RESEARCH LETTER

Hepatitis C Virus (HCV) Test and Treat Training Improves HCV Screening Rates in Resident Associated Academic Primary Care Clinics

The World Health Organization tasked health systems to eliminate hepatitis C virus (HCV) as a public health threat by 2030. Specific goals include a 90% reduction in incidence and prevalence, treatment of 80% of eligible persons with chronic HCV, a 65% reduction in HCV-related deaths, and universal access to key prevention and treatment services. To meet elimination goals, 2020 United States Preventative Task Force guidelines expanded to recommend one-time screening for all adults aged 18-79 in addition to those with high-risk behaviors.[1]

Treatment consisting of pangenotypic direct-acting antivirals allows patients to receive a relatively short course of well-tolerated, highly efficacious, and often curative oral therapy. Their excellent safety profile and minimal need for monitoring allow nonspecialist providers such as nurses, pharmacists, and general practitioners to provide HCV treatment—expanding the pool of clinicians available to help achieve sustained virologic response (SVR).[1] Although HCV screening often falls to primary care practitioners (PCPs), most PCPs remain unaware of their ability to successfully treat HCV.[2] To increase treatment efforts in the primary care setting, the "ECHO" care pathway engages HCV specialists that support PCPs, often virtually, through a defined curriculum focused on mentorship and as needed consultation.[3,4] Other programs have trialed HCV treatment in primary care through directly training primary care providers in HCV management with overall high rates of SVR.[5–7] A limited number of studies evaluating the implementation of training curriculums specifically for resident physicians found a significant improvement in resident confidence in treating HCV[8] and high rates of SVR.[9]

To further increase the HCV provider pool, we developed an algorithm to train internal medicine resident physicians at our academic institution to both test for and treat HCV. We held training sessions in early 2023 and early 2024, reviewing updated HCV screening guidelines and teaching residents how to effectively treat HCV in their primary care continuity clinics. A survey was administered both before and after the training session to assess resident understanding and comfort levels with HCV screening and treatment. A "test-and-treat" protocol (Figure 1) was provided to residents to reference in future clinics. Specific parameters including fibrosis-4 index for liver fibrosis <1.45, negative HIV, and negative hepatitis b surface antigen, based on the American Association for the Study of Liver Diseases simplified guidelines for HCV treatment at the time,[10] were used to select patients appropriate for treatment in the resident primary care clinic setting; if these parameters were not met, referral to a specialist was recommended. Residents were also provided guidelines for monitoring via laboratory work and follow-up visits. Additionally, we developed a live dashboard to pull electronic medical record data on resident HCV screening and treatment practices to increase accountability (Figure A1).

From January 1, 2021, to January 25, 2023 (pre-training), 4811 encounters in resident clinic had HCV screening due. Of these, 668 were appropriately screened (13.88%) and 10 were HCV antibody positive; two had positive RNA polymerase chain reactions and were both referred to hepatology (Table 1). In the first three months post-training, the HCV screening rate improved to 24.04% (151/628, $P < .0001$) and the antibody positivity rate increased from 1.50% to 2.65%. At six and 12 months, the improved screening rate held (24.31% and 20.97%, respectively). Since the initiation of the training program, no patients with positive RNA polymerase chain reaction have been detected. However, post-training, residents ($n = 46$) showed improved understanding of current HCV screening guidelines (56.5% → 100% correctly identified who should be screened) and management per the test-and-treat protocol (28.2% → 73.9% correctly identified referral parameters). Residents ($n = 46$) also felt significantly more comfortable prescribing HCV treatment post-training (mean comfort level on a Likert scale of 1-5 increased 1.78 → 3.87, $P < .0001$).

Despite significant increases in HCV screening rates, the overall rates remain inadequate. We therefore polled residents ($n = 22$) to determine the cause of infrequent testing. The most common response was "not going for any other bloodwork, decided to delay until next bloodwork due" ($n = 12$, 54.5%), followed by "patient declined" ($n = 5$, 22.7%) and "forgot" ($n = 4$, 18.2%). Delaying screening can lead to omission of screening if patients are lost to follow-up or establish care elsewhere. It was also noted that screening rates declined between 6 and 12 months, either due to lack of consistent practice or new, untrained resident physicians joining the clinic. These limitations emphasize the need for ongoing education in residency training.

Our study shows that the implementation of a test-and-treat algorithm in the primary care clinic significantly improves screening rates for HCV. A model that increases providers through an education mentoring network, such as a residency program, may be more effective than single-directed educational interventions. These residents can mentor incoming trainees and share their expertise at other practices after graduation. Moving the management of HCV to primary care increases access to HCV testing and treatment, especially in rural

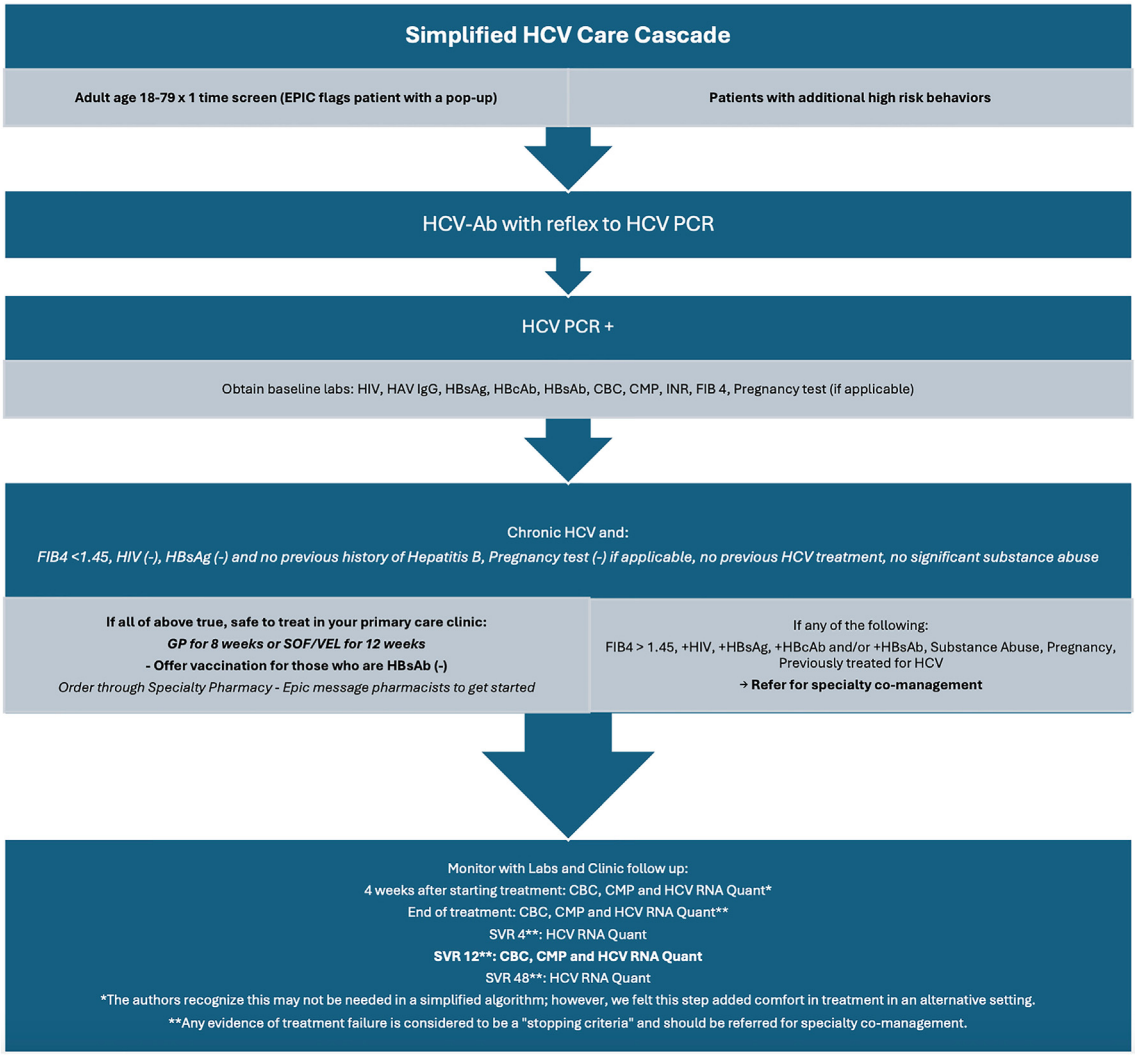

Figure 1. The HCV test and treat workflow includes screening guidelines and parameters for safe treatment in resident primary care clinic.

areas. Using the defined algorithm, only patients that truly warrant academic consultation will be referred, improving wait list times in hepatology clinics. Given the demographics of HCV, this should be <10% of the entire screened population. Finally, a model that uses existing resources, such as HCV providers and residents in training, will have decreased budget constraints and will be more cost-effective.

Table 1. Table Showing Data Pre- and Post-Test and Treat Training. Post-Training Order Data Included in This Table Is Pulled From the 6-Mo Post-Training Time Mark

Orders and survey data	Pretraining	Post-training	*P* Value
Orders			
HCV Ab orders	668/4811 (13.88%)	262/1075 (24.37%)	.0001
HCV Ab+	10/668 (1.50%)	7/262 (2.67%)	.229
RNA PCR+	2/10 (20.0%)	0/7 (0%)	.208
Survey data			
Correctly identified HCV screening guidelines	26/46 (56.5%)	46/46 (100%)	<.0001
Correctly identified referral parameters	13/46 (28.2%)	34/46 (73.9%)	<.0001
Mean comfort level (Likert scale 1-5) prescribing HCV medications	1.78/5	3.87/5	<.0001

PCR, polymerase chain reaction.

Historically, one major limitation to moving HCV treatment to the primary care setting has been Medicaid and Medicare prescriber and prior authorization restrictions. While this varies on a state-by-state basis, the nationwide trend in recent years has been toward an overall expansion in access to direct-acting antivirals. In our state, prior authorization is not required for Medicaid patients for preferred hepatitis C treatment regimens (glecaprevir/pibrentasvir and sofosbuvir/velpatasvir), but prescribers are required to complete HCV-specific continuing medical education. State restrictions also require a mentoring relationship[11]; our specialty pharmacy supports any patient on treatment, and we ensured that our training complies with continuing medical education requirements.

Given the increased screening rates and overall positive feedback from residents, we plan to continue to offer serial educational test-and-treat sessions to include incoming residents, advanced practice providers, and precepting attending physicians to further increase HCV testing and treatment. Our test-and-treat program with a live dashboard can easily be implemented at other programs, thereby increasing screening and treatment rates with the goal to meet eradication goals.

ELEANOR AUBREY BELILOS[1]
ZOË POST[2]
RAEESH VAHORA[3]
NANCY REAU[2]
[1]Department of Internal Medicine, Rush University Medical Center, Chicago, Illinois
[2]Division of Digestive Diseases and Nutrition, Department of Internal Medicine, Rush University Medical Center, Chicago, Illinois
[3]Rush University Medical Center, Information Technology, Chicago, Illinois

Correspondence:
Address correspondence to: Eleanor Belilos, MD, 1725 W Harrison Street, Suite 207, Chicago, Illinois 60612. e-mail: Eleanor_a_belilos@rush.edu.

Supplementary Materials

Material associated with this article can be found, in the online version, at https://doi.org/10.1016/j.gastha.2024.06.011.

References

1. Bhattacharya D, et al. Clin Infect Dis 2023. http://doi.org/10.1093/cid/ciad319.
2. Thomson M, et al. Dig Dis Sci 2016; 61:3460–3468.
3. Georgie F, et al. J Hepatol 2016; 64:S631–S832.
4. Ní Cheallaigh C, et al. BMJ Innovations 2017;3:144–151.
5. Wade AJ, et al. Clin Infect Dis 2020; 70(9):1900–1906.
6. Kattakuzhy S, et al. Ann Inter Med 2017;167:311–318.
7. Bloom, et al. J Gastroenterol Hepatol 2017;32(suppl 2):65.
8. Yang Y, et al. Med Sci Educ 2020; 30:1373–1377.
9. Rhodes MA, et al. PRiMER 2021;5:1. http://doi.org/10.22454/PRiMER.2021.532368.
10. AASLD. Simplified HCV treatment for treatment-naive adults without cirrhosis. 2020. https://www.hcvguidelines.org/sites/default/files/full-guidance-pdf/AASLD-IDSA_HCV-Guidance_TxN-Simplified-Tx-No-Cirr_e.pdf. Accessed January 30, 2024.
11. National Viral Hepatitis Roundtable. Center for health law and policy innovation, harvard law school. Hepatitis C: state of medicaid access report card. 2023. https://stateofhepc.org/wp-content/uploads/2021/05/Illinois-August-2023.pdf. Accessed January 30, 2024.

Abbreviations used in this paper: **HCV, hepatitis C virus; PCPs, primary care practitioners; SVR, sustained virologic response**

Most current article

2772-5723
https://doi.org/10.1016/j.gastha.2024.06.011

Received March 12, 2024. Accepted June 26, 2024.

Conflicts of Interest:
This author discloses the following: Nancy Reau has consulted for and has received research funding from AbbVie. The remaining authors disclose no conflicts.

Funding:
This research was funded by AbbVie. However, AbbVie did not participate in data collection or in the writing of this manuscript.

Ethical Statement:
This study was approved by the Rush University Medical Center Institutional Review Board, ORA Number 19081603-IRB01-AM02.

Data Transparency Statement:
Data, analytic methods, and educational materials can be made available to other researchers at request.

Reporting Guidelines:
No specific reporting guidelines/checklists were specifically followed as none were felt to be completely relevant for this study, especially given the brief format of publication. Many aspects of SQUIRE-EDU were followed.