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Implementation of a multidisciplinary, team-based model to treat chronic hepatitis C in the primary care setting: Lessons learned

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ABSTRACT

Hepatitis C virus (HCV) is the most common blood-borne virus in the U.S., and its incidence continues to rise. With approval of direct-acting antiviral medications, treatment for Chronic Hepatitis C (CHC) has become highly efficacious with a minimal side effect profile. Primary care physicians are well-positioned to address this increased demand, yet most do not feel comfortable treating CHC. In this case report, we describe implementation of a multidisciplinary team-based approach for treating CHC at multiple primary care sites across a large safety net health system. We focus on the evolving nature of implementation of our model through iterative Plan-Do-Study-Act (PDSA) cycles, highlighting the importance of developing an interdependent, multidisciplinary team, providing training, and ongoing support of Primary Care Hepatitis C Specialists, responding to the evolving nature of CHC treatment and policies, and ensuring high quality treatment. This process allowed us to continually grow and adapt our approach to make it feasible and successful. We share our "lessons" learned for others looking to bring CHC treatment, and potentially other specialty-based treatment, into the primary care setting.

1. Background

Hepatitis C virus (HCV) is the most common blood-borne virus in the United States, infecting an estimated 2.7–3.9 million Americans.[1,2] Among those infected, approximately 85% will go on to develop chronic hepatitis C (CHC) and 20–30% of these patients will progress to cirrhosis. Hepatic decompensation will occur in 20% and hepatocellular carcinoma will occur in 10% of patients with cirrhosis.[3] With approval of direct-acting antiviral medications, treatment for CHC has become highly efficacious with a minimal side effect profile.[4–6] The demand for specialty care to provide treatment has since increased. Of the approximately 3 million people living with CHC infection in the United States, an estimated 38% are linked to care, 11% are treated, and 6% achieve cure.[7] Low level of linkage to care may be related to patient perceptions of tolerability,[6] lack of provider expertise, and limited access to specialists who treat CHC.[8–10] Data from the Center for Disease Control report that the incidence of HCV infection is rising, especially in young adults.[11] Thus, there will be a continued demand for providers trained in HCV care.

Given the new, safe and effective treatments available for CHC, primary care providers are well-positioned to screen, evaluate and treat CHC in an outpatient setting while co-managing patients' other acute and chronic illnesses. However, a recent study of primary care physicians found that although a majority are up-to-date with CHC screening recommendations, most are not up-to-date with treatment and do not feel comfortable treating CHC.[12] Previous studies have demonstrated the potential value of bringing CHC treatment to a primary care setting.[13–17] When primary care providers were properly trained and supervised by a specialist, patients with CHC achieved similar cure rates across primary care and specialty sites.[13,14]

2. Organizational context

Our Institution is an academic health care system that serves as a safety-net for a large urban population across the greater Boston area, with over 140,000 patients in Cambridge, Somerville, and Boston's Metro North region. Each of the 12 primary care sites operates as a National Committee for Quality Assurance (NCQA) designated Patient

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Centered Medical Home (PCMH) where care is delivered in a team-based approach and coordinated with a robust Electronic Medical Record (EMR) system. This creates an ideal environment for collaboration between primary care providers and specialists.

3. Problem

Within our Institution, CHC care traditionally has been provided by two Infectious Disease specialists. With the introduction of the new direct-acting antiviral medications, these specialists found their clinical schedules quickly filling with patients desiring treatment for CHC, precluding evaluations of potentially more complex infectious disease-related issues and leading to long wait times for initial consultations. An EMR report found that the volume of CHC in our health system from October 2013 through October 2015 was 3800 patients.[1^] A 3-month review of one Infectious Disease specialist's clinics from July 1, 2015 through September 31, 2015 showed that, of 456 patient slots available, 299 (65.6%) were filled with CHC care.

4. Solution

Given the increased demand for CHC services and the ease of the new direct-acting antiviral therapies, one of the Infectious Disease specialists set out to develop a program to deliver high quality CHC care within the primary care setting across the institution. The goals of the program were to increase primary care capacity to manage patients with CHC and thus increase patient access to specialty care within the familiar setting of their primary care facility. Permission was obtained from the Chief of Medicine and as the program was rolled out, from medical directors at each primary care site. In the model, the Infectious Disease specialist trains 1 or 2 providers to serve as the Primary Care Hepatitis C Specialist at each primary care site. These providers are chosen by the clinics' medical directors and tend to be highly motivated individuals desiring to learn a new skill. Some, but not all, have an interest in addiction management and opioid replacement therapy. These Primary Care Hepatitis C Specialists help teach other providers at their site about CHC, serve as the local experts for CHC management, and take referrals from within their clinic for the management and treatment of CHC. Templated notes and easy-to-follow treatment algorithms were designed and are updated and maintained by the Infectious Disease specialist. Initial exclusion criteria for treatment in primary care included any patient with HIV, chronic hepatitis B, a creatinine clearance $\leq$ 30 ml/min, decompensated liver disease, and/or treatment with any medication other than sofosbuvir/ledipasvir. After approval of sofosbuvir/velpatasvir in June 2016, the exclusion criteria were updated to include treatment with any medication other than sofosbuvir/ledipasvir or sofosbuvir/velpatasvir. With these two drugs, the vast majority of patients with CHC could be treated in primary care. Any patient not meeting criteria to be treated by a Primary Care Hepatitis C Specialist was referred to the Infectious Disease specialists.

Though we had an initial set of plans for implementing our model, we learned through various Plan-Do-Study-Act (PDSA) cycles that our approach would need to grow and adapt to systems issues, policy changes and the rapidly progressing nature of CHC treatment itself (see Table 1). In this report, we describe how our model evolved during our first year of rollout to deliver high quality CHC care across an increasing number of primary care sites. Because we focused on quality improvement, our institution deemed Institutional Review Board (IRB) approval unnecessary.

Initially, the plan was to model our program after the Extension for Community Healthcare Outcomes (ECHO) project.[13] Through project ECHO, primary care providers based in different rural clinics throughout New Mexico were able to provide treatment to their patients with CHC by participating in weekly teleconferences run by specialists at the University of New Mexico Health Center. During these teleconferences, primary care providers had the opportunity to discuss management plans and challenges. Additionally, these case discussions were supplemented with didactic presentations by interdisciplinary experts. Based on this model we initially planned to hold regular teleconference meetings to discuss active cases with the integration of a didactic education curriculum. However, as our program grew to include an increasing number of Primary Care Hepatitis C Specialists, it was not feasible to find a time when all providers could simultaneously participate in the teleconferences. Thus we changed our model to allow more flexibility. On their own time, each provider in training was required to complete relevant portions of the University of Washington's free "Hepatitis C Online" course modules.[18] Based on each provider's availability, arrangements would be made to have a 1:1 training session with the Infectious Disease specialist to review the program and a case-based lecture. Additionally, the primary care provider in training would spend at least one clinic session with the Infectious Disease specialist seeing patients with CHC. The flexibility of this training program allowed providers to participate in the program with little disruption to their regular clinical responsibilities.

Early on, we also realized that providing ongoing support to the Primary Care Hepatitis C Specialists was vital. Initially, the plan was that the Infectious Disease Specialist would be available to the Primary Care Hepatitis C Specialists by email, EMR, and pager for all questions related to CHC. Updates in CHC care would be sent via an email listserve. As the program expanded, it became clear that it was important to streamline questions and information into one centralized forum. Thus we created an online shared website, readily accessible through our EMR, that serves as a repository for resource materials and also includes a discussion board. Providers can submit questions to the discussion board, seeking expertise from the Infectious Disease specialist or implementation guidance from the other Primary Care Hepatitis C Specialists. The Infectious Disease Specialist reviews and answers these questions on a weekly basis, and these discussions remain available for all to review. As we rolled out our program to different primary care sites, Primary Care Hepatitis C Specialists found reviewing this discussion board a valuable part of their training. To date there are 25 separate discussions on the board, consistently averaging about 2 per month. For any urgent issues, the Infectious Disease Specialist remains available by pager. The website also contains folders of shared documents, including treatment protocols and algorithms, templated notes, patient education handouts, lectures, articles, news updates, and links to hepatitis C resources and online modules.

Informing providers at each primary care site about the new delivery model for treating CHC was important to ensure appropriate patient flow. After the initial rollout, we soon found that many referrals continued to be sent to Infectious Disease instead of the on-site Primary Care Hepatitis C Specialist when providers were informed of the new model through email alone. Thus we began to formally launch the program at each separate primary care site after the designated Primary Care Hepatitis C Specialist completed the required training. At one of each clinic's regularly scheduled all-staff meetings, the Infectious Disease specialist along with an experienced Primary Care Hepatitis C Specialist would introduce the program and that clinic's newly trained member. Time was spent answering questions to ensure all members of the clinic understood the new model of care. To maximize on-site referrals, each Primary Care Hepatitis C Specialist used our EMR system to create a list of all patients with active hepatitis C within their clinic, shared this with their primary care colleagues, and encouraged active

[1] ^Chronic Hep C (CHC) infection was defined as a positive hepatitis C antibody or hepatitis C viral load or hepatitis C listed on the Health Problem List or as an Encounter Diagnosis. A limitation in using this definition is a likely overestimation of the true number given it does not account for those patients who have been previously cured or spontaneously cleared. However, because many patients were referred to specialty care solely based on a positive hepatitis C antibody, it is a close approximation of the burden of consult requests.