

# A Non-Specialist Treatment Model for Hepatitis C Virus (HCV) in Canadian Carceral Settings: A Telemedical Focus

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## Abstract

Hepatitis C virus (HCV) is a pronounced health problem in carceral settings globally. For Canadian prisons, it is estimated that approximately 25% of those incarcerated have been previously exposed to HCV. Despite being a high prevalence context, Canadian corrections facilities have largely failed to provide adequate care to those with HCV due to their reliance on traditional treatment models. Specifically, this involves hospital-based specialist clinics for patients in corrections facilities nearby – a practice known to be associated with a low incidence of treatment initiation. This paper will explore the use of a contemporary model premised on empowering non-specialist care and the use of telemedicine. This model has found success within other global settings, as will be discussed using case studies from Australia and the United States, and other HCV literature. With the WHO setting an ambitious 90% HCV global reduction goal by 2030, it has become imperative that Canada prioritizes high prevalence populations, such as those in carceral settings, and in turn, looks to more efficient and targeted models of HCV care for these individuals.

**Keywords:** hepatitis C virus, treatment, incarcerated peoples, telemedicine

## Introduction

Hepatitis C virus (HCV) infection is a global health challenge with an estimated 58 million people living with it in 2019 according to the World Health Organization (WHO) (1). As of 2017, the Public Health Agency of Canada estimated that there were around 317,000 people in Canada who had ever been infected with HCV, and of these, an estimated 194,000 were people living with chronic HCV (2). Injection drug use (IDU) represents the large majority of HCV cases in the country, and it contributes to around 40% of the global disease burden measured by disability-adjusted life-years (3). IDU is especially elevated among several populations in Canada, including amongst incarcerated individuals, Indigenous peoples, and street-involved young peoples (3). Henceforth, HCV is more prevalent amongst these

groups.

This paper will focus on HCV as a pronounced issue in Canadian carceral settings. The disproportionate prevalence of HCV within this context is a combination of two driving factors: 1) HCV is readily transmitted through injection drug use and 2) there is an overrepresentation of individuals who exhibit high-risk behaviors like injection drug use in correctional settings (4). For Canadian prisons, it is estimated that approximately 25% of those incarcerated have been previously exposed to HCV (5). Despite being a high prevalence context, Canadian authorities have largely failed to provide adequate care to those with HCV due to their reliance on traditional treatment models (5). These traditional models involve

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bringing patients to hospital-based specialist clinics located near carceral facilities – a practice associated with a low incidence of treatment initiation (6). This is largely the result of disruptions in the HCV care continuum due to referral delays between diagnosis and treatment initiation by specialists and a lack of access to on-site specialists for HCV treatments (4).

This paper will draw from two international case studies: Project ECHO in New Mexico, United States (7) and Princess Alexandra Hospital, Brisbane, Australia (8). These were chosen based on their novel use of telemedicine to produce a non-specialist model of care for HCV and their citation in relevant literature regarding their respective successes (3,9,10,11). They will be used, in turn, to demonstrate the viability of 1) non-specialist care models and 2) use of telemedical consultation to facilitate shifts in the traditional HCV care model. These offer potential avenues for Canada to pursue when considering changes to HCV care models in carceral settings.

The traditional model of hospital-based specialist clinics (generally led by physician specialists) that provide care for people in carceral facilities is still relied upon at both the provincial/territorial and federal levels. Due to the short median lengths of stay in carceral settings – particularly at the provincial/territorial level (over one-third of these lasting less than one week and more than half lasting less than a month), the need to escort individuals for assessment and treatment at nearby hospitals becomes a significant barrier for linkage to care (5). Referral delays and lack of on-site staff to administer treatment post-diagnosis in carceral facilities mean that those entering the carceral system for short periods often leave without initiating treatment (4). In a Scottish study performed during the pre-direct-acting antiviral (pre-DAA) era, a time in which interventions to eliminate HCV were time consuming and featured a high treatment burden, HCV cure rates were significantly lower for those who were released while undertaking treatment in the carceral system (45%) as compared to those who completed their treatment while incarcerated (74%) (12). This, in turn, reflects how disruptions in the HCV care continuum (due

to referral delays and lack of access to direct treatment), in conjunction with shorter stays, result in reduced cure rates. With the WHO setting an ambitious 90% HCV 2030 global reduction goal (13), it is imperative that Canada prioritizes populations experiencing high prevalence and incidence of HCV, and thus, look to more targeted strategies for HCV care. Implementing a non-specialist treatment model for HCV care with a telemedicine focus offers a promising solution to addressing the issue of inadequate HCV care within Canadian carceral settings.

## **Approaches to Improve HCV Care in the Canadian Carceral System**

### *Introducing a Non-Specialist Treatment Model*

Within carceral settings, a shift towards a treatment model that empowers non-specialist healthcare providers in conjunction with the use of telemedicine offers an alternative to the current status quo in Canada. Essentially, for on-site services, components of the care cascade (steps in delivery of HCV care from diagnosis to access and retention for the purposes of care and treatment) could be transferred from hospital-based specialists to skilled nurses or general practitioners (non-specialists). DAA treatments can be delivered through simplified models of care, including through primary care settings, which have been shown to be more cost-effective and improve treatment uptake compared to hospital-based care (14).

In this model, from the point of contact in carceral settings, staff evaluate patients by completing standardized procedures that involve a mental health assessment and physical examination, a targeted review of medical history, and fibroelastography in order to stage hepatic fibrosis (this is because liver damage is a potential consequence of chronic HCV) (14). Once this evaluation is complete, nurses triage the cases based on the severity and risk of adverse events while engaging in a treatment program. High-risk patients are transferred for in-person assessments with specialists, medium-risk patients engage in telemedical consultation with a specialized physician, and low-risk patients are discussed in a teleconference without disclosing the

patient's identifying information and are prescribed the appropriate DAAs (14).

Telemedicine plays a critical role in this model—particularly through its modalities as both a means to train non-specialists, and also as a mechanism for telemonitoring (tracking various patient parameters remotely like blood pressure, pulse etc.). The use of telemonitoring is evident in the triage system. Telemedical education is also a critical aspect of telemedicine as it incorporates multiple carceral and non-carceral stakeholders to produce an integrated HCV model of care<sup>1</sup> (15).

### ***Integrating Telemedicine into a Non-Specialist Treatment Model***

#### ***1. Telemedical Education for Non-Specialists – Project ECHO, New Mexico, United States***

To train non-specialists, telemedical education can serve as an important tool for knowledge transfer. Not only does it help overcome geographic barriers between specialist providers and non-specialists, but it helps to better integrate multiple stakeholders in a model of HCV care in which non-specialists can connect with specialist care providers, carceral departments, academic medicine, and public health offices.

Project Extension for Community Healthcare Outcomes (ECHO) in New Mexico was a ground-breaking mixed-methods study piloted in 2004 that employed telemedical education to train non-specialists in HCV care for rural communities (7). The program employed learning loops and case-based knowledge networks to enable both specialists and non-specialists to co-manage patients. Nurses and general practitioners gained intimate domain expertise in HCV through case-based learning clinics that enabled them to work with experts in HCV nationally<sup>2</sup> (7).

Though implemented at the community level, the potential of telemedical education from this study has

helped to inform the training mechanisms necessary to implement non-specialist treatment models in carceral settings at a global level. The Project ECHO study not only demonstrates the ease in which knowledge can be transferred through telemedical education, but also the importance of an integrated approach to HCV care that incorporates multiple health stakeholders. This modality of telemedicine could be implemented in Canada. Frequent reference of Project ECHO in systematic reviews of non-specialist models of HCV care, as well as in global case studies that focus on non-specialist models in carceral settings in a positive manner, could provide the necessary precedent for considering its use in a Canadian setting (3,9).

#### ***2. Telemedical Consultation Mechanisms – Princess Alexandra Hospital, Brisbane, Australia***

A telementoring service was employed to facilitate the administration of a non-specialist model of care between Princess Alexandra Hospital Secure Unit and five Queensland carceral facilities (8). Videoconferencing was used to support a triage system and to connect specialists and non-specialists in assessing patients, prescribing medication, and reviewing treatment courses.

The telemedical consultation system helped to increase access to HCV treatment for incarcerated peoples substantially – a major problem before the study was initiated (8). This was due to an increase of in-reach services because of a greater presence of upskilled staff (staff now trained in HCV care) who could identify patients suitable for treatment. The study notes that “[incarcerated peoples] were grateful to receive therapy quickly and without the burden of travel to tertiary facilities” (8 p.693). Knowledge gains were reported amongst non-specialist staff and broader organizational improvements in HCV care were noted – particularly in the improved coordination of service (8).

<sup>1</sup> This also ensures non-specialists have the necessary knowledge of virus assessment, treatment, and management.

<sup>2</sup> Ranging from university specialists in hepatology to leading psychiatrists and experts in substance abuse to help develop their knowledge of HCV care.

This case study directly reveals the potential benefits that could accrue from the transition to a non-specialist model of HCV care premised on the use of telemedicine. Serving as direct precedent for implementation in a carceral setting, this case offers an insight into the benefits of an integrated model of care for HCV using telemedicine, including better HCV treatment access for incarcerated peoples, and greater organizational efficiency<sup>3</sup>. Similar to the Canadian situation, the Queensland carceral facilities had previously relied on a hospital-based specialist clinic model to provide care.

## Discussion

### *Addressing the Issue of HCV Care Cascade Disruption and Short Carceral Stays*

Evidence from the international cases described has demonstrated that a non-specialist model could help to specifically address the issues of treatment cascade disruption currently faced by the Canadian carceral system. Results from the Princess Alexandra case study showed how there were significantly shorter delays in patient screening, assessment, and treatment; and thus, more effective completion of the HCV care cascade. Furthermore, with the issue of shorter carceral stays at the provincial/territorial level, faster transitions between the steps of initial screening to treatment through the non-specialist model could significantly improve treatment initiation and cure rates. Project ECHO has also shown that geographic barriers that can arise at the provincial/territorial level could be overcome by using telemedical consultation and training – especially given the often more remote nature of some carceral facilities in Canada that lack access to specialist care (16). As a result, a non-specialist model using telemedicine would significantly reduce wait times for incarcerated peoples who require HCV care.

### *Compatibility with a Canadian Context*

In addition to the precedent that international cases establish for the use of a non-specialist model for

HCV care in a carceral context, there is also evidence for compatibility within a Canadian context. A study conducted in 2017 on the use of DAA Therapy for HCV care using telemedicine in Ottawa found that patients achieved high Sustained Virologic Response (SVR) that were comparable to a traditional hospital-based model (17). The study specifically sought to target individuals in under-served and remote areas; however, it closely paralleled the Project ECHO study in its methodology (17). Ultimately, the study suggests that the benefits described at the international level also have been realized at a local level through the use of a telemedicine-integrated non-specialist model of care. This shows significant promise for implementation in Canadian carceral settings due to success at the community level.

### *Presence of Complementary Measures - Harm Reduction*

The extent to which HCV care is effective is impacted by the presence of complementary care measures such as harm reduction services. Therefore, shifting models of care may not have their intended effects unless they are accompanied by changes to such services – thus, raising the cost of transition (6). Since HCV is readily transmitted through injection drug use and there is an overrepresentation of individuals who exhibit high-risk behaviors like injection drug use in carceral settings, an approach employing harm reduction is vital to any sort of improved model of care.

However, it is important to note that cases such as Project ECHO demonstrate how an integrated care framework can be achieved using a non-specialist model that also incorporates existing services – such as harm reduction services (7). Though there are some costs to integrating existing services into such a model through the telemedicine channel, costs can be offset by greater organizational efficiency for carceral health systems as demonstrated by the Princess Alexandra case. Furthermore, from the perspective of the participants in the Princess Alexandra case, greater integration of

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<sup>3</sup> Costs were also significantly lowered by avoiding prisoner transport – a significant geographical financial burden given the more remote nature of some carceral facilities in the study.

existing harm reduction services within a non-specialist model ultimately produced a more positive outcome for access to treatment and virus management more broadly (8).

### *Continuity of Care Post-Release*

Another potential drawback of a non-specialist model is that community health facilities used in the hospital-based model may provide greater support for continuity of care and treatment retention post-release. Seeing as patient stays can be shorter at the provincial/ territorial level, hospital-based clinics provide a place that those who at least have had a diagnosis can visit for further care (18). This also applies to individuals at any point of the HCV care continuum who have not fully been cured.

Though this is certainly possible, it is important to note that specialist clinics would still exist at the community level despite a model shift in carceral systems. Based on the telemedicine approach suggested in this report, a care continuum can still exist post-release if specialists are able to connect and refer patients to primary care physicians using telemedical consultation. Specialist providers are not completely removed in a non-specialist model, but rather, the presence of upskilled HCV care staff will complement their services to a greater degree. The non-specialist model would likely reduce the burden on tertiary facilities outside of prisons that patients might seek to use post-release seeing as more primary care staff are trained to focus on incarcerated peoples.

### **Conclusion**

This paper ultimately recommends that the Canadian carceral system adopt a non-specialist treatment model for HCV care with a telemedicine focus. A non-specialist model has the ability to expand in-reach services by increasing the number of upskilled staff that are knowledgeable about HCV diagnosis, treatment, and management on-site, thus, preventing disruptions in the HCV care cascade. International cases such as Project ECHO and Princess Alexandra establish a precedent for the potential of a non-specialist model to be employed in a Canadian setting through their use of telemedicine modalities as both a training and consultation tool.

Furthermore, the successful use of telemedicine for HCV care at the Canadian community level shows great potential for this paper's recommendation. Not only does the model specifically address disruptions in the HCV care cascade and short stays in the carceral system that are issues specifically present in Canada, but it also can be integrated with existing harm reduction services. The model also supports continuities of care post-release by taking pressure off specialist clinics.

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