Population-Based Standing Orders: a Novel Approach to Hepatitis C Screening

INTRODUCTION

An estimated 4 million people in the USA have been infected with hepatitis C virus (HCV).[1] Up to 75% of people with HCV were born between 1945 and 1965, leading the CDC and USPSTF to recommend universal one-time HCV screening for this birth cohort.[1] Several studies have investigated methods to increase HCV screening rates such as physician-targeted education, electronic medical record (EMR) reminders, and EMR-embedded best practice alerts (BPAs), which alert clinicians to current guidelines and facilitates HCV antibody testing.[2–5] However, HCV screening rates remain low.[2–5] With the USA migrating from primarily fee-for-service to more value-based reimbursement models, payors are tying reimbursement to outcomes such as HCV screening and treatment.[6]

In this study, we conducted a quasi-experimental pre-post controlled trial and implemented a novel initiative of population-based bulk standing orders for HCV screening.

METHODS

After partnering with the laboratory on creation of a HCV antibody test with reflex to RNA PCR, a database of eligible patients was created for two separate resident academic internal medicine practices at Yale New Haven Hospital (one with intervention and the other without). These practices have relatively similar provider/patient demographics (Table 1). Both practices use an Epic-based EMR system (Epic Systems Corporation, Verona, WI), each with over 14,000 patient visits per year. Patients were eligible for inclusion if they (1) were born between 1945 and 1965, (2) lacked a prior diagnosis of HCV infection, (3) lacked prior documented anti-HCV testing, and (4) were active with our clinic in the last 2 years.

Using the birth cohort database created, a one-time bulk population level standing order was placed, independent of a patient-provider interaction. The laboratory would automatically draw the blood during the 3-month trial window (alone or in addition to other laboratory tests). Providers were notified of the screening via EMR documentation and messaging. Patients were notified of the test order via mail and EMR messaging (opt-out in nature). Patients were notified of results and positive cases were linked to care. Data were abstracted from the EMR for 3 periods: December 1, 2016–November 31, 2017 (pre-intervention), December 1, 2017-March 1, 2018 (3-month trial period), and March 1, 2018–May 1, 2018 (post-intervention). Data abstraction included age, sex, race, zip code, insurance status, and HCV testing-related data. The primary outcome was the rate of HCV antibody testing for eligible patients per month.

All analyses were performed with SAS software (version 9.4; SAS Institute, Cary, NC). Distribution of demographic characteristics was compared between the two sites using standardized difference. An interrupted time-series analysis was performed to examine change in HCV screening rates over time.

RESULTS

In the 12 months prior to the intervention, the HCV screening rate was 3.08% at the intervention site and 3.53% at the control site, without significant month-to-month change in overall screening rates between the sites ($p = 0.66$). Immediately following the intervention, the screening rate at the intervention site significantly increased by 6.69% ($p < 0.0001$), while the change remained insignificant at the control site. Following the intervention, there was a significant decreased month-to-month trend at the intervention site ($p < 0.001$), while the change remained insignificant at the control site (Fig. 1). Viral PCR seroprevalence in the intervention group during the trial period was 6.67%.

CONCLUSIONS

Introduction and implementation of a population-based standing orders initiative led to a significant increase in HCV testing among the birth cohort. The initiative serves as a model for

Table 1 Demographics

	Encounter department			
	Control site (*N* = 5462)	**Intervention site (*N* = 5471)**	**Total (*N* = 10933)**	**Standardized difference**
Sex				
Female	3021 (55.3%)	3636 (66.5%)	6657 (60.9%)	0.23
Male	2441 (44.7%)	1835 (33.5%)	4276 (39.1%)	
Race				
Asian	55 (1.3%)	78 (2.0%)	133 (1.6%)	0.26
Black or African American	2522 (59.3%)	2275 (57.5%)	4797 (58.4%)	
White or Caucasian	1674 (39.4%)	1606 (40.6%)	3280 (40.0%)	
Unknown/missing	1211	1512	2723	
Primary payor				
Commercial	656 (12.0%)	507 (09.3%)	1163 (10.6%)	0.16
Managed Medicare	587 (10.7%)	464 (08.5%)	1051 (09.6%)	
Medicaid	2321 (42.5%)	2329 (42.6%)	4650 (42.5%)	
Medicare A/B	1235 (22.6%)	1534 (28.0%)	2769 (25.3%)	
No insurance	639 (11.7%)	623 (11.4%)	1262 (11.5%)	
Other	24 (00.4%)	14 (00.3%)	38 (00.3%)	

population-based standing orders as an EMR intervention to facilitate uptake of guideline-based recommendations. Our approach could be applied towards other screening tests that are recommended by the USPSTF such as screening blood glucose in obesity or human immuno-deficiency virus in adults. Furthermore, EMR databases can be queried for various cohorts of individuals, allowing for scaling of population-based orders to an entire health system coupled with timely treatment and follow-up for those with abnormal results.

The study's applicability is limited to practices that use an electronic medical record system which allow for bulk order placement. Obtaining laboratory testing for entire patient populations without the need for a provider-patient encounter moves panel management to a new frontier. With incentives increasing to encourage population health management, utilizing novel methods such as population-based screening has the potential to rapidly scale up screening and reduce gaps in care cascades throughout medicine.
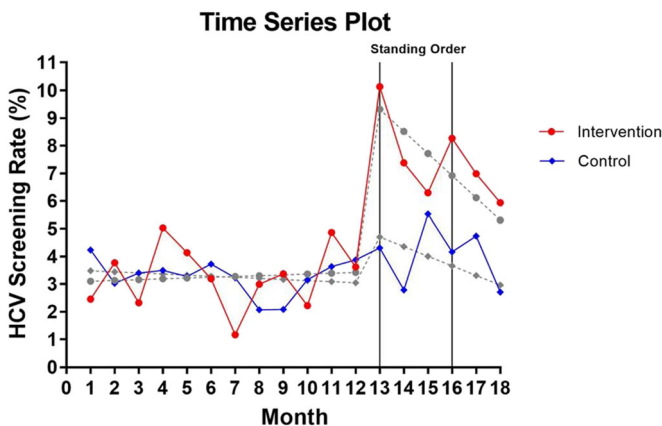

Figure 1 Time series plot.

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