# Shelter-based managed alcohol administration to chronically homeless people addicted to alcohol

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## ABSTRACT

**Background:** People who are homeless and chronically alcoholic have increased health problems, use of emergency services and police contact, with a low likelihood of rehabilitation. Harm reduction is a policy to decrease the adverse consequences of substance use without requiring abstinence. The shelter-based Managed Alcohol Project (MAP) was created to deliver health care to homeless adults with alcoholism and to minimize harm; its effect upon consumption of alcohol and use of crisis services is described as proof of principle.

**Methods:** Subjects enrolled in MAP were dispensed alcohol on an hourly basis. Hospital charts were reviewed for all emergency department (ED) visits and admissions during the 3 years before and up to 2 years after program enrolment, and the police database was accessed for all encounters during the same periods. The results of blood tests were analyzed for trends. A questionnaire was administered to MAP participants and staff about alcohol use, health and activities of daily living before and during the program. Direct program costs were also recorded.

**Results:** Seventeen adults with an average age of 51 years and a mean duration of alcoholism of 35 years were enrolled in MAP for an average of 16 months. Their monthly mean group total of ED visits decreased from 13.5 to 8 ($p = 0.004$); police encounters, from 18.1 to 8.8 ($p = 0.018$). Changes in blood test findings were nonsignificant. All program participants reported less alcohol consumption during MAP, and subjects and staff alike reported improved hygiene, compliance with medical care and health.

**Interpretation:** A managed alcohol program for homeless people with chronic alcoholism can stabilize alcohol intake and significantly decrease ED visits and police encounters.

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Alcoholism is well known to affect homeless people. It has been reported to affect 53%–73% of homeless adults,[1–3] with a high frequency of heavy alcoholism (i.e., > 20 drinks/day).[4–6] Because of its availability and low cost, nonbeverage alcohol (e.g., mouthwash) is commonly used.[7,8] People with chronic alcoholism are frequent users of crisis health services such as the emergency department (ED);[9,10] at one centre, alcoholism was a characteristic of 81% of homeless people who sought care.[11] ED visits because of alcohol intoxication, withdrawal or its complications are recurrent.[9,11] In addition, homeless people have higher rates of chronic illnesses,[12,13] longer hospital stays with higher costs[14] and increased mortality[15–18] compared with those who have home addresses.

Police encounters are recurrent for public drunkenness.[19,20] In one study,[3] 70% of homeless alcoholic men had a history of imprisonment.

Although treatment with detoxification and abstention ("detox") is the best option from a health perspective, the likelihood of rehabilitation among among people both alcoholic and homeless is low.[6,21–25] Obstacles to sobriety include psychiatric illness, poor social support, lack of stable housing, duration of addiction and refusal of treatment.

Harm reduction is a policy to reduce the adverse health, social and economic consequences of substance use without requiring abstinence. Methadone maintenance treatment of opioid dependence, for example, is superior to detox in reducing heroin use and behaviours that increase the risk of HIV infection.[26] After an inquest into the freezing deaths of homeless alcoholic men, a pattern was noted of heavy alcohol consumption before shelter entry to achieve in-shelter abstinence, followed by early-morning alcohol-seeking to avoid the symptoms of withdrawal.[27] Despite the high incidence of people with chronic alcoholism dying homeless in cities worldwide, this population has been underrecognized in program development and in the clinical literature. In response, a managed alcohol harm-reduction program was developed for people with long-term homelessness and refractory alcoholism.

In Ottawa, an estimated 1000 people are chronically homeless,[28] with 48%–63% having a history of alcohol abuse.[13] With the city and the University of Ottawa, the Managed Alcohol Program (MAP) was developed in a harm-reduction model to deliver health services to homeless adults within the shelter system. The objective of this study was to examine the effectiveness of MAP, as proof of principle, in reducing the use of crisis services and consumption of alcohol and improving health care in a cohort of chronically homeless people with refractory alcoholism.

## Methods

MAP is an ongoing 15-bed shelter-based project in Ottawa. Potential participants are referred by shelter staff, police or community workers familiar with them as being chronically homeless, having severe alcoholism (according to DSM-IV diagnostic criteria for alcohol abuse) and showing evidence of harm to self and community, and for whom abstinence-based programs had failed or been refused. Admission was arranged upon agreement of the participant, shelter staff and the program manager, a registered nurse.

Study subjects were housed at the shelter in an area designated for MAP and were provided with beds and meals. The program employed a client care worker to supervise the participants, give aid with activities of daily living, help fill out applications for social benefits, accompany them to medical appointments and dispense regular medications. Participants were given up to a maximum of 5 ounces (140 mL) of wine or 3 ounces (90 mL) of sherry hourly, on demand, from 0700–2200, 7 days per week. Medical care was provided 24 hours per day by nurses and 2 physicians associated with the project, with daily nurse and weekly physician visits. Medical records were kept on a secured online system developed by the Ottawa Inner City Health Project.[29]

Program participants were enrolled into MAP and included for analysis with approval from the Ottawa Hospital research ethics board and police services. Inclusion required continuous program participation for at least 5 months by July 2002. Data for all 17 eligible subjects were included for analysis; no one left the program before 5 months or was excluded from the study. A consent and confidentiality statement was read to each person at program entry, and written consent obtained to access hospital and police records. The project was analyzed as a before-and-after study design. Charts from all 5 area hospitals were reviewed for 3 years before program entry and while participants were in the program for number of ED visits, ambulance use and diagnoses of trauma, seizures or intoxication at presentation. Hospital admissions and lengths of stay were recorded, as were blood-test markers of alcohol use. The police services' computerized database was accessed for each participant by name, date of birth and all aliases, and the number of police encounters recorded for the same period as for hospital records.

Descriptive statistics using the mean and standard deviation were used for normally distributed continuous outcomes. Average monthly rates of use of ambulance services, visits to hospital EDs, diagnoses, hospital admissions and police encounters were calculated for a 36-month period before and up to 24 months after program enrolment. Differences in outcome measures before and after program entry were assessed with the paired Student's *t* test. Average values for blood-test results were calculated for the 24 months before and during program enrolment for each participant, and analyzed for statistical differences.

Eligible participants underwent structured interviews about their drinking patterns before and after enrolment and their perceived health, nutrition and sleep. Participants estimated their typical daily beverage and nonbeverage alcohol consumption before program entry, which was compared with in-program daily alcohol intake averaged over the program period. Life satisfaction was measured by means of Diener's Satisfaction With Life (DSWL) Scale.[30] The client care workers involved were interviewed for their observations of the participants' drinking patterns, hygiene, sleep, nutrition and medication compliance.

## Results

Fifteen men and 2 women who had been homeless for at least 2 years participated in MAP for 5–24 months (mean 16 mo; Table 1). The majority were single white males aged an average age of 51 years, had alcoholic parents, had started drinking in their early teens and were not educated beyond high school. Study participants had been alcoholic for an average of

| Table 1: Characteristics of participants in the Managed Alcohol Program (MAP) | |
|---|---|
| Characteristic | No. (%) of participants*<br>n = 17 |
| Sex, male | 15 (88) |
| Age, mean (SD), yr | 50.7 (10.6) |
| Program stay, mean (range), mo | 16 (5-24) |
| Ethnic background | |
| White | 16 (94) |
| Aboriginal | 1 (6) |
| Education | |
| Less than high school | 8 (47) |
| High-school graduate | 5 (29) |
| More than high school | 4 (24) |
| Marital status | |
| Married | 0 |
| Previously married | 11 (65) |
| Never married | 6 (35) |
| Parents had alcoholism | 12 (71) |
| Age at onset of alcoholism, mean (range), yr | 15.5 (7-30) |
| Duration of alcoholism, mean (SD), yr<br>Range, yr | 35.2 (10.2)<br>21-59 |
| Homeless (sheltered) for > 2 yr pre-MAP | 16 (94) |
| Consumption of nonbeverage alcohol pre-MAP | |
| Daily | 8 (47) |
| Weekly | 3 (18) |
| Occasionally | 1 (6) |
| Never | 5 (30) |
| Detox attempted | 13 (76) |
| Pre-MAP diagnoses, no. of chronic conditions | |
| 0 | 2 (12) |
| 1 only | 7 (41) |
| 2 or more | 8 (47) |

Note: SD = standard deviation, detox = detoxification and abstinence.
*Unless otherwise indicated.

35 years, with most consuming nonbeverage alcohol regularly. Typical consumption before MAP enrolment was reported to average 46 drinks per day. Most had tried detox and abstention, but were unable to maintain sobriety. Fifteen (88%) had at least one chronic medical or psychiatric illness.

For the 3 years before entry into the program, the total mean monthly number of ED visits by all participants was 13.5, a monthly mean per participant of 0.79 (Table 2). During the program, this number decreased to a group monthly total of 8.1 (mean 0.51 visits per participant), with a decreased mean monthly paired difference per subject of 0.28 (standard deviation 0.35, $p = 0.004$; Fig. 1). Use of ambulance services, hospital admissions and ED visits all showed a decreasing trend, as did diagnoses of intoxication, trauma and convulsion, although statistical significance was not attained. Police encounters decreased from a monthly mean of 18.1 for the group to 8.8 ($p = 0.018$).

When concentrations of blood markers of alcoholism recorded during the 2 years before enrolment were compared with those obtained during the program, differences in group averages were nonsignificant, as were individual paired differences (results not shown).

Three people declined to be interviewed about their drinking history, health and life satisfaction, and 3 others died before being interviewed. The remaining 11 participants all reported a markedly decreased consumption of beverage and nonbeverage alcohol, and most reported improved sleep, hygiene, nutrition and health. Paired data were available for 10 participants to compare the amount of alcohol they were consuming before program entry with the amount consumed during MAP (Table 3). Subjects noted that a typical day's consumption was difficult to estimate; most described drinking all the alcohol that was available and would drink until they lost consciousness. For all participants, the absolute amount of alcohol consumed was found to decrease, from an average of 46 drinks per day to 8 ($p = 0.002$). Ten participants who agreed to be administered the DSWL Scale scored a median of 22, consistent with feeling "slightly satisfied" with life.[30]

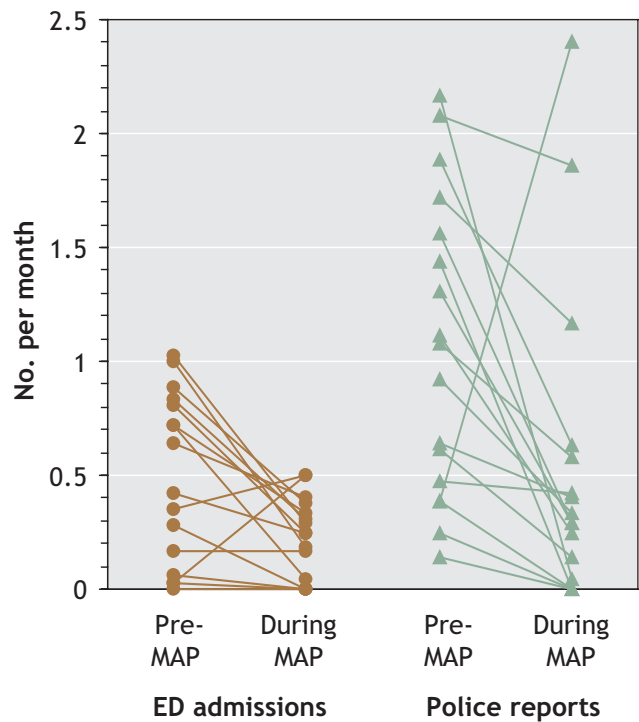The client care workers interviewed all noted improved hy-



**Fig. 1:** Monthly numbers among study participants ($n = 17$) of visits to the emergency department (ED) and police encounters before and during the program. One subject's ED visits (not shown) decreased from 5.1 to 4.8 per month. MAP = Managed Alcohol Program.

giene and nutrition for all participants during the program. Compliance with medication, defined as taking it as prescribed at least 80% of the time, was noted for 88% of subjects. The majority were reported to attend scheduled medical appointments.

A cost analysis was performed (results not shown). Mean monthly direct cost of the program was $771 per client, with estimated per-client reductions in the costs of ED services of $96; hospital care, $150; and police services, $201.

## Interpretation

This article describes the effect of providing supportive shelter for a subset of chronically homeless people with alcoholism and providing them with institutionally administered alcohol as a harm-reduction measure. The 17 participants enrolled in MAP drank heavily and had long drinking histories. They were regular users of nonbeverage alcohols such as mouthwash, had significant medical and psychiatric comorbidities, and were frequent users of emergency, hospital and police services. Within MAP they received housing, health care and treatment of their alcoholism with doses of alcohol that were modest in comparison with their previous levels of consumption.

Police encounters decreased by 51% and ED visits by 36%, which, given the associated "unit encounter" costs ($93 and $270, respectively), offset a portion of the costs of MAP. Po-

**Table 2:** Mean monthly use of emergency and police services before and during the Managed Alcohol Program (MAP), $n = 17$

| Service use | Mean no. (SD) per mo | | |
| --- | --- | --- | --- |
| | Pre-MAP | During MAP | p value |
| Ambulance calls | 0.50 (0.74) | 0.42 (1.08) | 0.46 |
| ED visits, for | | | |
| Intoxication* | 0.55 (0.78) | 0.39 (1.14) | 0.21 |
| Trauma | 0.14 (0.15) | 0.07 (0.09) | 0.07 |
| Convulsion | 0.09 (0.17) | 0.04 (0.08) | 0.14 |
| Total visits | 0.79 (1.25) | 0.51 (1.17) | 0.004 |
| Hospital stay, d | 0.33 (0.65) | 0.09 (0.17) | 0.36 |
| Police reports | 1.07 (0.66) | 0.52 (0.68) | 0.018 |

Note: SD = standard deviation, ED = emergency department.
*From alcohol.

lice encounters and ED visits were seen to increase for 2 subjects (Fig. 1), but both had been in jail or living in another province during the 2 years before MAP enrolment and their reports were not captured in the Ottawa system. Blood-test markers of alcohol use remained stable, and participants and client care workers reported improvements in health, nutrition and hygiene. Compliance with prescribed medications and attendance at medical appointments was excellent compared with what might be predicted for alcoholic individuals living without homes. Three participants died of causes and at ages that have previously been described among homeless people;[15,16,18] they died of intracerebral hemorrhage, cardiac arrest and acute alcoholic hepatitis, respectively. It must be noted that MAP is intended as a program with no stop date per admitted individual; participants would be expected to die of causes that are consequences of life-long addiction.

This study had limitations. Although it may have been preferable to compare 2 such groups in a randomized controlled trial, logistical, population and financial constraints made such methodology unfeasible. Potential biases identified with the one-group pretest–post-test study design include biases of history, maturation, testing and instrumentation, as well as statistical regression to the mean. However, there has been no change in ED, police or social policies to account for the decreased use of ED and police services. Maturation or biologic changes in the participants over time would tend to bias against MAP, with expected declines in health. Pre- and post-program hospital and police encounters would not be subjected to testing bias, since external databases were used. Observations were repeated over time with no instrument decay or regression to the mean. Clinical

regression, in which participants might enter MAP when addictive consequences were at their worst and therefore appear to improve, is another possible source of bias; but the addiction in this group was of a severe and long-standing nature, and severity at program entry was likely representative of overall severity.

Continuity of care among homeless people has been found to be exceptionally difficult. Shelter operators already having demonstrated cultural competence in caring for the homeless were integrated into a shelter-based medical model of care to address previously unmet needs. This served to treat vulnerable individuals in a timely manner and coordinate their care, which allowed timely discharge from hospital. Police in frequent contact with people repeatedly inebriated in public have the opportunity to refer potential program participants to MAP and address a need within a system otherwise obliged to repeatedly process minor offences and bring people in for overnight detox in a police cell. Program development is ongoing for preventive care against infections such as tuberculosis and hepatitis and for administration of HIV tests and immunizations. For people whose drinking pattern has stabilized in MAP, psychiatric evaluations and follow-up have been successful.[31] Finally, the option to detoxify from alcohol is always presented; once stabilized in the program, a few participants have successfully been medically detoxified and received housing, a formidable accomplishment considering the severity of an on-average 35-year addiction in which subjects drank daily to unconsciousness. This appears attributable to tempering alcohol consumption in a safe environment, which makes alterations of behaviour, including detoxification, possible.

In one large study,[32,33] mentally ill homeless people in supportive housing had decreased shelter use, incarcerations, admissions to hospital and lengths of hospital stay. In another study,[24] only 20% of people with case-managed alcoholism were able to maintain housing. Although housing is immensely beneficial for health, it is difficult to maintain without appropriate skills. Part of the success of MAP has likely been due to the supportive housing provided, but housing alone would not have prevented alcohol-seeking, consumption and the harm therefrom.

MAP is an innovative program based on a harm-reduction model that, when evaluated in a small group, appeared to be effective in decreasing alcohol consumption and the use of crisis services. Those responsible for the well-being of homeless people should consider the implementation and prospective evaluation of programs that integrate health services within shelters using a harm-reduction strategy.

**Table 3:** Mean daily consumption of alcohol before and during the Managed Alcohol Program (MAP) by each study participant

| Pt no. | Reported average daily alcohol consumption (range), pre-MAP | Mean daily no. of std. drinks* | | |
| --- | --- | --- | --- | --- |
| | | Pre-MAP | During MAP† | Δ |
| 1 | 26 oz rum + 750 mL Listerine | 31.9 | 7.5 | -24.4 |
| 2 | 26 oz rum | 18 | 13.5 | -4.5 |
| 3 | 4 L Listerine | 74 | 4.9 | -69.1 |
| 4 | 5 (4-6) L sherry | 64.9 | 7.3 | -57.6 |
| 5 | 16 pints beer | 21.3 | 9.5 | -11.8 |
| 6 | 7 (6-8) bottles sherry | 68 | 10.3 | -57.7 |
| 7 | 8 (8-9) bottles wine | 45 | 8.4 | -36.6 |
| 8 | 10 (10-12) bottles sherry | 97.4 | 13.2 | -84.2 |
| 9 | 6 beers + 26 oz whisky | 23.3 | 5.7 | -17.6 |
| 10 | 26 oz rye whisky | 17.3 | 9.8 | -7.5 |
| | Total mean daily consumption ± standard deviation | 45.6 ± 28.8 | 8.3 ± 3.5 | -37.1‡ ± 28.3 |

Note: Pt = participant, std. = standardized, Δ = difference.
*One standardized drink = 14 g alcohol. Conversions were based on wine, 5 oz/drink at 11% alcohol; beer, 1 US pint (16 oz)/drink at 4.5% alcohol; spirits, 1.5 oz/drink at 40% alcohol; sherry, 2.6 oz/drink at 18% alcohol; Listerine mouthwash, 1.8 oz/drink at 26% alcohol.
†Quantities consumed during MAP but off MAP premises went unrecorded.
‡p = 0.0025.

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## Editor's take

- Homeless people with severe alcoholism are frequent users of health care services, especially the emergency department, and have high rates of hospital admission and death. Treatment programs involving abstinence rarely succeed.

- Based on a framework of harm reduction, this homeless shelter program dispensed alcohol on an hourly basis to alcoholics in the shelter.

- Program participants consumed less alcohol, visited emergency departments less often and had fewer police encounters. Staff and clients reported improvements in hygiene, general health and compliance with medical care.

**Clinical implications:** Harm reduction is now a mainstream approach to drug abuse. This pilot project demonstrates that the strategy may be successful even in this very-difficult-to-treat group of longstanding homeless people addicted to alcohol.