus group interview. The themes from focus groups were used to identify modifications to include if we develop future work focused on the development of patient portal for ECHO HCV patients.

Each survey was reviewed by ECHO technology staff and specialist clinicians in terms of its content, length, and section design and implementation method (paper, web, or both). In addition, there was a review after each administration of the instrument and the context in which it was used for appropriate content, duplication, relevance, and new and emerging issues that need to be considered in administration, use and data from the instrument. Most items were rated using an adjectival or Likert rating with anchors that were appropriate to the item and its content.

## **Results**

Project ECHO has designed and implemented an effective disease management tool called iHealth to assist in the treatment of HCV. Through this project, ECHO has demonstrated that iHealth is a useful tool in the treatment of HCV and participants were willing to use it. Clinician and patient focus groups helped to establish attitudes, needs, barriers, usefulness and willingness of HCV infected patients to use a proposed patient portal. The success of this project has readied

Project ECHO to move to the next phase, which is expanding the adoption of iHealth into other disease areas.

**Specific Aim 1: Develop a disease management tool (DMT) that will standardize data collection, provide practice support, create a central data repository, and allow authorized personnel to view individual patient records.**

Project ECHO was able to support research and programming for enhancements to the DMT iHealth. The enhancements addressed: new reporting capabilities, data standardization, and practice support. To improve reporting capabilities new presentation, safety, and patient reports were created. Two new patient safety reports were introduced; one that is automatically generated based on audit parameters that are established by clinical criteria and another that can be generated by anyone with appropriate authorizations to query certain clinical parameters. The updated patient report has been named "HCV Summary Report" in the software and it tracks clinical data over time during the patient's course of HCV treatment. In regards to creating a separate case study submission, it was found that this would not be a useful learning tool. The FAQs that arise are addressed via didactics in clinic making a separate tool unnecessary. Practice support tools were developed to support an internal calendar that identifies future dates for clinical encounters and which specific which labs need to be realized for compliance with best-practices protocols.

Pre-release testing of iHealth was conducted with a small number of participating clinicians from rural and underserved areas to provide feedback on its usability and acceptability. Participants were recruited from existing HCV TeleECHO Clinic partners and were given comprehensive training of the various components of iHealth. Following the training, participants participated in a simulation where they used the DMT to complete a hypothetical patient record by copying data from a paper chart.

Surveys were given to participants in two phases, once before and once after the implementation of iHealth. The goal of the surveys was to compare the individuals surveyed for interest in an electronic functionality like iHealth with the individuals who had some exposure to the actual iHealth program. Some of the individuals who completed the follow-up survey were new to the program and had not completed the initial survey, so no change in attitude or opinion could be gauged for these individuals. As such, any questions illustrated opinions about iHealth or its uses were compared only within individuals who completed each survey. For demographic and background information, as well as electronic medical record (EMR) usage status, the two groups were compared.

All components of iHealth, including any new enhancements, fully conform to industry standards for all information security issues and will be monitored regularly to maintain these standards.

**Specific Aim 2: Develop a web portal that creates a central identity for the HCV program and provides a single access point for its resources.**

The web portal for clinicians treating HCV through Project ECHO was completed. As part of the development of the web portal the following online educational tools were created: HCV Clinical Guidelines, patient education information, HCV FAQs, National Institute on Alcohol

Abuse and Alcoholism (NIAAA) guide for patients who drink, HCV Risk Factor Screening Tool, list of open HCV clinical protocols, and vitamin D information.

To help create a central identity for the HCV program, ECHO conducted system-wide training sessions on iHealth HCV tools for New Mexico community clinics, Project ECHO ambulatory care providers, and staff. As of February 2012, iHealth training is now incorporated into the standard HCV training for all new community partners.

A patient portal prototype was developed which included the following educational tools: a moderated HCV discussion BLOG; a video explaining HCV; links to useful sites; a self-assessment tool, Center for Epidemiologic Studies Depression Scale (CESD); a guide for patients who drink; a sample patient treatment record; and documents regarding the treatment, side effects, and educational resources of Hepatitis C. In addition, it was determined that the best and most concise educational tool for patient information is a clinical summary report which includes a customized treatment plan.

Patient support for the patient portal was determined through a needs assessment using two focus groups. The focus groups were held to assess the interest and likelihood of individuals with HCV to access and use an internet website “patient portal” relevant to managing the ongoing needs and treatment of their disease. The patient portal prototype allows access to a participant’s treatment plan, resources and information about the disease and the treatment process, an e-mail type communication with the primary care clinician, and a moderated BLOG in which patients share their experiences, post questions, and provide advice to each other involved in the treatment process.

The first focus group was conducted May 16, 2012 in Las Vegas, NM. Participants in this focus group were for the most part forthcoming and open about their opinions of the patient portal and their experience with the disease and treatment (if applicable). Participants expressed great interest in a collection of resources to help with understanding their treatment and the disease, a messaging system to access their clinician in between visits, and a moderated blog or forum to share experiences with others who are undergoing or have undergone the treatment process. The only requests participants made were for more layman explanation of the details and tests shown in the treatment plan, and the ability to print out the treatment plan and resources since not everyone had easy internet access at home. Overall, the unanimous response was that the portal would be a valuable tool for patients to access and that they would make use of it regularly to be involved in their treatment process and educate themselves about the process and the disease.

The second focus group was conducted August 15, 2012 at the First Choice Community Health Center in Albuquerque, NM. Participants expressed interest in resources to help with understanding their disease and treatment. A moderated BLOG to share experiences with others who are undergoing or have undergone the treatment process appealed to them. The participants requested the addition of “tool tips” to the web page so they would not have to memorize lists of medical acronyms and terms. Overall, the focus group participants felt that once trained on the use of the patient portal coupled with regular access to computers that they would access and use a patient portal. They described access to quality information on the disease, their own treatment, and interaction with the clinician would enhance their ability to educate themselves and others about the disease. They were positive about a patient portal but to utilize it would need some technological support.

Overall, participants indicated that an HCV patient portal would be a valuable tool for them to access disease information, treatment status, and to educate themselves and others about the

disease. They expressed interest in an embedded messaging system for communication between patients and providers, as well as an expert moderated blog, and most participants also said they would visit and use the Patient Portal.

Provider and clinic staff support for the patient portal was determined through a needs assessment using two focus groups with Project ECHO community clinic sites. The focus groups assessed the interest and ideas of clinicians on the use of an HCV patient portal, including a messaging system between patients and providers, as well as an online blog and health information resource page.

The first focus group was conducted on April 3, 2013. The clinicians that participated in this focus group seemed to be open and honest about their concerns and opinions. The overarching theme of their opinions seemed to be the need for a universal approach. They needed a system that works well with their own EMR so that they don't have to enter data twice, and a system that meets the health literacy needs of all patients. The clinicians liked the idea of patients having access to their own labs on the portal, as well as educational links and videos, but worried about possible patient anxiety from these sources. They also see the value in a messaging system and blog and are generally interested in participating if the messaging system wasn't cumbersome and if the blog is moderated. Overall, the clinicians seem to support the idea of a patient portal as discussed, once fully developed.

The second focus group was conducted on May 1, 2013. The clinicians that participated in this focus group openly discussed their opinions, ideas and concerns. The overarching theme of their input was that they would utilize a system that works well with their own EMR so that they don't have to enter data twice, and that the portal would need to meet the needs of all patients at a reasonable health literacy level. The clinicians liked the idea of patients having access to their own labs on the portal, as well as educational links and videos. Although they see the value in a messaging system, they were not interested in using it. They support the use of an online blog. Overall, the clinicians seem to support the idea of a patient portal once fully developed and collectively they agreed they would always be willing to support Project ECHO's initiatives by trying the system and see how it goes. As this focus group was conducted during the final quarter of the grant period, the complete report was not included in the quarterly reports so it has been included at the end of this report.

### **Specific Aim 3: Create search tools that program personnel can use to extract data for monitoring data quality, profiling, quality improvement, and research.**

Analytical data marts were created. As a result, extracting subsets of data from the database to develop outcome studies is now possible. Significant concerns regarding approval from the Institutional Review Board (IRB) and confidentiality have led ECHO to decide that this should not be a web-based functionality at this time, and have opted for a human interface to ensure authorization for data extraction. Project ECHO's *New England Journal of Medicine* article, published in June 2011, was the first extracted data set used for research purposes. This functionality can be made available to any researcher meeting authorization requirements, but again for confidentiality it has been determined that this will also require a human interface.

Project ECHO is in the process of identifying which data sets are most necessary for ad hoc reports, and this will drive the data dictionary, and as a consequence, search tools. As the data marts and extracted data sets will not be a web-based function, data reports in the appropriate

data layout, will be provided with any extracted data sets. To monitor quality of data extracted using iHealth, validation rules and range-checking were developed for all critical fields.

**Specific Aim 4: Develop a system that automatically uploads laboratory data from TriCore Reference Laboratories (TriCore).**

ECHO successfully developed a system that automatically uploads laboratory data from TriCore Reference Labs into iHealth. Chemistry, hematology, and serology results are now uploaded into iHealth from TriCore's extensive database. Transfers occur through a common server to which TriCore and Project ECHO are securely linked. TriCore loads the data as soon as it becomes available. iHealth automatically interrogates this system every 12 hours by transmitting a set of identifiers for all Project ECHO patients. This set of identifiers is used to link each ECHO patient to TriCore's master patient index which, in turn, identifies all new test results for that subject. Once the data is transferred, iHealth formats it for proper retrieval and display.

**Specific Aim 5: Promote adoption of iHealth clinical management system.**

Project ECHO has promoted the adoption of iHealth through: the HCV TeleECHO Clinic, informal conversations with clinicians and healthcare providers, visits at community clinics, and by offering ongoing iHealth training and technical support at no cost. Since February 2012, iHealth training has been incorporated into standard HCV training for all new community partners.

Quality improvement for iHealth and the web portal is based on themes identified during iHealth ECHO clinics. The presentation report has been used in HCV TeleECHO Clinics, and feedback is being regularly generated, resulting in changes to the tool. ECHO continues to elicit feedback from regular users of iHealth and incorporate changes. To help with feedback and quality development of iHealth, Project ECHO developed an ad hoc advisory group of early adopters. This group continues to provide feedback on a regular basis regarding iHealth and its utilization.

## **Evaluation**

Evaluation methods were built into all five of the specific aims including: assessing provider usability and acceptability of iHealth, determining patient support for the web portal, and establishing provider and clinical team support of the web portal.

iHealth utilization was tracked in 2011 and 2012. These dates were used as iHealth adoption and utilization were heavily promoted and many trainings were done in 2011 and early 2012. Prior to this time, iHealth was not universally being used (particularly by long-standing partners who had been involved in HCV TeleECHO clinics long before iHealth was introduced). In 2011 a total of 554 HCV patients were presented in the HCV TeleECHO Clinic, of those 221 (39.89%) were presented using iHealth. In 2011, 56.67% (17/30) of participating clinic sites utilized iHealth. In 2012, a total of 516 HCV patients were presented in the HCV TeleECHO Clinic, of those 439 (85.08%) were presented using iHealth, an increase of 45.19%. In 2012, 75.67% (25/33) of participating clinic sites utilized iHealth, an increase of 19.09%. The presentation of patients in clinic using iHealth has greatly enhanced learning during the clinic. When a patient on

HCV treatment is presented in TeleECHO clinic, all other clinic participants can see the patient’s de-identified lab information on the screen. (See patient presentation screenshot attached.)

Processes of care were demonstrated through evaluation of initial patient case presentations given before and after the adoption of iHealth. This was achieved by assessing if certain patient information was included in the case presentation such as: route of transmission, height, weight, alcohol consumption, and medication dosages. This information is very important in the initial evaluation of the patient. The documentation did improve modestly after iHealth adoption.

**Table 1. Processes of Care**

Measurement	Documentation Before Adoption of iHealth (%)	Documentation After Adoption of iHealth (%)
Route	93%	97%
Height	87%	93%
Weight	93%	100%
Alcohol	87%	93%
Medication Dosages	73%	97%

Improved outcomes were demonstrated by again reviewing patient case presentations submitted before and after adoption of iHealth and tracking if the treatment start date and the 4 week viral load were recorded. This information is extremely important for following patients on HCV treatment. The patients’ response to treatment at week 4 is necessary to determine duration of therapy. The adoption of iHealth improved the documentation rate dramatically which will hopefully translate into improved care. Because the treatment of HCV is so long in duration and cure cannot be determined until 6 months after completion of treatment we could not compare cure rates before and after the adoption of iHealth during the period of this grant.

**Table 2. Outcomes**

Measurement	Documentation Before Adoption of iHealth (%)	Documentation After Adoption of iHealth (%)
Start of TX Date	53%	100%
Week 4 VL Recorded	53%	93%

## List of Publications and Products

- Arora S, Thornton K, Komaromy M, et al. Demonopolizing Medical Knowledge. *Acad Med* Accepted for publication October 2013.
- Arora S, Thornton K, Murata G, et al. Outcomes of Treatment for Hepatitis C Virus Infection by Primary Care Providers. *N Engl J Med* 2011 Jun;364:2199-207.
- Arora S, Kalishman S, Dion D, et al. Quality Profile: Partnering Urban Academic Medical Centers and Rural Primary Care Clinicians to Provide Complex Chronic Disease Care. *Health Affairs* 2011 Jun;30(6): 1176-84.
- Arora S, Kalishman S, Thornton K, et al. Expanding Access to Hepatitis C Virus Treatment – Extension for Community Healthcare Outcomes (ECHO) Project: Disruptive Innovation in Specialty Care. *Hepatology* 2010 Sept;52(3):1124-33.

# Appendix

## Project ECHO<sup>®</sup> Office of Program Evaluation

### Clinician Focus Group Report: HCV Patient Portal AHRQ Health Grant

May 1, 2013

#### Introduction

**Purpose:** To assess the interest and ideas of clinicians on the use an HCV patient portal, including a messaging system between patients and providers, as well as an online blog and health information resource page.

**Background:** Two patient focus groups were held in different locations of New Mexico in 2012 to assess patient's interest in the use of an HCV patient portal. A total of twelve HCV patients participated in these focus groups, as well as one HCV patient family member. Overall, participants indicated that an HCV patient portal would be a valuable tool for them to access disease information, treatment status, and to educate themselves and others about the disease. They expressed interest in an embedded messaging system for communication between patients and providers, as well as an expert moderated blog, and most participants also said they would visit and use the Patient Portal. These patient responses were summarized for the clinicians in this focus group. The clinicians were then asked to share their ideas and concerns.

**May 1, 2013 Focus Group Participants:** Three clinical providers participated via video teleconferencing, this included one Physician's Assistant, one Family Nurse Practitioner and one Registered Nurse. Also in attendance were group facilitators/observers including an ECHO HCV specialist, IT support and evaluation staff.

#### Focus Group Questions to Clinicians

##### 1. Have you been involved in or implemented an electronic patient portal?

One of the providers has been involved in a patient portal as a clinician. However, the system was recently implemented. This particular clinical site is in the process of getting their patients web enabled which entails having them log on and set up their own accounts that has taken a long time to establish. The provider indicated that some patients use the patient portal for medication refills. The lab results have to be approved for viewing by the provider for the patient to be able to view them. Other than that the provider does not have a lot of personal experience with their patient portal.

**2. Having heard the summary of the HCV patients' interests and views about a patient portal and access to their own patient information, what are your thoughts?**

a. Strengths

Clinicians liked the idea of patients being able to see and understand their own labs. All the participants agreed that it would be very useful for patients to view their own labs but only after approval from the provider.

It was mentioned that a patient portal with educational links could help the patients come more prepared for their visit.

Clinicians also believed that educational links/videos on the website would be a strength. As busy clinicians they feel they may not have enough time to do all of the education themselves, so an educational section on the portal would be a good option for them to further educate patients.

An additional strength mentioned was the blog/community support environment on the portal. The providers agreed that it could be a very powerful tool for patients.

b. Concerns

The providers would want the patient portal to be integrated with their current EMR so they would not have to enter into the EMR and iHealth since iHealth does not communicate with EMRs. One provider indicated that with the advent of individual clinics/center's own versions of EMRs and patient portals, the idea of expanding iHealth for such a duplication of effort is less of a useful idea.

None of the providers were interested in copying and pasting information from one system to another. The providers are not sure that many of their patients have computers or access to computers, some know of patients with cell phones but doubt they would log onto a patient portal with their phones.

Additionally, there could be firewall difficulties with connectivity.

c. What to include in a patient portal?

It was suggested that the terminology might need to be adjusted to a certain educational level so all patients can easily understand it.

In addition to having local patient testimonials/interviews on the portal, it was suggested to have other educational videos, especially for patients who cannot read. This would allow clinicians to play educational videos for patients in the clinic while the clinicians attend to other matters, saving them time.

Another suggestion was to add anticipatory guidelines so that patients would know what to expect and how they can react to future circumstances in treatment.

**3. Patients expressed interest in being able to directly communicate with you as their provider through a patient portal supported messaging system. In the prototype, you can copy and paste the patient's question and your reply into the patient chart.**

a. What is your reaction/thought about such a system?

The clinicians were very willing to try new ECHO technology initiatives.

All noted that it would be most helpful for a patient messaging system to be integrated within their clinic's EMR system so that it would go straight into the patient's records so the clinicians would not have to do the work twice. This would also lessen the risk of missing an important message when the clinicians take time off or are not signed-on their computers.

b. Are you interested in participating in a system like this?

Clinicians stated that they would be interested in trying the messaging system, but because of their existing systems view using it a duplication of effort.

**4. Patients' expressed interest in being guided to HCV information and educational online resources and information. They also expressed interest in the patient portal supporting an online blog.**

a. What is your reaction/perception about adding these features to the patient portal?

The providers thought a blog on the portal would be a good idea but struggled with concerns about how it would be managed.

b. Are you interested in participating?

The clinicians in this focus group indicated that if a patient portal containing educational information like the "HCV Advocate" web site was designed and implemented by ECHO they would recommend it to their patients undergoing treatment. However, they would not utilize a patient portal system with a messaging component.

## Summary

The providers that participated in this focus group openly discussed their opinions, ideas and concerns. They offered some possibly useful suggestions that can be further explored. The overarching theme of their opinions seemed to be they would utilize a system that works well with their own EMR so that they don't have to enter data twice, and a system that meets the needs of all patient's at a reasonable health literacy level.

The clinicians liked the idea of patient's having access to their own labs on the portal, as well as educational links and videos. Although they see the value in a messaging system were not interested in using it. They support the use of an online blog.

Overall, the clinicians seem to support the idea of a patient portal once fully developed and collectively they agreed they would always be willing to support Project ECHO's initiatives by trying the system and see how it goes.