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Research paper

From principles to practice: Description of a novel equity-based HCV primary care treatment model for PWID

Rozalyn Milne^{a,*}, Morgan Price^b, Bruce Wallace^c, Anne Drost^a, Irene Haigh-Gidora^a, Frank A. Nezil^a, Chris Fraser^b^a Cool Aid Community Health Centre, 1st Floor 713 Johnson Street, Victoria, BC, Canada V8W 1M8^b UBC Department of Family Practice, Cool Aid Community Health Centre, 1st Floor 713 Johnson Street, Victoria, BC, Canada V8W 1M8^c School of Social Work, University of Victoria, Box 1700 STN CSC, Victoria, BC, Canada V8W 2Y2

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ABSTRACT

Background: Knowledge is increasing regarding effective models of HCV care for people who inject drugs (PWID). However, examples implementing such models in primary care are lacking, leaving a gap in our applied understanding of how practically we best scale-up such care: this is critical and urgent if the benefits of treatment advances are to be realized for PWID.

A case study: The Cool Aid Community Health Centre (CHC) provides HCV programming for PWID, putting recent advances into practice. A case study of the CHC's HCV programming describes the practice experience and outcomes of its novel, multidisciplinary, primary care, inner-city HCV treatment program for PWID. This paper describes how this model of care functions to address the many barriers to treatment and successfully facilitate adherence to treatment.

Conclusion: Medical advances for HCV will be ineffectual without effective management of complex barriers to care related to substance use, mental health, trauma, poverty, homelessness, criminalization, cultural issues, stigma and marginalization. HCV treatment for PWIDs benefits from low-threshold settings which are culturally appropriate and where trusting relationships between clients and providers are nurtured. Public investment in primary care treatment for PWID living with HCV, including investments in supports that address the social barriers faced by these vulnerable populations would build on existing evidence and improve HCV outcomes for PWID.

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In this paper, we present a case study of a current program for treatment of Hepatitis C in marginalized peoples attending a multidisciplinary, primary care community health centre, the Cool Aid Community Health Center in Victoria, British Columbia, Canada where comprehensive in-house primary care has proven successful in diminishing commonly experienced barriers to treatment in this population.

People impacted by structural inequities, including poverty and homelessness, criminalization, and stigmatization of substance use and mental illness, experience both poorer health and significant barriers in accessing primary healthcare services (Browne et al., 2012). While Hepatitis C (HCV) rates may be decreasing amongst the general population (Myers, Kraijden, & Bilodeau, 2014), certain groups experiencing severe economic hardships, problematic substance use and social exclusion

experience increasing incidence and prevalence of HCV and persistent barriers to care (Grebely, Bruggmann, Backmund, & Dore, 2013; Grebely & Dore, 2014; Klein et al., 2013). People who inject drugs (PWID) specifically have a high risk of infection, a high incidence of HCV and HIV co-infection, and low-uptake, adherence and efficacy of HCV treatment (Grebely, Bruggmann, et al., 2013).

Illicit drug use and other barriers to care are frequently exacerbated by poverty and homelessness. Inner-city populations experiencing unstable housing or homelessness specifically have extremely poor health status (Hwang et al., 2011), and barriers of access to primary care exist despite universal health insurance (Hwang et al., 2010). These populations also have high rates of HIV and HCV infection, low rates of access to testing and care, lower rates of treatment adherence, and poorer treatment outcomes (Gelberg et al., 2012; Milloy, Marshall, Montaner, & Wood, 2012).

New treatment advances hold promise of substantial reductions in morbidity and mortality related to both HIV and HCV (Klein et al., 2014). However, inner-city populations including PWID impacted by HIV have not fully benefited from advances in

* Corresponding author. Tel.: +1 250 385 1466; fax: +1 250 383 1327.
E-mail address: rmilne@coolaid.org (R. Milne).

treatment, such as, highly-active antiretroviral therapy (HAART) (Milloy et al., 2012). Similarly, new HCV treatment regimens will not likely realize their potential impact unless HCV treatment uptake and adherence among inner-city populations including PWID is made a public policy priority and successful treatment models enhanced and expanded (Bruggmann & Litwin, 2013; Grebely & Dore, 2014). Indeed, without urgent action to address the well-documented barriers to HCV care for PWID, then uptake of the current medical advances disproportionately benefits those without these barriers (Hepworth, Bain, & van Driel, 2013) and health inequities related to HCV can be expected to increase.

Canada's public health system does not specify coverage for prescription medications: provincial governments decide which medications are funded resulting in inconsistent access to treatment for HCV across the country. In British Columbia publically funded HCV medication coverage must be pre-approved for each patient based upon specified criteria for evidence of liver disease stage. Previously, two alanine transaminase values (taken at least 3 months apart) at least 1.5 times the upper level of normal, or evidence of at least F2 fibrosis. In October 2014, this changed to evidence of at least F2 fibrosis, as determined for non-cirrhotic cases by transient elastography, APRI score (aspartate transaminase to platelet ratio index), FIB-4 (fibrosis 4), or liver biopsy. In the case of cirrhosis, the fibrosis must be determined by transient elastography or biopsy, despite the fact that transient elastography is neither publicly funded nor accessible with only one machine on Vancouver Island at the time.

With Hepatitis C direct acting agents made publicly available to patients in British Columbia (BC), Canada, the potential of higher sustained virologic response (SVR) rates became a reality in principle. The challenge remained: how to reach and successfully treat HCV in this population. The treatment cascade is a conceptual model describing access and adherence to services for people living with HIV across the entire continuum of care (Gardner, McLees, Steiner, del Rio, & Burman, 2011). The same model has been applied to HCV (Linás et al., 2014) to inform interventions that seek to prevent leaks in the cascade of care that result in diminished engagement and adherence and reduced efficacy of treatment advances. The Cool Aid Clinic thus embarked to fix the leaky HCV cascade for its clients, initiating a program to review current practices, identify barriers for priority populations and pilot strategies to maximize patient access to treatment. This paper presents a case study of the Cool Aid CHC's novel HCV interdisciplinary primary care based treatment program for PWID in Victoria.

Models of HCV care for PWID

Elimination of HCV among populations of PWID is currently perceived as feasible (Alavi, Grebely, et al., 2013; Aspinall et al., 2013; Grebely, Bilodeau, et al., 2013; Grebely & Dore, 2014). It is now accepted that good outcomes for PWID are possible and that patients should not be excluded from HCV treatment due to active substance use, opiate substitution therapy, or mental health disorders (Aspinall et al., 2013; Dimova et al., 2013; Grebely et al., 2015). Moreover, there is increasing knowledge about the components of effective models of HCV care for PWID (Alavi, Grebely, et al., 2013; Bruggmann & Litwin, 2013; Mravčík et al., 2013). Still, questions remain about 'how' these models operate and what makes them effective to best support the scaling up of these responses (Grebely, Bilodeau, et al., 2013; Hepworth et al., 2013). Indeed, scaling-up is critical and urgent if the benefits of treatment advances are to be realized for PWID (Alavi et al., 2014; Bruggmann & Litwin, 2013; Grebely, Oser, Taylor, & Dore, 2013; Klein et al., 2013; Robaey et al., 2013).

Multidisciplinary approach

A review of models of HCV care for PWID observed that an integrated multidisciplinary team approach is the foundation of tailored HCV care for PWID (Bruggmann & Litwin, 2013). Usually, multidisciplinary teams include physicians, nurses, mental health and counselling services, social work and advocacy as well as services related to problematic substance use (Bruggmann & Litwin, 2013). Close collaboration within these models is viewed as essential to success with the multidisciplinary model providing a forum for interaction in which the providers support each other while providing supports to patients (Ho et al., 2013).

Uninterrupted access to care

Referrals to off-site care is acknowledged as an obstacle to treatment adherence for PWIDs whereas facilities that can provide on-site, uninterrupted services from testing to treatment appear more capable to achieve successful outcomes (Zeremski et al., 2013). Testing outside of hospital settings and specifically within harm reduction services in which PWIDs may already access services or health care are perceived to maximize uptake; we also recognize that this setting requires a non-judgmental approach and recognition of internalized stigma and institutional mistrust among the PWID patient cohort (Harris, McDonald, & Rhodes, 2014).

Frequently, these multidisciplinary teams are integrated primary health care settings. HCV treatment by primary health care providers has been shown effective to treat HCV infection in underserved communities (Arora et al., 2011) with primary care and HCV management provided by the same clinicians. The effectiveness of this model is likely highest in settings such as community health centres providing patient-centred care in accessible locations by culturally competent clinicians for which patients can build a trusting relationship with (Arora et al., 2011). Unfortunately, a literature review on HCV, mental health and antiviral therapy shows that, despite these insights, it is more typical today for access to interferon to be through specialist clinics in a hospital setting. While the reviewers acknowledge that this evidence has yet to be translated into practice, they support HCV testing and treatment within community-based primary care settings to shift care of vulnerable populations (such as PWID) from hospitals, possibly resulting in overall cost savings – and increased equity – for those affected by HCV (Hepworth et al., 2013). Indeed, community-based screening has been identified as the initial step to improving the entire cascade of HCV care for inner-city populations defined by homelessness and problematic substance use (Norton et al., 2014), in recognition of the subsequent benefits of uninterrupted, on-site linkages to care that eliminates referrals to specialists (Trooskin et al., 2015).

Our case thus provides a practical example of a low threshold (Islam, Topp, Conigrave, & Day, 2013) highly accessible multidisciplinary primary care community clinic treating otherwise problematic HCV clients in a setting familiar to them and where trust may already have been established.

PWID treatment with PWID services

There is ongoing evidence and recommendations for the co-location of HCV treatment and care for PWID within settings dedicated to serving PWID such as harm reduction programs including opiate substitution therapy and needle exchange as well as supports for problematic substance use (Grebely, Knight, & Genoway, 2010; Harris, Arnsten, & Litwin, 2010; Martinez et al., 2012; Treloar, Rance, Grebely, & Dore, 2013; Zeremski et al., 2013). These recommendations further emphasize the need for HCV

services in settings deliberately designed for a PWID patient population (Alavi, Grebely, et al., 2013). A review of PHC services tailored to PWID (Islam et al., 2012) describes such services as providing non-judgemental and cost-free services under a harm-reduction framework. Other features include providing anonymous services, located near to PWID, and possibly co-located with other services accessed by PWID, appropriate opening hours, and drop-in services. One feature of such services would be general practitioners with skills and interests in working with a PWID patient population. In other settings, physicians who provide opioid maintenance to their patients also achieve successful outcomes with HCV treatment for PWID patients (Seidenberg, Rosemann, & Senn, 2013). Research of existing models of HCV care for PWID recommend service delivery within settings designed to be culturally appropriate for PWID and other vulnerable populations (Alavi, Grebely, et al., 2013).

Trusted relationships in a trusted setting

The conventional relationship between PWID and medical staff has been described as a relationship of “mutual mistrust” which is frequently entered with trepidation, uncertainty and mutual suspicion (Merrill, Rhodes, Deyo, Marlatt, & Bradley, 2002). Low-threshold healthcare programs for PWID can reduce the multiple barriers to access care, however, even within these services, possibly the most challenging barrier when engaging vulnerable drug using populations is trust (Edland-Gryt & Skatvedt, 2013; Treloar & Rance, 2014). Consideration of trust as a barrier to services is perceived as critical to planning and delivering low-threshold services and consideration of how trust in service delivery may impact the demands of efficiency (Edland-Gryt & Skatvedt, 2013). Community health centres have been specifically named as settings for effectively addressing the barriers to adherence due to the potential of trust that can result from the ongoing patient–provider relationships (Afdhal et al., 2013). Trust has been presented as the mechanism for addressing stigma, with positive, trusting relationships between patients with HCV, health care workers and health settings being central to what defines a successful model of care (Treloar, Rance & Backmund, 2013).

Addressing the social determinants of health

Acknowledging the barriers for successful access to HCV treatment for PWID is not enough: models of care necessitate responses beyond the clinical to the social factors experienced by PWID. Medical advances will be ineffectual without addressing the complex barriers to care related to substance use, mental health, trauma, poverty and homelessness and criminalization, stigma and marginalization (Alavi et al., 2014; Bruggmann & Grebely, 2015; Cachay et al., 2014; Cox et al., 2014; Harris & Rhodes, 2013; Sublette et al., 2014; Zeremski et al., 2013). Responding to these social factors alongside clinical responses is critical within HCV services for PWID (Harris & Rhodes, 2013) and requires identifying the barriers as part of the treatment plan with pretherapeutic assessments evaluating issues such as income, housing, cultural issues and social functioning and supports (Robaey et al., 2013). Indeed, the availability of support services during HCV treatment may significantly increase the treatment completion rates among PWID (Dimova et al., 2013).

Principles to practice: a case study

The Cool Aid Community Health Centre (CHC) is an example of HCV programming for PWID that seeks to apply these principles to practice.

Context

Victoria is the capital of the province of British Columbia, Canada with almost 375,000 people living in the region. While idyllic in some respects, Victoria suffers from significant income inequalities and the clinic’s downtown location provides inner-city medicine to the region’s low-income, homeless and vulnerably housed citizens. In the region where the clinic is located, the HCV incidence rate was estimated in 2013 to be 39.1 per 100,000 (BCCDC, 2014). A local survey (VIHA, 2010) of PWID conducted in 2009 that included blood tests for HCV found, of the 249 PWID tested 63.1% tested positive of HCV. The survey reports that 87% of PWID surveyed report having tested for HCV within the past 2 years, however, 30% of HCV+ were not aware that they had been previously exposed.

The clinic

Cool Aid’s CHC provides low-threshold access to interdisciplinary primary health care services geared towards economically vulnerable clients with complex medical needs and multiple barriers to accessing care. Through clinical services and outreach programs the CHC serves those experiencing marginalization, homelessness and poverty, and those with HCV, HIV, severe mental health issues, problematic substance use and/or chronic illness. The multidisciplinary health team includes physicians, nurse clinicians, nurse practitioners, counsellors, a nutritionist, psychiatrists, acupuncturist, dentists and dental hygienists, and pharmacists and pharmacy technicians, and medical office assistants. The CHC multidisciplinary team delivers health services including the initiation and management of opiate substitution therapy as well as antiviral therapy for HIV and HCV within the context of primary care. HCV, HIV and opioid maintenance medications are prescribed by onsite clinic physicians; the entire team is involved in supporting adherence, side effect management, as well as engaging patients in care and working to address social determinants of health.

The CHC is integrated within a “one-stop shop” or medical home model. The ACCESS Health Centre houses the CHC on the main, storefront level, along with its in-house dispensary which includes opiate substitution treatment dispensing and harm reduction supply distribution. The next level houses the CHC’s dental clinic and outreach services operated by the local health authority including an Intensive Case Management outreach program and the top floor houses the city’s AIDS Service Organization which also provides harm reduction supplies. Outreach services are central to the services of both the community health centre and the AIDS service organization and the building is a primary site for harm reduction services including harm reduction and opiate substitution treatment, peer programming, counseling and supports.

The community health centre has an estimated 4000 active clients. In 2013/14, physicians and nurses conducted 26,793 patient visits including 3300 patient encounters through outreach services. In addition, there were over 3500 visits to the clinic’s integrated care providers (i.e. dietician, acupuncturist, clinical counselor, and psychiatrist) and over 5500 patient visits in the dental clinic. In a typical week, the healthcare providers make about 300 referrals to other providers within in the clinic and 140 referrals to other services, most often to mental health and substance use programs and housing services. Approximately two-thirds of patients were perceived to be living with mental health issues (64%) or problematic substance use (62%). Over a third (35%) of all patients were perceived to be living with concurrent disorders. 13% are known to be living with HIV with 98% engaged in HAART treatment. Approximately, one of every four patients was

identified as homeless or unstably housed. When surveyed, half (48%) of patients surveyed report some problematic illicit drug use while about a third (37%) report an episode of problematic alcohol use in past year and most patients (71%) report daily smoking.

The HCV patient group

Clinic collected data estimates that approximately a third (30%) of patients are known to live with HCV. The clinic provides low-barrier access to HCV treatment to a complex patient group. Almost half (45%) are known to be actively using substances during treatment and a third (32%) receiving OST. Approximately two-thirds (65%) are known to have psychiatric diagnoses. 18% are known to be HIV positive. Overall, 19% of patients in HCV treatment at the clinic have cirrhosis, which has been steadily increasing and in the most recent year a third of patients starting HCV treatment had cirrhosis. On average each patient treated for HCV has four (3.96) comorbidities as well as significant socio-economic challenges.

Implementing the equity-based framework

Using the concept of the leaky cascade, in 2012, practitioners at Cool Aid's community health centre examined limitations in ability for patients to receive HCV treatment. The primary strategies that comprise Cool Aid's equity-based integrated care framework for HCV care are outlined here. These activities were developed to help achieve the desired outcomes of increasing screening/monitoring, increasing treatment numbers, and maintaining/improving success rates.

Dedicated HCV programming and staffing

A HCV Program Coordinator position was developed utilizing industry funding. This full-time Nurse Clinician position provided the capacity for the development and implementation of the enhanced care delivery. The HCV Program Coordinator is actively involved in the identification and monitoring of patients, application and coordination of treatment coverage, and the provision of treatment supports. This includes administering medications, texting and phone support, home visits, as well as liaising with the CHC treatment team, specialists and community partners. The Coordinator engages the clinic's interdisciplinary team in the HCV program and facilitates record keeping and staging of practice through the clinic's electronic medical record.

Culturally safe/competent care

The CHC has well-established policies to ensure that health care and support services are provided in a trauma informed, culturally safe environment. All staff have completed cultural competency training designed for health care professionals working with Indigenous people which is generalizable to working across diverse cultural and vulnerable groups. Outreach clinics, which incorporate HCV screening and care, occur in various settings including shelters, supportive housing facilities, First Nations Community Centres and Reserves. HCV care and support is coordinated in partnership with existing programs and services to increase individualized care. Additionally, as a comprehensive community health centre, practitioners are able to work with individuals at all stages of treatment without time-specific parameters to the clinical care relationship.

Flexible/low-barrier access

The community health centre has existing low-barrier access practices in place including a balance of same-day appointments

with scheduled appointments to best serve the diversity of needs and preferences. Similarly, flexible, low-barrier access to the HCV program has been essential. Patients can self-refer for an assessment with the HCV nurse either through pre-booking an appointment or by attending peer-groups. Patients are referred from within the CHC as well as from the associated community agencies, including Provincial and Federal Corrections Services, and co-located AIDS service organization and integrated case management teams.

Liver days

Practitioners sought an innovative strategy to increase diagnostic assessment of the priority populations known to have prevalence of HCV without loss to follow-up. The numbers of patients being assessed were low and when referred to specialists for assessment the follow-through was significantly compromised. This was seen as a significant leak in the HCV treatment cascade. Therefore "Liver Days" were established at the CHC to provide patients with a seamless, low-barrier, on-site diagnostic assessment, interpretation and care plan development process.

Over 3 days in 2014, 117 patients received transient elastography assessments, of which 114 received immediate follow-up with a clinician for interpretation and care plan development. "Liver Days" proved to be an efficient model of care: approximately double the number of assessments were completed in three "Liver Days" than over 2 years (2013–2014) of traditional referral. Further, the loss to follow up was minimal compared to 28% through traditional referral. Half of patients who were assessed during the three "Liver Days" were found to have stage F2 fibrosis and above, indicating a large proportion of patients with advanced liver disease who meet requirements for publicly funded therapies.

Assessments for integrated treatment plans

A significant component of the intervention was pre-therapeutic assessments that included assessments by the clinic's integrated care team that also identified socio-economic needs. For treatment adherence and success, it was critical to address the multiple barriers to care when establishing treatment plans. Patient complexity guides the treatment plans. The CHC strategy is to provide effective, patient-centered care sufficiently tailored to address an individual's care barriers. This includes preparatory management such as prioritized dental assessments at the community health centre's on-site dental clinic, assessments by the clinic's nutritionist and income and housing needs assessment. Plans are developed to ensure a patients' poverty and vulnerabilities are addressed in the treatment plans. Together this assists with adherence throughout treatment.

Harm reduction, substance use and opiate substitution services

The HCV program is explicitly a non-abstinence based program and staff purposefully sought to raise awareness throughout the community that abstinence is not a requirement for treatment. This messaging included the development and distribution of information brochures and posters amongst community agencies to address this possible misconception and potential barrier to accessing care. The community health centre is the second largest provider of harm reduction services in the community including safe injection and smoking supplies. Supplies can be accessed anonymously by individuals with the opportunity to be linked to additional supports on-site, such as safe-injection teaching, opiate substitution therapy, and the full range of health and social supports at the community health centre. For many, this includes accessing the clinic's onsite pharmacy for prescription,

management and dispensing of opioid maintenance medications. For others, the provision of harm reduction services can be a link to clinicians' assistance to access detox and stabilization services if indicated.

On-site pharmacy support

Having an on-site pharmacy is vital to this model of individualized care by integrated health care providers ensuring high rates of adherence to treatment and low loss to follow-up. Current HCV treatment includes complex medication regimes with multiple drug–drug interactions. The in-house pharmacists review medications to ensure patients are on appropriate and safe treatment regimes. In response to the multi-dose, high pill burden of currently funded therapies, medications are repackaged to support adherence. Dispensing of medications is personalized from daily witnessed to weekly blister-packs. This also ensures that the medications patients receive accurately reflect dose adjustments or medication changes. Pharmacy staff have frequent contact with patients and coordinate their services with other clinicians as well as with community partners such as the AIDS service organization and housing and shelter services to ensure close monitoring for side effects and drug–drug interactions.

High frequency patient contact/proactive primary care

The model of care for HCV patients at the community health centre is more proactive than responsive and requires a high frequency of contact with HCV patients from multiple care providers on the interdisciplinary team. The entire clinic assists in the proactive care patients receive: the high frequency of contacts patients have with medical office assistants, pharmacy staff, and clinicians ensures patients are closely monitored and supported throughout treatment.

The nursing team administers pegylated interferon injections weekly for nearly all patients. The on-site pharmacy provides oral medications and tailors services to patient needs and complexities with practices ranging from daily pick-up, blister packing, and linking HCV dispensing with methadone and HAART dispensing.

Patients are assessed weekly at minimum to identify and address side effects early. The treatment team aggressively manages side effects to improve adherence. The team approach frequently involves patient contact with multiple providers at a single clinic visit. Consultation with off-site specialists is very rare, less than 5% of cases treated to date.

Income as treatment

The community health centre's patient population is defined by dire poverty, food insecurity, housing instability and homelessness. HCV patients' financial status is assessed and the treatment plan includes help accessing appropriate financial supports for basic needs as well as treatment related needs.

The project included a government social assistance worker who came to the clinic on a weekly basis to meet with both patients and providers. This on-site resource improves patients' ability to access provincial financial supports to which they are entitled, such as disability benefits and special diet allowances. The integration of the social assistance worker on the team additionally ensures patients receive these benefits and subsidies promptly.

Medications are cost prohibitive so the treatment plan includes facilitating access to government sponsored benefit plans, private medication coverage, if entitled to this, as well as accessing compassionate access programs. Since public funding

for medication coverage is based upon the stage of liver disease, it is critical that the clinic facilitates access to transient elastography assessments (usually on "Liver Days"): this subsequently improves access to publicly funded medications. When over-the-counter medications are required due to treatment related side effects, these costs can be absorbed by the community health centre's on-site pharmacy if needed.

Housing as treatment

While the clinic treats clients who are experiencing homelessness, housing can be critical to treatment adherence and success. Therefore, the treatment plan is inclusive of assessing housing needs and supports. The treatment team plays an integral role in advocating for client's access to affordable and suitable housing as well as supporting clients through possible barriers to accessing housing (i.e., assistance with referrals and forms). Multidisciplinary Assertive Community Treatment Teams and other community partners collaborate with the clinic to provide support to HCV patients with serious mental illnesses and problematic substance use facilitating and realizing successful housing outcomes. Most critically, the clinic is operated by the Cool Aid Society which also operates almost all of the city's emergency shelters (125 beds) and is the largest supportive housing provider in the region providing 374 apartments for the formerly homeless. Interagency collaboration is frequent with shelter and housing workers integral to supporting patients accessing care and treatment adherence. For patients whose housing becomes unstable or unsafe during treatment, access to temporary housing is more realistically facilitated through these interagency connections and supports.

Nutrition as treatment

Food insecurity is common among HCV patients at the clinic. Many access food from charitable programs such as food banks and soup kitchens and face multiple barriers to maintaining good nutrition. Therefore, the treatment plan also includes assessing the nutritional needs. The community health centre's integrated team includes a nutritionist who assesses all HCV patients prior to treatment initiation. The team facilitates claims for nutritional supplement benefits from social assistance. Also, nutritious snacks and supplements are provided at weekly peer support groups and for take home while on treatment.

Peer-facilitated HCV groups

The HCV project sought ways to more fully integrate peers in the program. A peer-facilitated support group was initially piloted, and then expanded to three weekly HCV peer groups (one held off-site). Two groups are inclusive of individuals at all stages of treatment and facilitated by peers who have successfully completed treatment at the clinic. The third peer group is a post-treatment group.

The HCV peer-facilitated groups are designed to be low-barrier, self-referred and flexible. Stipends for peer-facilitators and food for participants are provided to encourage attendance and value participants' engagement in the process. Attendance typically has ranged from 9 to 16 peers at each group. The groups fulfill multiple functions. Overall, the groups provide peer-informed education based on real-life experiences for those impacted by HCV. The groups also provide an efficient point of contact with HCV patients enabling clinicians to provide individualized treatment support and respond to potential side effects. A further function of the peer groups is linking participants to community partners for continued

social supports including employment, volunteer, educational and religious organizations.

Onsite integration

All care is provided onsite at the community health centre, unless patients on HCV treatment are admitted to hospital (at less than 2% of those treated to date). The clinic's on-site integrated team includes psychiatry and, as of January 2013, infectious disease specialist. However, with the novel HCV treatment model used at the community health centre, all prescriptions for HCV and related conditions are initiated by the clinic's primary care physicians, with on-site specialist consultation being reserved for complications of treatment, which have occurred in approximately 6% of treated cases to date.

Having integrated resources means less loss to follow-up, timely, appropriate assessment, support and specialty consultation and continuity of care if patients require hospitalization while on therapy. This integration increases the HCV Team's ability to treat HCV in patients with complex co-morbidities. Care and attention to patient complexity is crucial when referring to off-site specialists including dermatology, endocrinology, respirology, gastroenterology infectious disease and community mental health providers. As much as possible, the treatment plan seeks to provide wrap around care for patients with minimal loss to follow-up.

Reviewing progress

Results from the Cool Aid model of HCV care confirm existing research on effective HCV treatment for PWID. Over the last decade (2004–2014), there have been 131 HCV patients who have started treatment at the clinic (107 males, 24 females). Before the project, the clinic on average would see eight or nine patients annually beginning HCV treatment. With the initiation of the HCV project the rate of patients initiating HCV treatment doubled and by 2014 doubled again. SVR rates have consistently been high and increasing since the interventions were implemented in 2012. The discontinuation rates, which include loss to follow-up, have remained very low (Table 1). In addition, there has been only one documented case of re-infection in the clinic's 10 years of HCV

treatment of a predominantly complex and vulnerable PWID patient population.

Even with this success, there are still leaks in the HCV treatment cascade (Fig. 1). Although there are over 700 patients on the registry, it is estimated that over 1350 of the 4000 active patients have chronic HCV. The community health centre effectively manages patients while in treatment, with only four lost to follow up. Current goals are to improve both screening and diagnostic rates.

The clinic's SVR rates over the last decade (2004–2014) demonstrate significant treatment successes for complex patients using pegylated interferon and ribavirin based therapies, with overall SVR rates maintained between 72% and 88%. Specifically, the clinic has achieved:

- 80% SVR for patients with active substance use during treatment.
- 78% SVR of patients with psychiatric diagnosis.
- 71% SVR for patients receiving opiate substitution therapy.
- 57% SVR for patients coinfecting with HIV.
- 30% SVR for patients with cirrhosis.

Clinic staff witness changes in clients' lives over the course of treatment including reduced substance use, renewed family contacts, decreased social isolation, engaging in training and education programs, maintenance of housing and overall increased confidence and self-care. The impacts of these changes play a significant factor in improved outcomes for co-morbid conditions post-treatment. Furthermore, the clinic continues to be the medical home for patients and provides continuous primary health care for co-morbidities throughout and post treatment for HCV.

Cool Aid's HCV treatment program is an example of how the integration of multiple models of HCV care for PWID translates into positive practice outcomes. HCV treatment at Cool Aid has always been provided in the context of primary care; prescribed by general practitioners with nursing support within trusted relationships in a trusted setting (Edland-Gryt & Skatvedt, 2013; Treloar & Rance, 2014). The community health centre is well situated to adapt to changing treatment regimes. Support for community-based multidisciplinary care settings such as Cool Aid hold the

Table 1
HCV clinical data and treatment outcomes for the Cool Aid CHC.

	2012	2013	2014		
<i>HCV patient frequencies (2012–2014)</i>					
# patients in clinic's HCV registry	83	453		705	
Annual # patients on HCV treatment	23	30		40	
Monthly mean # of HCV patients contacts with HCV nurse	109	107		163	
Monthly mean # of unique HCV patients in contact with HCV nurse	33	58		62	
Monthly mean # of HCV patients on treatment	11	11		19	
Monthly mean # participants in HCV peer groups	64	83		94	
# patients initiated on HCV treatment	19	18		34	
# patients initiated on HCV treatment who were treatment experienced	2	6		4	
# patients initiated on HCV treatment with F4 cirrhosis	2	5		10	
# patients initiated on HCV treatment with HIV coinfection	4	3		10	
	2004–2011	2012	2013	2014	Total
<i>HCV patients initiating treatment and SVR and discontinuation rates</i>					
# patients initiated on HCV treatment	60	19	18	34	131
Genotype 1	26	14	11	22	73
Genotype 2	10	2	2	2	16
Genotype 3	24	3	5	10	41
Sustained virologic response	77%	84%	72%	88%*	75%
Genotype 1	65%	69%	73%	88%*	68%
Genotype 2	100%	100%	50%	100%*	94%
Genotype 3	79%	67%	80%	88%*	78%
Patient discontinuation	3%	0%	0%	6%*	4%*

* SVR rate is to July 1, 2015.

** Includes one death during treatment.

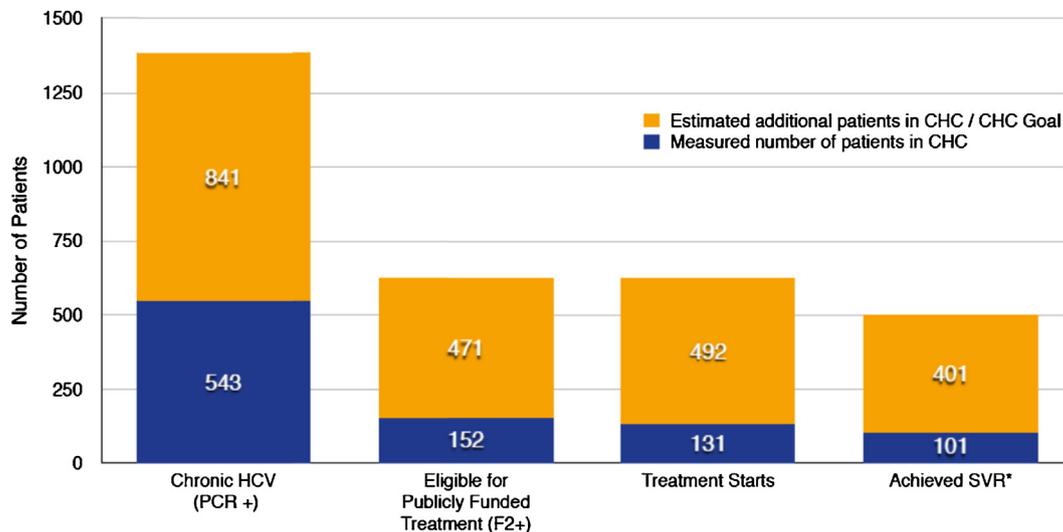


Fig. 1. The CHC's treatment cascade (*Note: SVR rate includes all eligible outcomes to July 2015 with an additional 8 cases PCR negative at end of treatment.).

potential to meet public health agendas to increase equity for those impacted by HCV (Hepworth et al., 2013).

Conclusion

While forming a large majority of those living with HCV, PWID have largely been marginalized and excluded from access to its treatment. As the era of direct-acting antiviral agents for HCV progresses, it is essential that effective, health equity informed, culturally competent health services are in place for PWID. We have reviewed a case study of such services at the Cool Aid community health centre and described the practice experience and outcomes of its novel primary care, inner-city HCV treatment program for PWID, illustrating how such a model of care practically functions to address many barriers to successful treatment. This is a model which can be replicated in other high HCV prevalence regions, particularly through engagement and training of community health centres, the staff of which are ideally situated to adapt to the rapidly changing treatment landscape in provision of culturally appropriate, timely care to PWID living with HCV. Enhanced public investment in primary care treatment for PWID living with HCV, including investments in supports that address the social barriers faced by these vulnerable populations, would build on existing evidence and improve HCV outcomes for PWID.

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