Hepatitis C Screening Practices in Primary Care

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Introduction: The Clinical Problem

An estimated 2.7-4 million people in the United States have been infected with the hepatitis C virus (HCV), of those, about 3.2 million have current HCV infections. However, 45-85% of people infected do not know they have HCV (Litwin, Smith, Drianoni, McKee, Gifford, Koppelman, Christiansen, Weinbaum, & Southern, 2011; Centers for Disease Control and Prevention [CDC], 2013c; CDC, 2015). Chronic HCV infection can lead to cirrhosis, liver failure, and hepatocellular carcinoma (HCC) (World Health Organization [WHO], 2014). Hepatitis C virus is the primary reason for liver transplantation in the United States, has high mortality and morbidity, and is very costly to the healthcare system (Barocas, Brennan, Hull, Stoke, Fangman et al., 2014). However, the majority of those infected do not know they are infected with the virus.

It is important to identify patients infected with HCV in order to offer preventative services (alcohol cessation education, vaccination against hepatitis A and B viruses, and education on decreasing transmission), and treatment services (CDC, 2013b). Once infected with HCV, about 15% will clear the virus spontaneously, without intervention; however, 85% will develop chronic HCV infection. (Litwin et al., 2011; CDC, 2013c).

To optimize patient management, differentiating between those with current infections and those with a cleared infection is a primary goal. The 2003 CDC guidelines for HCV testing recommended the use of a HCV antibody test to identify people exposed to HCV. This antibody test does not, however, differentiate between a cleared and current infection, it only identifies patients who have reacted to an infection of HCV (CDC, 2013c). The most recent 2013 CDC guidelines recommend including reflex testing for HCV RNA (viremia) in order to determine if there is a current infection present.

One approach to optimize HCV screening is universal birth cohort screening since 75% of patients infected with chronic HCV are in the 1945 to 1965 birth cohort (Smith et al., 2012). A recent study showed an HCV positivity rate of 11.6% in the birth cohort (Patel, Vellozzi, Smith, 2016). Overall screening rates for HCV are estimated between 1-15% (Linas, Hu, Barter, & Horberg, 2014). Studies report a positive HCV test rate of 0.2-4.5% in those who are present in a healthcare setting (Smith, Yartel, Krauskopf, Massoud, Brown, Fallon, & Rein, 2015; Roblin et al., 2011). However, as stated previously, the rate of undiagnosed HCV positive patients is estimated at 45-85%. Several authors have evaluated HCV screening rates in a variety of settings. Although many studies were conducted prior to the recommendations for universal birth cohort screening, they do shed light on overall screening rates.

Purpose of the Project

The purpose of this project was to increase HCV screening rates in a primary care clinic among the birth cohort. This was accomplished after identifying the current screening rate in the birth cohort group (born 1945-1965) in a primary care clinic. The project involved determining a pre-intervention screening rate, a short intervention of education, awareness, and system/clinic flow manipulation, and determination of a post-intervention screening rate in the birth cohort.

Review of Literature

Several national guidelines and organizations all support universal testing in the birth cohort (Smith et al., 2012; American Association of the Study of Liver Disease [AASLD], 2015; Center for Medicare and Medicaid Services, 2014; Lushniak, 2014; United States Preventative Services Task Force [USPSTF], 2013). In 2012 there was a significant addition to the CDC HCV screening guidelines. The newest recommendation is to conduct one-time HCV screening in the birth cohort, that is, patients born between 1945 and 1965 in addition to screening those

most at risk as described in earlier CDC guidelines (Smith et al., 2012). The USPSTF published the same recommendation in 2013 and considered it a grade B recommendation (USPSTF, 2013). The Surgeon General and the American Association of the Study of Liver Diseases in collaboration with the Infectious Disease Society of America and International Antiviral Society support the birth cohort one-time screening (AASLD, 2015; Lushniak, 2014). In addition, Medicare and Medicaid, parts A and B, cover one-time screening in the birth cohort and those at high risk (Centers for Medicare and Medicaid Services, 2014). The agreement among all the national recommending groups emphasizes the importance and strong evidence base for the addition of this level of screening.

Most of the research on screening practices in primary care was conducted before publishing the newest CDC guidelines that include universal screening of the birth cohort. The initiation of universal screening in the birth cohort is to capture more patients who are asymptomatic and positive for HCV in an effort to manage and treat their liver disease.

The Netherlands implemented a birth cohort screening recommendation, similar to the CDC 2012 recommendation. Following this Dutch recommendation, the percent of positive HCV tests decreased as the number of people who qualify for screening increased. Screening the birth cohort increases the screening of a lower risk group compared to targeting screening for those most at risk. However, many more patients were diagnosed with HCV (Vermeiren et al., 2012).

In a 2011 EMR review of the Atlanta Veterans (VA) Medical Center, a screening rate of 50% was found, with a positive HCV rate of 15%. Of those veterans who sought healthcare in 2011 in Atlanta, 53% of VA patients born between 1945 and 1965 were screened for HCV (Cartwright, Rentsch, & Rimland, 2014). Determining the reason for the high screening rate in

the VA system would shed light on areas of screening improvement in order to increase screening rates in other settings. Even with the relatively high screening rate and positivity rate in the VA system, there is room for improvement in screening practices.

Universal birth cohort screening would dramatically increase identification of those with HCV. Screening the birth cohort only (and disregarding risk assessment) would miss 25-30% of positive patients (Southern et al. 2011). Therefore, a combination of risk based screening and birth cohort screening will identify more patients than either strategy alone.

Since the recommendation for birth cohort screening is relatively new, to date, most of the research related to HCV screening is focused on risk-based screening. Therefore, there is limited data on full HCV screening rates of patients who present to healthcare providers who should be screened (meet risk or birth cohort criteria) and are not screened for HCV. Before implementing strategies to improve HCV screening practices, it is necessary to understand the current HCV screening rates after implementation of the 2012 CDC guidelines to include the birth cohort screening (screening both those at risk and those in the birth cohort).

Screening Education for Providers

Risk based screening tools can be effective for providers to identify patients who should be screened for HCV. However, studies show that providers are not asking risk-screening questions during patient encounters. This may be related to provider embarrassment, time, or lack of knowledge. In addition, patients may not be truthful in answering risk-based factors on screening questionnaires (Denniston et al., 2012; Litwin et al., 2012). Increasing provider knowledge and comfort in screening patients appropriately for HCV risk is very important in the control of this disease. CDC guidelines for universal birth cohort screening, if fully implemented, should significantly increase the number of patients screened who might be missed

in risk-based screening. However, birth cohort screening does not replace risk based screening in other age groups, it is additive (Smith et al., 2012). Implementing the current CDC guidelines will increase HCV screening rates and identification of positive patients.

Ideally, the 2012 CDC guidelines for universal HCV screening of the birth cohort will increase the screening rate because it will not rely only on identification of stigmatized behavior, providers asking about those behaviors, and patients truthfully answering behavior questions (Litwin et al., 2012). However, data related to full implementation of the new 2012 CDC guidelines is lacking, specifically how many more patients will be identified by screening the birth cohort. The Smith et al. (2015) primary care study found very large percentages of people who should be screened for HCV are not being screened.

EMR Alerts

In a 2008 study of New York City primary care clinics Litwin et al. (2012) studied the effects of electronic medical record (EMR) reminders on the screening practices of primary care providers. The Litwin et al. (2012) EMR reminder study showed that 2.9% of patients were screened for HCV before the study intervention. Screening recommendations at the time of the Litwin et al. (2012) EMR reminder study (2008-2009) did not include the birth cohort. The 2003 CDC guidelines focused on risk exposure and risky behavior as reasons to screen patients for HCV. The purpose of the Litwin et al. (2012) EMR reminder study was to: 1) evaluate if EMR reminders increased the screening rates, and 2) evaluate the effectiveness of identifying positive HCV patients using risk based screening verses birth cohort screening. This study proved the use of EMR reminders as an effective way of increasing screening. They showed the birth cohort based screening alone identified more HCV positive patients than the risk based screening alone, 5.8% and 5.3% respectively (Litwin et al., 2012). The Litwin et al. (2012) EMR reminder

study, did not conduct retrospective analysis to identify how many patients should have been tested based on risk factors or birth cohort and were not.

Standing Orders

The use of standing orders streamlines medical care, increases compliance, and increases both providers' and medical assistant (MA) job satisfaction (Sinsky, Willard-Grace, Schutzband, Sinsky, Margolius, Bodenheimer, 2013). MAs can function at their greatest ability and scope of practice opening time for the providers to attend to issues only within their licensure and scope of practice.

Credentialed medical assistants (MAs) are eligible to enter orders for lab tests as long as a credentialing body other than their employers credentials them. The orders that are entered are eligible to count towards the CMS meaningful use measures (Balasa, 2015), which increases clinic funding. In one primary care clinic influenza vaccination rates were increased 1.4 fold by using standing orders for vaccine that were opt-out in nature (Logue, et. al, 2011).

Screening Awareness

Denniston (2012) found that fifteen percent of patients who tested positive for HCV had never heard of hepatitis C. Among those who tested positive for HCV, almost 20% did not understand that HCV could be transmitted through sexual intercourse (Denniston, 2012). The lack of understanding about transmission and HCV is a risk factor for continued spread of the disease. To improve knowledge and potentially HCV screening rates, community awareness campaigns focused on prevention, transmission and screening, especially those focused on at-risk and birth cohort populations may improve HCV knowledge (Southern et al., 2011).

The CDC is currently working on raising community awareness about HCV through the *Know More Hepatitis* campaign. This campaign is focusing on testing in the birth cohort and

includes public awareness messages in the form of radio, television, billboards, posters, etc (Koh & Valdiserri, 2014). Future studies could investigate the propensity of patients and providers to screen for HCV after viewing such campaign advertisements.

Jorgensen, Carnes, & Downs (2016) reported the CDC's *Know More Hepatitis* campaign reached 1.2 billion audience impressions, resulting in a 12:1 return on a $1 million investment. People clicked on the Google CDC advertisement 4 times more often than the industry standard, and the public service announcement (PSA) video was the third most often viewed PSA on the CDC YouTube channel (Jorgensen, Carnes, & Downs, 2016). Data on increases in screening rates is not yet available.

Medication Assistance

Roblin et al. (2011) showed that providers expressed reluctance to screen for HCV because they felt the HCV treatment was worse than the disease and patients could not afford treatment. The newest medications (sofosbuvir, simeprevir, and ledipasvir) for treating chronic HCV into sustained virologic response (SVR) are more effective (95%) and better tolerated with fewer side effects, but more expensive than the old standard of care (peginterferon, ribavirin, boceprevir, and telaprevir) (Chhatwal et al., 2015). Compared to the old standard of care, treating 10,000 patients with the newer drugs (sofosbuvir and ledipasvir) could prevent 600 cases of cirrhosis, 310 cases of HCC, 60 liver transplants, and 550 liver-related deaths (Chhatwal et al., 2015). The newer drugs are two and half times more expansive than the older drugs; however, the increased reduction of liver mortality and morbidity as described above is vast. The newer drugs were found to be more cost effective in patients who are younger or with advanced liver disease. A large portion of the cost burden of treating HCV will fall on the government payers, Medicare and Medicaid. Medicaid has expanded coverage under the Affordable Care Act, in

states that applied. The increased screening of the birth cohort will increase the number of Medicare recipients (federal coverage) who are HCV positive (Chhatwal et al., 2015). While HCV treatment is very expensive, treating the sequelae of the disease is also very costly to the healthcare system. It is inappropriate for providers to resist screening patients in accordance with standard national guidelines because of the high cost of treatment. Patients have the right to know their status and make healthcare decisions based on all available treatments.

Care Management Education

The 1998 CDC guidelines advocated for education for risk reduction in sexual practices and drug use, as well as hepatitis A and B vaccination (CDC, 1998).

A study published in a May 2015 *Morbidity and Mortality World Report* showed improved screening rates of HCV by implementing six strategies in five Philadelphia primary care clinics (Coyle et al. 2015). The following strategies, implemented in the Coyle et al. (2015) Philadelphia study, increased HCV screening rates: 1) MAs identified patients at risk or in the birth cohort, 2) reflex HCV testing was ordered to seamlessly identify chronic verses resolved infection, 3) screening cost barriers were eliminated, 4) co-testing patients initiated for HIV and HCV, 5) EMR reminders, and 6) implementation of a clinic care coordinator to link HCV positive patients to treatment. Some of these strategies are time consuming and costly. For example, MAs are busy and may not have time to identify all patients who should be screened. Offering free or reduced cost testing, while ideal, is probably not feasible for all locations and business models. Testing all patients for HCV and HIV at the same time showed an 82% increase in HCV testing in the Coyle et al. (2015) Philadelphia study. This is an easy and effective addition to care. The AASLD advocates for HCV screening in all HIV positive patients (AASLD, 2015). A clinic care coordinator, who focuses on the community resources available

to link positive HCV patients to care, can decrease providers' resistance to screen patients based on limited knowledge of HCV treatment and community care.

A recent study from Norton, et al. (2016) showed no difference in care milestones (viral load, referral to evaluation and treatment, and sustained viral response) for HCV positive patients identified through birth cohort universal screening as compared to risk-based screening. Overall, 43% of HCV positive patients were referred to care and only 4% started treatment (after an average of 300 days from initial diagnosis) (Norton, et al., 2016). This low rate of referral and initiation of treatment with the long lag from diagnosis can potentially increase the morbidity of the disease. Effective and time sensitive screening is important to reduce morbidity and healthcare costs.

Quality Improvement Study

Gemelas, et al. (2016) conducted a quality improvement project in an Indian Health Services primary care clinic in Oregon to improve HCV screening in the birth cohort. The screening rate improved from 5% to 75% screening rate over a two-year period after implementing screening recommendation education training, EMR reminders, standing HCV orders, delegation of screening responsibilities, and training on follow-up and linkage to care. A follow-up survey of providers showed the EMR reminders to be helpful in improving the screening rate. The providers felt more comfortable discussing HCV with the birth cohort after and during the intervention period. They felt the increased awareness normalized HCV and gave providers and the community a platform in which to discuss infectious disease transmission, screening, and treatment (Gemelas, Locker, Rudd, Prevost, Reilley, & Leston, 2016).

Improvements in HCV screening can be accomplished through policy change based on recommendations and guidelines, patient and provider educational campaigns, simple chart

reminders, staff involvement, and clinic culture shifts. Guidelines are constantly updated. Since implementation of the newest HCV screening guidelines, few but ever increasing numbers of studies report HCV screening rates and practices as well as barriers to HCV screening.

Quality Improvement Project – HCV Screening

Project Summary

The purpose of this quality improvement project was to increase the HCV screening rate in the birth cohort at one rural clinic. A baseline-screening rate in the clinic was determined and the providers were surveyed to determine which evidence based interventions would be most useful in this setting to address the clinic's specific barriers.

The following is a summary of the interventions proposed to the providers and staff during the pre-intervention meeting in January:

1. ***Screening Education for Providers.*** Educate providers on the importance of HCV screening, the ramifications of HCV, etc.
2. ***EMR Alerts***. Implement health maintenance tab and pop-up alerts in the electronic chart of unscreened birth cohort patients to remind providers and medical assistance of the need to screen these patients for HCV.
3. ***Screening Awareness.*** Posters from the CDC about birth cohort screening displayed in bathrooms, and patient waiting rooms.
4. ***Medication Assistance.*** Medical assistances sign up HCV positive patients on I-assist and Gilead website in an effort to obtain reduced cost medications. Gilead is the pharmaceutical company that makes Harvoni, one of the new HCV treatments.

5. ***Care Management Education*.** Educate providers on the importance of alcohol cessation, vaccination against hepatitis A and B, and transmission reduction; review liver staging with providers; review Harvoni treatment algorithm with providers

The providers were formally surveyed after the pre-intervention meeting. The most widely agreed upon solutions to the clinic's barriers to screening were implemented for two months. After completion of the intervention the post-intervention HCV screening rate in the birth cohort was assessed. The providers were surveyed after the intervention to determine self-assessment of the screening rate, what interventions worked and which did not.

Project Setting

The research project took place at Mid-Columbia Medical Centers (MCMC) River View Internal Medicine clinic in The Dalles, OR. There are 4 providers (Nurse Practitioners and Medical Doctors), 1 mental health provider, 1 pharmacist, 2 Registered Nurses, 5 Medical Assistances, and 3 front desk staff. The providers are contracted employees of Oregon Health & Science University. This clinic is located in The Dalles; with a population of 15,000 people. This is a rural, aging, farming community.

Function of the setting: purpose, processes, and activities

The purpose of completing this quality improvement project at this clinic is multifactorial. A relationship with this clinic has been established through clinical rotations. As a part of the Rural Track at OHSU in the DNP program, there is requirement to complete a project in a rural setting. This clinic population has a large proportion of patients who are in the birth cohort, born 1945-1965. The coordinated care organization (CCO) this clinic resides in, Pacific Source – Gorge, has demonstrated a particular interest in managing HCV patients by

using excess funding from the CCO to pay for the treatment of 15 HCV positive patients. The providers at this clinic have voiced concern regarding their current HCV screening practices.

The MCMC River View Internal Medicine Clinic providers and staff were involved in this QI project in the following ways. The information technology department of this clinic, MCMC-IT, ran two reports in order to gather the pre-intervention HCV screening rate and post-intervention HCV screening rate. The providers and staff were recruited via email to be involvement in this project. The providers were instrumental in gathering information about current barriers to HCV screening. The providers and staff were informed of the newest guidelines to complete one time universal screening in the birth cohort. The providers and MAs were educated about the electronic chart reminders to screen the birth cohort. The MAs were trained to use a new template in their rooming process that assessing the need for HCV screening. The MAs and registered nurse assisted in the interventions of entering electronic chart reminders. The providers and staff were involved in assessing barriers and potential solutions to screening.

Project barriers, facilitators, and challenges

Working on this project from a distance while not an active staff member proved slightly challenging. The clinic's needs and potential barriers to screening were assessed during a very interactive clinic meeting, survey responses, and email communications. As an outsider of the clinic culture, it was difficult to assess the flow of the clinic to best address the barriers and determine solutions that were culturally sensitive to this clinic.

The facilitators included providers who already demonstrated an interest in HCV screening. Medical assistants facilitated some of the key interventions – the electronic chart reminders, use of the rooming template, and order entry for the HCV lab. Both medical

assistants and providers helped facilitate patient interest in screening as both professionals helped raise education and awareness of HCV screening in the birth cohort.

Working with the information technology department at MCMC clinic was a facilitator. The MCMC-IT department was able to capture the (pre- and post-intervention) screening rates from the computer system. The health maintenance tab for HCV screening was easy to initiate the use of in the EPIC e-charting system. A clinic provider was able to add the health maintenance item for one time HCV screening to all current patients in the birth cohort.

Participants/population

Inclusion and exclusion criteria. Three out of the four providers returned completed pre-intervention surveys, four out of four completed the post-intervention survey and all four providers were included in the email communications and interventions. All medical assistances were included in the interventions and emails. The providers are the research participants in this project.

Patients included in the project data were all patients, born between 1945 and 1965, who had a clinic encounter between September 1, 2015 and October 31, 2015 (pre-intervention screening rate, a total of 988 patients) and between March 1, 2016 and April 15, 2016 (post-intervention screening rate, a total of 691 patients) who were not positive or screened for HCV prior to September 1, 2015 and March 1, 2015, pre- and post-intervention, respectively. Thirty charts were randomly selected from each time period to calculate the pre- and post-intervention screening rate.

Size and rationale. All providers were included in the study. Including all providers ensured all voices were involved in the discussion about barriers and solutions. The providers and MAs were encouraged to brainstorm the most logical workflow for incorporating research-

based solutions to improve screening rates. The MAs were involved in the study more casually through conversations, as this study focused on the providers' perspective of HCV screening.

Recruitment. A short email was sent to all providers and medical assistants at the MCMC River View Internal Medicine Clinic explaining the purpose and process of this quality improvement project, their role, and request for assistance. See Appendix A for details.

Protection of participants. No identifying information for the participants was collected or shared. Their remarks were kept confidential. The report of the discussion regarding barriers and solutions is given in general ideas or themes of conversation and feedback, no specific remarks are shared.

Implementation

Intervention

Pre-intervention data. The pre-intervention screening rate was determined by the MCMC-IT department through EPIC chart review, the e-charting system (Appendix B). Calculations for determining the rates of screening pre- and post-intervention were also conducted. The pre-intervention screening rate was 27%.

The pre-intervention survey was distributed to all full time providers (1 MD, 3 NP) at the MCMC River View Clinic. Three of the four providers returned completed pre-intervention surveys, a 75% response rate. Responding providers have worked in this clinic for 2-5 years and one has practiced medicine for greater than 10 years. The survey included a Likert scale, multiple choice answers, and space for free response comments. The self-assessment of the HCV screening rate during the pre-intervention phase was 54%; the actual rate based on EMR review during this period was 27%.

All providers agreed the main barrier to screening was forgetting to screen. They also agreed the following were not barriers to screening: lack of knowledge on how to treat patients for HCV, and lack of knowledge of current screening guidelines and screening tests. One of three providers thought other barriers included: patients were uninformed about the HCV risks, expense of treatment, and lack of insurance coverage for treatment.

In terms of potentially successful solutions, the providers strongly agreed EMR alerts and involving the MAs to enter HCV lab orders would improve screening rates. The providers agreed it would be slightly less successful to have the MAs check if the patient was previously screened, to use HCV campaign posters in the clinic, to provide education on HCV treatment algorithm, to provide education on medication assistance websites, and HCV. Based on the results of the pre-intervention survey, the interventions were determined.

Interventions and Implementation of the Project.

1. ***EMR Alerts***. Medical assistances and providers added the EMR alert in the health maintenance tab "need to screen for HCV" for all patients who had not been screened previously for HCV and were in the birth cohort. This EMR alert in the health maintenance tab was universally added to all established patients in the birth cohort. However, the alert was not automatically added to new clinic patients; a request for this automatic EMR alert for any new or established birth cohort patient was initiated with the EPIC IT department. MAs were given an algorithm to determine if the patient needed to be screened for HCV (Appendix F).

   The MA EMR rooming template was altered with two additional questions. The rooming template is part of the encounter documentation completed by the MA including data entry for vital signs, chief complaint, etc. This is information the provider can see

before the patient encounter. The additional rooming questions included: 1. Is this patient born between 1945 and 1965? If no, no further assessment is needed. If yes, 2. Has patient been screened for HCV? If no (after checking both the current EMR, EPIC and the former EMR, Nexgen), the MA pended a HCV antibody screening test. If there was a previously completed screening test in EPIC for HCV the results automatically populated in the questionnaire.

The HCV antibody test is used for HCV screening in this setting. The RNA test must be ordered separately after a positive antibody result, causing a lag in diagnosis. A positive RNA test shows active HCV. EPIC is a new EMR system in this clinic, the HCV antibody test with reflex RNA is not yet an available order set. In the future this simplified order set (HCV antibody with reflex RNA) might be available.

2. ***Screening Awareness***. Posters from CDC *Know Hepatitis* Campaign about the birth cohort screening were posted in bathrooms, patient waiting room, and clinical assessment rooms. The MAs were given talking points about HCV and screening in the birth cohort (Appendix D).
3. ***Medication Assistance.*** An I-Assist checklist was created and distributed to MAs and providers by email. The clinic supervisor printed this material and distributed it as well (Appendix G).
4. ***Care Management Education***. An algorithm was printed by the clinic manager and distributed to providers by email (Appendix H).

The intervention period ran January 1, 2016 – February 29, 2016. All educational materials were distributed during this time, as described above. Feedback was used to improve the materials ease of use. The clinic meeting and survey was conducted on January 21, 2016.

Follow-up emails were sent to the providers and staff, including the aforementioned materials. During the post intervention period no one from the study interacted with the clinic personnel (March 1, 2016 – April 15, 2016) to reduce bias in the results.

Post-Intervention. On May 1, 2016 a report for the post-intervention screening rate was obtained for March 1 – April 15, 2016 (Appendix B). The post-intervention rate was 53.3% screening in the birth cohort, a 2-fold improvement from the pre-intervention rate of 27%.

The providers completed a post-intervention questionnaire (Appendix E). The results of the post-intervention questionnaire were as follows. Four out of four providers at the clinic answered the questionnaire, 3 NPs and 1 MD, average of 14 years of experience in practice. On average the self-assessment of their rate of screening for HCV in the birth cohort during the post intervention period was 66% (actual rate was 53.3%) and their self-assessment pre-intervention rate of screening was 54% (actual rate 27%). The actual rate of increase in screening was 2 fold; the perceived rate of increase was a 22% increase.

The providers widely agreed the main barrier to screening remained "forgetting to screen". The providers agreed that the best interventions to improve the screening rate were EMR alerts and involving the MAs to help identify patients who needed to be screened and having MAs enter the HCV lab per protocol. The single most effective intervention, determined by provider survey, was involving MAs to enter HCV lab orders. Seventy-five percent of the providers agreed that they screened patients twice as often in the post-intervention period as compared to the pre-intervention period.

Outcomes in relation to the literature

There was very little literature about interventions used to increase HCV screening rates based on the birth cohort guidelines when this quality improvement project was designed and

implemented. Since project implementation several similar studies have been published. Most notably Gemelas, et al. (2016) showed an increase in HCV screening rates from 5% to 75% in two years after implementing screening recommendation training, EMR reminders, standing HCV lab orders, delegation of screening responsibilities, and training on follow-up and linkage to care. There was positive provider feedback in terms of HCV care and provider satisfaction after the completion of this quality improvement study. The interventions presented in this paper were very similar to Gemelas, et al. however in the MCMC study the screening rate improved from 27% to 53.3% in two months, as compared to improving to 75% after two years.

Although the Atlanta Veteran retrospective study showed a HCV screening rate of 53% in 2011, which occurred before the 2012 CDC guidelines were published on screening the birth cohort (Cartwright, Rentsch, & Rimland, 2014), the authors did not report on the causes of the high screening rate in this Atlanta Veteran population. In addition, Coyle, Kwakwa, & Viner (2016) exceeded the national average HCV screening rates (birth cohort and risk based) after implementing MA initiated, opt-out, laboratory HCV screening tests, staff training on HCV screening and disease, clinic flow analysis, and EMR modification. These interventions are very similar to the interventions used in this QI project. All projects have showed improved screening rates.

There is very little data that describes screening rates for the birth cohort after the 2012 CDC guidelines were published. Cook et al. (2016) conducted a large retrospective data collection from over 60,000 patients seen in community health centers in 2013. Only 8.3% of patients who were eligible for universal birth cohort screening were screened (Cook, Turse, Garcia, Hardigan, & Amofah, 2016). In the MCMC clinic, baseline-screening rates were 3 fold that found by Cook, et al. (2016). This higher baseline screening rate may have been due to the

recent CCO focus and involvement in funding treatment for several HCV positive patients, or that this QI project took place 3 years after the published 2012 guidelines giving providers time to adjust practice, or the MCMC providers may have been more aware of the guidelines due to their consistent connections with academic medical centers

HCV screening rates can be improved by the above methods. Norton, et al. (2016), however, found there is no difference in the rate of care and treatment for HCV in the birth cohort screening group compared to risk based screening groups. Improving the care cascade is an opportunity to improve management of this chronic (and treatable) disease.

Practice Related Implications and Recommendations

Based on the literature and the above MCMC project the most effective interventions to improve HCV screening rates of the birth cohort in primary care is to use EMR alerts and standardized screening lab input by opt out method or medical assistant entry. The other interventions discussed and performed in this QI project may be helpful as well. In the future, focusing on one intervention at a time would identify more clearly which intervention is the most effective.

The clinic in which this QI project was conducted had a preexisting interest in HCV as their CCO provided funding to treat several HCV positive patients. Just before the baseline data was collected the clinic was identifying HCV positive patients to treat. Therefore this clinic may have been well positioned to easily increase screening rates

To be successful, project support from the key stakeholders is extremely important, in this case, the providers and clinic staff. They were the ones making the changes in the clinic that were necessary to improve the screening rate. In the future, the MAs and staff could be more formally surveyed on their role in the screening rate improvement. Standardizing training for the

MAs to input labs, as not all MAs were consistently completing this task, would possibly lead to an increase in the screening rate. Continuing use of the EMR alert and the rooming template will potentially increase the screening rate. The implementation period (including the post-intervention period data collection) was only 4 months (January – April 15, 2016). Gemeles, et al. (2016) implementation period was over 2-years and eventually achieved a 75% screening rate in the birth cohort. Therefore, our data suggests that it may be possible to achieve acceptable screening rates with a short time frame. Although consistent data on present screening rates is not available, a 75% goal rate seems reasonable. Further, even though screening rates were increased, those rates may not continue over time. Therefore evaluating screening rates every 6 months, or in the case of the MCMC clinic, reassessing in October 2016 (six months after the post-intervention period ended) to determine optimal screening rate maintenance. Since the number of patients that require HCV screening will continue to decrease, the focus should move to HCV management and treatment.

A post-intervention educational meeting with the providers will be used to report the change in screening practices, discuss what interventions did and did not work, and discuss what can change going forward to continue to improve HCV screening practices.

Conclusions

A two-fold increase in the HCV screening rate in the birth cohort (to a total rate of 53%) in less than a 2-month intervention period is significant. The use of the EMR alert, rooming template, and MA lab entry interventions could be applied to several other standard health maintenance items such as flu vaccination, colonoscopy screenings, regular diabetic care, based on individual site needs assessments. While bringing attention to too many items of change at

once can be overwhelming and thus ineffective, concentrating on one health care practice improvement item at a time could prove effective.

Summary

This quality improvement project was performed at MCMC Internal Medicine Clinic in a rural community. This project's objective was to increase the screening rate of HCV in the birth cohort through simple interventions determined and performed by the clinic providers and staff. The use of delegation of lab input to the MAs was found to be the most effective intervention to improve the screening rate. The HCV screening rate increased 2-fold from pre- to post-intervention, 27% to 53%, respectively.

There are several possible next steps in this QI project that will be discussed and determined at the upcoming clinic wide meeting.

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Appendix A – Recruitment Email

Dear MCMC River View Internal Medicine Clinic Providers and Medical Assistants,

I am Erin Grap. I am a Doctorate of Nursing Practice student at Oregon Health & Sciences University. I am contacting the providers at the MCMC River View Internal Medicine Clinic in an effort to recruit you for my DNP Quality Improvement Project.

I will be conducting a pre and post intervention survey of hepatitis C virus (HCV) screening rates in the birth cohort (born 1945-1965). One time universal screening in this group is recommended by the CDC, USPSTF, and a number of specialty professional organizations. Hepatitis C is linked to cirrhosis, liver cancer, and death. Literature shows the birth cohort encompasses about 75% of those infected with HCV, however screening rates are between 1-15%.

I am working with Dr. Dorothy Sherwood on this quality improvement project. My project is to assess the current HCV screening rates of the birth cohort. I would like to present the current screening rates of your clinic to the providers during a brief meeting, have you complete a short (8 item) questionnaire about screening, barriers, and potential solutions. I will then move forward with a few evidence-based interventions to hopefully increase HCV screening rates. I will complete a post intervention assessment of screening rates and again present the information in a brief provider meeting with a second questionnaire.

PROVIDERS - What I am asking of you – Are you available to attend the 2 meetings, possibly 3 (the third meeting is and educational intervention meeting). These 3 meetings will take place during the intervention period January 2, 2016 – February 29, 2016. Can you complete the 2 questionnaires? Can I run an IT report in order to assess the pre and post intervention screening rates?

MEDICAL ASSISTANTS – What I am asking of you - Are you willing to help with the work flow to remind providers to screen the birth cohort for HCV? Are you available for one 30 minute meeting to discuss the EMR chart alerts and database patient information entry?

Thank you for your time and consideration. Please don't hesitate to contact me with any questions.

Sincerely,

Erin Grap
grap@ohsu.edu
804-647-4314

Appendix B - EPIC Reporting Specifics

- MCMC-IT calculated the pre- and post-intervention rates. The total number of patients in the birth cohort seen in the clinic (meeting the corresponding inclusion and exclusion criteria) was determined.
- There were 988 patients in the birth cohort seen in the clinic from September 1, 2015 – October 31, 2015 (pre-intervention period). There were 691 patients in the birth cohort seen in the clinic from March 1, 2016 – April 15, 2016 (post-intervention period).
- 30 patient charts were randomly selected for each study period. The following inclusion and exclusion criterion was applied to these 30 charts to determine the rate of the 30 randomly selected charts. The rate was extrapolated to each sample.

Run report to capture – PRE-Intervention Report

1. NUMBER OF PATIENTS WHO HAVE BEEN SCREENED - Number of patients in the birth cohort (born between January 1, 1945 – December 31, 1965) who have not previously been diagnosed with HCV and have not previously been screened for HCV and at an encounter between September 1, 2015 – October 31, 2015 were screened for HCV using the HCV antibody blood test with the RNA reflex testing if positive for the antibody.

   INCLUSION: Born 1/1/1945 – 12/31/1965
   Office visit 9/1/2015 – 10/31/2015
   Hepatitis C antibody blood test
   If Hepatitis C antibody is positive, RNA reflex test

   EXCLUSION: Diagnosis of Hepatitis C Virus prior to 9/1/15
   Previously screened for HCV.

2. NUMBER OF PATIENTS WHO SHOULD BE SCREENED - Number of patients in the birth cohort (born between January 1, 1945 – December 31, 1965) who have not previously been diagnosed with HCV and have not previously been screened for HCV at an encounter between September 1, 2015 – October 31, 2015.

   INCLUSION: Born 1/1/1945 – 12/31/1965
   Office visit 9/1/2015 – 10/31/2015

   EXCLUSION: Diagnosis of Hepatitis C Virus prior to 9/1/15
   Previously screened for HCV.

#1/#2 x 100 = Percentage of patients screened who were eligible for the universal HCV screening test in the PRE intervention period.

PRE-INTERVENTION RATE = 8/30 = 27% screening rate

Run report to capture – POST-Intervention Report

3. NUMBER OF PATIENTS WHO HAVE BEEN SCREENED - Number of patients in the birth cohort (born between January 1, 1945 – December 31, 1965) who have not previously been diagnosed with HCV and have not previously been screened for HCV and at an encounter between March 1, 2016 – April 15, 2016 were screened for HCV using the HCV antibody blood test with the RNA reflex testing if positive for the antibody.

   INCLUSION: Born 1/1/1945 – 12/31/1965
   Office visit 3/1/2016 – 4/15/2016
   Hepatitis C antibody blood test
   If Hepatitis C antibody is positive, RNA reflex test

   EXCLUSION: Diagnosis of Hepatitis C Virus prior to 3/1/16
   Previously screened for HCV.

4. NUMBER OF PATIENTS WHO SHOULD BE SCREENED - Number of patients in the birth cohort (born between January 1, 1945 – December 31, 1965) who have not previously been diagnosed with HCV and have not previously been screened for HCV at an encounter between March 1, 2016 – April 15, 2016.

   INCLUSION: Born 1/1/1945 – 12/31/1965
   Office visit 3/1/2016 – 4/31/2016

   EXCLUSION: Diagnosis of Hepatitis C Virus prior to 3/1/16
   Previously screened for HCV.

#3/#4 x 100 = Percentage of patients screened who were eligible for the universal HCV screening test in POST intervention period.

POST-INTERVENTION RATE = 16/30 = 53.3% screening rate

Appendix C – Provider questionnaire – pre-intervention

1. What is your licensing?
   MD DO NP PA Other

2. What is your specialty?
   Family Internal Medicine Adult Geriatrics Other

3. How long have you been practicing as a provider?
   0-1 years 2-5yrs 5-10years >10years

4. How long have you been practicing at this clinic?
   0-1 years 2-5yrs 5-10years >10years

5. How often September 1, 2015 – October 31, 2015 did you screen patients, whom you encountered in clinic, born between 1945-1965 for HCV using the antibody test with reflex RNA testing? Including only patients who were not previously screened or diagnosed with HCV.
   25% 50% 75% 100%

6. Determine how much of a barrier the follow are to universal HCV screening in the birth cohort

Potential barriers to screening for HCV	**Strongly agree**	**Somewhat agree**	**Neutral**	**Somewhat disagree**	**Strongly disagree**
Knowledge of current guidelines and screening tests					
Forget to screen					
Patient uninformed about HCV risk, etc					
Lack of knowledge about how to treat a patient for HCV					
Expense of treating HCV					
Lack of insurance coverage for treatment					
Other:					
Other:					

7. Determine how successful the following interventions might be in an effort to improve your universal screening of the birth cohort for HCV.

Potential solutions to improve screening for HCV	**Strongly successful**	**Somewhat successful**	**Neutral**	**Somewhat unsuccessful**	**Strongly unsuccessful**
Provider education					
E-chart alert					
Posters in the clinic					
Education on HCV treatment algorithm					
Education on available medication assistance websites					
Involving medical assistances to check if patient in the birth cohort have been screened for HCV					
Involving MAs to enter HCV lab orders, per protocol.					
Other:					
Other:					

7. Any further comments you would like to add about this Quality Improvement Project?

Appendix D

MA talking points
Hep C and Birth Cohort (Born 1945-1965)

- 75% of patients with Hepatitis C are born between 1945-1965
- Most people (45-85%) don't know they have Hep C (asymptomatic), but the virus can damage the liver
  - Causing liver cirrhosis, liver failure, and death
- There is a curative medication that is highly effective and tolerable

Appendix E - Provider questionnaire – POST-intervention

1. What is your licensing? What is your specialty?

2. How long have you been practicing as a provider?

3. How long have you been practicing at this clinic?

4. How often March 1, 2016 – April 315, 2016 did you screen patients, whom you encountered in clinic, born between 1945-1965 for HCV using the antibody test with subsequent RNA testing? Including only patients who were not previously screened or diagnosed with HCV.
   25% 50% 75% 100%

5. Determine how much of a barrier the follow are to universal HCV screening in the birth cohort between March 1, 2016 – April 15, 2016.

Potential barriers to screening for HCV	**Strongly agree**	**Somewhat agree**	**Neutral**	**Somewhat disagree**	**Strongly disagree**
Knowledge of current guidelines and screening tests					
Forget to screen					
Patient uninformed about HCV risk, etc.					
Lack of knowledge about how to treat a patient for HCV					
Lack of insurance coverage for treatment					
Other:					
Other:					

6. Determine how successful the following interventions helped to improve your success in HCV screening.

Potential solutions to improve screening for HCV	**Strongly successful**	**Somewhat successful**	**Neutral**	**Somewhat unsuccessful**	**Strongly unsuccessful**
Provider education					
E-chart alert					
Posters in the clinic					
Involving medical assistances to check if patient in the birth cohort have been screened for HCV					
Involving MAs to enter HCV lab orders, per protocol.					
Other:					
Other:					

7. What was the MOST important intervention that you think helped to increase your HCV screening rate?

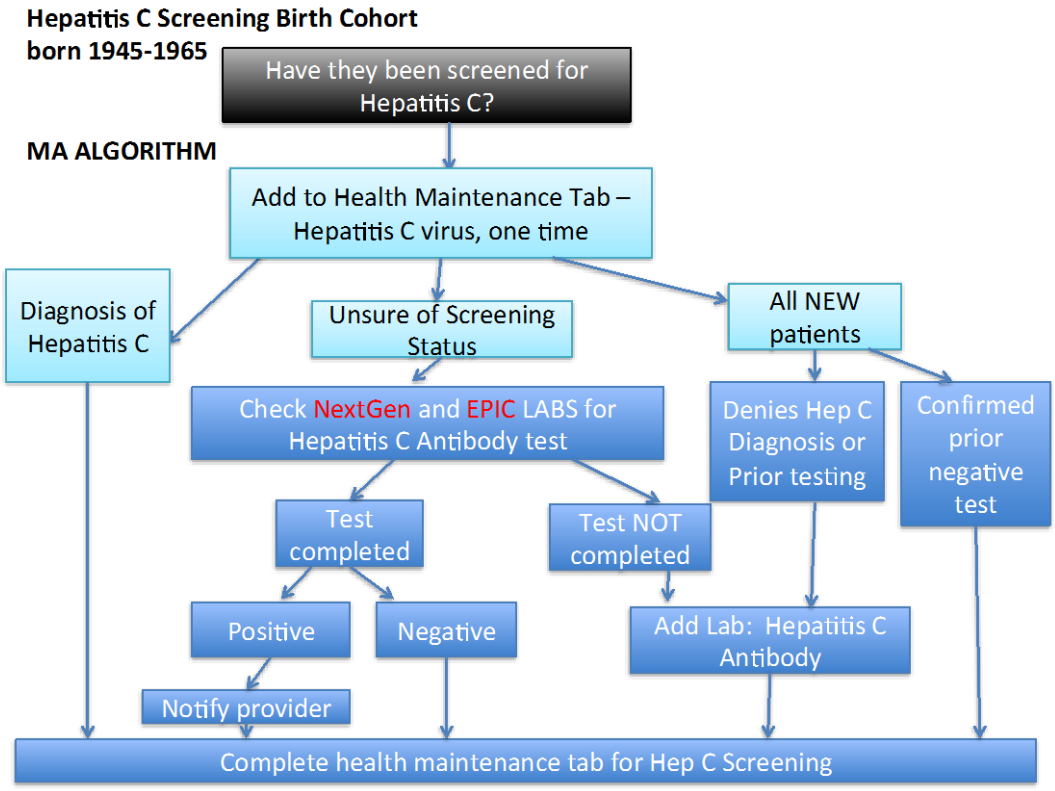
    - Provider education and awareness
    - E-Chart alert
    - Posters in clinic
    - Involving medical assistances to check if patient in the birth cohort have been screened for HCV
    - Involving MAs to enter HCV lab orders, per protocol.
    - Other:

8. The screening rate improved about 2 fold from Pre-intervention period (Sept – Oct, 2016) compared with the post-intervention period (March – April 15, 2016). Do you feel you screened patients in the birth cohort twice as often in the post intervention period as you did in the pre-intervention period?

   YES NO

9. Any further comments on the Quality Improvement Project?

Appendix F



Appendix G

I-Assist

I-Assist.com

- Mission is to improve patient access to specialty medications through technology that streamlines prescribing process.
- Accesses Prior Authorization from the patient's insurance, if declined uses the patients' clinical information to seek medication coverage elsewhere (i.e. drug company).
  - One step with "reflex" to other options

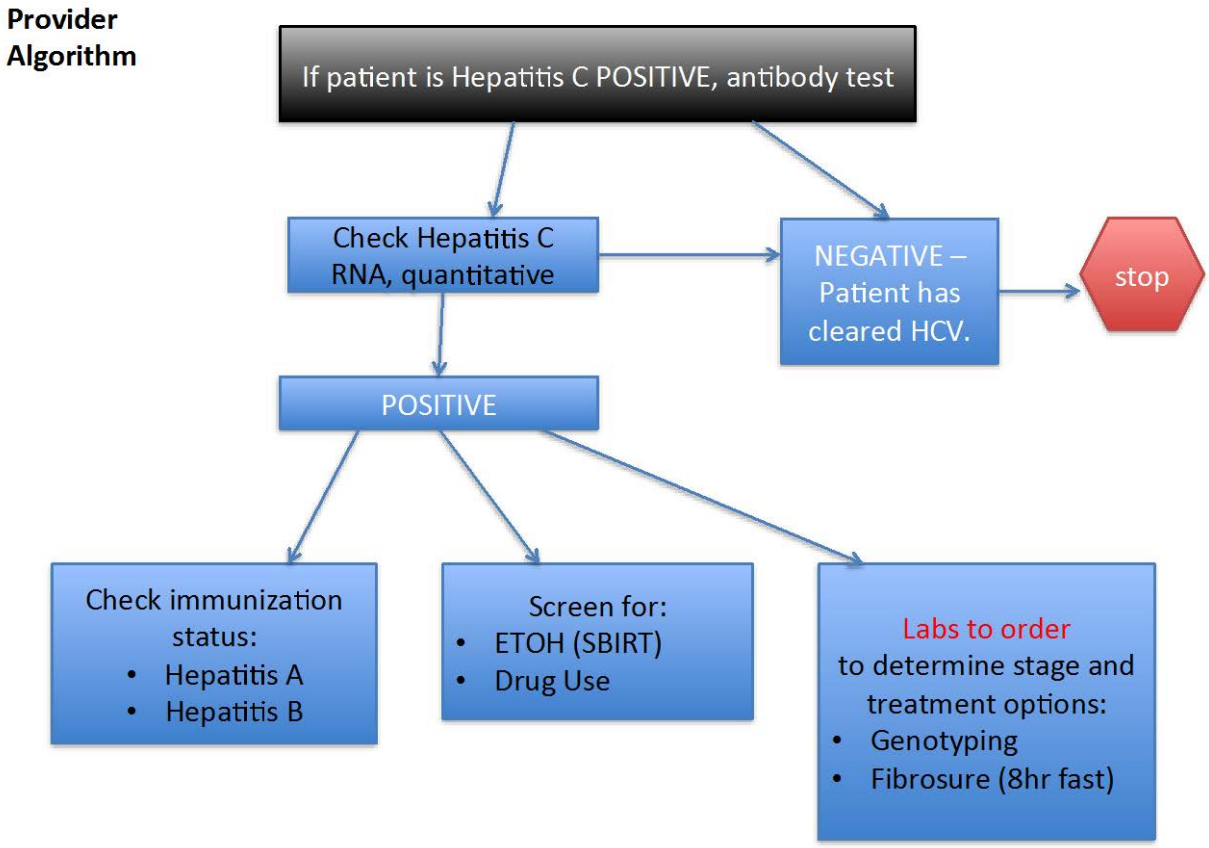
This tool could be passed between provider and MA in order to collect all information needed for the I-assist application packet

I-Assist Checklist

- ❑Payer prior authorization form, complete
- ❑Previous tried/failed treatments

  _____
- ❑Lab values (to be printed from EMR)
  - ❑Hepatitis C Virus, RNA, quantitative:_____
  - ❑Fibrosure score (8hr fasting):_____
  - ❑Hepatitis C Genotype (subtyping):_____
- ❑Last clinic note

Appendix H


Provider Algorithm
If patient is Hepatitis C POSITIVE, antibody test
Check Hepatitis C RNA, quantitative
NEGATIVE – Patient has cleared HCV.
stop
POSITIVE
Check immunization status:
• Hepatitis A
• Hepatitis B
Screen for:
• ETOH (SBIRT)
• Drug Use
Labs to order
to determine stage and treatment options:
• Genotyping
• Fibrosure (8hr fast)