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# Provider and Staff Education Surrounding Universal HCV Screening and Linkage to Care in an Ambulatory Care Setting

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**Provider and Staff Education Surrounding Universal HCV Screening and Linkage to Care**

**in an Ambulatory Care Setting**

Submitted in Partial Fulfillment of the Requirements for the Degree of Doctor of Nursing

Practice at the University of Kentucky

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**Abstract**

**Background:** In the United States, it is estimated that there are more than 2 million cases of Hepatitis C (HCV), with over 66,000 new cases since 2020 However, an estimated 75% of those with HCV go undiagnosed and less than 35% receive treatment within a year of diagnosis. In 2018, UK Healthcare (UKHC) implemented a universal HCV screening method using a Best Practice Advisory (BPA) for anyone 18 and older who presented to the Emergency Department and had labs ordered. Patients who screened positive were then referred to outpatient clinics for HCV treatment. Approximately ten percent of positive patients who were referred ultimately received treatment, and the average time from diagnosis to treatment exceeded 400 days . This led to the creation of an ED-based,pharmacy-driven, HCV linkage to care model where the pre-treatment work-up is off loaded from providers onto dedicated pharmacists through a collaborative care agreement. This model was very successful in the ED and is expected to be easily replicated in other healthcare settings including ambulatory care clinics at UKHC. With the rapid expansion, there was no information on baseline staff knowledge surrounding HCV screening and current treatment practices, and no education on the importance of using the universal BPA in an ambulatory care setting.

**Purpose:** The purpose of this quality improvement project was to expand and evaluate provider and clinical staff knowledge and screening practices surrounding universal opt-out HCV testing and linkage to care in ambulatory care settings and increase patient screening rates.

**Methods:** A quality improvement study using a quasi-experimental pre and posttest design was conducted with providers and clinical staff at two ambulatory care clinics at UKHC. A link that connected participants to a combined pretest, educational video and posttest on Qualtrics was

sent out to all providers and staff using two separate list servs. A retrospective data collection was conducted 2 weeks following the completion of the survey.

**Results:** Of the 27 who opened the survey, 12 completed it. Participants were all female and predominantly MD, APRN, nurses and MAs. The responses revealed high knowledge and intentions to screen for HCV among providers and staff. However, data revealed only 4.86% of ambulatory patients were screened for HCV pre-intervention. Post-BPA screening rates increased to 8.3% with a relative change of 11.45% after the education. Provider likelihood to screen increased from a 75% likelihood to a 100% likelihood.

**Conclusion:** This project lays a solid foundation for future research and practice aimed at ensuring high rates of HCV screening and fostering positive health outcomes across diverse healthcare settings.

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# Background and Significance

## Problem Statement

Hepatitis C (HCV) is one of the most common bloodborne illnesses in the world (Center for Disease Control and Prevention, 2020a). In the United States, it is estimated that there are more than 5 million cases of Hepatitis C (HCV), with over 66,000 new cases since 2020 (Ryerson, 2020). However, an estimated 75% (approximately 1.8 million, Doyle, Leavitt, & Rigg, 2020) of those with HCV go undiagnosed and less than 35% receive treatment within a year of diagnosis (Lewis et al., 2023). Undiagnosed HCV is the leading cause of cirrhosis of the liver and hepatocellular carcinoma (Ryerson et al., 2016). All-cause mortality related to these diseases and untreated chronic HCV infection is 40% higher than it is in those who are treated for the infection (Piselli et al., 2021). Of the 220 counties with the highest risk for infectious outbreak in the U.S., 54 are in Kentucky (Ryerson et al., 2016). Researchers estimate that 1.6% of the Kentucky population are HCV RNA positive (Cabinet for Health and Family Services, 2016).

Hepatitis C (HCV) is a viral liver infection that leads to inflammation and damage (Center for Disease Control and Prevention, 2020a). Approximately 30% of cases clear spontaneously, while 70% of infections develop into a chronic state (World Health Organization, 2022). The incubation period for Hepatitis C is two weeks to six months, and 80% of individuals do not exhibit any symptoms (Center for Disease Control and Prevention, 2020b). For this reason, HCV remains a silent disease with a high potential for spreading to other individuals and developing into chronic disease and early death (Center for Disease Control and Prevention, 2020b). According to the Center for Disease Control and Prevention (2020b), out of every 100 people infected with HCV, approximately 5–25 will develop cirrhosis within 10–20 years.

Cirrhosis is the leading cause of hepatocellular carcinoma, with 290,000 deaths from HCV-related cirrhosis or hepatocellular carcinoma in 2019 (World Health Organization, 2022).

The CDC now recommends that universal screening be implemented in populations with a seroprevalence greater than 0.1% (Wojcik et al., 2020). In 2018, researchers implemented a non-targeted HCV screening program with linkage to treatment in the UKHC Emergency Department (UKED) using a Best Practice Advisory (BPA) when placing orders. This program ensures that all patients, 18 years and older who have labs drawn in the ED, are offered testing for HCV. Between 2018-2020 the non-targeted screening program yielded a 10.8% HCV antibody-positive rate (Moore et al., 2021). This same model of non-targeted screening and linkage to care used in UKED is expanding into ambulatory care clinics at UKHC. However, the success of the ED HCV screening program and the plans for the ambulatory clinics to adopt this process had not been disseminated to ambulatory care providers, leaving a gap in provider knowledge.

**Context, Scope, and Consequences of the Problem**

Intravenous drug use (IVDU) remains the highest risk factor for contracting HCV. In Kentucky, IVDU has continued to be a health emergency. Dearinger et al. (2019) have estimated that 2.6% of the Kentucky population report IVDU; among this population of People Who Inject Drugs (PWID), an estimated 67% have HCV, but only half know they are infected. Therefore, it is likely that around 38,925 people in Kentucky are unaware they are infected with HCV and are rapidly spreading it to others (Dearinger, White, & Thoroughman, 2019). Because of increasing HCV rates, in 2020, the CDC changed their recommendations for HCV screening to include all adults aged 18 and older at least once, as well as all pregnant women during each pregnancy and annual testing for people who currently inject drugs and share needles or syringes (Center for

Disease Control and Prevention, 2023). The CDC continues to highlight that high-risk populations need screening more often; those include people who have ever injected drugs, people with HIV, people who receive maintenance hemodialysis, people with persistently abnormal ALT levels, and prior recipients of blood transfusions or organ transplants prior to 1987 (Center for Disease Control and Prevention, 2023). Targeting these populations has been ineffective; therefore a community based universal screening and linkage to care approach is recommended for populations with a seroprevalence greater or equal to 0.1% (Center for Disease Control and Prevention, 2023). Seroprevalence refers to the level of pathogen in a community. Therefore, with a seroprevalence of 1.6 in Kentucky, universal testing is the recommended method of screening (Cabinet for Health and Family Services, 2016).

Treating HCV has become a national priority since the USPSTF and the National Academy of Science created the goal to eradicate HCV by 2030 (Smith et al., 2012). Aligned with this goal, president Biden passed a bill that provides 12.3 billion dollars toward HCV treatment over the next five years (Smith et al., 2012). Treatment decreases the risk of liver cancer by 75% and the risk of all-cause mortality by 50% (Jagpreet Chhatwal, 2023). Treating HCV will also decrease extrahepatic manifestations related to chronic HCV infection (Center for Disease Control and Prevention, 2020a; Jagpreet Chhatwal, 2023). These initiatives to eradicate HCV over the next 10 years will prevent 20,000 cases of cancer, 49,100 cases of diabetes, 25,000 cases of chronic kidney disease and 24,000 deaths (Furman et al., 2019; Huang et al., 2023; Llovet et al., 2021). To achieve these goals, UKHC providers and staff can work together to discover undiagnosed and untreated HCV patients using universal screening.

**Current Evidence-based Interventions/Strategies Targeting the Problem**

Kentucky has already taken the initiative to decrease HCV rates in several ways, including the use of a BPA in UKED, funding from the Gilead Focus Group to expand HCV research, increased treatment affordability, and the Kentucky Hepatitis Academic Mentorship Program (KHAMP). The BPA with linkage to care in the UKED focuses on screening and linkage to treatment for HCV using a pharmacy-driven treatment team (Moore et al., 2021). The Gilead Focus Group provides grants to patients whose insurance does not completely cover screening costs and helps support programs such as the UK Specialty Pharmacy Group while also tracking HCV screening and linkage to care data. Through the Viral Hepatitis Program, Kentucky has worked hard to make both screening and treatment more accessible and affordable to all Kentuckians (Kentucky Cabinet for Health and Family Services, 2020). Kentucky is also the first state to mandate HCV screening on all women during pregnancy (Winter, 2020). Some state Medicaid programs have removed restrictions for HCV treatment coverage, like removing retreatment restrictions, and removing prior authorizations for treatment (Hepatitis C State of Medicaid Access, 2023). Finally, the KHAMP program is expanding access to HCV treatment across all clinics in Kentucky (Kentucky Rural Health Association, 2023). This program provides Zoom training and mentorship to primary care providers, allowing for easier access to HCV treatment through primary care offices (Kentucky Rural Health Association, 2023).

The Emergency Department Universal HCV Screening and Linkage to Care Program at the University of Kentucky provides screening to all ED patients 18 years and older who have labs ordered. Since 2018 this program has discovered over 5000 treatable patients, all needing linkage to care (UK HCV Specialty Pharmacy Group, 2023 ). Treatment with Direct Acting Antivirals (DAA) was made available in 2013, making treatment more accessible and successful

ultimately leading to a viral cure (Kentucky Cabinet for Health and Family Services, 2020). Yet the average days from diagnosis to treatment for these ED patients was over 400 days until June of 2023, when the pharmacy-led HCV treatment group was made available (UK HCV Specialty Pharmacy Group, 2023 ). With the implementation of this universal screening with linkage to care method out of the ED, time from diagnosis to treatment has decreased to an average of  27 days (UK HCV Specialty Pharmacy Group, 2023 ).

There is potential to treat thousands more HCV patients if the Universal HCV Screening and Linkage to Care model expands to all ambulatory care clinics at UKHC. Since 2021, there are 275,467 patients identified as "unique," which means that they have the potential to test positive for HCV (UK HCV Specialty Pharmacy Group, 2023 ). Yet only 16,213 have received testing (UK HCV Specialty Pharmacy Group, 2023 ).Since the universal screening and linkage to care program using UK HCV Specialty Pharmacy Group is effective, this group now wants to adapt this model for the ambulatory care clinics at UKHC. This project seeks to improve provider and staff education surrounding the expansion of this model of care and improve compliance with the change, ultimately increasing patient HCV screening and treatement rates.

**Purpose**

The purpose of this quality improvement project was to expand and evaluate provider and clinical staff knowledge and screening practices surrounding universal HCV testing and linkage to care in ambulatory care settings and increase patient screening rates.

**Objectives**

1) Increase HCV education to providers and clinical staff across ambulatory care settings at UKHC;

2) Evaluate the changes in provider and clinical staff knowledge, screening practices and

attitudes around HCV screening guidelines and treatment, before and after providing education;

3) Evaluate potential barriers to rolling out universal non-targeted HCV screening;

4) Evaluate the number of patients screened following the intervention.

## Review of Literature

### Search Methods

The use of universal screening has shown to increase the number of HCV diagnoses, leading to this literature review (Wojcik et al., 2020). The literature review was conducted using the databases of PubMed, Medline, and CINAHL. Search criteria included English language articles with full text available and published between 2013 and 2023. Search terms included: "HCV" or "hepatitis c" and "universal screening" or "universal testing" "screening rates" and "education." Included in the search were systematic reviews, meta-analyses, cohort studies, and randomized controlled trials. Excluded from the search were articles without an abstract, articles that came from other countries, and articles that were not peer-reviewed. Thus, the level of evidence was an IV or higher. A total of 196 articles were found and narrowed down based on titles containing keywords of universal screening, HCV and hepatitis C. After applying inclusion and exclusion criteria, seven articles remained, including two systematic reviews, three cohort studies, and two retrospective studies.

### Review, Analyze, and Synthesize Evidence

The literature supports using universal HCV screening to identify previously undiagnosed cases of HCV. A study conducted using universal screening in Appalachian emergency departments found a 2% higher positivity rate than with targeting high-risk patients (Wojcik et al., 2020). These findings suggest universal screening should be used to ensure HCV cases are being diagnosed at the highest rate. Another study found significant testing gaps in demographics

and health behaviors, concluding that testing must increase to achieve HCV elimination. A systematic review of universal testing showed that this method, with Direct Acting Antiviral (DAA) treatment available to those who test positive, is cost-effective and the recommended strategy for achieving eradication (Kasting et al., 2022). Yet, HCV treatment uptake continues to decrease (CDC, 2021). The literature tells us that there are large gaps in rolling out the testing and linkage to DAA treatment, opening up the need for further research.

The University of Kentucky has been at the forefront of universal screening in emergency departments, operating the most extensive program in the nation. Between 2018 and 2021, the ED tested close to 65,000 patients for HCV (Moore et al., 2021).  Of those patients, 1 out of 10 people were found to be HCV Ab reactive; this rate is six times higher than the estimated community prevalence (Moore et al., 2021). The emergency department setting sees a large population of vulnerable patients, including a high population of intravenous drug users leading to high rates of HCV that will likely be higher than in an outpatient setting. Moore (2022) believes that expanding into ambulatory care clinics will increase screening by 55,000 patients and could yield 2,500 HCV Ab reactive patients, a rate of 4.8%.

Although this literature review did not find any research that specifically focused on universal screening as a method for improving HCV screening rates in ambulatory care settings, it did indicate a benefit to having cohesive screening processes throughout all healthcare settings. Calner et al. (2019) found that across a large medical center, active HCV infection (HCV RNA positive) rates varied greatly among five clinical locations. The ED setting had the highest positivity rate at 7.2%, while the family medicine clinics had a 2% positivity rate (Calner et al., 2019). The largest limitation of the study was the different standards for HCV testing across all settings, with the ED testing the most patients (Calner et al., 2019). Therefore, a potential

solution for increasing the 2% positivity rate would be to increase HCV screening by using a cohesive universal screening method across the enterprise.

One barrier to expanding universal screening is that the patient may never get the testing done. Kasting et al. (2022) looked at testing rates at large academic medical centers and found that to improve testing follow-through, it is essential to target systems, healthcare providers, and patients (Kasting et al., 2022). Wong et al. (2017) investigated healthcare provider education and patient education and found that improvement in HCV screening rates occurred after providing provider education during resident conferences, posting signs in resident work areas, and providing pamphlets to patients. The authors found that preintervention screening rates were 6%, increasing to 35% three months post-intervention (Wong et al., 2017). Using these strategies to target healthcare providers at UK ambulatory care clinics could improve compliance with ordering universal HCV screening and improve the change process.

**Current State and Gaps in the Literature**

One significant gap in this literature search is the lack of research conducted on universal screening, specifically on education necessary for providers. Most studies surrounding the topic were conducted in ED settings making ambulatory care-specific information difficult to find. The study conducted by Wong et al. (2017) was the closest research that focused specifically on provider education for HCV screening expansion. Yet it was neither conducted in an ambulatory care setting nor specifically aimed toward universal screening. This study tells us that provider education improves screening rates. Still, it does not give guidance on the best educational approach to improve provider compliance with universal HCV screening, and it does not give us any information on current provider knowledge or screening methods. Nevertheless, these studies suggest that following CDC universal screening guidelines is the most effective way to

identify undiagnosed HCV-positive patients; moreover, provider education is necessary to promote this change. A study on provider adherence to asthma guidelines indicates that having pharmacy support paired with decision support tools, such as a BPA, increase provider likelihood to adhere to guidelines. Therefore, this project aimed to fill the gap using a similar method to the asthma guideline study, providing decision support using a BPA paired with education on the UK HCV Specialty Pharmacy Group support.

## Theoretical Framework

In this project, the theory of planned behavior guided the implementation of provider education of universal HCV screening across ambulatory care. This theory assumes that people's behavior is determined by subjective norms, attitudes and perceived behavior (Bosnjak, Ajzen, & Schmidt, 2020). The key variables in this project are staff knowledge, screening practices, and attitudes of HCV screening guidelines. There are several assumptions underlying this project. First, it is likely that providers are not ordering HCV screening because they have a lack of knowledge, believing that it is the norm not to order HCV screening on everyone. In addition, this project assumes that staff will not order HCV screening based on the universal HCV screening BPA because they perceive that this behavior will make their job more difficult. Finally, there is the assumption that providers will have a negative attitude towards the changes being made. The pre-survey provided answers to these assumptions, the educational intervention addressed these barriers to change, and the post-survey determined if providing education improved lack of staff knowledge, attitudes and intended screening practices.

**Methods**

**Project Design**

  This quality improvement project used a quasi-experimental pre/post-test design with a retrospective chart review to discover the impact of education on process change surrounding universal HCV screening in two ambulatory care settings. There was no control group or randomization needed for the study. The project was designed to examine the relationship between provider and staff knowledge and attitudes pre and post a 13-minute education video and the impact it had on patient HCV screening in ambulatory care clinics at UKHC.

**Setting**

*Agency Description*

  The project was conducted at two family medicine clinics at UKHC. The two clinics provide primary care to patients from all over Kentucky. The average patients seen per provider is close to twenty patients, making time efficiency very valuable. Established clients of this clinic are insured by Medicaid, Medicare, PPO/HMO plans, or are self-paying patients. The clinic is open Monday through Friday from 7a to 6p.

*Congruence of Project to Selected Agency*

  UKHC uses the DIRECT (diversity, innovation, respect, compassion, and teamwork) values to build its mission and goals (UKHC, n.d.). This project directly aligns with the mission and values of the agency. The 2025 Strategic Plan objectives created by UKHC are to "build our culture, invest in our people, provide more value, advance care strategically, and create a healthier Kentucky" (UKHC, n.d.). This project will advance care by aligning provider HCV screening standards with the CDC guidelines to screen all patients 18 years and older. It will also

create a healthier Kentucky by identifying patients that can receive treatment for HCV and help link them to treatment.

### *Description of Stakeholders*

A major stakeholder in this project is the Ambulatory Operating Committee, one of six executive committees at UKHC. Other stakeholders involve the family medicine medical director, the nurse manager, the HCV Specialty Pharmacy Group, ambulatory care providers and staff, and ambulatory care patients. The Ambulatory Operating Committee oversees change in the ambulatory clinics; approval for this project came directly from the medical director of family and community medicine. The HCV Specialty Pharmacy Group created the BPA involving practice change, increasing the importance of this project's success. The HCV Specialty Pharmacy Group, including their APRN, worked closely on this project. This group provided expert knowledge throughout the educational video. The ambulatory care providers and staff are stakeholders because their responses created the results of this study. Finally, the patients are involved because they will be affected if providers follow through with ordering the screening though the BPA.

### *Site-specific Facilitators and Barriers to Implementation*

The facilitators for this site include the accessibility to reach providers. UKHC already has many educational platforms in place, such as myUK learning and listserv, that are used to keep the staff up to date on best evidence-based practices. It was easy to incorporate this project into those platforms, making it accessible to all providers of ambulatory care clinics. Another facilitator was the UK HCV Specialty Pharmacy Group. Their expert knowledge along with evidence based practice was essential to creating the education intervention for this project. A barrier to the this project was willingness to participate due to survey fatigue. Another barrier

was UKHC email fatigue and the email sent for this project could have easily been lost to the providers and staff other emails.

**Sample**

The sample includes all family and community medicine providers and staff at two UKHC Family Medicine Clinics. Inclusion criteria was providers and staff on the listserv at these two clinics. The exclusion criteria were those who were not 18 years or older, people who did not speak English, and providers who were no longer working at UKHC. The survey was sent out to 23 nursing staff and 33 providers across both locations. A power analysis was conducted to receive ideal sample size. Using 56 as a population size and a 90% confidence interval, 47 participants was the target sample size.

**Procedure**

*IRB Submission Process*

This project was submitted to IRB for approval to ensure the safety of human subjects. To facilitate approval, a letter was obtained from population health, the HCV specialty pharmacy committee, The Office of Graduate Medical Education and student affairs for The College of Medicine. Following submission IRB approval was granted on October 31, 2023. Prior to study initiation, a modification was submitted to include students and residents in the study. Approval from the GME and OME was necessary for this modification. Getting approval from these two groups required a letter from the director of residents for internal medicine and family medicine. Approval after this modification was granted on December 1, 2023. See Appendix 1 for project dates.

*Description of Evidence-Based Intervention*

The literature showed that universal HCV screening works, yet the data surrounding best implementation in ambulatory care is lacking. Therefore, collecting data from the HCV Specialty Pharmacy Group during their expansion into the two clinics was the next step. The BPA was activated for universal HCV screening in the two family and community medicine clinics prior to the education and survey being sent out. With the BPA, an option for HCV antibody screening automatically prompted providers when placing other orders in Epic. This occurred with every patient, 18 years and older, who had not had an HCV screening in the past year at any clinic within UK. Some providers may have dismissed the BPA pop-up in Epic due to lack of knowledge. After the BPA was activated, this project educated staff on the importance of giving every patient who meets the criteria, the option to receive HCV screening. An educational video with information on the importance of HCV screening, the current impact HCV has on Kentucky, how the change will impact their practice, how the prompt will work in their Electronic Medical Record (EMR), how to follow through with the order and how to link the positive patients to treatment was sent to all providers through a listserv email. Embedded in the link with the educational video was a pre- and post-survey given through Qualtrics. When participants clicked on the link in the email sent, they were brought to a cover letter. Simply clicking next took participants to the pre-survey, followed by the education and post-survey.

*Measures and Instruments*

The main outcome measures for this project were evaluating provider knowledge surrounding HCV screening and treatment, screening practice rates, intent to use the universal screening method, and understanding of universal screening roll-out and potential barriers. These variables helped determine the effectiveness of the educational video and offer the HCV

specialty pharmacy group insight into provider attitudes surrounding the change. The demographic variables included provider gender, area of practice, degree/certification, and years of practice. See Appendix 2 for survey.

**Data Collection**

The data collection for this project was over one month period. First, the survey went out to providers at the two clinics, on January 16th. The survey was open to providers for one week before going out to all nursing staff on January 25th. The reasoning for the one week difference was a decision made by the HCV Specialty Pharmacy Group. The group felt that providers needed to get confortable with the order before sending out to all staff. The pre-survey, education and post-survey were all included in the same link and both groups received the same invitation email from their supervisors. The providers received one from the director of family medicine and the nursing staff received one from their clinical nurse manager. A reminder email was sent in the same manner on February 5th , letting the whole sample know that the survey would be closing on February 15th. Data survey links were sent through a secure listserv; no IP address information was collected. All data was collected securely through Qualtrics and stored in SPSS on the Primary Investigators firewall protected computer.

**Data Analysis**

The data analysis was completed by using IBM SPSS version 29 software. Descriptive statistics were used for the demographics of the population, including frequency distributions, standard deviations, and means. Total scores on the pre and post-test true or false questions were calculated and put through a paired t-test. Paired t-tests were then used on each provider's intention question. Finally, all open responses were read individually.

**Results**

**Sample Characteristics**

Of the 56 providers and staff who received the survey, 27 opened it. Of the 27 that

opened the survey, 19 completed the demographic questions and 12 completed all questions. All

participants identified as female. A majority identified "Primary Care" as their primary area of

practice (94.7%), with three identifying "Other." The sample was made up of six

certifications/degrees, the majority of which were MDs, APRNs and MAs. Finally, the years of

experience ranged from 1-30 years; 26.3% with 1-5 years of experience, 42.1% with 6-15 years

of experience and 31.6% with 15-30 years of experience (see Table 1).

**Provider and Staff Knowledge**

The true/false knowledge questions regarding HCV screening and treatment were

analyzed for participant correctness. The $p$-value of .339 did not show statistical difference in

knowledge between the pre and post-test. With the potential range of 0-8 correct questions, the

pretest (n=17) had a mean (SD) of 6.75 (.63) and the post-test (n=12) had a mean (SD) of 6.5

(.80). Although the knowledge levels did not significantly change, it is of note that providers

have high baseline HCV knowledge. See Table 2 for results.

**Current Practice**

Providers and staff were asked to rate the importance of HCV screening to their practice

on a scale of 0-10. The following question had them give a percentage of their patients 18 years

and older that they believe have already been tested. The importance of HCV screening to the

participants' practice was analyzed using mean (SD) with a potential range of 0-10. The pre-test

(n=17) showed 8.73 (1.85) and the post-test (n=12) showed 8.82 (1.78). The amount of patients

claimed to be screened by participants was 48.5% (?) (30.73) prior to education, with intent to

screen 53.3%(33.62) post-education. Although both questions showed increased means post-education, the *p*-value for importance of screening was .34 and the *p*-value for percent of patients screened was .54. This does not show statistical significance (see Table 2).

**Likelihood of Using BPA**

A question regarding intention to follow through with ordering the HCV screening was asked to all providers and staff. The questions potential range was 0-5 using a Likert scale, zero being extremely unlikely and five being extremely likely. Both pre-education and post-education the results remained the same with a mean (SD) of 3.45 (.93). The *p*-value was 1. An open response was connected to this question, allowing participants to explain why they would be unlikely to follow through. Three participants responded that they "are not a provider." Data were then extracted based on demographics. Of the providers, APRNs and MDs, 75% said that they were likely to screen the patient pre-survey and 100% said they were likely to screen their patients post survey. See Table 2 for results.

**Key Themes**

The final question of the post-test allowed the participants to leave an open response regarding potential barriers to the change. This allowed respondents to give feedback on ways to improve this change process and provide insight on why the testing and linkage to care may not work for their patients. Of the 12 participants who completed the survey, 4 left responses to the question, their answers are as follows:

- *Patient insurance being charged*

- *Patient refusing to get tested, no insurance*

- *Time, patient agreement*

- *Current ordering prompts are not user-friendly.  there [sic] are several clicks still needed to complete the order - have to add diagnosis and change details.  Is it covered by all insurance or will patient get billed?*

**HCV Screening Trends**

The HCV screening rates were extracted from the two ambulatory clinics. Pre-intervention, throughout 2023, the screening rates trended from 2% to 7.5% of patients. Throughout the week of December 26th, when the BPA was triggered, screening rates were 4.86%. Screening rates were 8.3% the week of January 16th, the week the education was sent out. The week of February 26th, when data was collected, screening rates increased to 9.25%. The relative change from the week education was sent out, to the week data was collected was 11.45%. See Table 3 and Figure 1 for results.

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**Discussion**

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This project aimed to achieve the following objectives: enhance HCV education among providers and clinical staff at UK Healthcare ambulatory care settings, assess the impact of this education on their knowledge, screening practices, and attitudes towards HCV guidelines and treatment, evaluate barriers to implementing universal non-targeted HCV screening, and measure the increase in HCV screening rates among patients post-intervention. All measures of this project were met. Universal screening is a newer concept to medicine, the literature reveals it is imperative to identify new cases and rediscover previous cases (Havens & Anderson, 2020). Yet there is little research and no standardization on best implementation with linkage to treatment. This study ultimately found that using an educational video intervention can be successful to increase provider adherence to HCV universal screening. In addition, this project generated optimism and adherence among providers, by having a strong plan and dedicated staff for

linkage to treatment. Finally, providing open communication to address barriers early on is important for successful change.

**Provider Adherence vs. Intentions**

This project emphasizes the necessity for a varied measurement approach of intention on provider adherence. Comparing survey results with data collection found discrepancies between provider intention and actual adherence. True screening rates 4.86% at the start of the project, while providers believed they were screening at a rate of 48.5%. Even though providers knew that universal screening was important, the numbers showed different. Intentions not aligning with true screening rates further emphasized the necesity of providing education to providers and staff.

Understanding provider intention is critical to validating the reasons for adherence. Provider adherence refers to the extent to which healthcare professionals adhere to evidence-based recommendations (Labeau, 2020). Labeau (2020) study highlights the complexities of measuring provider adherence and promotes utilizing diverse methodologies for assessment. Recognizing that provider intentions often do not align with their actual adherence to guidelines is imperative for future progression and intervention. It emphasizes that there should be more research surrounding effectively educating on the topic. Educating providers and staff is valuable for implementing universal screening. However, investigating further into provider intention will shed light on the factors driving adherence and enable stronger education efforts in the future.

**Theory of Planned Behavior**

To further explore how intentions and behavior have impact on HCV practice change, the Theory of Planned Behavior can be helpful. As hypothesized by this theory participants' beliefs and intentions significantly influence their capacity for change. Literature on Dissemination and

Implementation Science delves into how the Theory of Planned Behavior can impact evidence-based practice change (Burgess et al., 2017). Similar to this project, Burgess et al. (2017) observed that the perception of difficulty greatly influences practice change. The HCV specialty pharmacy group has effectively offered to ease responsibilities if a patient tests positive. However, without education, providers and staff may have continued to perceive the BPA as a burden. Addressing perceived difficulty and simplifying linkage to treatment are crucial steps in advancing the expansion of universal HCV screening.

**Screening and Linkage to Care**

Ultimately, the most valuable aspect of this project lies in increasing screening rates and facilitating patient linkage to treatment. A recent University of Kentucky DNP student project found education emerged as a pivotal factor in enhancing HCV screening trends, particularly in the Emergency Department setting. *Increasing Staff Compliance with Routine HCV Screening and Improving Linkage to Care Among Patients Testing Hepatitis C Positive in the Emergency Department* used the question "I never order the test" to assess the impact of education on screening practices, revealing a significant improvement in testing frequency after education (Swartz, 2022).

To further validate these findings, this project conducted in ambulatory care presents the actual patient screening rates before and after education. Adding a BPA to the providers practice may not have been as successful without education. Ensuring providers are adequately educated on the recommended screening practices and linkage to care at their facility, can improve screening rates as evidenced in both Swartz and this project's findings.

**Addressing the Barriers**

Addressing the barriers to the process change highlighted in this project was essential. While universal screening prompted by a BPA has demonstrated effectiveness, studies have predominantly focused on ED settings, highlighting a significant gap in ambulatory care. The implementation of this project exposed the fact that simply triggering HCV testing does not necessarily simplify HCV orders. Unlike the ED, outpatient providers must link each order to a diagnosis ICD-10 code. This project facilitated necessary corrections to ensure that ordering through the BPA automatically connects the two. By addressing these issues, the project aimed to enhance provider follow-through, ultimately impacting patient outcomes in ambulatory care settings. Encouraging open communication for promptly addressing barriers can enhance provider adherence, thereby leading to improved screening rates.

## Implications for the Future

**Practice and Education**

This project highlights the importance of having a clear HCV screening and linkage to care plan that alleviates the burden on providers, providing a sustainable way to implement practice change. In addition, it can easily be transferred to different settings and populations of participants. Primarily, the research emphasizes the effectiveness of simplifying HCV screening and treatment processes. However, a standardized approach to achieve this is lacking. The HCV specialty pharmacy group's implementation of a BPA streamlined linkage to treatment, eliminating the need for follow-up appointments for simplified patient care. This method was clearly laid out for providers during the education intervention, impacting their likelihood to follow through with the order. Thus, when implementing practice change regarding HCV screening it should include education regarding the linkage to care plan. The intervention for this

project is a video that can easily be used for other clinics moving forward. Ultimately, taking this education and continuing to trigger the BPA across ambulatory care clinics at UKHC can lead to an enterprise-wide practice change.

Research indicates that introducing practice changes to medical students early in their training enhances the likelihood of adoption (Burnett et al., 2018). Therefore, incorporating education on HCV management based off UK Specialty Pharmacy Groups findings and success is integral. This project originally intended to reach medical students and residents, approved through the GME and OME at UKHC. Yet, due to time constraints and approval this aspect of the study was not conducted. In the future, this information should be disseminated to all individuals who are learning to become providers, including residents, Nurse Practioner students and Physician Assistant students.

**Policy and Research**

In healthcare, the future of HCV screening and linkage to care holds immense potential for change, as evidenced by this project, alongside research findings and government policy and funding. Policy and research must work hand in hand to address the need for a standardized aggressive approach to screening and linkage to care. For instance, the Gilead Focus Group funds policy change and implementation programs while also meticulously tracking data from all funded programs. While ongoing data collection is crucial, this project highlights the importance of effectively disseminating this information to those who can positiviely impact change at the patient level.

This project not only supplements the expansion efforts but also offers an accessible means of education and feedback for providers and staff. By fostering open communication with providers and staff, this project has facilitated the early resolution of barriers encountered during

the change process. As research continues to emphasize the positive impact of universal screening and the linkage to care process employed by the HCV Specialty Pharmacy Group on patient care, policy adjustments will become imperative.

Finally, further investigation into the impact of this project on facilitating linkage to care and examining the effectiveness of patient education in ensuring treatment adherence are essential avenues for future research in HCV intervention. Swartz (2022) highlighted the efficacy of using flyers to enhance linkage to care, an aspect which could not be explored within the timeframe of this project. Therefore, moving forward, it is crucial to prioritize the examination of linkage to care. If the numbers indicate low linkage to treatment, the next logical step would be to consider implementing patient flyers based on Swartz's findings.

**Financial Impact**

The financial ramifications of the proposed project are profound, with a dedicated $12.3 billion allocated to HCV treatment and research. Highlighted in existing literature is the critical need for a universal HCV screening method that expedites patient access to treatment, as failure to do so risks the loss of patients within the healthcare system (Kasting et al., 2022). Left undiagnosed, HCV infections pose grave health risks, including hepatocellular carcinoma, cirrhosis, and mortality, with projected costs exceeding $5 billion by 2025 (Razavi et al., 2013). Failure to reverse the upward trend in HCV rates threatens to compound these expenses. Despite the considerable financial investment required for insurance coverage and grants, they represent pivotal steps toward achieving the overarching objective of HCV eradication. This thesis emphasizes the urgency and importance of implementing comprehensive strategies to address HCV detection, treatment, and prevention to mitigate its substantial economic burden and public health impact.

**Sustainability and Transferability**

Impacting change across UKHC is only the beginning, taking the information learned in this project and effecting change across the nation is imperative. Simply using a short educational video to outline process change and the importance of HCV screening proved effective. Continuing to edit the education to meet the needs of providers and staff at different locations will be easy because of the survey data provided by the project. Going forward, implementing a Plan-Do-Study-Act (PDSA) cycle for each stage of UKHC expansion will strengthen education efforts. Once standardized across the entire enterprise, processes can easily transfer to other facilities, depending on their EMR systems. While replicating the BPA may face challenges in differing EMR, a similar model with an HCV Specialty Pharmacy Group can be used. The insights on open communication from this project are crucial, especially when expanding to other facilities.

## Limitations

The project encounters two primary limitations: sample size and timeline constraints. Ideally, the sample size would have consisted of 47 participants; however, only 12 completed the entire survey. This discrepancy significantly affects the statistical power of the study. A larger sample size would have enhanced the reliability of the findings.

Furthermore, the project was constrained by changes in the timeline. Given more time, it is reasonable to anticipate that screening rates would have shown even greater improvement. A chart review should be conducted after more time is passed to ensure screening rates are continuing to increase. A review after more time will show true impact in the ambulatory care setting. Unfortunately, due to project constraints, this aspect could not be further explored or validated.

## Conclusion

In summary, HCV has increased trifold since 2010, affecting greater than an estimated 5 million people (Center for Disease Control and Prevention, 2020a). Universal screening with a linkage to care program using HCV Specialty Pharmacy Group has proven to be an effective process in the UKHC ED setting. Continuing to expand this method can be the impact needed to eradicate HCV by 2030. This DNP project demonstrates the critical need for improved HCV screening rates and linkage to care programs within primary care settings. Through the utilization of an educational video intervention and a streamlined plan for linkage to treatment, this project demonstrates promising results in enhancing provider adherence and generating optimism for change among providers. Moving forward, educating providers and staff, providing a clear linkage to care plan, and providing open communication to address barriers can improve adherence to screening efforts. Despite inherent limitations, this project lays a solid foundation for future research and practice aimed at ensuring high rates of HCV screening and fostering positive health outcomes across diverse healthcare settings.

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  0years.

Table 1. Provider and staff demographic variables (*N*=19)

| Characteristic | *n* (%) |
|---|---|
| Gender | |
|   Male | 0 (0.0%) |
|   Female | 19 (100.0%) |
| Primary Area of Practice | |
|   Primary Care | 18 (94.7%) |
|   Other | 1 (5.3 %) |
| Degree/Certification | |
|   MD | 4 (21.1%) |
|   APRN | 4 (21.1%) |
|   RN | 2 (10.5%) |
|   LPN | 2 (10.5%) |
|   MA | 3 (15.8%) |
|   NCT | 1 (5.3%) |
|   Other | 3 (15.8%) |
| Years of Experience | |
|   1-5 years | 5 (26.3%) |
|   6-15 years | 8 (42.1%) |
|   15-30 years | 6 (31.6%) |

Table 2. Changes in knowledge and intentions pre-education, (*n*=17) post-education, (*n*=12)

| | Potential range | Pre-education mean (SD) | Post-education Mean (SD) | p |
|---|---|---|---|---|
| Knowledge | 0-8 | 6.75 (.63) | 6.5 (.80) | .339 |
| Importance of HCV screening to their Practice | 0-10 | 8.73 (1.85) | 8.82 (1.78) | .341 |
| Patient screening rates | 0-100 | 48.5 (30.73) | 53.3 (33.62) | .543 |
| Ease with connecting patients to treatment | 0-10 | 6.89 (2.09) | 8.22 (1.56) | .016 |
| Likelihood of following through with HCV screening | 0-5 | 3.45 (.93) | 3.45 (.93) | 1 |
| APRN and MD Likelihood of following through with HCV screening (n=4) | 0-100 | 75% | 100% | NA |

Table 3. Retrospective data screening rates at two ambulatory care clinics (*N*=67,592)

|  | Screening Rates | Relative Change from Previous |
|---|---|---|
| Week BPA triggered | 4.86% |  |
| Week education sent out | 8.3% | 70.78% |
| Week data collected | 9.25% | 11.45% |

Figure 1. HCV screening trends (*N*=67,592)
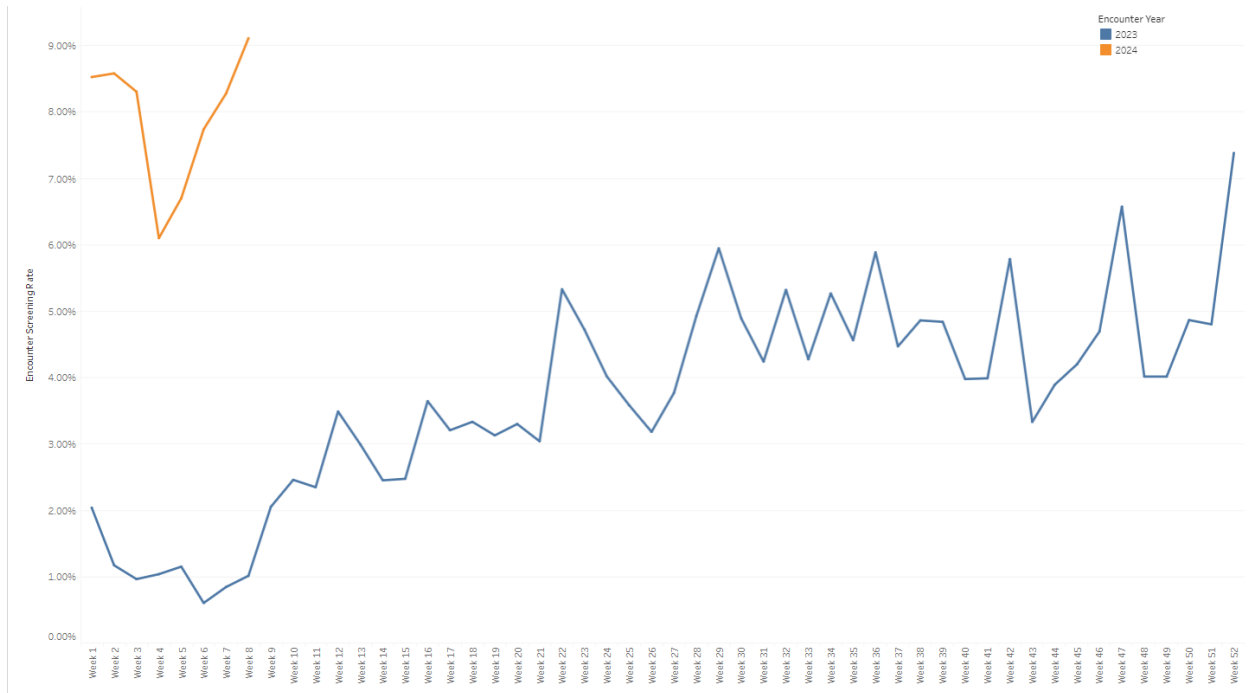
Appendix 1. Dates

| Dates | Goals |
| --- | --- |
| IRB approval | October 31 |
| IRB modifications | December 1 |
| BPA triggered at clinics | December 26 |
| Survey and Education to Providers | January 16th |
| Survey to Nurses and Staff | January 25th |
| Survey Closed | February 15th |
| Post- intervention screening rates collected | Feb 26th |

Appendix 2. Qualtrics Survey/Education



I work at UK Healthcare

Yes

No

What is your Gender?

Male

Female

Non-binary

Prefer not to answer

Other

What is your primary area of practice?

Primary Care

Cardiology

Gastroenterology

Neurology

Urology

Hepatology

Oncology

Addiction Medicine

GYN/Womens Health

Urgent Care

UK Health Services

Other

[            ]

What is your degree/certification?

MD

DO

PA

APRN

RN

LPN

MA

NCT

Medical Student

Other

[            ]

How many years of experience do you have?

Less than one year

1-5 years

6-15 years

15-30 years

30+ years

Are you attending an in-person or online training? (If you are taking this on your own it is an online training)

Online

In-Person

→

It is estimated that up to 85% of HCV cases are still undiagnosed.

True

False

All patients 18 years and older should be screened for HCV.

True

False

HCV positive patients can be treated if they are still using IVD.

True

False

Patients cannot be treated again if they become reinfected.

True

False

HCV treatment is covered by insurance.

True

False

Treating HCV decreases the risk of Liver cancer by 75%.

True

False

Treatment of HCV requires frequent labs and diligent monitoring.

True

False

Patients only need HCV treatment if they show signs of liver fibrosis.

True

False

→

On a scale of 0-10 how important is HCV screening to your practice?

| 1 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|----|

Importance

Of your current patients, what percent of patients 18 years and older have been screened for HCV?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|----|----|----|----|----|----|----|----|----|-----|

Percent

I am aware that clinics at UK Healthcare will be implementing a Non-targeted HCV Screening Best Practice Alert in Epic with Linkage to Care.

True

False

What is the likelihood you will follow through with ordering HCV Screening?

Extremely Unlikely

Unlikely

Neutral

Likely

Extremely Likely

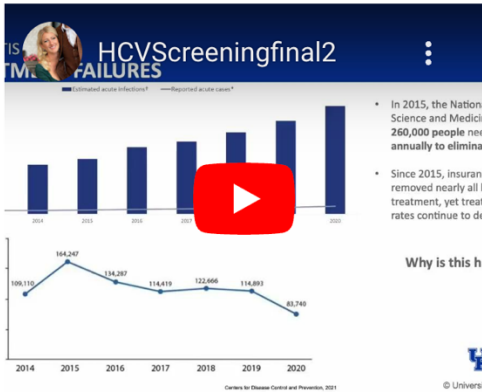If you answered "Unlikely" to the above question, what is your reasoning?

If you have had positive HCV patients, on a scale of 0-10 how easy is it to connect them to treatment?

| Extremely difficult | | Somewhat difficult | | Neither easy nor difficult | | | Somewhat easy | | | Extremely easy |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 |

Difficulty

→

Please view the education below on HCV screening and linkage to care.



→

It is estimated that up to 85% of HCV cases are still undiagnosed.

True

False

All patients 18 years and older should be screened for HCV.

True

False

HCV positive patients can be treated if they are still using IVD.

True

False

Patients cannot be treated again if they become reinfected.

True

False

HCV treatment is covered by insurance.

True

False

Treating HCV decreases the risk of Liver cancer by 75%.

True

False

Treatment of HCV requires frequent labs and diligent monitoring.

True

False

Patients only need HCV treatment if they show signs of liver fibrosis.

True

False

→

On a scale of 0-10 how important is HCV screening to your practice?

| 1 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 |

Importance

Of your current patients, what percent of patients 18 years and older have been screened for HCV?

| 0 | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |

Percent

I am aware that clinics at UK Healthcare will be implementing a Non-targeted HCV Screening Best Practice Alert in Epic with Linkage to Care.

True

False

What is the likelihood you will follow through with ordering HCV Screening?

Extremely Unlikely

Unlikely

Neutral

Likely

Extremely Likely

If you answered "Unlikely" to the above question, what is your reasoning?

If you have had positive HCV patients, on a scale of 0-10, how easy do you think it will be to connect them to treatment with this new process?

| Extremely difficult | | Somewhat difficult | | Neither easy nor difficult | | | Somewhat easy | | | Extremely easy |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 6 | 7 | 8 | 9 | 10 |

Difficulty
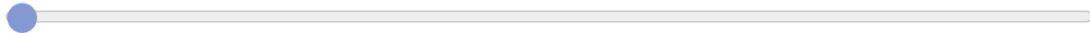
What are some potential barriers you could see your clinic running into with these changes?

→

Appendix 3. Recruitment Email

Dear Ambulatory Care Providers and Staff,

You will see a new Best Practice Alert which will prompt you to order HCV/HIV screening on all patients. Along with the roll out of the Best Practice Alert, any patients needing linkage to care will be managed by our dedicated specialty pharmacists and social workers as per the Collaborative Care Agreement.

**Please follow the link below to view an educational video on this process change:**

[https://uky.az1.qualtrics.com/jfe/form/SV_a6662fI3Tpl2lro](https://uky.az1.qualtrics.com/jfe/form/SV_a6662fI3Tpl2lro)

If you would like to partake in the associated DNP project, please review the instructions on the first page of the link explaining the pre and post surveys that go along with the video.

Best,

Morgan Stacey, APRN, DNP

Lauren Clifford, DNP Student