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Hepatitis C Screening in Primary Care

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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

HEPATITIS C SCREENING IN PRIMARY CARE

A Capstone Project Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Nursing Practice

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College of Natural and Health Sciences
School of Nursing
Nursing Practice

August 2017

This Capstone Project by: Elizabeth Leigh Cirbo

Entitled: *Hepatitis C Screening in Primary Care*

has been approved as meeting the requirement for the Degree of Doctor of Nursing Practice in the College of Natural and Health Sciences in School of Nursing, Program of Nursing Practice

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EXECUTIVE SUMMARY

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Primary care clinics are often the first stop when a patient has a question regarding health, needs screening for health conditions, and/or needs to complete maintenance healthcare items such as mammograms or colonoscopies. As such, primary care providers are in prime position to screen for possible diseases that could poorly affect health for their patients. These screenings are usually directed by guidelines and policies published through the National Guideline Clearinghouse (NGC) and the Agency for Healthcare Research and Quality (AHRQ; 2013). One such guideline is entitled *Screening for hepatitis C virus infection in adults: U.S. Preventive Services Task Force (2013) recommendation statement*. This guideline recommends that all persons born between 1945 to 1965 be screened once in a lifetime for the Hepatitis C virus (HCV). The recommendation is because chronic HCV infection can lead to decreased quality of life and high cost of care for the individual and the healthcare system if left untreated. Untreated HCV can lead to liver cirrhosis and hepatocellular carcinoma. A person who screens positive for infection with HCV can be appropriately treated and, in most cases, have complete disease eradication.

From the researcher's clinical experiences, the screening processes in many primary care clinics in northern Colorado were lacking in numbers of patients screened

and provider knowledge of when to screen their patients. The researcher developed a capstone project to implement at a primary care clinic through the use of three objectives:

1. Increase screening rates for HCV at a primary care clinic
2. Identify a barrier preventing providers from screening patients for HCV
3. Overcome the barrier preventing screening for HCV

Objective 1 was met through the use of an electronic medical record (EMR) review of patients who completed well-visits at the clinic before and after an educational seminar with the providers and staff at the clinic. Objectives 2 and 3 were met through an educational seminar to identify and overcome barriers through the use of surveys and handouts, respectively. The educational seminar allowed the researcher to offer screening coding tips to help with insurance coverage (as this was the barrier identified that prevented screening) and also to refresh providers and staff on the importance of HCV screening per the guideline for the birth cohort born from 1945 to 1965. The EMR reviews of well-visits showed a 30% increase in screening rates for HCV at this clinic-- the pre-seminar rate was 37.8% and the post-seminar rate was 68.89%. This shows the capstone project was a success to increase screening rates, identify a barrier preventing screening, and overcome this barrier. Success of this capstone will have effects into the future as hopefully, the providers and staff continue to increase HCV screening rates for patients at the clinic. The continued increase in screening rates could insure proper offering of treatment to patients identified as having positive HCV status to increase quality of life by preventing worse negative sequelae associated with chronic HCV infection.

DEDICATIONS AND ACKNOWLEDGEMENTS

I would like to dedicate this capstone project to my husband, Lucas, and son, Elijah. Through this process, they offered me endless support, love, and encouragement. Without your cheering me on, laughter, and devotion through the last four years, I'm not sure I would have made it!

It is also important to acknowledge and profusely thank the members of my committee for their direction, support, and recommendations that allowed me to pass this project. To my committee chair, Dr. Karen Hessler, thank you so much for the expertise, guidance, and help in answering my many questions about the capstone project. To my faculty committee member, Dr. Katrina Einhellig, thank you for giving me motivating pep-talks and feedback along the way as you also immensely helped me navigate through the capstone project process. To my community committee member, Maribeth Taylor, FNP, thank you for your involvement, research experience, and encouragement throughout the process as you helped me conduct this project. It has truly been a pleasure and a joy to work with you at your clinic as I implemented my capstone project.

To all my family and friends, thank you so very much for the continuous encouragement through the years of completing my doctorate and this capstone project. You all believed in me when I wasn't sure I could complete this undertaking! I appreciate your support of my family in watching Elijah, encouraging me, and loving me

as I journeyed through this rigorous academic goal. Completing this degree would have been impossible without you all and for you I am truly grateful.

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LIST OF ABBREVIATIONS

AASLD	American Association for the Study of Liver Disease
AHRQ	Agency for Healthcare Research and Quality
APRN	Advanced Practice Registered Nurse
CDC	Centers for Disease Control and Prevention
CINAHL	Cumulative Index of Nursing and Allied Health Literature
DAAs	Direct-acting antivirals
EMR	Electronic Medical Record
HCV	Hepatitis C Virus
PCC	Primary Care Clinic
IDSA	Infectious Disease Society of America
IT	Information Technology
MA	Medical Assistant
MD	Medical Doctor
MeSH	Medical Subject Headings
NGC	National Guideline Clearinghouse
PCP	Primary Care Provider
PICOT	Population/Patient Problem, Intervention, Comparison Outcome, Time

CHAPTER I

STATEMENT OF THE PROBLEM

Introduction and Background

Primary care providers (PCPs) have been called the gatekeepers to health care. Primary care providers are the first to assess a health situation and determine the best course of action. As such, PCPs need to be well-versed in many diagnoses and plans of care for such diagnoses as well as be able to provide a thorough well-check or annual physical. The recently enacted Affordable Care and Safety Act mandates insurances pay for more preventative medicine to save costs involved in caring for chronic, highly-progressive diseases and have a healthier population in general. This results in more people getting annual well-exams and completing preventative and screening healthcare protocols. Some of these protocols include primary interventions like influenza and shingles vaccinations and education on healthy lifestyles to try to circumvent disease. Other secondary surveillance methods include screenings for various diseases as indicated. Common blood work included in typical screenings at a PCP office are lipid levels, thyroid tests, and metabolic panels to screen for cholesterol imbalances, hypo- or hyper-thyroid disease, and glucose and electrolyte imbalances. Other screenings include colonoscopies, mammograms, and pap smears to screen for colon cancer, breast cancer, and cervical cancer.

Most primary care offices adhere well to these screening and prevention recommendations from the Centers for Disease Control and Prevention and the National Guideline Clearinghouse (NGC), which is operated by the Agency for Healthcare Research and Quality (U.S. Preventive Services Task Force [USPSTF], 2013). Many of these protocols and recommendations were developed by experts in each field as well as based on meta-analysis of research on the associated topic. Most of these screening recommendations come from the NGC and are graded upon evidence and outcomes as A through I--where A is supported by the most evidence and highly recommended with benefits outweighing risks and I is not recommended as not enough evidence is available to support implementation (USPSTF, 2013). One such grade B recommendation is for adults born from 1945 to 1965 be screened for HCV once in a lifetime with a potential for rescreening based upon high-risk behaviors or receipt of a blood transfusion before 1992. This grade B recommendation is perceived as having moderate net benefit in preventing further clinical poor outcomes related to HCV as well as preventing further spread of disease and providing opportunities to teach about this disease process (USPSTF, 2013).

Hepatitis C virus is spread from bodily fluid contact and is a mostly preventable disease. According to McCance, Huether, Brashers and Rote (2010), HCV is the most common cause of chronic liver disease in the Western world; it is contracted through contact of bodily fluids and 40% of cases are from intravenous drug users (p. 1489). As such, HCV is largely preventable and now also treatable, especially when detected early. For the birth cohort of adults in the United States born between 1945 and 1965, it is recommended each individual be screened for HCV at least once in their lifetime even if

asymptomatic of liver disease or abnormalities (USPSTF, 2013). The guideline has determined it to be important for this population to be screened due to high risk for transmission of disease from possibly receiving a blood transfusion before HCV was part of the universal screening in blood products and the possibility of transmission from high-risk behaviors in younger years such as multiple sexual partners, unprotected intercourse, and/or intravenous drug use (USPSTF, 2013). This birth cohort is at higher risk for these behaviors partly due to living through the 1970s and 1980s when previously mentioned high-risk behaviors were a common part of the lifestyle.

It is recommended this birth cohort be screened because untreated HCV can cause major negative health sequelae for the individual as well as being unknowingly transmitted to other persons through sexual contact and intravenous drug use.

Undetected and, thus, untreated HCV causes an increased cost load on the healthcare system to treat the negative health sequelae of HCV disease progression. Proper screening and treatment helps prevent decreased quality of life for those infected with the advanced untreated disease. By implementing a screening process for the birth cohort born from 1945 to 1965, those who received a blood transfusion before 1992, and high risk individuals, the cost on the healthcare system could be decreased and more adults could have increased quality of life with less negative health sequelae from HCV.

As an Advanced Practice Registered Nurse (APRN), preventing illness and limiting negative outcomes from disease process are key to holistic care provided by nurses. Implementing HCV screening in primary care for the aforementioned populations is one simple addition to routine health screenings that could have a large impact on individual health care, a population's health, and associated healthcare costs.

Hepatitis C virus is a disease that in its early stages, even in a chronic disease state, is often times asymptomatic. According to the American Association for the Study of Liver Disease-Infectious Diseases Society of America (AASLD-IDSA; 2015), approximately 2.2 to 3.2 million persons are infected with HCV in America and about half do not know they are infected. To decrease transmission rates and increase treatments rates, proper screening methods must be adhered to in primary care settings. Screening for HCV is a simple blood test but is not often offered to patients. This can be due to lack of knowledge by providers to implement this screening (Bechini et al., 2015), lack of time in office visits for providers, or lack of knowledge of treatment if results are positive from a screening test.

The practice setting for the capstone was a primary care clinic (PCC) located in Greeley, Colorado. This practice has five providers: four medical doctors (MD) and one family nurse practitioner or APRN. Two of the doctors are full-time at the clinic, one is there one day per week, and one is an on-call position, filling in on an as-needed basis. The APRN sees patients four days per week. The clinic cares for adult patients with chronic illnesses such as chronic obstructive pulmonary disease, diabetes mellitus, and asthma among other chronic conditions. The providers serve as patients' primary care providers (PCP) for well-visits and episodic visits as needed. The PCC focuses on quality of life for patients through preventive care and management of chronic disease. This capstone project focused on improving rates of screening for HCV by identifying and overcoming barriers to screening.

Population, Intervention, Comparison, Outcome, and Time Statement

An analysis of current practice of HCV screening in the PCC and many family practices in the Northern Colorado area found HCV screening for this particular birth cohort was not routinely offered or completed. Although HCV is not a diagnosis to make lightly, it is better to diagnose and treat it than let it go unmanaged, leading to chronic liver disease. By implementing standardized screening mechanisms for HCV for PCPs, the goal was to identify otherwise undiagnosed cases of HCV to reduce negative health sequelae and decrease healthcare costs.

Barriers to screening for HCV in primary care include time limitations with patients, little or no knowledge of HCV screening guidelines, and lack of knowledge of how to treat a patient with a positive screen. The target population of this capstone was patients in the birth cohort from 1945-1965 and high-risk patients: those who have in the past or are currently using intravenous drugs, patients who have been incarcerated, patients who engage in risky sexual behaviors, and patients who received a blood transfusion before 1992 (USPSTF, 2013). The researcher evaluated if screening was completed at well-visits over a three-month time period through a chart review of the electronic medical record (EMR) for the specified patient population. The desired outcomes of the capstone were increased rates of screening and identification and dismantling of barriers to screening for providers. Thus, this project answered the PICOT question: For patients born from 1945 to 1965, is appropriate screening offered for HCV routinely at the PCC compared to no screening process to improve screening rates after implementing a process change in a three-month time span?

Review of Literature

A literature review was conducted to evaluate current research, barriers to screening, and solutions to HCV screening utilizing CINAHL and PubMed databases, UpToDate, the Agency for Healthcare Research and Quality (AHRQ), and text books. While searching digital search engines, MeSH terms were used including hepatitis C, mass screening, and costs and cost analysis. This researcher reviewed multiple articles about this subject matter. The research yielded much information regarding HCV screening, the benefits of screening that could lead to early treatment, and barriers to treatment.

Hepatitis C virus is a disease that comes from bodily fluids being shared from an infected person to an uninfected person. According to Sanjiv, Bisceglie, and Bloom (2016), chronic HCV is often asymptomatic in many patients or the symptoms can be vague, e.g., arthralgia and fatigue. Vague symptoms lead to underdiagnoses for many patients or lack of recognition of an issue to report to the PCP for diagnosis and treatment. Chronic HCV infection can then lead to cirrhosis of the liver within 20-30 years, the leading cause of liver transplant in the United States of America (Sanjiv et al., 2016). This deterioration of the liver over time through misdiagnosis or missed diagnosis increases healthcare costs for patients and the healthcare system while decreasing quality of life for patients. Treatment of HCV with direct-acting antivirals (DAAs) is becoming more easily accessible and has revolutionized care of HCV to eradicate it completely from the host (Brouard et al., 2015).

Negative sequelae associated with chronic HCV infection include cirrhosis, liver failure with ascites, hepatic encephalitis, esophageal varices, and hepatocellular

carcinomas (Howie & Hutchinson, 2004). Upon utilizing a computer-generated model, Howie and Hutchinson (2004) utilized current data of HCV infection rates to estimate a cost burden of HCV if there was no process change of recognition and treatment of HCV. The CDC (cited in Howie & Hutchinson, 2004) estimated the direct cost of care for chronic liver disease in the United States would be approximately \$10.7 billion and indirect costs from associated mortality and morbidity of cirrhosis would be approximately \$54 billion. Although the cost of treatment with the preferred method of pegylated-interferon and ribavirin is costly, the cost of initial treatment is much less than the future burden of a large population of undiagnosed HCV patients developing cirrhosis or hepatocellular cancers (Howie & Hutchinson, 2004). As a comparison of costs from HCV developing into hepatocellular carcinoma or cirrhosis leading to liver transplant, the cost of a liver transplant is estimated to be \$103,548 and the five-year cost for a person diagnosed with hepatocellular carcinoma is \$106.4 million (Smyth et al., 2014). With the baby-boomer generation (the birth cohort born 1945-1965) having a high undiagnosed infection rate for HCV and if the majority of the undiagnosed cases of HCV develop into cirrhosis, end-stage liver disease, or hepatocellular carcinoma, the cost burden to patients and the healthcare system could be astronomical.

To prevent the development of HCV into cirrhosis, hepatocellular carcinoma, and end-stage liver disease for this large population, it is imperative to screen appropriately. This ensures HCV can be quickly diagnosed and treated with DAAs to eradicate disease (Smyth et al., 2014). Gane et al. (2015) extrapolated data about aggressive screening, diagnosis, and treatment rates of 16 different countries. The data showed increasing

screening and treatment three- to five-fold would dramatically decrease healthcare burden costs of HCV (Gane et al., 2015).

However, one barrier to adequate screening and, thus, diagnosis and treatment of HCV is provider awareness of appropriate screening. Bechini et al. (2015) conducted a semi-quantitative study in six European countries of providers regarding knowledge of guidelines about screening for HCV. A survey was developed by the researchers and sent to various healthcare providers with diagnosis and treatment scope of practice to determine knowledge of screening guidelines for HCV; 56% of the providers surveyed knew of national guidelines regarding HCV (Bechini et al., 2015). The survey results also found if providers were screening and received positive results, treatment and appropriate referral rates were low (Bechini et al., 2015). This exemplifies the need for increased awareness of screening guidelines as well as appropriate treatment upon positive screening.

The cost of screening is relatively minimal. A local laboratory in northern Colorado, Horizon Laboratory (2016), offers direct access testing to any person in Colorado at a fee-for-service cost of \$45; the testing does not require an order by a provider so a patient might complete tests as desired. This is a minimal cost compared to possible negative health sequelae related to chronic HCV infection progressing to one of the aforementioned disease processes. Also, most insurances cover preventative lab work such as the screening previously discussed. According to Alter, Kuhnert, and Finelli (2003), laboratory costs to conduct an anti-HCV test are as follows excluding the payment of laboratory personnel, facility usage, etc.: “\$5/sample for initial screening test, \$15/sample for those testing initially reactive and repeated in duplicate,” and “\$50-

\$295/sample with reflex recombinant immunoblot assay RIBA and or nucleic acid test testing (NAT)” (Estimated Costs, para. 4). The reflex testing is lab and provider specific; however, if a screening anti-HCV test is positive, reflex RIBA or NAT testing must be completed to confirm positive HCV infection (Alter et al., 2003).

Another factor of HCV screening to consider is the sensitivity and specificity of the test. When screening is ordered, the USPSTF (2013) recommends Hepatitis C Immunoglobulin G antibody as the test of choice for chronic HCV. This test works by testing blood serum for antibodies to HCV in the patient (Sanjiv et al., 2016). Per Alter et al. (2003), if an anti-HCV test is positive, reflex testing is recommended to confirm a positive HCV infection. The anti-HCV test is completed with various manufacturers’ machinery utilizing enzyme immunoassays (EIA) or enhanced chemiluminescence immunoassay (CIA; Alter et al., 2003). When utilizing EIA testing for anti-HCV, the specificity is $\geq 99\%$; however, among immunocompromised patients, false-positive results can be as high as 15%. Due to the possibility of false positive, the CDC (cited in Alter et al., 2003) recommends reflex testing with RIBA or NAT to confirm a positive screening test.

After thorough appraisal of existing research, HCV screening has proved to be an effective use of healthcare costs with positive benefit to the patient and healthcare system as an outcome. The risk of screening is minimal compared to benefits gained from early identification of disease as are the treatment costs compared to the costs of late stage disease treatment. As recommended by the AHRQ (2013), routine screening is beneficial to individual patients, the healthcare population, and the healthcare system. The research showed evidence that HCV is treatable; the earlier the diagnosis is made, the better the

prognosis and lower cost compared to late stage disease treatment and care (see Appendix A for literature review table).

Theoretical Framework

For this capstone project, Lewin's change theory (Petiprin, 2016) guided the researcher in identifying barriers to change in the PCC, developing an action plan to overcome the barriers, and implementing new changes regarding the screening process for HCV in the birth cohort born 1945-1965. It is important to utilize theory to guide practice changes as changes within a clinic can be cumbersome to staff and providers alike. This theory gave a pathway to increase likelihood of acceptance and implication of changes regarding new practices.

Lewin's change theory (Petiprin, 2016) utilizes three major concepts: driving forces, restraining forces, and equilibrium; and three major stages: unfreezing, change, and refreezing. Driving forces bring changes and shift the equilibrium; restraining forces hinder and oppose change; equilibrium is a state where no change is occurring as the driving force and restraining forces are equal (Petiprin, 2016). The stages of change begin with unfreezing--when old patterns are released and resistance is overcome. Change is the moving piece; thoughts, feelings or behaviors change the workflow to be more productive. Re-freezing is when the new habit or process becomes the standard operating procedure (Petiprin, 2016). Figure 1 shows the change stages.

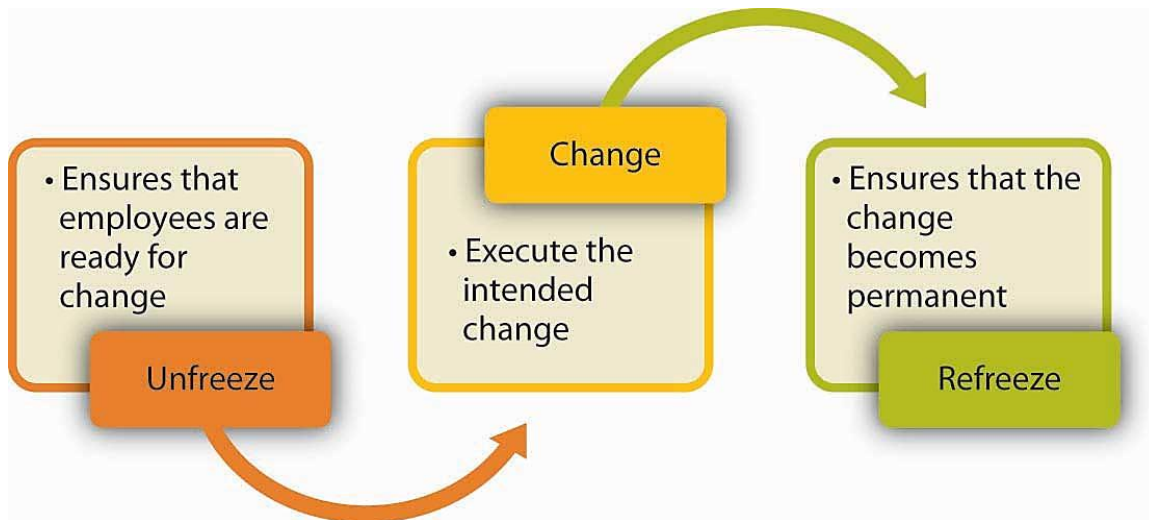


Figure 1. Stages of change according to change theory (O'Loughlin, 2013).

Applying the stages of change to overcoming barriers was a challenge as the barriers for the different providers in the clinic were different. By having an educational seminar or lunch and learn, this researcher identified whether the clinic valued the role of HCV screening enough to want to change or unfreeze the patterns regarding HCV screening and change and refreeze into a pattern that utilizes HCV screening regularly. The method to change the process regarding HCV screening was also varied depending on what the barriers were and at what level the changes needed to be implemented, i.e., system level or personal level.

CHAPTER II

PROJECT DESCRIPTION

Project Objectives and Timeline

This capstone project was designed to implement evidence-based practice and theory into practice. The goal of the project was to improve screening rates of HCV within the primary care clinic for high-risk populations including the birth cohort previously mentioned. This capstone project utilized a multiphasic approach to assess current screening rates, implemented a new process to improve appropriate screening measures, and re-evaluated screening rates post-implementation of screening tactics.

Project objectives included

1. Increase screening rates for appropriate patients for HCV.
2. Identify barriers to screening.
3. Develop action plan to overcome barriers to screening.

The first objective of this project was to complete a medical record review of the patients at this clinic to determine if appropriate HCV screening was occurring. This mainly focused on the birth cohort but also included high-risk patients, which were sorted from the clinic population using the EMR. The researcher reviewed well-visits within a three-month period to examine if patients were screened for HCV at the well-visits in the past, if they met criteria for screening, if they were offered HCV screening, or if there was a documented refusal of screening. This established a base number of patients at the

primary care clinic who had been screened or were offered screening. This also showed if the providers were offering screening appropriately.

Barriers to screening were identified through a lunch and learn for the providers at the primary clinic provided by this researcher (see Appendix B for flyer). The lunch and learn focused on guideline recommendations for HCV screening and the importance of screening for high-risk patients--mainly the patients in the birth cohort (USPSTF, 2013). After the lunch and learn, the researcher followed up with providers to discuss their views and opinions regarding barriers to screening if needed. From this lunch and learn, this researcher developed a plan to follow up on commonly mentioned barriers to assess a full picture of why HCV screening was not routinely offered or conducted--barriers like lack of knowledge of how to screen or how often to screen, provider attitude, distrust of guidelines, time restrictions, etc. The researcher also followed up with personal interviews as needed to clarify barriers, which allowed the researcher to synthesize which barriers were possible to overcome and which barriers were insurmountable. Part of the efficacy and effectiveness of the lunch and learn was measured by a pre-seminar survey about HCV screening and asking about barriers (see Appendix C), which was followed by a post-seminar survey (see Appendix D). A consent form for human participants in research was attached to each survey (see Appendix E).

The third objective of developing an action plan to overcome barriers to screening depended on what the focus group forum and surveys of the providers revealed as hindrances to screening for HCV. If it was time constraints of appointments, then administrative changes could be attempted. If lack of knowledge of what to do after screening was a barrier that prevented screening from happening, then an education

session could be scheduled to increase knowledge and comfort with what screening results meant and how to appropriately treat. As stated previously, overcoming barriers through an action plan would depend upon the results of the survey and what the follow-up conversations about HCV screening revealed.

Evidence-Based Project Plan

Completing a chart review of HCV screening at well visits provided a baseline of screening rates for the primary care clinic. The follow-up lunch and learn discussions with accompanying surveys helped the researcher discern barriers to screening rates and guide an action plan for overcoming these barriers to increase screening rates.

Phase One

Phase 1 addressed objective one, which was to increase HCV screening rates for appropriate patients. The objective entailed obtaining a baseline rate of screening for well-visits at this clinic to compare later to the post-focus group about barrier rates of screening. To obtain the baseline to calculate an increase of screening rates, the researcher reviewed the EMR for all patients in a three-month time period who visited the primary care clinic for a well-visit for evidence of HCV screening in the past, at the appointment, or a documented refusal of screening. The patients' EMR review was for all patients in the birth cohort of 1945-1965 or a documented history of intravenous drug use or other high-risk behavior over the age of 18. As this project was focused on barriers for providers to screening, a simple table was developed.

As the focus of the objective was to help providers increase their rates of screening, a "yes" response included documentation of previous screening as long as it was addressed by the provider (this demonstrated awareness of the need for HCV

screening), a current order of blood work to screen for HCV, and documentation of discussion of the importance of HCV screening between a provider and a patient.

Phase Two

Phase two addressed objective two--identify barriers to screening. During this phase, this researcher educated staff and providers of who to appropriately screen for HCV. This lunch and learn discussed USPSTF's (2013) guideline recommendation regarding HCV screening, the importance of appropriate screening, and possible disease burden reduction that could come from appropriate screening and treatment. During the lunch and learn, the researcher recorded and took notes regarding providers' concerns and questions about barriers that decreased screening rates of HCV as well as utilized surveys to assess knowledge. The researcher developed and distributed pre- and post-lunch surveys to the providers regarding the most discussed barriers to screening as well as a section on the survey for "other" barriers not included in the survey. The surveys were further extrapolated for clarification to fully understand and be able to create a change method for overcoming the barriers.

Phase Three

The third phase of the project addressed objective three--develop an action plan to overcome barriers to screening. This phase utilized the results of the surveys and discussions to determine one or two barriers most often recognized by providers to develop changes to the practice to make screening more feasible at the primary care clinic. This phase also included implementation of a barrier breaker. After the barrier change implementation occurred, the researcher waited approximately eight weeks to reassess if the change was working to increase screening rates for HCV. This

reassessment was evaluated by a repeated chart review of well-visits from the eight weeks after the barrier change was implemented. The number of screenings were then compared to the baseline comparison of EMR reviews captured in phase one.

Congruence

This primary care clinic is part of a larger healthcare system located in the Western region of the United States of America. The mission of the system is to provide excellent patient care. Part of providing excellent patient care is to circumvent disease or decrease disease burden when possible to increase quality of life. Increasing screening rates for HCV complies with the mission of the organization by decreasing harm to patients.

Timeline

This capstone project began on December 2, 2016 with a capstone proposal defense. The researcher obtained approval from the University of Northern Colorado's Institutional Review Board to conduct the research (see Appendix F). After this approval, the project was also approved by the primary care clinic's organization research body (see Appendix G); a Statement of Mutual Agreement was also obtained (see Appendix H).

Phase one was a retrospective chart review of the EMR that began in March 2017. The retrospective chart review took approximately one month. This was happening concurrently with phase two that began in March 2017 as well. The lunch and learn occurred during this time period as well as surveying the providers to discover barriers to screening practices. Phase three began after the lunch and learn and survey completion in March 2017. The selected barrier was utilized to create an action plan to overcome it to

increase screening rates. After implementing the action plan to overcome the barrier, the researcher waited eight weeks to reassess the HCV screening rates by again utilizing an EMR review.

Resources

The resources utilized for this project included the providers at the clinic (two medical doctors and one family nurse practitioner who practice full time and two per diem doctors), a nurse case manager who helped with chart review and identified high-risk patients, and the office manager and information technology specialists. The information technology specialists were also good resources for data mining within the EMR review. Potential barriers to implementing this evidence-based capstone project included unfamiliarity with the charting system to be able to conduct a thorough chart review, inadequate time to conduct a thorough chart review, and resistance to HCV screening by patients. Benefits to conducting this study included increased screening rates, which could lead to increased identification of HCV and, thus, adequate treatments to decrease poor outcomes and reduce healthcare costs.

Capstone committee members were also resources who were utilized during the capstone. Karen Hessler, Ph.D., FNP, MSN, RN was the capstone chair and was vital to the success of the project. Katrina Einhellig, Ph.D., RN, CNE served as a committee member and was valuable to research and evidence-based practice changes. Maribeth Taylor, MSN, FNP, RN served as the outside committee member and was employed at the primary clinic where the capstone research occurred.

Stakeholders

Stakeholders for this project included the University of Northern Colorado; the School of Nursing, the Graduate School, and the committee members for the capstone were especially invested as stakeholders. At the primary care clinic, stakeholders included the providers, especially Maribeth Taylor, the FNP onsite; the Medical assistants (MAs); case managers; and the office manager. The patients also stood to gain from this capstone as it could circumvent problems via early disease detection and treatment.

Strategic Analysis

Strategic analysis of the capstone project was through utilization of a strengths, weakness, opportunity, and threats (SWOT) tool, which allowed the researcher to analyze how well the implementation of overcoming barriers to screening HCV worked.

Strengths of conducting this project included desire for increased screening rates, which could lead to increased identification of HCV and adequate treatments to decrease poor outcomes and reduce healthcare costs. This project also follows a national guideline developed by experts in the field of hepatology. The capstone also utilized the strength of conducting research in a clinic part of a bigger system, which offered more resources to utilize in overcoming barriers.

Potential weaknesses to implementing this evidence-based capstone project included unfamiliarity with the charting system to be able to conduct a thorough chart review, inadequate time to conduct a thorough chart review, resistance to HCV screening by patients, and resistance by providers to implement changes.

Opportunities within this capstone included increased quality of patient care, increased provider satisfaction and safety in following appropriate guidelines, and potential decreased burden on the healthcare system. Threats to the capstone included provider resistance, time constraints, and possible resistance to learning and changing habits.

CHAPTER III

EVALUATION PLAN

Project Evaluation

The objectives of the capstone were to increase screening rates for appropriate patients, identify barriers to screening, and overcome barrier(s) to increase screening rates. The project was evaluated in three phases over approximately five to six months.

Phase One

Initial surveillance of the program included a medical chart record review of three months' worth of well-visits for all providers at the primary care clinic. The table depicted in Figure 2 in Chapter II served as the data collection tool for the EMR review. During this EMR review, a systematic review surveyed for appropriate patients to screen for Hepatitis C. These appropriate patients included the birth cohort of people born between 1945 and 1965 per the target population of the guideline (USPSTF, 2013). During this EMR review, the table's category of HCV screening ordered included information about whether the patient was offered screening with the provider at the well visit and thus completed. The results were interpreted as percentages of screenings offered and completed. The screening rates were determined by comparing total population of well-visit patients seen by providers in the three-month period in the birth cohort surveyed by this researcher. The researcher then created percentages of the pre-

and post- educational seminar surveys to analyze the data pulled from the EMR at the primary clinic.

Phase Two

As previously stated, a lunch and learn was facilitated by this researcher regarding the importance of HCV, which patients were appropriate for screening, and appropriate treatment to follow upon a positive screen. Following the short educational forum, this researcher followed up with discussion of perceived barriers to screening at the clinic. This discussion was reviewed by this researcher who utilized a follow-up survey to delve deeper into why the issues were barriers to implementing HCV screening. The survey also included room for other barriers not mentioned in the forum to be accounted for so this researcher could have a full picture of what barriers prevented appropriate screening from occurring.

Phase Three

After teaching about the NGC (USPSTF, 2013) guideline and surveying the providers at the primary care clinic, the researcher selected one barrier to screening rates and developed an action plan to overcome that barrier to improve screening rates. The action plan depended on the lunch forum discussion of barriers and the post-seminar survey to address the most common barriers. After implementing the action plan to overcome the barrier, the researcher waited eight weeks to allow the action plan to be implemented and change the screening process at the primary clinic. After the eight weeks, the researcher re-surveyed all well-visits within this time span for a medical chart review regarding the rates of appropriate screening for patients seen at the primary clinic. The table depicted in Figure 2 was once more utilized to provide descriptive data about

screening rates. The descriptive statistics were then compared to pre-implementation rates collected in phase one. This statistical comparison showed an increased percentage of screenings, thereby successfully overcoming the barrier identified by the researcher and the providers.

Method Analysis

To provide statistical significance to this project, data recorded from the chart survey were analyzed and converted into a percentage of patients screened compared to the number of patients who met criteria but were not screened. This provided a baseline of potential screening opportunities missed. As previously mentioned, a similar medical chart review was also conducted after the education when barriers were identified and overcome. The desired statistics were gathered using the data collection table.

To evaluate the process of identifying barriers and overcoming them at the primary care clinic, nursing change theory was used to evaluate the practice change in the phase it now resided. Although, a specific framework was not used to apply the statistics, the database created and maintained from the pre-barrier breakdown implementation versus the post-barrier breakdown period provided numerical value to the statistical and clinical significance of the HCV screening process in the primary care clinic.

CHAPTER IV

RESULTS AND OUTCOMES

The objectives of this capstone project were to increase screening rates for HCV in the 1945-1965 birth cohort at a primary care clinic in Northern Colorado, identify barriers to screening in a primary care clinic, and overcome barriers to improve screening rates. This chapter presents the results of the planned evaluation as outlined in Chapter III. To meet the objectives, this researcher utilized an EMR review of patients seen in a three-month time period before the lunch and learn seminar who met the criteria of being born in the birth cohort to check for a baseline screening rate. This method helped to determine baseline screening rates in order to have a rate to compare to the post-lunch and learn seminar and implementation of an action plan to increase screening rates.

Results Linked to Problem Statement and Evaluation Plan

On March 8, a lunch and learn educational seminar was given to the providers and staff at the clinic. Two weeks prior to the seminar per discussion with the manager, a date was set for the seminar and all clinical staff and providers received an email from the manager regarding the date and time of the lunch. Prior to the seminar, the researcher met with the nurse practitioner who was part of this capstone project committee and the clinic manager to discuss potential barriers at the clinic in order to be better prepared for the seminar. Concerns included time spent with patients and mainly a billing and coding

concern. Per the manager, screening diagnosis codes assigned to screening lab orders, like the Hepatitis C antibody test, were not being accepted by Medicare as valid codes for screening and preventative testing. Patients were then getting charged for the lab testing when usually screening lab work is covered by insurance companies. This created a challenge in how to bill and appropriately code for screening lab work like the HCV antibody test.

As previously stated, a chart audit of the EMR was performed on all well-visits for patients in the birth cohort for a three-month time period prior to the lunch and learn seminar and the subsequent action plan at the primary care clinic. To get an accurate random sample of patients from the birth cohort, a list was compiled of all patients seen by the five providers at the clinic in the three-month time period. The majority of the patients were seen by two doctors of the five providers who work at this clinic full time, followed by patients seen by the full-time nurse practitioner; a small amount of the patients was seen by the other two doctors who were only at this clinic one to five times per month depending on the scheduling needs of the clinic. This query for patients initially totaled over 2,200 patients. This list was then sorted by “schedule reason,” meaning the reason the patients scheduled the appointment. For this chart audit, all episodic, acute, or “sick” reason appointments were excluded from the chart audit. This left all patients scheduled to see a provider based on the reason of well-visits or annual physical appointment. The list was then further limited by the age of the patient. All patient charts were removed from the list of potential audits if they did not meet criteria of being born between 1945 and 1965. For the three-month period, 124 patient charts remained to be audited.

According to the manager of the clinic, the total number of established patients at the clinic who are in the birth cohort was 317 (Personal communication, 2017). The total number of patients within the birth cohort (born from 1945-1965) was 317. The sample population of well visits between November to January was 124 patients. This meant approximately 39.1% of the total birth cohort population at the clinic was represented in the chart review. Of the 124 patient charts that were audited for whether HCV screening was completed, 47 of the patients were screened within the last two years for HCV or were able to verbalize a negative screen in the past and the provider documented as such. This yielded a 37.9% positive screen rate for the sample of the birth cohort seen by providers at well visits for a three-month period.

For the data collection from the EMR, the time period of the three months prior to the lunch and learn, the data review sample population was limited to just patients who came to the clinic for a well visit. Hepatitis C virus screening could be ordered and completed at any appointments other than a well-visit. The review of well-visit data revealed one of the three main providers consistently included discussion and offering of HCV screening to the birth cohort; the other two main providers either did not document the discussion or did not offer it to their patients. During the three-month time frame, the two part-time providers at the clinic worked a total of 10 days each; thus, a majority of the patients were seen by the three main providers. After the lunch and learn seminar, one of the part-time providers resigned from the clinic. The two part-time providers did not consistently offer, document, or discuss HCV testing for patients in the target population during well visits.

For the post lunch and learn eight-week chart review, the sample size of the total birth cohort was 45. Therefore, the sample population was 14.19% of the total birth cohort at the clinic. The chart review revealed that 31 of the 45 well visits in the birth cohort were screened for HCV at their well-visit. Having 31 patients screened yielded a 68.89% screening rate for patients within the birth cohort. The screening rate prior to the lunch and learn was approximately 37.9%. This was a 30.99% increase in the sample of the birth cohort being screened for HCV. Table 1 shows the results of the screening rates prior to the lunch and learn seminar compared to the post seminar screening rates after addressing the barrier of coding.

Table 1

Comparing Screening Rates Prior to and Before the Seminar

	Prior to Seminar	Post Seminar
Total Patients Reviewed	$N = 124$	$N = 45$
Patients Screened for HCV	$N = 47 (37.8\%)$	$N = 31 (68.89\%)$

While also discussing information with the manager and NP at the clinic regarding potential barriers preventing HCV screening, the researcher found the common barrier for HCV screening was the billing and coding issue. From this information, the researcher developed two surveys for use at the lunch and learn seminar to evaluate understanding of the topic. The researcher also developed two handouts for the staff at the seminar that educated about HCV screening and potential coding information to assist in ordering the screening. The coding informational handout was developed by the

researcher with consultation from the coding specialist onsite for the clinic. Survey 1 can be found as Appendix C. Survey 2 can be found as Appendix D. The coding handout can be found in Appendix I. The HCV informational handout can be found in Appendix B. Survey 1 was given to all in attendance before beginning the seminar and collected by the researcher. Then the handouts were given to all attendees and the researcher gave a short presentation about the HCV screening guideline pertaining to the birth cohort and allowed time for questions. The intervention discussed to help improve screening rates was in relation to coding appropriately. The coding handout was referenced. All in attendance were allowed to ask clarifying questions and verbalized understanding of the improved coding options. Following the presentation of information and answering of questions regarding the coding process, the researcher gave all attendees the second survey. In total, the meeting attendees included the three main providers of the clinic, the clinic manager, a laboratory technician/phlebotomist who is a full-time employee of the clinic, and three medical assistants (MAs) for a total of eight participants.

Preliminary barriers identified from the discussion at the seminar revealed mainly concerns about how to code the appointment appropriately for the screening tests to avoid patients being billed directly for the screening. After discussing the handouts that included helpful coding information, all attendees verbalized no further questions at this time and agreed that HCV testing should be offered to any patient who met criteria. All in attendance were able to successfully identify the correct test for HCV screening (HCV antibody) and which patient population met guideline recommendations for once in a lifetime screening (birth cohort from 1945 to 1965).

Survey data was compiled by the researcher. Survey 1 had eight completed surveys returned to the researcher. Only seven of Survey 2 were returned to the researcher. Table 2 shows the results from Surveys 1 and 2. Question 1 addressed the confidence level of the attendees to identify screening methods for HCV. A 5-point Likert scale was used to determine confidence levels where 1 = *Not confident at all* and 5 = *Very confident*. The pre- and post-seminar confidence levels showed an increase from 3.25 to 4.714, respectively, when averaging all the survey results. Question 3 addressed confidence with identifying a positive screen result. Although the purpose of the lunch and learn was to increase screening rates, it was important for providers to have the knowledge of what the next steps were for a positive screening in order to get treatment for patients to prevent the poor outcomes previously discussed related to chronic HCV. The seminar had a positive impact on the confidence levels of identifying positive HCV screening results as evidenced by the increased Likert scale. The pre-seminar scale score was 3.25 and the post-seminar scale score was 4. Question 4 addressed next steps if a positive result was discovered. The seminar was effective on this topic as well for this question as answers remained correct. Question 5 addressed referral resources for treatment for positive HCV screens. On the pre-seminar survey, four of the eight responders left this question blank but after the seminar, all seven responders answered to refer the patient to gastroenterologists or gastrointestinal specialists. Questions 6 and 7 were free text answers regarding motivators for the attendees to screen their patients for HCV and barriers preventing screening patients for HCV, respectively. Answers can be seen in the table. However, especially with regard to the barriers, repeated answers revealed reimbursement, insurance, and coding problems were common. Patient choice

was also a barrier listed that could be addressed through education. However, at this time, the researcher focused on the more prevalent answer related to coding and reimbursement costs for patients. Another barrier that could have been addressed as evidenced by one answer, “not listed in health maintenance section of chart,” is addressed later in this capstone but was not addressed as a barrier during the research and implementation phase of this project.

Table 2

Results of Surveys One and Two

Question	Survey 1 (Pre-Seminar)	Survey 2 (Post-Seminar)
1. Confidence level with screening for HCV (1=not confident at all, 5=very confident)	3.25	4.714285714
2. Test to be ordered to screen for HCV	HCV antibody (100% of surveys had correct answer; one also put hepatitis panel as a second answer)	HCV antibody (100% of surveys had correct answer)
3. Confidence level with identifying an abnormal HCV value (1=not confident at all, 5=very confident; average score in results box for survey 1 and 2)		4
4. If a screen for HCV is found to be abnormal, what are next steps?	call pt and call GI, ?,HCV RNA, HCV genotype, viral load, HCV PCR, refer to GI	refer to GI, viral load, viral load PCR, HCV genotype/RNA
5. What are the referral resources in this area for diagnosis of HCV?	4 of 8 surveys left blank, others answered GI referral	refer to GI (response from all 7 surveys)
6. Top 3 motivators for you to participate in screening for HCV?	"right thing to do," great pt care, to help pt, age/demographic, lifestyle, possible exposure, symptoms, early identification/referral/treatment, task force recommendation, pt agreement, disease finding, improved pt outcomes, reduce risk of liver cancer, reduce transmission, further, education about HCV, what to expect if dx with HCV	age group, early dx, avoid/prevent complications of chronic liver disease, education/knowledge, educating patients, patient care, good pt care, identify disease, treat disease, US task force recommendation, improve pt outcomes, worsening of pt conditions, reduce carrier co-infections
7. What are the top 3 barriers that may keep you from screening for HCV?	"my mind," not listed in health maintenance section of chart, insurance, cost/no insurance, not being aware of the need, insurance, patient unwillingness to be screened, insurance not covering testing, pt not wanting testing, time availability, reimbursement, time, pt willingness, "I don't test patients-not a provider," cost/no insurance	coding for reimbursement, insurance, treatment decisions, "not a provider," coverage-insurance, patients not wanting testing, stigma, coverage, pt doesn't want testing, time, reimbursement, pt choice, time,
8. What was the most useful part of the educational program today?	n/a on part 1	reinforcing importance of screening, codes to help with screening diagnosis coverage, refresher/classifying need of screening baby boomers learning about HCV
9. How could the program be improved to better serve your needs?	n/a on part 1	"you did awesome", <u>visuals</u>

Extent to Which Objectives Were Achieved

It is clear the objectives of this capstone project were achieved. The providers agreed at the lunch and learn that screening this birth cohort per the national guideline was important and barriers were identified and addressed to help increase the screening rates. The researcher of this project saw an increase of more than 30 percentage points in the screened population. However, the sample size for the post-lunch and learn screening rate evaluation was much smaller. This could have been due to providers taking time off from work during the time frame so there were less patient appointments in total. Addressing the barrier of coding seemed to be effective in helping providers code appropriately for screening of HCV. This researcher assumed patient screening rates would continue to improve over time as the providers refreeze their new habit to include HCV screening as part of annual lab work addressed at well-visits. As the providers refreeze their screening habits, hopefully the entire population of patients that meet criteria for screening will be screened. If the data review process of ascertaining if HCV screening was offered and completed continued over the next year, the researcher anticipates the rate would continue to increase as patients complete their annual well visits over the next year.

Key Facilitators and Barriers

Key facilitators of the capstone project included the primary care clinic manager and the three main providers at the clinic who agreed to screen the population based on the guideline (USPSTF, 2013). The three providers who attended the lunch and learn agreed to screen and found the handouts helpful in ordering the testing with the appropriate codes for the birth cohort. The fourth and fifth providers who were not

regular, full-time providers at this clinic did not attend or verbalize their agreement but it did not appear their rates greatly impacted the results of this project. One provider resigned from the clinic before the post lunch and learn review. The other provider only assessed patients during three days of the eight-week period and none of her patients were there for a well-visit. Although the barrier addressed was coding appropriately for the screening test, the researcher did not evaluate the codes used before and after the lunch and learn seminar to code for the HCV testing.

Another key group of facilitators to this capstone project included the MAs who were in attendance at the lunch and learn. By having them attend the lunch and learn, their knowledge of HCV screening and its importance would help in answering questions for patients. The MAs and laboratory technician in attendance at the education seminar could also better understand the next steps for positive results should they arise and help direct the patients appropriately to their providers. The MAs could also send a letter or call patients with normal (negative lab results) or schedule the patients with the providers in the case of a positive result to complete the next steps.

This researcher was also a key facilitator in this quality improvement process at the primary care clinic. She spent 40+ hours completing chart reviews on patients at the clinic for well-visits, planning and executing the lunch and learn, and speaking with the staff to follow up on and identify barriers to screening. She also created ideas to address these barriers that were sensible to this particular clinic (i.e., creating a handout about coding appropriately). The researcher was also on site and available to the providers and staff to answer any questions or clarify information about the HCV screening and guideline. This researcher realized objective one addressing increasing screening rates

could have been increased even more by utilizing the EMR to create a screening reminder for providers seeing patients at their well-visits. Although no major barriers were encountered during this project, one barrier the researcher identified post-EMR chart review that might have deterred providers from screening was the use of formatted smart text. All the providers used a pre-made format of questions and objectives to address with patients at well-visits and unless the pre-made format included screening for HCV, it was not often addressed. Two of the providers utilized a smart text that included addressing HCV screening and one did not. This appeared to impact screening rates for HCV for this provider.

Recommendations

In summary, the researcher found this capstone project was beneficial and successful regarding the objectives of increasing screening rates for HCV and identifying and overcoming a barrier that decreased screening rates in the birth cohort. All the providers and the clinic manager found this project to be useful in improving the quality of care provided to the patients regarding screening for HCV in the birth cohort. The providers made strong efforts to offer HCV screening and document screening choices made by the patient to increase screening rates for HCV. In the future, educating the providers regarding the use of formatted smart text to help prompt asking patients about screening for HCV could be a helpful tool to improve screening rates. An EMR chart reminder could also be utilized to increase screening rates.

The researcher did not identify unintended consequences of the capstone project but as anticipated, the screening rates for HCV in the birth cohort did improve significantly in the eight-week post lunch and learn period. The researcher assumed the

screening rate would increase more after the lunch and learn seminar and address the barrier of coding with a tip sheet (see Appendix I). She anticipates the screening rates will continue to rise as providers refreeze their habits of including screening for HCV in the birth cohort. As previously stated, the researcher noted a 30% increase in screening rates of the sample birth cohort in the eight-week period of patients screened after the lunch and learn seminar compared to the previous chart review. After completing the eight-week period of chart reviews post lunch and learn, informal discussion with the providers yielded information that indicated providers were changing habits to always include screening for HCV. However, in reviewing the progress notes associated with the well-visits, documentation was not consistent between providers about whether patients refused HCV screening. Providers did not consistently document their discussion of HCV screening within the patient's chart. In the future, having smart text formatting that includes screening discussion surrounding HCV would help clarify if patients were refusing based on lack of knowledge, previous screening, or other reasons.

CHAPTER V

RECOMMENDATIONS AND IMPLICATIONS FOR PRACTICE

The objectives of this capstone project were to increase screening rates for HCV in patients born between 1945 and 1965 at a primary care clinic in northern Colorado by identifying and addressing a barrier that hinders providers from screening this birth cohort. These objectives were executed utilizing three main methods:

1. Investigated barriers that hindered providers from screening patients for HCV.
2. Utilized a lunch and learn educational seminar about HCV that included surveys about barriers.
3. Addressed the barrier of coding properly with a handout for providers and clinical staff with information about how to code properly for lab work to be completed.

In this chapter, the researcher provides recommendations for the primary care clinic about how to further increase screening rates and how the project would likely prove to be beneficial if screening rates for HCV continued to increase.

Recommendations

This researcher recommends the project conducted on increasing HCV screening rates for the birth cohort born between 1945 and 1965 continue into the future. Although

the lunch and learn educational seminar about the national guideline regarding screening for HCV in the birth cohort (USPSTF, 2013) was a one-time event, the addition of the tip sheet found in Appendix I for all providers at the clinic could be helpful in reminding them about the importance of screening for HCV the birth cohort. This would help prevent future poor outcomes associated with undetected chronic HCV infections. This researcher makes the following recommendations to improve screening rates for HCV for the birth cohort:

- Educate and encourage all providers, existing and new, at the clinic to include HCV screening for the birth cohort born between 1945 and 1965 in the smart text format of items to review with patients who come to the clinic for well visits; and encourage documentation of either a past screening, a patient refusal of screening after discussion with the provider, or a lab order placed to have the patient screened for HCV.
- Use the EMR program to generate an alert reminder for the MAs to ask patients about HCV screening before the providers see the patient to help with the barrier of time with patients. After the educational seminar, MAs can feel competent to at least ask patients if they are interested in this screening as the purpose for the screening was made known.
- Utilize the “health maintenance” section of the EMR that helps providers and MAs ensure patients are up to date on various tests and immunizations by creating a HCV screening reminder under the “health maintenance” tab to be addressed at all visits by either the provider or the MA.

After implementing this capstone project, it was easy to see that changes in behavior patterns and refreezing habits take time. Although the national guideline (USPSTF, 2013) regarding HCV screening in the birth cohort born from 1945 to 1965 is not a brand-new guideline to implement, it takes time to integrate any changes into practice. If this capstone project were to continue over time, it is the researcher's expectation that the providers and MAs would refreeze habits to include always asking patients in the birth cohort about screening for HCV at well visits just as many other health maintenance items are routinely addressed at well-visits, e.g., being up to date on vaccinations. To add an alert or reminder in the EMR under the "health maintenance" section of the EMR would add an automatic-type screening similar to always asking patients at well-visits about their screening mammograms or other blood work to check for diabetes or high cholesterol. Most providers, as observed by the researcher, have frozen habits to include this kind of screening routinely and do not generally need an EMR alert or reminder. At this time, the phases of the capstone project are completed. The researcher has no further plans for evaluation or improving processes regarding HCV screening outside of this project at this time.

As the mission of the system is to provide excellent patient care, the screening of all patients born between 1945 and 1965 for HCV at least once in a lifetime per the National Guideline Clearinghouse (USPSTF, 2013) is both feasible and beneficial to patients and meets the mission of the system. Although it is a change of habit and perhaps even increases workload for the providers and MAs initially, the long-term benefits of HCV screening far outweigh any risks for an individual patient at system and population levels. The positive identification and referral of patients infected with

chronic HCV to a gastroenterologist for treatment has many long-term benefits for patients. Treatment of HCV can prevent poor outcomes and health disparities related to chronic HCV infection like liver cirrhosis, cancers, and need for transplant (Sanjiv et al., 2016). If the project was to continue, perhaps a continued education for staff could be completed as a refresher by one of the providers or the office manager so all staff stay up to date on protocol for screening and treatment if a positive result is yielded.

As the primary care clinic is part of a bigger healthcare system, this capstone project could definitely be applicable to other primary care clinics within this system. As previously stated, the NGC (USPSTF, 2013) recommends screening all patients born between 1945 and 1965 for HCV once in their lifetime. After completing chart reviews of the EMR of a sample of patients born in the birth cohort at the primary care clinic, the researcher found there was no standard procedure or approach to ensure all patients who call the primary care clinic their primary care office were being screened. The researcher found it easy to extrapolate this finding of lacking a standard procedure to other primary care clinics in the area, within the healthcare system, and even clinics located throughout the nation. Per the NGC, this recommendation to screen all people born between 1945 and 1965 is necessary and valuable to contributing to a healthier individual and population. To make screening more likely to happen on a large-scale level, educational seminars like the lunch and learn conducted at this primary care clinic could be conducted including the handouts to help educate all providers and MAs who care for this population. It is important to educate providers since an early identification of positive results for a patient could mean complete cure rate for the majority of patients, which lessens the risk for liver disease, cancer, and need for transplant (Sanjiv et al, 2016).

Contribution to Personal Goals

This capstone project contributed to the researcher's personal goals regarding development into a nurse leader and advanced practice nurse. This project exemplified the researcher's ability to identify an area lacking standard procedure based on evidence about screening for HCV in the birth cohort, disseminate information about the recommendation, and help create new habits for providers and clinical staff to increase quality of care provided at the clinic. All of these abilities were utilized specifically as related to chronic HCV infection and the ramifications of untreated disease but could easily be transposed to other evidence-based practice guidelines to improve quality of patient care. The researcher was organized, systematic, and attentive to specific needs of the primary care clinic in carrying out this capstone project to fruition. The researcher expects that as the providers continue to increase screening rates for their patients, other clinics will begin to do the same within the healthcare system as evidence-based practice is an ever-important part of providing quality care for patients. In looking to the future as an advanced practice provider, this researcher is confident in being able to implement other similar evidence-based information into practice after completing this capstone project. This primary care clinic is part of a healthcare system that strives to be innovative in providing quality and up to date care. The researcher hopes the practice will continue to increase in screening rates for HCV as well as further disseminate information about the importance of screening for HCV in the birth cohort born between 1945 and 1965. The researcher hopes this kind of welcome reception to implement evidence-based guidelines and practice into practice for the best care of their patients becomes the standard for all primary care clinics.

Five Criteria for Executing a Successful Doctor of Nursing Practice Final Project

In 2014, Waldrop, Caruso, Fuchs, and Hypes wrote *EC as PIE*. This article describes five criteria for executing a successful Doctor of Nursing Practice (DNP) project. By meeting the five criteria in a final DNP project, the student has met the outcomes of the essentials of doctoral education in advanced practice nursing as described by the American Association of Colleges of Nursing (cited in Waldrop et al., 2014, p. 300). The letters *EC as PIE* stand for enhance, culmination, partnerships, implements, and evaluates (Waldrop et al., 2014). Each of these criteria is discussed in relation to this researcher's capstone project.

The "E" stands for "enhances health care outcomes, practice outcomes, or healthcare policy" (Waldrop et al., 2014, p. 301). This capstone project enhanced current healthcare by utilizing the nationally recognized guideline of screening all patients born 1945-1965 for HCV to improve patient care and decrease healthcare burden at a personal level and at a system level. The project analyzed current literature to guide project implementation and sought a better outcome for patients through implementing evidence-based practice.

The "C" represents a culmination of practice inquiry and expertise (Waldrop et al., 2014). The capstone project showed culmination as this researcher has become an expert on the subject matter of HCV screening, repercussions of untreated chronic HCV, and next steps to follow when a positive screen is identified from a screening. The researcher used information gained from the DNP program and courses to integrate evidence into practice. The project interfaced with the EMR through the use of data collection and could further use the EMR to improve screening rates with expertise

consultation with information technology experts. After further discussion with the manager of the clinic, the use of EMR task reminders to screen for HCV is a possibility to be further explored.

The “P” stands for partnership and engagement within interdisciplinary teams or collaboration within interprofessional teams (Waldrop et al., 2014, p. 302). From the project process, this researcher worked with various members of the primary care team. The laboratory technician, the MAs, the coding expert, and the clinic manager were all vital parts of the research process. The researcher also discovered medical specialty groups in the northern Colorado area for referral of positive HCV screening results.

The “I” stands for implementation. Implementation could also be application or translation into practice (Waldrop et al., 2014, p. 302). As discussed, this researcher saw a gap in screening efforts at a clinic level and implemented a new practice of screening to improve screening rates. This was applicable at the clinic level and if screening levels increase at more than just the single clinic, it could have population and system-wide benefits. Translating the evidence of increased screening rates for HCV to a system level can have huge savings to the healthcare system in a monetary sense and a population health sense.

The final letter “E” from EC as PIE stands for evaluation of healthcare practice outcomes (Waldrop et al., 2014, p.302). The evaluation criteria were met by increased data percentages of patients being screened at this clinic for HCV. The researcher utilized a two-fold EMR review to evaluate a clinic level change and show an improved outcome. The long-term outcomes of increasing screening rates are harder to monetarily account for but the literature review and data showed the outcomes of increased

screening allowed for increased treatment of chronic infection of HCV to decrease mortality associated outcomes.

Summary

Hepatitis C virus screening in the birth cohort born between 1945 and 1965 is a Grade B recommendation from the National Guideline Clearinghouse (USPSTF, 2013) and well worth the effort in primary care clinics for individual patients as well as the total population. This capstone project was successful per the researcher's evaluation as screening rates for HCV drastically increased following a lunch and learn educational seminar and a barrier preventing screening was successfully identified and overcome through the use of an informational handout. There is little risk and much to gain for other primary care clinics to begin routinely screening this birth cohort for HCV as the patients who screen positive could be treated to prevent individual costs both physically and fiscally as well as decreasing burden on the healthcare system as a whole. The researcher viewed this project as successful based on the increase in screening rates and the overall increase in knowledge of providers regarding HCV as evidenced by the survey responses. After conducting the second eight-week chart review, the researcher found smart text formats that helped guide providers in their topics to discuss with patients at a well-visit had a large impact on whether or not HCV screening was addressed. If the EMR and specifically smart text formatting or targeting productive use of the EMR as a reminder tool for HCV were utilized, rates of screening could increase even more in the future. However, the researcher enjoyed seeing this project come to fruition as she honed her leadership and advanced practice skills as she prepared to

become an advanced practice provider in a similar setting to the primary care clinic where this project was implemented.

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APPENDIX A
LITERATURE REVIEW FINDINGS TABLE

Author(s)	Hypothesis	Objectives	Questions	Variables	Design	Sample setting	Findings	Other commentary
AASLD/IDSA HCV Guidance Panel (2015)	This study was done to create recommendations for the screening and treatment of HCV.	Screening of birth cohort and high risk populations. Screening done per FDA approved testing method. Annual testing for IV drug users. Educate about liver damage prevention for patients with + result. Prompt treatment of HCV positive patients by qualified providers. Antiviral Tx recommended for all patients with tx regimens.	Do providers appropriately screen for HCV and follow up with appropriate treatment?	No variable, just recommendations.	No design method, just recommendations.	n/a	Same as stated in objectives. All patients with positive HCV should be treated promptly to prevent further health deteriorations and costs to patients and health care system.	
Bechini et al (2015)	Training and implementation of HCV and Hep. B guidelines for screening is very important for providers.	Discover if training and guidelines are available and utilized by providers regarding HCV and Hep B screening.	Do providers adequately screen for HCV and HBV?	Guidelines vary by country.	This was a meta-analysis of guidelines in databases and disseminated to providers and whether training was available on when to use.	A literature review was performed followed by a survey of healthcare professional inquiring about the knowledge of HCV screening practices.	Further education is needed for health care professionals re: HCV screening and treatment practices and protocols.	
Brouard et al (2015)	Estimate of prevalence of HCV positive individuals who do not know infection status and increase	Comparative data of 2004 prevalence of HCV status and knowledge of status with 2014 data.	What can be done to increase screening rates of HCV in appropriate populations to	Screening processes from 2004 to 2014 have changed.	Data surveillance	n/a	A new screening strategy in France can increase diagnosis rates, but more availability is needed for	

	screening practice to increase diagnosis and treatment.		properly diagnose and treat HCV?				treatment upon further examination.	
Gane et al (2014)	Can increased screening rates help to decrease the disease burden of HCV?	Descriptive focus of showing the disease burden of HCV rates increasing without further screening.	How will HCV screening rates change the population outcome of disease in birth cohort and high risk individuals?	A model to forecast HCV disease burden to attempt to measure prevalence, treatment, and therapy options.	The use of a forecast model shows that an increase in successful diagnosis and treatment for a small population will decrease disease burden.	Fifteen countries.	Disease burden can be reduced by appropriately screening and treating HCV.	
Howie and Hutchinson (2004)	If HCV virus rates increase at current rates, disease burden and prevalence will increase disproportionately to cost of treatment.	To show that the disease burden of HCV is significant; there is major benefits to adequate screening and thus, treatment.	IS there enough resources to screen and treat appropriate populations?	No variable, just predictive values	n/a	n/a	HCV is costly to the health care system and to the patient. However, burden of liver cirrhosis in the next 10-20 years is more costly than treatment.	
Smyth et al (2014)	The cost comparison of treatment of HCV versus the cost of clinically significant disease of HCV makes early diagnosis and treatment a promising venture.	Provide real world cost estimates of ambulatory management of early to moderate stages of HCV compared to end stage and severe HCV clinical manifestations to show the relativity of price of treatment to prevent chronic liver disease.	Is treatment feasible to prevent costs and mortality and morbidity of late stage liver disease from HCV?	Variable is cost of clinically significant illness of HCV patients compared to cost of treatment.	Cross sectional study in Ireland.	Patients in Ireland.	Current treatment costs of HCV are expensive, but comparatively to the costs of end stage liver disease and complications of untreated HCV, the costs of early treatment make screening a worthwhile endeavor.	Although disease rates of HCV have gone down, it is estimated that many patients do not know their disease status and will not until they become symptomatic with liver failure.

APPENDIX B

LUNCH AND LEARN EDUCATIONAL FLYER

HCV SCREENING REVIEW

Review of National Guideline Clearinghouse 9937–
HCV Screening in Baby Boomers: <https://ngc.gov/summaries/summary/46769/screening-for-hepatitis-c-virus-infection-in-adults-us-preventive-services-task-force-recommendation-statement?q=hepatitis+c>

Birth Cohort Based Screening

Baby Boomers, AKA, those born from 1945-1965, should be screened for HCV at least once in a lifetime, when risk factors are not present. This should be offered at well visits, unless patients opt out of screening.

Why to test: Baby Boomers have higher likelihood of having received a blood transfusion before universal precautions began in 1992 or may have engaged in high-risk behaviors (high numbers of unprotected sexual encounters or users of IV drugs) decades ago and can be carriers of HCV without symptoms.

What to order: HCV antibody. If positive, lab will conduct polymerase chain reaction testing for viremia in order to ensure accurate recognition of chronic HCV patients.

What's next: If a positive result is found, refer patient to GI specialist for treatment with antiviral treatment regimens to prevent liver complications of HCV (cirrhosis, liver failure, hepatocellular carcinoma) which are much more costly to treat than treating chronic HCV.

Grade B recommendation. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.

Therefore: offer or provide this service.

Possible Referral Options in Northern CO:

Banner Health Clinic Gastroenterology

University of Colorado Health Gastroenterology

Centers for Gastroenterology

Contact Referral specialist at Office for more information



Key points:

- Once at well visits for all patients **born 1945-1965**
- Order **Hepatitis C antibody**
- If **negative** - no further treatment needed
- If **positive** - refer to GI for treatment to prevent further complications

Photo from: http://www.healthcareworkersalary.com/wp-content/uploads/2014/05/medical_doctors.jpg

Contact Info: Liz Cirbo, RN, BSN, DNP-S liz5188@gmail.com

APPENDIX C

SURVEY ONE

APPENDIX D
SURVEY TWO

Hepatitis C Virus Screening Survey – Part 2

Elizabeth Cirbo, FNP-Student, DNP-candidate

In order to identify specific needs for screening of Hepatitis C Virus (HCV), please take a few moments to complete each question below. You will not be identified with your responses and data will be reported in a group or aggregate format. **By filling out this survey, you are consenting to participation in the study.** Thank you for your time!

On the scale below, rate your *confidence level with screening* for Hepatitis C Virus (HCV) (please circle one):

1
2
3
4
5
Not confident at all
Very confident

What laboratory value should be ordered to screen for Hepatitis C Virus (HCV) (write in below):

On the scale below, rate your *confidence level with identifying an abnormal value* for HCV? (please circle one):

1
2
3
4
5
Not confident at all
Very confident

If a screen for *HCV value is found to be abnormal*, what should the next step(s) be? (write in below):

What are the referral resources in this area for diagnosis of HCV? (write in below):

What are the *top 3 motivators* for you to participate in screening for HCV?

1. _____
2. _____
3. _____

What are the *top 3 barriers* that may keep you from screening for HCV?

1. _____
2. _____
3. _____

What was the most useful part of the educational program today? (write in below):

How could the educational program be improved to better serve your needs? (write in below):

Additional Comments:

Thank you!

APPENDIX E
CONSENT FORM FOR HUMAN PARTICIPANTS
IN RESEARCH



Consent Form For Human Participants In Research

University of Northern Colorado School of Nursing

Project Title: Hepatitis C Screening in Primary Care

Researcher: Elizabeth Cirbo, BSN, DNP-S Email: cirb3015@bears.unco.edu

Research Advisor: Karen Hessler, PhD, FNP Email: karen.hessler@unco.edu

Phone #: 970-351-2137

Purpose and Description: Thank you for participating in this survey. These questions concern basic clinician knowledge regarding screening for Hepatitis C Virus in primary care. The purpose of the survey is to further evaluate process improvement outcomes as part of a DNP Capstone. Participation in this survey has no anticipated risk or inconvenience to you, and should only take about 5-10 minutes of your time.

Once the study is completed, results will be shared with you if you desire. There is no anticipated risk outside of what might occur in everyday interactions associated with completing the surveys and there will not be any compensation for doing so. There is no direct benefit to being in the study but you may help increase quality of patient care. Your consent form will not be stored with your responses, and your name will not be on your surveys to help protect your anonymity. The survey's will be kept in a locked office in the school of nursing separated from your consent forms, only accessible by the researcher and research advisor. If you have any questions or concerns, please contact the researcher or the research advisor. The advisor may ask your name, but all complaints are kept in confidence.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Sherry May, IRB Administrator, Office of Sponsored Programs, 25 Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

APPENDIX F
INSTITUTIONAL REVIEW BOARD APPROVAL



Institutional Review Board

DATE: February 20, 2017

TO: Elizabeth Cirbo, BSN
FROM: University of Northern Colorado (UNCO) IRB

PROJECT TITLE: [1008936-2] Hepatitis C Screening in Primary Care
SUBMISSION TYPE: Amendment/Modification

ACTION: APPROVAL/VERIFICATION OF EXEMPT STATUS
DECISION DATE: February 20, 2017
EXPIRATION DATE: February 20, 2021

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB approves this project and verifies its status as EXEMPT according to federal IRB regulations.

We will retain a copy of this correspondence within our records for a duration of 4 years.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.

APPENDIX G
BANNER HEALTH APPROVAL



Date: 02/22/17

To: Elizabeth Cirbo

From: Shelly Fischer, PhD, RN

Re: Hepatitis C Screening in Primary Care

I have assessed your project proposal for implementation potential and appropriateness of the project within the Banner Internal Medicine (Greeley) practice. From my review, I have determined that this is a process improvement project, and that it has transferability, feasibility, and a high cost-benefit ratio.

I understand that the purpose of the project is to improve screening processes in primary care by working with clinic providers and educating in regard to national guidelines related to primary care screening for Hepatitis C. It is my understanding that you have garnered the support of the practice manager, Shannon Tetiva, and your preceptor, Maribeth Taylor, FNP, for this project, and that the design provides for strict confidentiality of protected and/or proprietary data.

Please follow the Banner Health "Process to Approve DNP Students Academic Projects". In accordance with that process, your next steps will include submitting required materials, including the letter of approval from your institutional IRB, to me at Shelly.Fischer@BannerHealth.com. I will then forward your packet of materials to the system director for nursing research for final approval to begin your project.

Best wishes on the successful completion of your project.

Sincerely,

A handwritten signature in black ink, appearing to read "Shelly Fischer".

Shelly Fischer, PhD, RN
Western Region Director of Professional Practice
Banner Health
1801 W. 16th St.
Greeley, CO 80631
(970) 227-8378

APPENDIX H
STATEMENT OF MUTUAL AGREEMENT

Statement of Mutual Agreement
University of Northern Colorado
Doctorate of Nursing Practice Capstone Project
Elizabeth Cirbo
December 2, 2016

The purpose of the “Statement of Mutual Agreement” is to describe the shared view between Banner Health Internal Medicine Clinic in Greeley, CO, and Elizabeth Cirbo, DNP Candidate from University of Northern Colorado, concerning her proposed capstone project.

Proposed Project Title: Hepatitis C Screening in Primary Care

Brief Description of Proposed Project: To increase screening rates for Hepatitis C virus (HCV) by identifying and overcoming barriers that prevent screening at well-visits for patients born in the birth cohort born between 1945-1965 at Banner Health Internal Medicine Clinic. This goal to increase screening rates is based on a Grade B recommendation from the U. S. Preventive Services Task Force. This birth cohort is at high risk for carrying HCV without having symptoms. Left untreated, HCV can lead to many negative sequelae including liver cirrhosis, fibrosis, or failure, and hepatocellular carcinoma. HCV is easily treatable to cure the affected individual if caught before liver damage has been done. This drives the project forward to complete a review of the electronic medical record (EMR) of patient screening rates for HCV, educate providers about the guideline to screen this birth cohort, identify barriers preventing screening from occurring, and formulate an action plan to overcome the barriers, in order to increase screening rates.

Goal of Capstone Project: To increase screening rates of HCV within the birth cohort born between 1945-1965 by identifying barriers that prevent providers from offering to patients to be screened for HCV and developing an action plan to overcome these barriers, thereby increasing screening rates. As HCV is treatable for most patients, it is prudent for patient quality of life and burden on the healthcare system to screen, identify and treat HCV before it progresses to the negatives outcomes associated with liver cirrhosis, fibrosis, end-stage liver disease, and hepatocellular carcinomas.

Proposed On-site Activities: Review EMR of well visits of patients seen at this clinic for evidence of screening being offered, educate providers about the Grade B guideline, identify barriers to screening, and develop and implement an action plan to overcome barriers to screening in order to increase HCV screening rates. Following the implementation of the action plan, a second EMR review will occur by this student in order to compare rates of screening of HCV to the initial rates.

Confidentiality of Patient Records: Patient records and personal information will be kept completely confidential to protect the patient. Patients’ names will also not be identified in the written project or in the oral presentation of the report.

The designated Capstone Community/Agency member will agree to participate in the review and approval of the proposal and presentation of the final version of the project. She will attend (either on campus or remotely) the meetings for both.

The DNP Capstone project will include a final report, an abstract, potential publication or oral presentation of the report. No personal identifiers will be included and all data will be reported in aggregate form. The author welcomes any comments or suggestions from the Agency, but reserves the right to publish findings and analysis according to professional standards and principles of academic freedom. For any work of a scholarly nature, the Author agrees to follow the Agency preferences in how it is to be named (or not) in the work.

Signature of Student

12-2-16

Date

Signature of Agency Member

12-2-16

Date

Signature of Capstone Chair

12-2-16

Date

APPENDIX I
CODING HANDOUT

Baby Boomer HCV Screening Tip Sheet for Billing and Coding

E&M Codes: for well-visits for the baby boomer population (born 1945 to 1965) include:

- 99386, 99387 new patients for comprehensive preventative visits
- 99396, 99397 established patients for comprehensive preventative visits
- G0438 initial Medicare well-visit
- G0439 subsequent Medicare well-visit

ICD-10 Codes:

If patient has a well-visit that has **no abnormal issues** addressed (ie Z00.00), the codes associated with the anti-HCV order are as follows:

1. Z00.00
2. Z11.59 Encounter for screening other viral disease (this code by itself is not enough, must be secondary to Z00.00)

This is used for the patient who is completely asymptomatic of any symptoms that could be included in chronic HCV infection differential diagnosis.

If the patient **has any symptoms** at their well-visit associated with the differential that could include chronic HCV, or is an established patient that has had vague symptoms that could be associated with HCV, the coding will be based on the symptoms. Here are examples of acceptable codes to use for anti-HCV (This list is not comprehensive or guaranteed, but can be used as examples of codes to apply to the anti-HCV test).

- R53.83 Other fatigue
- M25.50 Pain in unspecified joint (this is related to the symptom of generalized arthralgia that can be a vague symptom of chronic HCV infection)
- K76.9 Liver disease, unspecified (or a more specific liver function related code can be used if patient has had altered LFTs in past)
- K77 Liver disorders in disease classified elsewhere (or a more specific liver function related code can be used if patient has had altered LFTs in past)