

# Predictors of Hepatitis C Treatment Outcomes in a Harm Reduction-Focused Primary Care Program in New York City



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## Introduction

There are an estimated three to five million persons in the United States living with the Hepatitis C Virus, which remains the number one cause of liver transplantation in the country. The arrival of highly effective direct acting anti-viral agents and the related goal of achieving HCV elimination makes it a priority to optimize patients' successful completion through the HCV care cascade. It is imperative to study the means by which to accomplish this task, as a multifaceted approach will be necessary to treat a complex patient population.

The Respectful & Equitable Access to Comprehensive Healthcare (REACH) is a primary care program for persons who use drugs (PWUD) integrated into Internal Medicine Associates. REACH provides comprehensive primary care services to PWUD that include buprenorphine and HCV treatment, stigma-free risk reduction counseling, overdose response training, psychosocial assessment and support groups. REACH promotes drug user health, a set of services built on harm reduction philosophy that addresses the structural and social issues underlying drug use and provide individuals with compassionate, competent, and stigma-free healthcare.

## Methods

We used retrospective cohort data from the primary care-based REACH Program. Among persons who began direct-acting antiviral treatment between December, 2014 and March, 2018 we assessed these outcomes:

- 1) Treatment Completion
- 2) Returning for 12-week post treatment completion viral load testing

Along with routinely collected sociodemographic data, several primary predictors were ascertained including:

- History of drug use
- Psychiatric illness
- Housing stability
- History of Incarceration

We evaluated associations between various predictors and outcomes using univariate and multivariable statistical methods.

**Table 1**

Univariate T-test and Chi-Squared Analysis

	Treatment Completion n=331		P	Return for SVR 12 test n=304		P		Treatment Completion n= 331		P	Return for SVR 12 test n=304		P
	Yes	No		Yes	No		n (%)	Yes	No		Yes	No	
n (%)	304 (92)	27 (8)		227 (75)	77 (25)		n (%)	304 (92)	27 (8)		227 (75)	77 (25)	
<b>Age</b>							<b>Diabetes</b>			0.519			0.026
Mean Range	53.6 20-77	53.2 36-82	0.868	54.3 24-77	51.5 20-70	0.067	Yes	48 (16)	3 (11)		42 (19)	6 (8)	
20-30	19 (6)	0 (0)	0.353	11 (5)	8 (10)	0.079	No	256 (84)	24 (89)		185 (82)	71 (92)	
31-50	85 (28)	11 (41)		62 (27)	23 (30)		<b>Other Comorbidity</b>			0.417			0.014
51-70	189 (62)	15 (56)		143 (63)	46 (60)		Yes	182 (60)	14 (52)		145 (64)	37 (48)	
71-82	11 (4)	1 (4)		11 (5)	0 (0)		No	122 (40)	13 (48)		82 (36)	40 (52)	
<b>Gender</b>			0.849			0.422	<b>Alcohol Abuse Past Year</b>			0.066			0.76
Male	220 (72)	20 (74)		167 (74)	53 (69)		Yes	48 (16)	8 (30)		35 (15)	13 (17)	
Female	84 (28)	7 (26)		60 (26)	24 (31)		No	256 (84)	19 (70)		192 (85)	64 (83)	
<b>Ethnicity</b>			0.718			0.785	<b>Sedative Abuse Past Year</b>			0.004			0.455
African American or Black	71 (23)	4 (15)		54 (24)	17 (22)		Yes	26 (9)	7 (26)		21 (9)	5 (6)	
Hispanic	118 (39)	13 (48)		85 (37)	33 (43)		No	278 (91)	20 (74)		206 (91)	72 (94)	
White	58 (19)	5 (19)		43 (19)	15 (19)		<b>Anxiety/Panic attack in the past month</b>			0.004			0.681
Other	57 (19)	5 (19)		45 (20)	12 (16)		Most Days	12 (70.6)	5 (19)		8 (4)	4 (5)	
<b>Liver Staging</b>			0.692			0.025	Some Days	59 (19)	5 (19)		46 (20)	13 (17)	
Non-Cirrhotic	246 (81)	21 (78)		177 (78)	69 (90)		Never	233 (77)	17 (63)		173 (76)	60 (78)	
Cirrhotic	58 (19)	6 (22)		50 (22)	8 (10)		<b>Housing</b>						0.948
<b>Insurance</b>			0.512			0.061	Stable	244 (80)	15 (56)	0.003	182 (80)	62 (81)	
Private	12 (4)	2 (7)		11 (5)	1 (1)		Unstable	60 (20)	12 (44)		45 (20)	15 (19)	
Medicaid	208 (68)	21 (78)		146 (64)	62 (81)		<b>Incarceration</b>			0.159			0.914
Medicare	44 (14)	1 (4)		39 (17)	5 (6)		<5 Years Ago	64 (21)	10 (37)		48 (21)	16 (21)	
Medicare + Medicaid	39 (13)	3 (11)		30 (13)	9 (12)		>5 Years Ago	160 (53)	11 (41)		118 (52)	42 (55)	
Uninsured	1 (0)	0 (0)		1 (0)	0 (0)		Never	80 (26)	6 (22)		61 (27)	19 (25)	
<b>HIV Coinfection</b>			0.165			0.104	<b>Methadone</b>			0.315			0.021
Yes	8 (3)	2 (7)		4 (2)	4 (5)		Yes	196 (64)	20 (74)		138 (61)	58 (75)	
No	296 (97)	25 (93)		223 (98)	73 (95)		No	108 (36)	7 (26)		89 (39)	19 (25)	

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## Results

From a cohort of 331 patients treated in an urban primary care center providing comprehensive harm reduction care to those who use or formerly used drugs, multivariable analysis (see Table 2) identified housing instability as the sole significant predictor for HCV treatment non-completion.

Of that original cohort, 304 patients completed treatment (92%) and were assessed for returning for SVR12. Among those completing treatment, 228 (75%) returned for SVR12 assessment. The sole predictor of this outcome was having Medicaid compared to other insurances. Notable identifiers which were not associated with treatment completion or return for SVR12 included any history of substance use, regardless of substance type and recency, psychiatric symptoms and history, and history of incarceration.

**Table 2**

Multivariate Logistic Regression

	Treatment Completion		Return for SVR 12	
Predictor	OR	95% Conf. Interval	OR	95% Conf. Interval
<b>Age</b>	1	0.9 - 1.0	1.0	1.0 - 1.0
<b>Gender</b>				
Male	REFERENCE		REFERENCE	
Female	0.8	0.3 - 2.4	0.7	0.3 - 1.3
<b>Ethnicity</b>				
White	REFERENCE		REFERENCE	
Black or African American	1.3	0.3 - 6.1	0.8	0.3 - 2.0
Hispanic	0.6	0.2 - 2.0	0.8	0.4 - 1.7
Other	0.9	0.2 - 4.1	1.1	0.4 - 2.8
<b>Medicaid</b>				
No	REFERENCE		REFERENCE	
Yes	0.7	0.2 - 2.7	0.3	0.1 - 0.8
<b>Cirrhosis</b>				
No	REFERENCE		REFERENCE	
Yes	0.9	0.3 - 2.5	2.0	0.9 - 4.8
<b>Diabetes</b>				
No	REFERENCE			
Yes	1.2	0.3 - 4.7	2.3	0.9 - 6.1
<b>Other Comorbidity</b>				
No	REFERENCE		REFERENCE	
Yes	1.2	0.5 - 2.9	1.7	0.9 - 3.0
<b>Alcohol Abuse Past Year</b>				
No	REFERENCE		REFERENCE	
Yes	0.5	0.2 - 1.4	0.9	0.4 - 1.9
<b>Sedative Abuse Past Year</b>				
No	REFERENCE		REFERENCE	
Yes	0.3	0.1 - 1.0	2.1	0.7 - 6.3
<b>Jail</b>				
Never	REFERENCE		REFERENCE	
<5 Years Ago	0.8	0.2 - 2.8	1.0	0.4 - 2.5
>5 Years Ago	1.2	0.4 - 4.0	0.8	0.4 - 1.6
<b>Anxiety/Panic Attacks Past Month</b>				
Never	REFERENCE		REFERENCE	
Most Days	0.3	0.1 - 1.0	0.7	0.2 - 2.7
Some Days	1.3	0.4 - 3.9	1.3	0.6 - 2.6
<b>Housing</b>				
Stable	REFERENCE		REFERENCE	
Unstable	0.4	0.2 - 0.99	1.1	0.5 - 2.2

## Conclusions

- Innovative strategies to help unstably housed persons complete HCV treatment are urgently needed in order to reach HCV elimination targets.
- Educational and motivational strategies should be developed to promote individuals with Medicaid to return for SVR12 viral load testing.
- The REACH model of HCV treatment incorporated within primary based care for our patients who use drugs is effective, and can be improved by addressing these highlighted needs and characteristics.

## REFERENCES

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