

# Effectiveness of and best practices for using contingency management and incentives in hepatitis C infection among people who use drugs

## ? Question

What is the effectiveness of and what are the best practices for using contingency management and incentives to support linkage to care and treatment for hepatitis C infection among people who use drugs?

## 🔑 Key Take-Home Messages

- Recent studies in Canada have indicated that hepatitis C virus (HCV) treatment uptake among individuals who use drugs remains low (1–3).
- Contingency management interventions and incentives have the potential to increase linkage to HCV care by providing individuals with an immediate gain in financial resources once they are linked to treatment (4). Examples of incentives identified in the literature include: cash such as USD 10 for every medication blister pack returned (4), entries into lotteries for cash prizes ranging from USD 10–100 (5), as well as food vouchers (6), and bus passes (7). The maximum incentive amount per participant in a Canadian-based intervention was CAD 100 (8).
- Various studies conducted among people who use drugs in high-income countries suggest that providing study participants with incentives can be a motivator to: take part in HCV testing (9, 10); attend an initial clinic appointment upon a positive HCV diagnosis (6); and comply with treatment adherence (5).

## Rapid Response: Evidence into Action

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### Suggested Citation

Rapid Response Service. Effectiveness of and best practices for using contingency management and incentives in hepatitis C infection among people who use drugs. Toronto, ON: The Ontario HIV Treatment Network; June 2021.

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- Some studies examined the perspectives of the recipients of contingency management or incentives (i.e. people who use drugs receiving HCV care). Overall, study participants expressed that they enjoyed receiving incentives to spend on personal necessities (11) and appreciated having access to information about HCV, safer injecting, and STI screening in a non-judgmental environment (12). Noted barriers to HCV care among homeless participants was medical mistrust, the stigma surrounding homelessness, and misconceptions about HCV (9).

## ❗ The Issue and Why it's Important

In 2017, an estimated 194,500 individuals were living with chronic HCV infection in Canada (13). In 2018, the reported rate of hepatitis C infection was 33.6 cases per 100,000 individuals (13). In Ontario, in 2018, 5,227 new cases were identified, representing a rate of 36.5 newly reported HCV cases per 100,000 individuals (14). A total of 4,516 cases reported at least one risk factor, of which 41.3% reported injection drug use (14). Globally, it is estimated 52.3% (95% confidence interval 42.4–62.1) of people who inject drugs are HCV-antibody positive (15). In North America, HCV prevalence among people who inject drugs is estimated 55.2% (40.8–67.7), and in Western Europe it is 53.2% (48.4–57.9) (15).

The current standard of care for HCV in high-income countries, including Canada, are all-oral drugs called direct-acting antivirals (DAAs) that specifically target cells infected with HCV (16). Prior treatment, an injectable formula of interferon-alpha, generally resulted in many side effects (16). DAAs are better tolerated and often result in “...cure rates of 95% or greater in many people...” (16). The introduction of DAA therapy has removed some barriers to accessing HCV treatment among people who used drugs in certain settings (17). Data from a prospective observational study (2010–2018) of Canadians (n=1,130) suggests that the introduction of universal access to DAAs initially resulted in an increase in the number of infected individuals being treated for HCV across the country (16). This was particularly true for individuals who inject street drugs: four-times as many people who inject drugs were treated for HCV with DAAs than with prior treatment methods (16). Nevertheless, HCV treatment rates dropped in the years after the introduction of universal DAAs due to factors such as rationing the distribution of DAAs, especially among marginalized groups such as people who inject drugs, Indigenous people, and those with lower socio-economic status (16).

Recent Canadian studies show that HCV treatment uptake remains low among individuals who use drugs (1–3). Despite the introduction of DAAs, barriers to accessing treatment still remain with evidence of low proportions of injection drug-users initiating HCV treatment (17). Potential barriers to accessing HCV treatment include difficulties remaining engaged in care due to competing priorities

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(18), insufficient access to harm reduction and mental health services (16), as well as jurisdictional differences in drug reimbursement which can influence treatment uptake (18, 19).

Contingency management interventions provide patients with incentives of monetary value once they achieve a predetermined therapeutic goal (20, 21). Financial incentives have been used to link vulnerable populations to care (4). Contingency management is based on the behavioural economic theory that individuals delay a healthy choice due to the uncertainty of long-term gains and instead make unhealthy choices for immediate gains (4, 22). Even though some people who inject drugs are diagnosed with HCV throughout various testing programs and community centres, only a fraction of them are linked to care and even fewer begin and complete treatment (23). Contingency management provides the potential to increase linkage to HCV care by providing individuals with an immediate gain in financial resources once they are linked to treatment (4).

Various aspects of using financial incentives to influence health behaviours are widely discussed in the literature (24). Opponents of such financial incentives maintain that they could be considered a form of coercion or bribery (25, 26), or a form of control in which power and influence are exercised (27). Opinions in favour of financial incentives state that they are small sums of money offered for a commonly accepted good, usually a person's well-being (28) and can provide a way for individuals to "act according to their true underlying preferences" (26). Financial incentives can also provide vulnerable populations with resources such as food and transportation costs which may be barriers to accessing care (4).

This review explores the effectiveness and best practices of financial incentives for the management of HCV infection among people who use drugs in high income countries.

## What We Found

Contingency management and/or incentives have been used widely in studies examining different aspects of HCV among people who use drugs. This includes epidemiological research, testing, care and management of HCV.

A 2017 systematic review aimed to gain a better understanding of HCV epidemiology among individuals who inject drugs through the use of respondent-driven sampling (29). The review identified 27 studies published between 2006 and 2016 which calculated or intended to calculate the prevalence of HCV, 14 of which took place in high-income countries (29). The studies utilized respondent-driven sampling, a method where an initial sample of people who inject drugs were given an incentive for taking part in a bio-behavioural survey and given a second incentive for successfully recruiting peers

6. Alimohammadi A, Holeksa J, Parsons R, Yung R, Amiri N, Truong D, et al. Diagnosis and treatment of hepatitis C virus infection: A tool for engagement with people who inject drugs in Vancouver's Downtown Eastside. *Canadian Liver Journal*. 2018;1(2):14–33.
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to take part in the survey (29, 30). Incentives included monetary rewards, food coupons, or gifts (29). The review concluded that respondent-driven sampling can be a useful strategy for estimating the epidemiological characteristics of HCV among people who use drugs, an important step in the process of HCV elimination (29).

Studies examining the use of incentives specifically for the management of HCV infection among people who use drugs were identified in Canada, the U.S., the UK, and Australia, and they are described in more detail below.

## Canada

In 2019 the Réseau Access Network (RAN), a non-profit in Sudbury, Ontario began a one-year pilot project funded by Gilead Sciences Canada, Inc. called the Sudbury/Manitoulin Micro-Elimination Project (11, 31). Micro-elimination initiatives consist of targeting HCV in specific populations to progressively reach countrywide elimination (31). Reported to be the first of its kind in Ontario (8), the pilot-project aimed to provide 100 HCV-infected people who use drugs with opioid agonist therapy as well as incentivized HCV treatment (11). Participants were able to receive CAD 25 at four time periods: during pre-treatment bloodwork, when receiving ultrasound results that are used to detect cirrhosis of the liver (8), at an intake assessment appointment, and upon achieving a sustained virologic response (SVR) at twelve weeks after completing treatment (11). Unpublished data indicate that the program successfully screened 666 individuals, of which 166 (25%) had a reactive result and were eligible for HCV treatment (32). A total of 88 (53%) of these individuals began HCV treatment which was more than five times the number of individuals initiating treatment through the RAN in the year prior to the pilot (n=13) (32). Among those that began treatment, 74 (84%) achieved SVR and five participants did not, four were lost-to follow-up which included leaving the Sudbury region, three had stopped treatment, and two died (32). A news report stated that the project has had a positive impact on vulnerable individuals who have used the service at RAN (11). Participants were able to use the cash incentives to purchase personal items such as a new pair of shoes or as one participant stated, “*I can treat myself to a lunch or a hot dinner, and I don’t have to go to a food bank*” (11). These results suggest that the pilot project may have encouraged people who use drugs to enroll in the program and successfully complete treatment for HCV (32).

Another initiative took place in Vancouver’s Downtown Eastside to engage people who inject drugs in HCV testing (6). Over a one-year period from 2016 to 2017, 44 pop-up clinics were set up to test individuals for HCV using the rapid OraQuick saliva assay (6). Those who were screened were given a CAD 10 gift card and those who tested positive for HCV were offered a clinic appointment with a physician where they could redeem a CAD 10 meal voucher (6). A

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total of 1,283 participants were tested and 942 (73%) self-reported as having injected drugs in the past six or twelve months (6). Of those tested, 274 (21%) had a positive HCV antibody, 208 (76%) of which consulted with an onsite specialist (6). Among those who were consulted, 166 (73%) were not engaged in care elsewhere (6). A total of 83 (50%) individuals not engaged in care attended an initial clinic appointment, all of which redeemed their food voucher (6). A total of 51 (64%) began DAA HCV therapy, with the remaining participants on track to begin therapy in the future (6). The study suggested that the incentive was an effective method to encourage participants to attend their clinic appointment (6). The pop-up clinics combined with a multidisciplinary care approach were found to engage vulnerable populations such as people who inject drugs in HCV care (6).

## U.S.

A randomized controlled trial in the U.S. implemented the CHAMPS (Chronic Hepatitis C Management to Improve OutcomeS) intervention at a single center in Baltimore, Maryland to examine the use of incentives to treat HCV among people who use drugs and coinfect with HIV (33). Between 2015–2016, the CHAMPS study recruited 144 individuals to one of three treatment arms: usual care; usual care with contingent cash incentives; and usual care with peer mentorship (33). Usual care consisted of linking patients to an HCV care provider as well as provided clinical visits and calls from a multi-disciplinary care team (33). Those in the treatment arm with cash incentives (n=54) received USD 10 at their first visit and each follow-up visit increased in value by USD 5, for a potential maximum of USD 220 per participant (33). If participants missed a visit, the incentive was reduced back to the original 10 USD for the following visit, with the increase in value beginning again (33). The median cash incentive given to each participant was USD 190 (range: USD 0–220), with 41 individuals (76%) in the cash incentive arm initiating treatment (33). The peer mentorship and cash incentive arms both had a high proportion of participants initiating treatment than the usual care arm, with 83%, 76%, and 67% of participants initiating treatment in each arm, respectively, but these differences were not statistically significant (33). The authors stated that one reason for this may be because the “cash incentive was too low to initiate behavioural change” among participants and recommended examining the use of larger incentives (33). The study also noted that a larger impact may be found in interventions where usual care is not as enhanced as it was in this single center trial (33). Using data from this randomized controlled trial, a subsequent study found that heavy alcohol use among CHAMPS participants was not significantly associated with failure to initiate or adhere to HCV treatment (34).

A 2020 study in San Francisco conducted focus groups among 20 individuals experiencing homelessness, eight of which reported a history of injection drug use (9). A total of four individuals reported

16. CATIE. Canadian trends in hepatitis C virus treatment for people co-infected with HCV and HIV. 2019. Available from: <http://www.catie.ca/en/catieneews/2020-03-05/canadian-trends-hepatitis-c-virus-treatment-people-co-infected-hcv-and-hiv> Accessed April 15, 2021.
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having tested positive for HCV (9). Participants noted that the incentive was a motivator to get tested (9). Barriers to testing for HCV among participants included medical mistrust, with one participant stating that, “[Medical providers are] making you a guinea pig. I don’t trust [them]. Because this trust has been breached already” (9). Other barriers to testing identified among participants included the stigma of homelessness and misconceptions about HCV infection (9). The study reported that financial incentives such as USD 10 gift cards from local community outreach programs were a strong motivator to take part in HCV rapid testing and HCV related education (9). The authors concluded that financial incentives could be useful in settings such as shelters to promote the uptake of HCV testing and education (9).

Another 2020 study in Massachusetts examined the provision of financial incentives for HCV testing at the Boston Medical Center which serves many individuals with substance use disorders in their Adult Primary Care HCV Treatment Program (35). The study evaluated effectiveness of providing a USD 15 gift card to an intervention group (n=149) who attended at least one appointment from April to June 2017 and compared outcomes to a group (n=94) who attended appointments in the year before incentivized treatment was initiated (35). Participants in the intervention group were able to receive a gift card at three time points: at an initial visit, a follow-up visit, and at a final visit three months after treatment completion for a maximum incentive of USD 45 (35). Results showed that 72.7% of those in the intervention group attended their appointments which was a significantly higher than those in the comparison group with 61.2% attending their appointments (35). The intervention was also “associated with an average increase of 15.4 attended visits per 100 appointments scheduled compared to the period prior to the intervention (p=0.01)” (35). Furthermore, attendance to appointments dropped after the intervention ended, suggesting that the incentives may have been a motivator for patients (35). Based on these results, the authors found that implementing financial incentives is feasible in a hospital HCV treatment setting and that financial incentives were associated with appointment attendance (35).

A 2019 pilot study in New York recruited participants from a needle and syringe program from 2015 to 2016 to participate in enhanced standard care (n=20) or a contingency management arm (n=20) (4). The contingency management participants received financial incentives which included USD 25 for attending each appointment, USD 10 for every medication blister pack returned, and USD 50 for having an undetectable viral load at week four of their treatment (4). Contingency management participants could receive up to USD 395 or USD 540, depending on the length of their treatment regimen (4). A total of 14 participants (74%) in the contingency management arm were successfully linked to care which was significantly higher than the enhanced standard care arm with 6 (30%) participants linked to care (4). All nine patients that began treatment in the contingency

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management arm successfully completed treatment, compared to only three of four participants in the enhanced standard care arm (4). Authors concluded that the contingency management incentive led to higher linkage to care for participants and such incentives should be considered as a way to improve the HCV treatment cascade for people who use drugs (4).

A 2017 randomized clinical trial conducted in a single center in North Carolina examined the feasibility of two strategies to incentivize HCV care (5). Patients were randomized to a fixed-incentive arm (n=28) or a lottery (n=31), with 46% of all patients reporting active drug use at baseline (5). The fixed-incentive arm participants received USD 40 for every appointment attended, USD 20 for adhering to medication, USD 50 for achieving an undetectable viral load at the end of treatment, and USD 50 for achieving SVR post-treatment (5). When participants in the lottery arm reached an aforementioned milestone, they could draw a card from a bag with cash values ranging from USD 10 to USD 100 (5). As there was no significant difference in drop outs rates or loss to follow-up between the intervention arms, both strategies were deemed to be acceptable to participants (5). Feasibility was measured based on study retention rates and the completion of study assessments (5). Results demonstrated that both incentive types were feasible with all 31 (100%) in the lottery arm and 24 (86%) in the fixed incentive arm completing treatment (5). A total of 93% and 92% achieved SVR in the lottery arm and fixed incentive arm, respectively (5). The study concluded that financial incentives could be useful for patients facing challenges in HCV treatment adherence due to substance use disorders (5).

An earlier study in North Carolina examined a coordinated HCV testing and linkage program operated by the Durham County Department of Public Health (7). HCV testing services were provided at clinics, the county jail, and community testing sites (7). Individuals who tested positive for HCV were able to receive a USD 10 gift card and a bus pass to attend their first appointment (7). A total of 2,004 individuals were tested for HCV, of which 241 (12%) were diagnosed with chronic HCV (7). Among those diagnosed, 150 (62.2%) reported a history of injection drug use and 197 (81.7%) received their HCV test results (7). A total of 134 (68.0%) individuals with test results were referred to care, and 123 (91.8%) of these individuals attended their first appointment (7). The study found that HCV testing and linkage to care can be enabled at the local level with support from federal funding to deliver an organized system of care (7).

## UK

A 2019 study in Dundee, Scotland examined the preferences for an HCV testing service among individuals prescribed opioid substitution therapy using a discrete choice experiment (36). A survey questionnaire was completed by 103 participants across six pharmacies (36). The survey asked participants to select their

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preferences among a series of hypothetical service configurations for HCV testing which varied in their attributes such as location, wait time, and amount of incentive (36). Participants indicated that being treated with dignity and respect was important and were willing to wait an additional nine weeks for their test results if it guaranteed that they would be treated well by service providers (36). Participants indicated that they preferred to be tested in their own pharmacy or by their drug worker over being tested by a general practitioner or other pharmacy. Wait time for test results and travel distance were also considered important but financial incentives were not (36). Results found that money received did not have a significant effect on participants' choices, suggesting that incentives may not increase testing uptake (36). A limitation of the study was that the choices made by participants were hypothetical and may not truly reflect the choices they make in real life (36).

## Australia

A 2021 study in Australia described a campaign to engage people who inject drugs in HCV testing at four different sites in July and August 2019 (10). The campaign was located at three non-profit community health services and at a private general practice that provided opioid substitution therapy (10). The campaign ran for 1–3 days at each site and was promoted in the weeks prior (10). Incentives were given to individuals who reported not having a recent HCV test and three sites also provided incentives to those who referred family or friends for testing (10). Incentives included cash which ranged in value from AUD 10 to AUD 20, and grocery gift cards (10). Across all sites, 91 individuals received an incentivized HCV test, of which 34 (37%) were non-regular clients of the site they attended (10). A total of 24 (26%) individuals tested had a positive result (10). Fifteen (62.5%) of those that tested positive returned to the health service location for their test results, 10 of which were prescribed DAAs (10). The results suggested that the incentivized campaign was successful in engaging both regular and non-regular clients in HCV testing (10).

A health promotion program called the Deadly-Liver Mob was evaluated in a pilot study conducted in Western Sydney (12). The program provided Aboriginal people who injected drugs with education related to HCV and harm reduction as well as linking participants to screening for HCV and other blood-borne viruses (12). The program provided participants with AUD 20 in vouchers for taking part in the education session, a AUD 10 incentive for each referral they made to the program with a maximum of three referrals, and AUD 10 for each referral peer-educated by them (12). An additional AUD 10 was given for each of the following: testing for HCV and receiving a hepatitis B vaccination, returning for test results, and returning for a final vaccination for a total maximum of AUD 110 per participant (12). Vouchers were provided for local supermarkets or local vendors in locations where major supermarkets did not exist (37). The program was conducted at two sites, with total of 655

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participants attending education sessions at site one and 55 clients attending education sessions at site two (12). A total of 79% and 73% of these participants attended HCV screening at each site, respectively (12). Site one ran the program from 2013 to 2015, and saw a significant increase in the proportion of Aboriginal clients attending the clinic, which rose from 11% in 2011 to 52% in 2015 ( $p < 0.001$ ) (12). Site two ran the program from 2015 to 2016, and saw a similar increase in the proportion of Aboriginal clients, which increased from 5.9% in 2013 to 8.4% in 2015 upon the program's introduction (12). Qualitative findings indicated some staff questioning the ethics of using vouchers, but vouchers were found to attract clients to the program and initiated discussion among clients about safer injection and HCV (12).

Participants appreciated having Aboriginal workers at the centers as well as the non-judgmental environment of the program with one participant stating, *"And the people are so nice here, they make you feel – like if you're wrong about something, they don't make you feel stupid, which is what a lot of Indigenous people would have a problem with, because of education and that. I had problems with learning and that, but they don't make you feel silly here..."* (12). Another identified theme among participants was that the program improved their access to information about HCV, safer injecting, and STI screening with one participant stating, *"I've actually found out I can get rid of it [hepatitis C] and I'm going to try and start treatment, yes"* (12). The study concluded that the pilot had high acceptability and high engagement among Aboriginal communities (12).

An earlier retrospective study compared outcomes in the first year of the Deadly Liver-Mob program to outcomes in the five years prior to the program's implementation (38). In the first year of the program, 313 participants attending the clinic identified as Aboriginal, which was ten times more than the 83 Aboriginal participants that attended the clinic in the five years prior, combined (38). A higher proportion of attendees reported risk behaviours during the first year of the program than in the five years prior, with 43% and 26% reporting ever injecting drugs, respectively (38). There was a statistically significant increase in the proportion of HCV screening tests completed with 215 (70%) participants taking part in testing

during the program compared to 19 (23%) Aboriginal clients in the five years prior (38). Among participants that screened for HCV, there was a significant increase in new HCV diagnoses detected during the program compared to the years prior, with 27 (12.5%) and 1 (5.2%) HCV cases detected in each time period, respectively (38). The study concluded that the Deadly Liver-Mob program increased clinic attendance and screening for diseases such as HCV among Aboriginal people in Western Sydney (38).

## Factors That May Impact Local Applicability

Many of the studies examined were small scale pilot studies which did not randomize participants, which may have led to unmeasured confounders. Only one randomized controlled trial was identified which took place in a single health center. Only one identified pilot project took place in Ontario, and therefore, these results may not be entirely generalizable to the local setting in Ontario.

## What We Did

We searched Medline (including Epub Ahead of Print, In-Process & Other Non-Indexed Citations) using a combination of (text term [contingency management] or terms [incentive\* or gift card\* or cash or nudg\*] in titles or abstracts) AND (MeSH term Hepatitis C or terms [hepatitis C or HCV] in titles or abstracts). Searches were conducted on April 12, 2021 and results limited to articles published in English from 2010 to present. Reference lists of identified articles were also searched. The searches yielded 59 references from which 38 were included. We also contacted Dominica Anderson, a Hepatitis C Treatment Nurse at the Réseau ACCESS Network in Sudbury for her expertise.