

Potential Health Outcome and Efficiency Gains of Consolidating the Hepatitis-C Screening and Linkage to Care Cascade in Substance Use Programs

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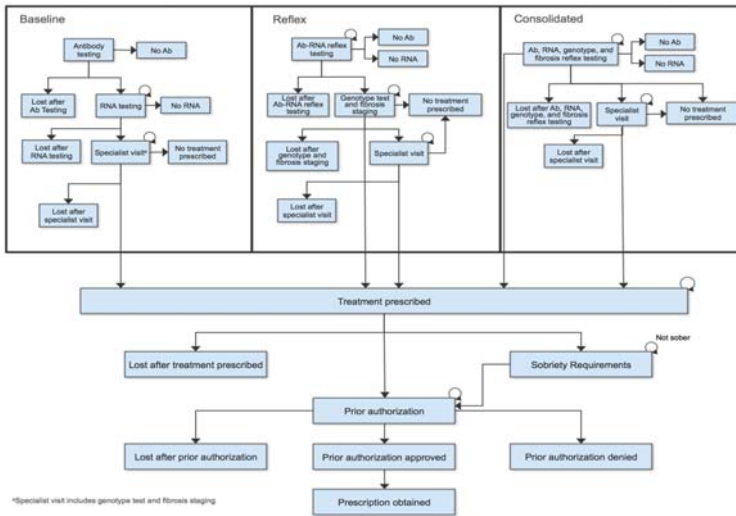
BACKGROUND

- Hepatitis C (HCV) affects an estimated 3.5 million people in the United States. [1]
 - More than half are unaware of their infection status. [1]
 - HCV is a leading cause of chronic liver disease, hepatocellular carcinoma (HCC), and cirrhosis, and is the number one indication for liver transplantations. [2]
 - HCV diagnoses in the injection drug user population account for half of new HCV cases annually. Disease management guidelines emphasize the importance of HCV SLTC for these patients. [3]
- HCV treatments are evolving rapidly, but clinical practice trials treatment innovations, having been slow to improve patient linkage to care.
- Current guidelines recommend a one-time screening for HCV for individuals born between 1945 and 1965 and individuals with increased risk of HCV infection, but initial screening only represents the first stage in the screening and linkage to care (SLTC) process. [4]
- Medicaid sobriety requirements in some states represent a salient barrier for the substance use (SU) population. [5]
- SU programs are an important care setting for vulnerable populations at high risk for HCV infection.

OBJECTIVE

Determine how an HCV-susceptible population moves through the HCV SLTC cascade in SU programs and identify opportunities to reduce the number of patients who are lost to follow-up.

Figure 1. Scenarios Modeling the HCV Screening and Linkage to Care Cascade



METHODS

Model Framework

- A discrete time Markov model was developed to simulate the HCV SLTC process for 10,000 HCV-susceptible patients, as adapted from guidance for clinicians and laboratorians published by the Centers for Disease Control and Prevention. [5]
- Patients begin at the initial screening stage (HCV antibody testing) and progress through subsequent screening and linkage to care stages.
- Patients can be lost to follow-up at any point in the SLTC process.
- The model is run until all patients complete the SLTC process or drop out.
- We assumed the cohort had the following insurance distribution: 80.7% Medicaid; 10% Uninsured; 9.2% Medicare; 0.1% Commercial [6]
 - Only Medicaid patients are required to receive drug and alcohol testing.
- Model population, transition, and timing parameters were sourced from published literature.

Scenario Design (Figure 1)

- The Baseline scenario was designed to represent an approximation of the real world screening process, and requires a minimum of 4 visits before chronically infected patients receive a treatment recommendation. Key features include:
 - An entirely separate visit for each step in the screening process;
 - Specialist requirement for genotype testing, fibrosis staging, and treatment recommendation.
- The Reflex scenario was designed to mirror Ab and RNA reflex testing, and requires a minimum of 3 visits before chronically infected patients receive a treatment recommendation. Key features include:
 - Reflex testing for Ab and RNA testing;
 - A required specialist visit only for patients with fibrosis score F2 or higher. [7]
- The Consolidated scenario requires a minimum of 2 visits before a treatment recommendation and represents a hypothetical "best case" scenario. Key features include:
 - Reflex testing for all tests (Ab testing, RNA testing, fibrosis staging, and genotype testing);
 - A required specialist visit only for patients with fibrosis score F2 or higher. [7]

Primary Outcomes

- Key outcomes included:
 - Yield, defined as the percentage of patients entering the model for HCV antibody screening who complete the process and initiate treatment;
 - Conditional Yield, defined as the percentage of patients who are either Ab+ or chronically infected with HCV who complete the process and initiate treatment;
 - Number of patients lost to follow-up at each stage.
 - Total number of patients treated
- We present outcomes for the full model horizon (Figure 2) as well as shorter time horizons of 2 and 6 months (Table 1)

DISCUSSION/CONCLUSIONS

- Integrating multiple steps in the HCV SLTC cascade reduces the total lost to follow-up by 50-76% and increases both efficiency and the number of patients treated.
- Introducing reflex testing increases the number of patients who are aware of their infection status by 12%, which could lead to a reduction in risky behavior and transmissions.
- Removing drug testing requirements reduces the time it takes for patients to initiate treatment by 1-2 weeks
- Requiring three separate visits for antibody, RNA, and genotype testing with fibrosis staging increases time to initiation of treatment.
- SU programs could significantly improve their identification and retention of HCV patients through reflex testing.

RESULTS

Figure 2. HCV Screening and Linkage to Care Cascade



Table 1. Model outcomes for a cohort of 10,000 screened patients

		2 Months	6 Months
		Yield	
	Baseline	0.47%	1.5%
	Reflex	7.7%	8.2%
	Consolidated	11.3%	11.4%
Conditional Yield Ab+ (Conditional Yield RNA+)	Baseline	1.1% (1.4%)	3.6% (4.5%)
	Reflex	18.7% (22.9%)	19.7% (24.2%)
	Consolidated	27.2% (33.4%)	27.6% (33.9%)
Total Lost to Follow-Up (% of RNA+)	Baseline	2312 (69%)	2734 (81%)
	Reflex	1423 (42%)	1424 (42%)
	Consolidated	646 (19%)	646 (19%)
Number Treated (% of Total Ultimately Treated)	Baseline	47 (30%)	150 (97%)
	Reflex	772 (95%)	816 (100%)
	Consolidated	1126 (98%)	1143 (100%)

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DISCLOSURES

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