



## Real-World Outcomes of Direct-acting Antiviral Therapy (DAA's) amongst Persons who Inject Drugs treated in an inner city Hepatitis C Program in Vancouver, Canada.

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## Conflict of Interest

- Support from National Institute on Drug Abuse (NIDA R01DA031043-01)
- His Institution has received honoraria for speaking engagements and/or consultancy meetings from the following: Bristol Myers Squibb, Gilead, Merck, Ortho-Janssen, and Viiv.



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## Background

- Persons who inject drugs (PWID) remain a key population at risk for hepatitis C infection.
  - Seroprevalence of HCV in a cohort of Vancouver PWID 81% in 1997 Patrick, D. CMAJ 2001; 165:889.
  - Overall approximately 65% of Vancouver PWID estimated to have active HCV infection Martin, N. et al. Hepatology 2013;58:1598.



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## Background

- Treatment uptake for HCV in Vancouver PWID in the pegylated ribavirin era has been low: 1-6% Grebely, J. J Viral Hepatol 2009; 16:352. Alavi, M. Liver International 2014;34:1198.
- The advent of direct-acting antiviral agents (DAAs) has led to improved treatment outcomes, and models suggest scale up of HCV programs in PWID may lead to significant reductions in HCV prevalence Martin, N. et al. Hepatology 2013;58:1598.

## Background

- Despite improved side effect profile of DAA's significant barriers remain for use in PWID
  - Lack of access through program-level exclusion of PWID Barua, S. Ann Int Med 2015;163:215
  - Lack of access to tertiary care-based programs offering DAA therapy
  - Physician-level concerns regarding poor adherence, treatment failure and re-infection in non-clinical trial settings



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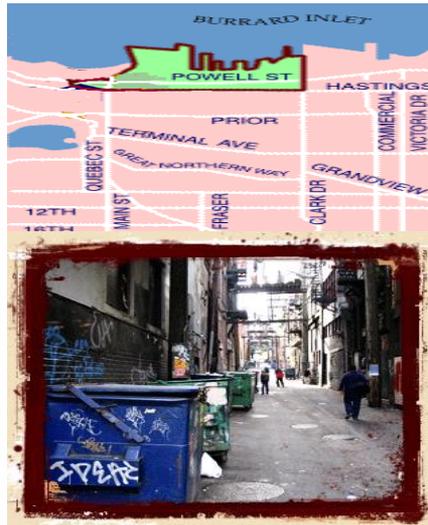


## Objective

- We aimed to evaluate the treatment outcomes of individuals undergoing DAA-based HCV therapy in an inner-city multi-site program in Vancouver, Canada.

## Setting

- The Downtown Eastside: a marginalized inner city population in the Downtown Eastside (DTES) in Vancouver
- Poorest postal code in Canada
- DTES home to an estimated 13,000 PWID



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How you want to be treated.



## Setting

- Vancouver Coastal Health operates community clinics in this neighbourhood
  - Primary Care
  - Opioid Substitution Programs
  - HCV program:
    - Multi-disciplinary (GP-run with ID specialist support, nursing and counselling support)
    - Group-based at 2/3 sites with third site offering group education sessions
    - Medications dispensed daily linked to other medications or weekly

## Setting

- HCV therapy provided through Provincial Pharmacare program
  - Publically supported program
  - No cost to low-income residents in BC
  - Treatment criteria:
    - $\geq$ F2 fibrosis (biopsy/Fibroscan/APRI)
    - Extrahepatic manifestations
- Or through compassionate access programs



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## Methods

- Data were analyzed from those initiating HCV therapy July 2014 (first access to compassionate DAA programs) to March 31, 2016.
  - Followup period August 2016
  - DAA therapy included peg interferon/sofosbuvir or interferon-free DAAs
  - Outcomes: Sustained virologic response at week 12 (SVR12), or loss-to-followup if no value was obtained.
- Bivariate comparisons of outcomes for PWID on OST and underlying HIV/HCV co-infection.

## Results – Demographics

Variable	Total Initiating Treatment (n=156)
Male	128 (82%)
Median age at time of treatment; Interquartile range (years)	54 (48 – 59)
IDU history	137 (87.8%)
Use of Opioid Substitution Therapy	83 (53.2%)
HIV co-infection	19 (12%)



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Results are median (Q1:Q3) or n (%).

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## Results – Demographics continued

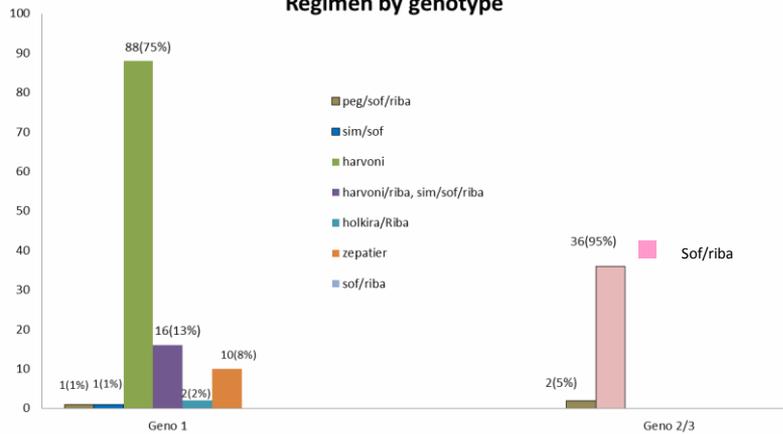
Variable	Total Initiating treatment (n= 156)
Presence of cirrhosis	79 (50.6%)
Treatment-experienced	28 (17.9%)
Genotype 1	118 (75.6%)
Genotype 2/3	38 (24.4%)

Results are median (Q1:Q3) or n (%).

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## Treatment Regimens

Regimen by genotype



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## Treatment Outcomes

- Overall SVR12 was **89%** for those who had reached this time point
  - Only **3** documented treatment failures
  - **13%** initially LTFU at time of planned SVR12
    - **8%** were LTFU at end of followup period with no value available (including 1 deceased patient)
- For Genotype 1 SVR 12 was **91%**
- For Genotype 2/3 SVR12 was **84%**



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## Summary of the 3 failures

genotype	Cirrhosis	Treatment experienced
1	Y	N
3	Y	N
3	Y	Y



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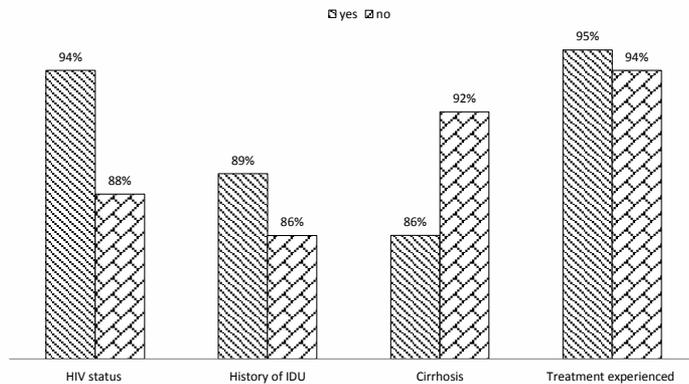


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## Treatment Outcomes for SVR 12 vs. LTFU

SVR 12 (%) by subgroups p. =NS for all comparisons



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## Bivariate analysis of factors associated with loss to followup at SVR 12

Variable	Loss to Followup at SVR 12		P value
	No	Yes	
IDU	91(87%)	9(90%)	0.990
Use of Opioid Substitution	59(55%)	8(80%)	0.184
HIV co-infection	17(16%)	1 (10%)	0.990



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Results are median (IQR) or n (%).

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## Summary

- Overall SVR12 rates were **approximately 90%** in this inner city population  
– >95% if LTFU excluded
- PWID had similar rates of SVR12 to overall population
- HIV co-infection did not affect outcomes



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## Discussion

- Rates of SVR12 have been found to be very high in PWID populations in clinical trials
  - C-EDGE CO-STAR trial Dore, G. Ann Int Med 2016;Aug 9
  - ION and ASTRAL trials post-hoc analysis Grebely, J. INSHU 2016, CID 2016
- Our data supports the effectiveness of DAAs in a PWID population in a non-clinical trial setting



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## Limitations

- Not able to determine if there are any differences in mode of medication scheduling
  - Weekly vs. Daily
- The follow-up period is not yet sufficient to evaluate re-infection



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## Conclusions

- DAA-based therapy in an inner-city population with high prevalence of PWID achieves similar outcomes to that seen in clinical trials
- Community-based multidisciplinary HCV programs are well situated to deliver care to vulnerable populations
  - Support programs/outreach may help reduce loss to followup for monitoring of HCV outcomes
- Longer-term followup for re-infection is required.



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## Acknowledgements

- We would like to thank the clinic staff and clients for supporting the community HCV program



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## Multivariate logistic regression model of factors associated with SVR12

Variable	Unadjusted Odds Ratio (95% CI)	Adjusted Odds Ratio (95% CI)
Age	1.67(0.81-3.44)	
Gender	1.45(0.36-5.80)	
IDU	1.35(0.27-6.83)	
Use of Opioid Substitution	0.55(0.16-1.89)	
Treatment Experienced	1.29(0.27-6.30)	
HIV co-infection	2.32(0.28-19.02)	



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