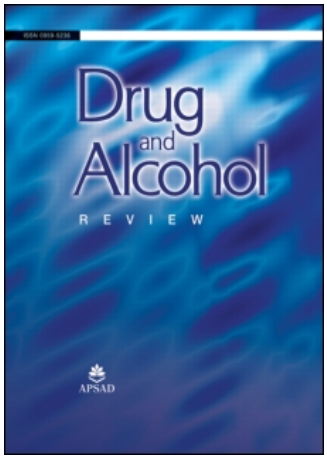


Drug and Alcohol Review
Publication details, including instructions for authors and subscription information:
http://www.informaworld.com/smpp/title~content=t713412284

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Bianca Watson [a]; Katherine M. Conigrave [ab]; Cate Wallace [a]; John B. Whitfield [a]; Friedrich Wurst [c]; Paul S. Haber [ab]
[a] Royal Prince Alfred Hospital, Sydney, Australia
[b] School of Public Health and Discipline of Medicine, University of Sydney, Australia
[c] Psychiatric University Clinic, Basel, Switzerland

Online Publication Date: 01 May 2007
To cite this Article: Watson, Bianca, Conigrave, Katherine M., Wallace, Cate, Whitfield, John B., Wurst, Friedrich and Haber, Paul S. (2007) 'Hazardous alcohol consumption and other barriers to antiviral treatment among hepatitis C positive people receiving opioid maintenance treatment', Drug and Alcohol Review, 26:3, 231 - 239
To link to this article: DOI: 10.1080/09595230701247681
URL: http://dx.doi.org/10.1080/09595230701247681

*Drug and Alcohol Review* (May 2007), 26, 231 – 239

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# Hazardous alcohol consumption and other barriers to antiviral treatment among hepatitis C positive people receiving opioid maintenance treatment

BIANCA WATSON[1], KATHERINE M. CONIGRAVE[1,2], CATE WALLACE[1], JOHN B. WHITFIELD[1], FRIEDRICH WURST[3], & PAUL S. HABER[1,2]

[1]*Royal Prince Alfred Hospital, Sydney, Australia,* [2]*School of Public Health and Discipline of Medicine, University of Sydney, Australia, and* [3]*Psychiatric University Clinic, Basel, Switzerland*

**Abstract**

*Amongst people on opioid maintenance treatment (OMT), chronic hepatitis C (HCV) is common but infrequently treated. Numerous barriers, including misuse of alcohol may limit efforts at anti-viral treatment. The aim of this study was to define barriers, including alcohol misuse, to the effective treatment of HCV amongst OMT recipients. Ninety-four OMT patients completed the 3-item Alcohol Use Disorders Identification Test (AUDIT-C). A semi-structured interview was used in 53 subjects to assess alcohol use in detail, psychological health, discrimination and access to HCV treatment. Feasibility of brief intervention for alcohol misuse was assessed. Of the screening participants, 73% reported they were HCV positive. Of the detailed interview participants, 26% reported no drinking in the past month, but 53% scored 8 or more on AUDIT and 42% exceeded NHMRC drinking guidelines. Twenty subjects received brief intervention and among 17 re-interviewed at one month, alcohol consumption fell by 3.1 g/day ($p = 0.003$). Severe or extremely severe depression, stress and anxiety were found in 57%, 51% and 40% of interviewees respectively. Episodic heavy drinking, mental health problems, perceived discrimination, limited knowledge concerning HCV were all common and uptake of HCV treatment was poor. Brief intervention for alcohol use problems was acceptable to OMT patients, and warrants further study.* [Watson B, Conigrave KM, Wallace C, Whitfield JB, Wurst F, Haber PS. Hazardous alcohol consumption and other barriers to antiviral treatment among hepatitis C positive people receiving opioid maintenance treatment. *Drug Alcohol Rev* 2007;26:231 – 239]

**Key words:** alcohol, buprenorphine, hepatitis B, hepatitis C, methadone, opioid dependence.

## Introduction

Hepatitis C is the most prevalent blood borne virus among Australian injecting drug users (IDU) and is found in 65 – 94% of those receiving opioid maintenance treatment (OMT) [1]. In New South Wales (NSW), approximately 15,000 individuals are currently on registered OMT programs, suggesting that more than 10,000 may be HCV positive. In about 10% of cases, HCV progresses to cirrhosis which is in turn associated with liver failure, liver cancer and liver-related death [2]. Chronic liver disease is the second most common cause of death amongst opioid-dependent people after overdose [3].

Anti-viral therapy using pegylated interferon and ribavirin is effective for chronic hepatitis C, with sustained viral responses in up to 75% of those with favorable genotypes who complete therapy. Antiviral therapy has also been shown to reduce the incidence of the major adverse outcomes of HCV including cirrhosis, decompensation and hepatocellular carcinoma [4]. Active injecting drug use has been considered a

Bianca Watson MBBS FRACGP, Public Health Registrar, Royal Prince Alfred Hospital, Katherine M. Conigrave MBBS (Hons), PhD, FAFPHM FAChAM, Staff Specialist, Drug Health Services, Royal Prince Alfred Hospital, Sydney and Associate Professor, School of Public Health and Discipline of Medicine, and Discipline of Psychological Medicine, University of Sydney, NSW, Australia, Cate Wallace MPH, Research Officer, Royal Prince Alfred Hospital, John B. Whitfield PhD, Deputy Director, Dept Biochemistry, Royal Prince Alfred Hospital, Friedrich Wurst MBBS, Psychiatrist, Psychiatric University Clinic, Basel, Switzerland, Paul S. Haber MBBS (Hons) MD FRACP FAChAM, Director, Drug Health Service Royal Prince Alfred Hospital and Professor, School of Public Health and Discipline of Medicine, and University of Sydney, NSW, Australia. Correspondence to Dr Paul S. Haber, Drug Health Service, Royal Prince Alfred Hospital, Missenden Road, Camperdown, NSW 2050, Australia. Tel: +61 2 9515 6419. E-mail: phaber@mail.usyd.edu.au

Received 20 February 2006; accepted for publication 17 November 2006.

ISSN 0959-5236 print/ISSN 1465-3362 online/07/030231–09 © Australasian Professional Society on Alcohol and Other Drugs
DOI: 10.1080/09595230701247681

contra-indication to anti-viral therapy [5] and very few IDUs receive such therapy [6]. There is increasing evidence that HCV antiviral therapy is feasible among those receiving OMT, even among those who continue to inject infrequently [7–9]. Injecting drug use is no longer an exclusion criterion for HCV therapy, but very few people on OMT currently receive antiviral therapy [10]. Increasing access to HCV treatment is both important as a strategy for reduction of HCV transmission [11] and critical in reducing HCV-related morbidity and mortality and the associated treatment costs of these infections.

A number of barriers to successful antiviral treatment of HCV infection have been identified amongst opioid-dependent people [7,12]. Excessive alcohol use is associated with accelerated liver injury [13] and incomplete treatment adherence [14]. The influence of moderate use on effectiveness of antiviral treatment is unclear [14] but a maximum of one standard drink per day during treatment is currently advised [15]. Alcohol-related problems have been reported by 50% and 45% of clients receiving methadone maintenance treatment (MMT) in the United States and the United Kingdom respectively [16–18]. Alcohol misuse may be amenable to change suggesting that this barrier may be overcome. There are few data concerning optimal interventions for alcohol use disorders in this setting. Two studies found that patients on OMT who were alcoholic did poorly in a formal alcohol treatment program [19,20]. No other studies have been reported. In particular, the feasibility of brief intervention for alcohol amongst HCV positive people on OMT has not been reported.

Untreated depression is a contraindication to interferon based antiviral treatment for HCV due to the risk of severe depression and suicide [21,22]. Lesser degrees of depression need not preclude successful antiviral treatment of HCV if recognised and addressed 23,24]. The prevalence of depression is high in patients on OMT making this a significant concern. Discrimination may also impede HCV treatment. Recent Australian research indicates that IDUs fear discrimination following disclosure of their injecting status to their doctors, and that this discrimination may impede access to health care, including HCV services [25,26]. Specific interventions have the potential to overcome these barriers.

Hepatitis B (HBV) infection is prevalent in cohorts of Australian IDUs [27–29] HBV co-infection is associated with accelerated liver disease in the presence of HCV [30]. Accordingly, health authorities recommend vaccination of HCV infected IDUs against HBV [31] and vaccine is available at no cost to the clients in public OMT clinics in NSW. However, vaccination rates among IDUs remain disappointing. Recent research by Anderson *et al.* (2000) reported that just 7% of IDUs attending a Sydney sexual health clinic had been vaccinated against HBV [32]. Loxley reported that only half of IDUs surveyed in Perth were aware of the existence of HBV vaccination [33].

This study investigated alcohol consumption patterns amongst those receiving OMT at an inner city clinic and the feasibility of a brief intervention for excessive alcohol use in this cohort. This study also reviewed other barriers to management of HCV and documented the uptake of HCV treatment and HBV vaccination in this cohort.

## Methods

Participants were recruited from the Royal Prince Alfred Hospital Drug Health Service (RPAH DHS). RPAH DHS provides free opioid maintenance treatment seven days a week, to inner metropolitan Sydney. The service, like the other public OMT clinics in NSW, is considered a 'stabilization clinic' and caters for a large number of unstable drug users who are actively injecting drugs and just commencing on OMT. Priority of access is given to Aboriginal and antenatal clients, those recently released from prison and those with serious medical disorders (but not HCV). Typical patients are dosed in clinic for 3 months before being transferred to dosing in a community pharmacy but may stay longer if unstable. Approximately half the service's clients are women. Potential participants were provided with both oral and written information about this study and invited to provide written informed consent. Those who completed the two interviews received $40 as reimbursement for their time. This study was approved by the Human Research Ethics Committee of Central Sydney Area Health Service (RPA Zone).

The study was conducted in 2 stages:

### *Stage 1: Screening*

All clients attending the opioid maintenance program over a two-week period were approached during dosing and asked to complete the 3-item Alcohol Use Disorders Identification Test (AUDIT-C) [34,35], provide simple demographic data and self-report HCV status. Those screened who were HCV positive and were current drinkers, were eligible for inclusion in the detailed interview.

### *Stage 2: Detailed interview*

Clients attending the pharmacotherapy service were invited to participate in more detailed interviews relating to alcohol use and HCV. HCV positive drinkers identified by screening were targeted first, then convenience sampling was employed using advertisements, personal approaches and a quasi snowball

technique As there is a constant change in the population being dosed at the service, with new clients entering treatment, and more stable clients moving on to pharmacy dosing, some clients who were screened were no longer at the dosing services when interviews happened, and some who were interviewed had not been screened.

*Inclusion criteria.* Clients currently receiving opioid maintenance therapy (either methadone or buprenorphine) dosing as an outpatient at RPAH; aged 17 years old and over; self reported anti-HCV antibody positive. Those subsequently shown to be HCV antibody negative were excluded from subsequent analysis.

*Exclusion criteria.* Unable to complete the screening or consent procedure due to intoxication, confusion or psychosis.

A semi-structured interview was used to assess alcohol use, psychological health and experience of discrimination as a result of drug use. The structured interview consisted of:

- Depression Anxiety Stress Scale (DASS 21) questionnaire [36]. This is a 21-item self-report inventory which yields scores for the 3 factors. It is validated, correlates well with Beck anxiety and depression inventories [36,37] and Australian norms are available.
- The Alcohol Use Disorders Identification Test (AUDIT) questionnaire [38]. This is a 10-item screening questionnaire developed by the World Health Organisation to identify harmful or hazardous alcohol consumption. It contains items on frequency of consumption, alcohol dependence and problems caused by alcohol consumption and has been evaluated for use in drug-dependent individuals [39].
- A 28-day retrospective alcohol-drinking diary.
- An interviewer-administered questionnaire about knowledge of HCV and HBV status, immunisation history, access to HCV treatment and information services and experiences of discrimination. These items were developed for this study.

Liver function tests (LFTs), full blood count (FBC) and Hepatitis B and C serology were tested unless results from the previous 2 months were available. HCV RNA testing by polymerase chain reaction PCR was not routinely completed.

### *Brief intervention*

There are no widely accepted guidelines regarding alcohol consumption limits for chronic HCV-infected individuals. For the purpose of this study we arbitrarily set a limit of half the National Health and Medical Research Council (NHMRC) limits for the general population. Accordingly, the revised alcohol consumption limit for HCV positive men was set at 2 standard drinks (20 g alcohol) per day and/or 3 standard drinks per any session and for women, 1 standard drink per day and/or 2 standard drinks per any session. Individuals identified in the 28-day alcohol consumption history as exceeding these limits were given a structured alcohol brief intervention. The intervention was based on World Health Organisation validated brief advice, presented in the Drink-Less kit [40] as recently revised [41,42]. The controlled drinking goals were modified by the researchers to reflect the increased risk from alcohol consumption in those with chronic HCV infection, together with risks of acute intoxication in conjunction with opioid maintenance therapy. Individuals with abnormal LFTs ($\gamma$GT, ALT or AST) were advised not to drink alcohol regularly and to consider abstinence. For those who wished to continue drinking, half the national recommended limit was suggested. Individuals who had received the brief intervention were re-interviewed after one month using the same consumption measures. Liver function tests and full blood count were repeated.

### *Statistical methods*

Episodic heavy drinking was defined in accordance with NHMRC (2001) as $>6$ drinks on one occasion for men and $>4$ for women using data from the drinking diary. Descriptive data are presented as mean $\pm$ SD for continuous variables and median for variables with skewed distribution. Alcohol consumption data before and after the brief intervention were compared using a paired *t*-test on natural log transformed data.

## Results

### *Demographics*

*Screened subjects.* Ninety-four of the 118 registered pharmacotherapy clients completed the screening with AUDIT-C, a response rate of 80%. Of these 73% ($n=69$) reported they were HCV positive (Table 1). Participant demographics were representative of dosing clients. Those who refused to participate were more likely to be male but were no different in age. There was no difference in Hepatitis C status or alcohol consumption in those who refused screening on medical record review review.

### *Subjects who participated in the detailed interview*

A total of 56 people volunteered to participate in the detailed interviews. The original screening

questionnaire had been completed by 66% ($n = 35$) of these. Of those who had not completed the initial screening, three had earlier refused and the remaining 15 had commenced dosing at the service after the screening. All 56 patients self-reported HCV antibody positive. On subsequent testing, three participants were antibody negative, and so were excluded from further analyses, leaving 53 patients for analysis of detailed interview data.

### *Hepatitis C*

In relation to their Hepatitis C care, all but three of those who participated in the detailed interview recalled having had at least one liver function test. The median duration since their last test was 5.5 months and 42% ($n = 21$) had been tested in the last 2 months. Forty-six percent and 28% of subjects had their last test more than 6 and 12 months ago respectively, and the maximum time since the last test was five years. Only 4 subjects (8%) had previously been referred to a liver specialist. Two had been on interferon therapy in the past, and none was currently receiving anti-viral treatment.

Few individuals recalled having discussed the availability and appropriateness of antiviral HCV treatment with their health care provider. Of those who had never received HCV treatment, only 38% ($n = 20$) recalled some mention of therapy by their health care provider. Of these, 12 stated they had been told they did not need treatment, three did not know why they had not received treatment and five said they had decided not to pursue therapy. Of those who had decided not to pursue therapy only one was concerned about potential side-effects while the others were either not interested or preferred to wait for a later date. One participant stated that he was not eligible for treatment due to a psychiatric illness. The majority of those who took part in the detailed interview, (74%; $n = 39$) stated they would like the opportunity to discuss their hepatitis care with their doctor. Sources of information about HCV were varied however the majority cited printed material as their principle resource (Table 2).

**Table 1.** *Demographics of the two samples*

| | Screening Questionnaire ($n = 94$) | Detailed Interview ($n = 53$) |
|---|---|---|
| Age | | |
| (mean) | 34.1 | 37.3 |
| (SD) | 8.5 | 8.1 |
| (range) | 17 – 61 | 22 – 61 |
| Sex (% male) | 50.0% ($n = 47$) | 56.6% ($n = 30$) |
| Hepatitis C status | HCV +ve 73% ($n = 69$)<br>HCV −ve 20% ($n = 19$)<br>Unknown 6% ($n = 6$) | HCV +ve 100% ($n = 53$) |
| Aboriginality | Data not available | 36% Aboriginal descent<br>64% non-Aboriginal descent |
| Full-time employment | Data not available | 92.5% ($n = 49$) unemployed<br>7.5% ($n = 4$) studying |

### *Alcohol consumption patterns*

*At screening.* At screening (with AUDIT-C) of the 94 participants, the majority were not regular drinkers: 66% stated that they either did not consume alcohol (29%; $n = 27$) or consumed alcohol monthly or less (37%; $n = 35$). Episodic heavy drinking of 6 standard drinks once a month or more frequently was reported by 16% ($n = 15$). Using the reported AUDIT-C cut-off score of 5 for males and 4 for females (43), 36% of males and 34% of females were drinking at hazardous levels.

*In the detailed interview.* In the detailed interview of 53 subjects (as with the screening sample) more than half the subjects (51%) were not regular drinkers: 19% ($n = 10$) were currently non drinkers and a third (32%; $n = 17$) reported drinking monthly or less. A total AUDIT score of 8 or greater was used to identify hazardous or harmful drinking [44]. The median AUDIT score was 10.5 (range 0 – 35) and half the subjects (52.8%; $n = 28$) scored 8 or more (Table 3).

**Table 2.** *Sources of information concerning hepatitis C accessed by subjects**

| | *n* (%) |
|---|---|
| Printed material | 45 (85) |
| Health care providers other than RPAH DHS | 34 (64) |
| Friends and peers | 22 (42) |
| RPAH drug health service | 20 (38) |
| Hepatitis C Council of NSW 'Hep C Review' | 9 (17) |
| New South Wales Users & AIDS Association 'Users News' | 9 (17) |
| Specialist hospital Immunology or Liver clinics | 6 (11) |
| Needle & syringe programs | 5 (9) |
| Prison health services | 5 (9) |
| Detoxification & rehabilitation services | 3 (6) |
| Work | 2 (4) |
| Phone line | 1 (2) |
| Never accessed information about Hepatitis C | 1 (2) |
| Internet | 0 |

*Subjects could nominate more than one source of information.

**Table 3.** *Alcohol consumption among subjects participating in the detailed interview*

| | Male ($n=30$) | Female ($n=23$) | Total ($n=53$) |
|---|---|---|---|
| Mean AUDIT score (SD) | 9.8 (SD = 7.6) | 10 (SD = 8.4) | 10 (SD = 7.8) |
| % with score ≥8 | 46.7% ($n=14$) | 60.9% ($n=14$) | 52.8% ($n=28$) |
| Alcohol (g/day) | | | |
| Median | 3.7 | 2.1 | 3.6 |
| Max | 124 | 58 | 124 |
| Mean alcohol free days per month in drinkers (SD) | 21.7 (7.5) $n=23$ | 21.3 (7.4) $n=16$ | 21.4 (7.4) $n=39$ |
| % subjects with mean consumption of ≥50 g alcohol/day | 6.7% ($n=2$) | 8.7% ($n=2$) | 7.5% ($n=4$) |
| Episodic heavy drinking | 37% ($n=11$) | 48% ($n=11$) | 42% ($n=22$) |
| Drinking above limits for HCV in last month | | | |
| Any days (no. of days) | 57% ($n=17$) | 52% ($n=12$) | 55% ($n=29$) |
| Median, mode | 1, 2 | 1, 5 | 1, 2 |
| Max | 25 | 22 | 25 |
| Maximum consumed on one occasion (g ethanol) | 450 | 370 | 450 |
| % Abstinent over 28 days | 23% ($n=7$) | 34% ($n=7$) | 26% ($n=14$) |

*28-day alcohol consumption history*

Analysis of the 28-day alcohol consumption data showed that no individuals drank daily and confirmed that the majority did not regularly consume alcohol (Table 3). The average number of alcohol free days per month was 21.4 days (SD = 7.4). Just under one in ten subjects 9.4% ($n=5$) reported drinking frequently (<2 alcohol free days per week). Episodic heavy drinking was relatively common as 37% ($n=11$) of men drank in excess of 6 standard drinks in one session at least once during the previous 28 days. Men reported a mean of 2.1 occasions of heavy drinking in this period, with one man reporting 25 such episodes in the month. Women reported higher rates of episodic heavy drinking as nearly half (48%) drank above NHMRC guidelines on at least one occasion in the 28 day period. Women reported a mean of three such episodes in this period. One woman consumed in excess of 4 standard drinks on most days (22 times in the previous month). Over half the subjects (57% $n=17$ of men and 52%, $n=12$ of women) exceeded the lower alcohol risk threshold for HCV-positive people on at least one occasion in the past 28 days.

*Brief intervention*

Twenty participants in the detailed interview reported consumption levels above the threshold for brief intervention, and of these 17 (85%) had a follow-up interview a month later. Of the three participants not reinterviewed, one had died of an opiate overdose, and two were unable to be contacted. Among those who were re-interviewed, the majority were satisfied with the intervention process, and their reported alcohol consumption had fallen by a mean of 3.1 g/day ($p=0.003$, paired *t*-test on ln transformed data).

*Blood test results*

A total of 49 participants had either blood collected at the time of interview or accessible recent blood test results. Four refused to have blood taken. Results outside normal limits were detected in 22 individuals, however the ALT level was raised in only 11 participants, the GGT was raised in eight and mild thrombocytopenia was found in two.

*Hepatitis B*

Of the 53 detailed interview participants, 34% ($n=18$) reported a previous HBV diagnosis. Thirty-eight percent ($n=20$) reported they had completed a full course of 3 vaccinations; 17% ($n=9$) had not completed the course, 4% ($n=2$) were in the process of receiving the vaccinations and one did not know their vaccination status. Of the 44 patients who had Hepatitis B surface antibody (HepBsAb) testing, 32% ($n=14$) had levels below 10 IU/ml, and so had inadequate immunity due to either incomplete or unsuccessful vaccination. Only two had failed to respond to full course of HBV vaccination. Reasons given for not being vaccinated included: the cost of vaccination (although it is available at this service at no cost to clients), lack of knowledge about the vaccine and lack of concern about Hepatitis B. One participant stated that as he was no longer injecting, Hepatitis B was no longer a risk.

*DASS results*

Overall, interviewed subjects showed high levels of depression, anxiety and stress, as measured by the DASS (Table 4). The means of all measures were significantly outside the normative range for the Australian population [45]. In total 57% reported

**Table 4.** *DASS 21 scores for Depression, Anxiety and Stress in 53 HCV-positive subjects on opiate maintenance pharmacotherapy compared against Australian general population values*

| | DASS score | | | |
|---|---|---|---|---|
| DASS axis | Normative sample* [mean (SD)] | Study sample [mean (SD)] | Score range* | Percent *n* (%) |
| *Depression* | 6.3 (6.8) | 20.6 (12.3) | | |
| Normal | | | <10 | 13 (25) |
| Mild | | | 10–13 | 5 (9) |
| Moderate | | | 14–20 | 5 (15) |
| Severe/extremely severe | | | >20 | 30 (57) |
| *Anxiety* | 4.7 (4.9) | 15.0 (10.7) | | |
| Normal | | | <8 | 18 (34) |
| Mild | | | 8–9 | 3 (6) |
| Moderate | | | 10–14 | 5 (9) |
| Severe/extremely severe | | | >14 | 27 (51) |
| *Stress* | 10.1 (7.9) | 21.1 (10.7) | | |
| Normal | | | <15 | 19 (36) |
| Mild | | | 15–18 | 5 (9) |
| Moderate | | | 19–25 | 8 (5) |
| Severe/extremely severe | | | >25 | 21 (40) |

*Cut-off scores for each severity category are based on normative data from 2914 healthy adults [36].

severe or extremely severe depression; 51% reported severe or extremely severe anxiety and 40% reported severe or extremely severe stress.

### *Discrimination*

Fifty-six percent ($n = 30$) of participants in the detailed interview reported regular experience of discrimination on the basis of their drug use. Participants most often reported experiencing discrimination while accessing employment, and in dealings with the police and retailers (data not shown). Several individuals reported a loss of trust by community members including family members which persisted despite successful cessation of heroin use. Participants also reported discrimination from health care providers regularly ($n = 9$) or all the time ($n = 2$), most commonly from pharmacists and their staff. Perceptions of drug seeking among GPs who were not their usual care providers or acute care professionals were also cited as problems. Most participants felt that their usual health care providers had not been a source of discrimination. When asked if they felt that discrimination had affected their hepatitis care, 33% agreed or strongly agreed, while 27% were undecided.

## Discussion

This study has highlighted a number of persisting barriers to engaging an OMT population in HCV therapy. A substantial proportion of people with HCV in Australia are currently on OMT and their lack of HCV treatment is a significant problem. The findings provide additional insight into the reasons for such low levels of HCV therapy in this population and suggest possible strategies to address this problem. Alcohol consumption above recommended levels, depression, anxiety, discrimination and lack of understanding of HCV therapy were all common in this population. As the study population was relatively unstable and transient, HCV treatment may be more feasible amongst those stabilised on OMT for a longer time. Only a small number of participants had received HCV therapy, and none had successful viral clearance. On a more positive note, alcohol consumption responded significantly to brief intervention. It is possible that more intensive intervention may further reduce the likelihood of alcohol-related harm exacerbating HCV liver injury and might facilitate HCV treatment.

The pattern of alcohol consumption in this group was very different from that of the general Australian population (Table 3). The rate of abstinence (26%) was more than double that reported for people aged 20–50 in the general Australian population (11%) [46] and the mean daily consumption was low. However, there was a high likelihood of risky episodic drinking in those who did drink (42% in the last one month) versus 16% for Australians aged in their 30s [46]. Only a small proportion drank alcohol in a low-risk fashion. Gossop *et al.* noted a similar pattern of alcohol consumption in a study of methadone maintenance clients in the UK [47].

In the presence of chronic HCV, alcohol may increase viral load, increase the progression of fibrosis and interfere with viral clearance [48–50]. The effect of moderate or episodic heavy alcohol consumption is not clear and there are no validated guidelines on alcohol consumption limits for chronic HCV-infected individuals. For those considering treatment, consumption of >10 g ethanol/day is considered a relative contraindication to HCV therapy [22] as alcohol limits treatment efficacy. Alcohol intoxication is also a risk factor for fatal opioid overdose among persons who use opioids. Advice to be offered about drinking should be tailored to this population.

Controlling heavy episodic alcohol consumption has the potential to improve health in this population. The brief intervention had a small but highly significant effect in this study. One should be cautious in generalising these results to clinical practice. The intervention was performed in association with a detailed interview about alcohol and hepatitis C, and this may have

contributed to its effect. It is also possible that the apparent benefit resulted from social expectation bias in self-reported alcohol use rather than the intervention. A randomised controlled trial is required to exclude this possibility. The loss of the heaviest alcohol user to follow-up and inability to recruit or provide brief intervention those heavily intoxicated may have tended to increase the detected effect. However, brief intervention has been shown to be effective in many other settings, in episodic as well as regular drinkers, and in many of those studies alcohol-dependent persons are excluded. The period of follow-up was short. Other studies have shown that repeated intervention is needed to sustain its effect.

There were other limitations in the study methods. As with most studies on alcohol use, the drinking history is dependent on self-report, which may be subject to social desirability bias, particularly at follow-up. It was not possible to have separate interviewers for follow-up. HCV polymerase chain reaction (PCR) testing for RNA was not available but in this population, the great majority would probably have been positive [51,52]. The sample size was not large, but the bulk of the clinic patients agreed to participate in screening. This may limit generalisability of the findings.

Depression is associated with both alcohol and opioid dependence and adds to the complexity of management of both problems. Depression is also a recognised side-effect of HCV therapy with interferon [21]. The high prevalence of severe anxiety and depression in this group was likely to present a significant barrier to treatment. Undiagnosed or unmanaged mental health disorders may also alter treatment seeking behavior and contribute to nihilistic beliefs surrounding HCV infection. However, depression and anxiety tend to resolve with stabilisation of opioid dependence [53] and may be themselves amenable to specific treatment. Further studies are required to develop and implement appropriate multidisciplinary interventions to reduce mental health comorbidity with a view to facilitating HCV treatment.

The individuals who participated in this study are engaged with health care providers as indicated by their enrolment in a OMT program, by the relatively high number who had had recent blood tests (43% within last 3 months) and by taking part in this research. Even so, the rates of Hepatitis B vaccination were inadequate (38%). Even allowing for the 34% who reported a past diagnosis of Hepatitis B, a significant proportion of subjects are at risk of co-infection, which could be simply prevented by vaccination. Furthermore, there appeared to be a lack of knowledge about treatment options for HCV, which has the potential to restrict access to appropriate HCV care. Fifty-nine percent of interviewees could not recall discussion of HCV therapy at any time with their health care providers. This suggests that communication with this group about HCV care and treatment options has been unsuccessful. One individual commented 'just because we don't ask about it doesn't mean we don't want to know about it'. The marginalisation and discrimination experienced by injecting drug users and others with substance use disorders has been widely documented and are linked with lower levels of utilisation of primary health care [26,54]. The results of this study suggest this problem also may influence access to HCV treatment as 33% felt their past drug use had affected their hepatitis care. Poor knowledge about HCV treatment in this population has been reported elsewhere suggesting a key role for OMT providers in increasing access to HCV by improving education of their clients [55].

The prevalence of HCV infection in this sample is consistent with other studies conducted at other OMT clinics within Australia [56]. These results emphasise the importance of identifying patterns of alcohol use on entry into OMT, and the feasibility of a brief intervention that may reduce alcohol-related harm in this population. Additional research in this area appears warranted. The impact of episodic heavy drinking on liver disease associated with HCV and on general health requires further study. Larger and appropriately controlled trials of brief intervention should also be conducted in this population as this study has demonstrated its feasibility and potential benefit. Successful intervention to control alcohol use may contribute towards improving uptake of HCV antiviral therapy Strategies to improve HCV 'literacy' could form an important part of comprehensive clinical management. Access to vaccination against hepatitis B still needs to be improved. Discrimination against drug users from both within health care institutions and a broader community level may be further addressed to reduce the marginalisation and stigmatisation that impair access to HCV care [26]. Treatment uptake is also contingent upon access to subsidised antiviral drugs and specialist nursing and medical care, provided in Australia via the S-100 scheme, and Medicare or State government funded public hospital staff respectively. Widespread implementation of interventions to overcome non-financial barriers to antiviral treatment may contribute to control HCV infection and prevent its long-term complications in this population.

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