

Effective Interventions Unit

EVALUATION OF THE PROVISION OF SINGLE USE CITRIC ACID SACHETS TO INJECTING DRUG USERS

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ABSTRACT

Three hundred and sixty injecting drug users (IDUs) took part in a survey to assess the acceptance, effectiveness and efficiency of the provision of single use citric acid sachets to IDUs in Greater Glasgow and Lanarkshire.

Overall, the introduction of the single use citric acid sachets has been very successful and well received by IDUs. The current provision of 100mg of citric acid in each sachet is sufficient for almost all users' needs and most IDUs reported both using and preferring to use the sachets rather than other acidifiers. Moreover, most IDUs seem to be aware that the single use citric acid sachets are a safer option for dissolving their drugs than most alternative acidifiers.

However, there is a need to further educate users on the importance of not sharing any of their injecting equipment and paraphernalia, including the citric acid sachets. Furthermore, the data suggests that some IDUs continue to reuse their needles. It is vital that these IDUs are encouraged to use a clean needle each time and to return to the needle exchange more often. The provision of the single use citric acid sachets appears to have had a positive impact on the number of visits being made by IDUs to the needle exchanges. The provision of further injecting paraphernalia such as single use sachets of Vitamin C, Stericups and sterile water may also lead to a further increase in visits.

This report recommends that the provision of the single use citric acid sachets be extended across the UK.

CHAPTER 1 BACKGROUND

Introduction

Recent estimates suggest that 2% of 15-54 year olds in Scotland misuse drugs. In the year 2000, there were 22,795 known drug users and an estimated 55,800 drug users in all. In Greater Glasgow, the prevalence of problematic drug use was reported to be slightly higher at 3.1% of 15-54 year olds, with 7248 known drug users and an estimated 15,975 drug users in total in 2000. In Lanarkshire the prevalence of drug misuse was reported to be slightly lower at 1.6% of 15-54 year olds, with 1828 known drug users and an estimated 5076 drug users in total in 2000. Across the whole of Scotland, males consistently account for around 75% of the problem drug using population (Hay, McKeganey & Hutchinson, 2001).

Much of the problematic drug use in Scotland involves drug injecting. In the year 2000, there were known to be 4542 injecting drug users (IDUs) with an estimated 22,805 in total (0.8% of 15-54 year olds). The prevalence of injecting drug use is higher than the national average in Greater Glasgow, where 1.4% of 15-54 year olds are thought to inject. In 2000, there were 1946 known IDUs and an estimated 7187 IDUs in total in Greater Glasgow. In Lanarkshire, the prevalence of injecting drug use has been reported to be slightly lower at 0.7% of 15-54 year olds. Here, there were 279 known IDUs and an estimated 2369 IDUs in total in the year 2000 (Hay, McKeganey & Hutchinson, 2001).

Table 1.1 Prevalence of drug misuse and drug injecting in 2000

<i>NHS Board</i>	<i>Problem drug use 2000</i>			<i>Injecting drug use 2000</i>		
	Known users	Estimated users	Prevalence (15-54 yr olds)	Known IDUs	Estimated IDUs	Prevalence (15-54 yr olds)
<i>Greater Glasgow</i>	7,248	15,975	3.1%	1,946	7,187	1.4%
<i>Lanarkshire</i>	1,828	5,076	1.6%	279	2,369	0.7%
<i>Scotland</i>	22,975	55,800	2.0%	4,542	22,805	0.8%

Source: 'Estimating the National and Local Prevalence of Problem Drug Misuse in Scotland: Executive Report' Hay, McKeganey & Hutchinson, 2001.

Injecting drugs is known to increase the risk of overdose, abscesses and infections, vascular problems and blood-borne viruses. Recent estimates suggest that around 34% of IDUs have shared their injecting equipment within the past month (ISD, 2001). Another study has found that a further 27% of IDUs reported that while they had not shared in the previous month, they *had* shared in the past (Effective Interventions Unit, 2001). When the definition of sharing equipment is extended to include all injecting paraphernalia, the figures are even higher. Galbraith et al (2001) reported that 58% of IDUs reported sharing needles, syringes, spoons, water and swabs in the past. Such sharing of equipment significantly increases the risk of acquiring blood-borne infections such as HIV, Hepatitis C and Hepatitis B

Since the early 1980s, when the infection was first evident in Scotland, the incidence of HIV infected IDUs has steadily declined. Recent estimates suggest that the prevalence throughout Scotland is very low at 1-2% (ISD, 2001). In 2000, there were only 19

diagnosed cases of HIV infected injectors – the lowest annual number ever recorded (ISD, 2001). This decline in cases has been accompanied by a rise in the average age at which HIV is diagnosed and suggests that the few infections that are being reported were contracted in the late 1980s or early 1990s. Recent HIV transmission seems to be a relatively rare occurrence. Such reduction in incidence can be at least partly attributed to the success of harm reduction interventions such as needle exchange and methadone maintenance programmes (Hurley, 1997; Des Jarlais, et al, 1996).

In contrast to the relatively low prevalence of HIV, the prevalence of Hepatitis C among IDUs in Scotland is very high. By December 2001, there were 13,535 known cases of HCV in Scotland (5019 in Greater Glasgow and 774 in Lanarkshire). Of these cases, 60% had injecting drug use as the probable route of transmission (SCIEH, 2002). Moreover, it is likely that a large number of IDUs are among the cases with an “unknown” cause of transmission. Recent estimates suggest that as many as 10,000 IDUs in Scotland have HCV and even this figure is likely to underestimate the true prevalence (Effective Interventions Unit, 2001). In Greater Glasgow, HCV is most prevalent, with estimates that 64% of IDUs have the disease (Goldberg, et al 2001). While treatments for HCV are becoming more successful, prevention undoubtedly remains the key to halting the progression of this disease.

Hepatitis B is less prevalent among IDUs in Scotland than Hepatitis C. In 2000, there were 360 known cases of the virus. Of these, only 89 cases were attributed to injecting drug use, but it is likely that most cases had injecting drug use as the probable route of transmission (ISD, 2001).

Harm Reduction: The Role of the Needle Exchange

Reducing the prevalence of injecting drug use and the spread of associated blood-borne viruses in Scotland is a complex task. The best interventions are based on the principles of harm reduction. Such interventions follow a set of practical strategies that aim to reduce the risks associated with injecting drug use and encourage safer use, which may or may not lead to abstinence.

One such harm reduction approach is to ensure that IDUs have access to clean needles and syringes. Needle exchange programmes recognise that people who inject drugs are at a greater risk of contracting HIV, HBV and HCV and other health problems associated with sharing needles and drug paraphernalia. By providing clean equipment, information and education on risk factors, and by making referrals to drug counselling services, their aim is to reduce the negative consequences associated with injecting drug use.

First established in the UK in the mid 1980s, needle exchanges are an effective method of disease control. By reducing the length of time that each needle spends in the drug injecting population, they ensure that there is less chance of it being contaminated and subsequently reused by another, potentially uninfected, IDU (Drucker, et al, 1998). Their efficacy in reducing sharing behaviour has been well documented (Blumenthal, et al, 2000). Other studies have reported that needle exchanges significantly increase single use of syringes and can reduce the number of injections per syringe by between 44% and 85% (Heimer, et al, 1998; Kipke, et al, 1998).

There is overwhelming evidence to suggest that needle exchanges decrease the prevalence of HIV among IDUs (Hurley, 1997, Des Jarlais, et al, 1996). In fact, all but two of the studies carried out to date have concluded that needle exchanges reduce HIV transmission. Even the two Canadian studies, which concluded that needle exchange

programmes were not sufficient to prevent HIV transmission, conceded that they had a crucial role to play (Strathdee, et al, 1997; Schechter, et al, 1999).

Less research has been carried out to investigate the role of needle exchanges in reducing the transmission of blood-borne viruses other than HIV. However, what evidence there is suggests that needle exchange programmes are also associated with reductions in HCV, HBV and subcutaneous abscesses (Harris, 1997). A study carried out in America reported that IDUs who used a needle exchange were between 6 and 11 times less likely to contract HBV or HCV compared with IDUs who did not use a needle exchange (Hagan, et al, 1995). In another American study, they found that needle exchange programmes were associated with a minimum of a 33% reduction in HBV incidence (Heimer, et al, 1996). Finally, research carried out in Australia found a concurrent decline of 50% in needle sharing behaviour and a decline from 22% to 13% in HCV prevalence among IDUs during a 3 year period (MacDonald, et al, 2000).

Critics of needle exchange programmes have argued that needle exchanges may increase the use of illegal drugs and cause more widespread use. However, extensive research has shown that this is not the case and that needle exchanges can actually reduce drug use through referrals to drug treatment and counselling (Watters, et al, 1994; Heimer & Lopes, 1994; Buning, 1991). Studies have also concluded that needle exchanges do not increase injection frequency among IDUs, the number of initiates to injecting drug use or more widespread drug use (Normand et al, 1995; American Institute of Health, 1997). Moreover, needle exchange programmes do not increase the number of syringes discarded in public places (American Institute of Health, 1997). Indeed, some areas where needle exchanges have been introduced have reported a decrease in the number of discarded syringes (Normand, et al, 1995; Oliver, et al, 1992).

Another argument often cited by critics of needle exchanges is that by giving IDUs access to needles, they may be discouraged from entering drug treatment programmes. Again, extensive research has shown this claim to be untrue. Many IDUs who use needle exchanges ask for referrals to treatment (Heimer & Lopes, 1994, Hagan, et al, 1993, Heimer, et al, 1996). In Australia, researchers found that introducing a needle exchange next to a methadone clinic did not reduce the number of admissions for treatment or result in an increase in dropouts or positive urine tests at the methadone clinic (Wolk, et al, 1990).

In addition to these benefits, needle exchanges also make economical sense, with the cost of running them far below the costs associated with treating or caring for IDUs with blood-borne viruses (Lurie, et al, 1993; Holtgrave & Pinkerton, 1997).

In summary, there is now overwhelming scientific evidence to show that needle exchange programmes reduce the spread of blood-borne viruses without increasing drug use or the number of discarded syringes. In fact, they can actually reduce drug misuse by referring IDUs to treatment programmes. They are also cost effective and serve to improve the lives of IDUs and their families.

In a further bid to reduce the harm associated with injecting drug use, and in an attempt to increase the use of their services, some needle exchanges are now starting to offer IDUs additional injecting paraphernalia such as single use citric acid sachets.

Provision of Single Use Citric Acid Sachets

The majority of IDUs who use needle exchanges in the UK are heroin injectors. While heroin in its purest form is highly water soluble, street heroin in the UK tends to be brown

and is sold in poorly soluble base form (King, 1997). In order to make the heroin base soluble, an acid must be added to convert it into a salt. Acids that can be used to facilitate solubility in this way include citric, ascorbic, acetic and lactic acids. IDUs have tended to use readily available forms of these acids such as commercial brands of processed lemon juice, fresh lemon juice, vinegar and other household products. Although these products are used to promote solubility and thereby reduce the risk of harm caused by injecting particles, they are in fact often a source of harm themselves.

Lemon juice both in its packaged and fresh forms can carry fungal infections, which, when injected, can infect the heart (endocarditis) and cause candidal endophthalmitis, an infection of the eyes that can lead to blindness (Gallo, et al, 1985). At a recent conference of needle exchange workers in the UK, there was a noted increase in reports of blindness among IDUs. These were attributed to candidal endophthalmitis caused by using lemon juice to acidify heroin prior to injection (Preston & Derricott, 2001).

There is limited evidence that using vinegar to dissolve heroin is harmful. However, as with lemon juice, because vinegar is a liquid it is conceivable that it could encourage the growth of bacteria or fungal infections such as candidal endophthalmitis (Lazzarin, et al, 1985).

Ascorbic acid (vitamin C) can also be used for the preparation of heroin for injection. Some have argued that it might be safer than citric acid because it allows a greater margin of error: ascorbic acid is less acidic than citric acid and a small increase in the amount used is unlikely to cause vein damage or burn the user. In practice, however, IDUs learn from experience and their peers how much acid to use and persistent over use of citric acid seems to be rare (Preston & Derricott, 2002). Moreover, it is now being suggested that if ascorbic acid is injected in large doses, as occurs in certain medical conditions, it could lead to the formation of kidney stones (Preston & Derricott, 2002). It is unlikely that the amount of ascorbic acid injected by IDUs would be large enough to cause such physical problems, but it nevertheless remains a possibility.

Citric acid is believed to be the safest acidifier to use for the preparation of brown heroin for injection, as it is readily available in pure form, is of consistent strength and complies with the British Pharmacopoeia (BP) standard (Preston & Derricott, 2002). However, supplying citric acid to IDUs remains, in principle at least, illegal by virtue of Section 9A of the Misuse of Drugs Act 1971. However, there have been recent calls for a repeal of this law, and to date no one has ever been prosecuted for supplying citric (or ascorbic) acid. This is because prosecution for harm reduction initiatives would not be in the public interest. Despite this, some pharmacists' concerns about the, albeit very low, risks of prosecution had, until recently, made them reluctant to supply it. This had made it very difficult for IDUs to obtain citric acid and had resulted in their use of more dangerous acidifiers.

Acting on behalf of the Greater Glasgow Drug Action Team (DAT), and in a bid to reduce concerns and reassure pharmacists, the Regional Procurator Fiscal (RPF) approached the Lord Advocate's department about the supply of citric acid sachets to IDUs. They were advised that under no circumstances would pharmacists supplying citric acid as part of an approved needle exchange programme be prosecuted. The three RPFs responsible for Greater Glasgow NHS Board and Lanarkshire NHS Board areas also provided "letters of comfort" which were forwarded to all pharmacists to further reassure them. There then followed a short pilot study of supplying IDUs attending needle exchanges with 200mg sachets of citric acid. This trial highlighted that while IDUs liked the idea of single use sachets, 200mg was excessive in terms of the amount of citric needed for each injection. Indeed, 100mg of citric acid was found to be more than sufficient to dissolve the £20 worth of heroin usually injected. 100mg is also the smallest amount of citric that can be feasibly packaged in single sachets and is therefore the safest option possible. As a result

of this research, in December 2001 pharmacy exchanges in Greater Glasgow started offering 100mg single use sachets of citric acid to IDUs and, in March 2002, pharmacy and needle exchanges in Lanarkshire followed suit. This provision was introduced with the support of Greater Glasgow and Lanarkshire DATs, the Home Office, Strathclyde Police, Greater Glasgow Primary Care Trust and the Royal Pharmaceutical Society in Scotland.

The 100mg single use citric acid sachets provided are manufactured and packed in surroundings that comply with the pharmaceutical industry standards of Good Manufacturing Practice (GMP). The sachets themselves are made from a combination of paper, plastic and aluminium foil, which ensures they remain airtight, water resistant and free from contamination.

As the sachets are designed for single use, they decrease the risk of contamination from sharing between IDUs and encourage hygienic injecting techniques. In addition, it is hoped that providing citric acid sachets in this way will increase both the number of people attending and the number of visits to the needle exchange. Despite these clear benefits, citric acid, like all acidifiers, is not designed for injecting and can lead to vein damage. It is therefore important that the smallest possible amount is used. Text on the exterior of the sachets advises IDUs to use as little citric as possible and to discard whatever remains. Each sachet also carries the warning that injecting citric acid can damage veins. This information and further injecting advice is also offered to IDUs on the small flyer supplied with the sachets and on the box in which the sachets are sometimes supplied to users. (Further information on the sachets, leaflets and information distributed can be found in Appendices C and D.)

While the provision of citric acid sachets in the UK is relatively new, a similar service has been available in some European countries for some time now. There it has increased the use of needle exchange services, reduced the use of more dangerous acidifiers, been popular with IDUs and improved their relationship with needle exchange staff (Preston & Derricott, 2002). A small pilot study carried out by the Hungerford Mobile Exchange Team in London has also produced positive results (Wilkinson, 2002).

The Effective Interventions Unit (Scottish Executive), Greater Glasgow Primary Care NHS Trust and Lanarkshire Primary Care NHS Trust provided the funding necessary to investigate if the provision of citric acid is just as successful in Greater Glasgow and Lanarkshire.

CHAPTER 2 METHODOLOGY

Aims & Objectives

The study aimed to assess the acceptability, effectiveness and efficiency of the provision of 100mg single use sachets of citric acid to injecting drug users. The objectives were to assess:

- If the amount of citric acid is sufficient to dissolve the amount of heroin used per injection.
- If the provision of one sachet per one needle/syringe is adequate for the needs of injectors.
- The number of citric burns experienced using the sachets.
- If the uptake of needles/syringes from exchanges has increased since the introduction of the sachets.

Project Management

A working group comprising Avril Taylor (Chair in Public Health, University of Paisley), Kay Roberts (Area Pharmacy Specialist – Drug Misuse, Greater Glasgow Primary Care NHS Trust), David Robinson (Project Co-ordinator, Lanarkshire Harm Reduction Team), Brian Rae (Research Manager, Greater Glasgow Primary Care NHS Trust) and Jennifer Garden (Research Officer, Scottish Centre for Infection and Environmental Health) met regularly to ratify the proposed interview schedule and methodology.

Sampling Strategy

Two pharmacy exchanges in Greater Glasgow, two pharmacy exchanges in Lanarkshire and two fixed site needle exchanges in Lanarkshire agreed to take part in the study. These exchanges were invited to participate in the project as they are among the busiest in Greater Glasgow and Lanarkshire and allowed for a large number of injecting drug users to be approached. Three hundred and sixty injecting drug users who attended these needle exchanges were recruited to the study between August and November 2002. The provision of the single use citric acid sachets began in Greater Glasgow in December 2001 and in Lanarkshire in March 2002. This meant that all the participants would have had the opportunity to use the single use citric acid sachets at the time of being interviewed. One hundred and twenty participants were from the Lanarkshire NHS Board area and 240 were from the Greater Glasgow NHS Board area. This sample represents 10% of all injectors who attended needle exchanges in Lanarkshire in August 2001 and 5% of all contacts to Glasgow pharmacies per month over the period September 2000 to March 2001 (the number of individuals using Glasgow pharmacies is not available).

Potential participants were approached after the needle exchange staff had served them. Interviews were carried out there and then in a quiet corner of the exchange. Each interview took less than ten minutes to complete and was completely anonymous and confidential. All participants were offered a bar of chocolate and a can of juice for taking the time to participate in the study.

Participants were approached using opportunistic sampling until the target sample size was met. Response rates at participating exchanges ranged from 78% to 94%, with the overall response rate being 84%.

Although the sample of 360 is only 5-10% of the IDUs who currently use needle exchange services in Greater Glasgow and Lanarkshire the demographic characteristics of the sample appear representative of the drug using population in these areas. For example, the ratio of 22% female participants to 78% male compares well with national figures that consistently show that males make up around 75% of IDUs in the UK (Hay, McKeganey & Hutchinson, 2001). The mean age of participants (29.3 years) also compares well with previous studies of IDUs (Hay, McKeganey & Hutchinson 2001; ISD 2001). Further, the vast majority of IDUs in this study reported injecting heroin most frequently, with relatively few injecting cocaine and other drugs. Almost all the IDUs who did inject cocaine were resident in Greater Glasgow. As these findings compare well with those of other studies (Hay, McKeganey & Hutchinson, 2001; Roberts 2002), we can be fairly confident that the sample used is as representative as possible of the larger drug using populations in Greater Glasgow and Lanarkshire.

Data Collection

The data was collected using a structured questionnaire (Appendix B). This schedule was split into two sections of mainly closed-ended questions. The first section asked for information regarding participants' demographic characteristics, drug use, injecting habits and use of needle exchanges. The second section asked participants about their attitudes to and use of the citric acid sachets and other acidifiers.

To ensure all participants would have had the opportunity to use the citric acid sachets provided by the needle exchanges at the time of interview, most questions referred to drug use within the previous three months.

At the end of the interview, participants were asked if there was anything that they thought could be done to encourage them to use the needle exchange more often. All participants also had the opportunity to add any comments on important issues that they felt were not sufficiently covered in the interview. The questionnaires were marked to show the location, date and time of each interview.

Data Analysis

The data gathered was analysed using one-way ANOVAs, t-tests for independent samples, chi-squares and Pearson's product moment correlation.

CHAPTER 3 RESULTS

Study Group Characteristics

Two hundred and eighty men and 80 women ranging in age from 17 to 52 years took part in the study. The mean age of participant was 29.3 years. Two thirds of the participants were recruited in Greater Glasgow and one third in Lanarkshire. The vast majority of the IDUs interviewed lived in their own or partner's home (70%) or a friend or relative's home (29%). These demographic details are presented in full in Table 3.1. (Numbers will vary throughout as not all participants answered every question.)

Table 3.1. Study group characteristics

Characteristic	N (%) Participants
<i>NHS Board</i>	
Greater Glasgow	240 (67)
Lanarkshire	120 (33)
<i>Needle Exchange</i>	
Pharmacy 1	120 (33)
Pharmacy 2	120 (33)
Pharmacy 3	40 (11)
Pharmacy 4	40 (11)
Pharmacy 5	10 (3)
Pharmacy 6	30 (8)
<i>Sex</i>	
Male	280 (78)
Female	80 (22)
<i>Age (years)</i>	
16-19	16 (4)
20-24	77 (21)
25-29	103 (29)
30-34	81 (23)
34-39	64 (18)
40+	19 (5)
<i>Living Accommodation</i>	
Own/partner's home	252 (70)
Someone else's home	107 (29)
Hostel	1 (1)
<i>Total</i>	360 (100)

Drug Use and Injecting Habits

The age at which the participants in this study first used illicit drugs (of any kind) ranged from 8 years to 38 years, with the mean age of first use being 16.5 years. Almost all the IDUs interviewed (90%) had begun using illicit drugs by 21 years of age. The participants'

drug using careers ranged from 6 months to 36 years, with the mean length of time spent using drugs being 12.9 years. The age at which injecting drug use began ranged from 13 years to 40 years of age, with the mean being 21.4 years of age. Injecting careers ranged from 6 months to 32 years, with the mean participant having spent 7.9 years as an IDU.

Overall, male IDUs were significantly more likely to have started using illicit drugs and injecting illicit drugs at slightly earlier ages than female IDUs. The mean age of initial drug use for male IDUs was 16.0 years, compared with 18.0 years for females ($t^{357} = -3.4$; $p < 0.001$), while the mean age of initial injecting behaviour for male IDUs was 21.0 years, compared with 22.7 years for females ($t^{357} = -2.5$; $p < 0.02$). IDUs in Lanarkshire tended to have begun using illicit drugs at a slightly earlier age (Mean = 15.7 years) than IDUs from Greater Glasgow (Mean = 16.8 years; $t^{357} = 2.3$; $p < 0.05$). However, IDUs from Greater Glasgow tended to have had longer injecting careers (Mean = 8.5 years) compared with IDUs from Lanarkshire (Mean = 6.6 years; $t^{357} = 2.8$; $p < 0.01$). As would be expected, there were positive correlations between the age of participants and the length of time spent using illicit drugs ($r^{359} = 0.8$; $p < 0.001$) and injecting drugs ($r^{359} = 0.6$; $p < 0.001$). In general, older participants had been using and injecting drugs for significantly longer periods of time than younger participants.

Almost all participants (93%) reported heroin to be the drug that they had most frequently injected in the previous three months. Twenty-three participants (6%) reported injecting cocaine most often, while one IDU (<1%) reported injecting crack most often. Virtually all of the IDUs who injected cocaine most frequently were resident in Greater Glasgow (22). All but 5 of the IDUs who had ever injected cocaine in the last 3 months were also resident in Greater Glasgow. Clearly, there is a greater cocaine injecting population in Greater Glasgow than there is in Lanarkshire. Few other drugs were reported to have been injected by the participants. (Table 3.2.)

Table 3.2. Drugs injected in previous three months

<i>Drugs</i>	<i>N (%) Participants</i>	
	<i>Most frequently injected in the previous 3 months</i>	<i>Ever injected in the previous 3 months*</i>
Heroin	336 (93)	340 (94)
Cocaine	23 (6)	44 (12)
Heroin & Cocaine together	-	4 (1)
Crack	1 (1)	1 (<1)
Temazepam	-	2 (<1)
Methadone	-	1 (<1)
Diconal	-	1 (<1)
Diazepam ("valium")	-	1 (<1)
Amphetamine ("speed")	-	2 (<1)

* Participants could cite more than one drug.

Table 3.3 outlines the frequency with which the participants in this study usually inject and the parts of their body into which they inject. The frequency of injecting varied greatly from less than once a day to 9 times a day, with most participants (65%) injecting between 1 and 3 times a day. IDUs who reported injecting 4 times a day or more had been using illicit drugs for significantly longer than participants who injected fewer than 4 times a day ($F(4, 354) = 12.3$; $p < 0.001$). IDUs who reported that they injected cocaine

more than any other drug also injected significantly more often than other participants ($\chi^2 = 53.6$; $df = 8$; $p < 0.001$). None of the IDUs who injected cocaine injected fewer than 2-3 times a day.

The parts of the body injected into also varied, with 60% of IDUs injecting into their arms, 38% into their groin and 19% into their legs on a regular basis. "Other" body parts injected into included fingers, hands, wrists and feet. Participants who reported injecting into their arms had been using ($M = 11.00$ years) and injecting (Mean = 5.9 years) illicit drugs for shorter periods of time than participants who injected into parts of their body other than their arms (Mean = 15.7 years; $t^{357} = -6.5$; $p < 0.001$; Mean = 10.9 years; $t^{357} = -8.1$; $p < 0.001$). Conversely, participants who reported injecting into their groin had been using (Mean = 16.4 years) and injecting (Mean = 11.5 years) illicit drugs for significantly longer than those who did not inject into their groin (Mean = 10.6 years; $t^{357} = 8.3$; $p < 0.001$; Mean = 5.6 years; $t^{357} = 10.1$; $p < 0.001$). This seems to suggest that IDUs only use their groin as an injection site once they feel they are running out of "good" veins on other parts of their body. IDUs from Greater Glasgow were significantly more likely to inject into their groin than IDUs from Lanarkshire ($\chi^2 = 3.6$, $df = 1$; $p < 0.05$). Again, this may be because the IDUs from Greater Glasgow tended to have longer injecting careers and may well have run out of available "good" veins in other parts of their body. IDUs who injected into their groin also injected significantly more frequently than participants who did not use this part of their body for injecting ($\chi^2 = 69.7$; $df = 4$; $p < 0.01$). It seems that injecting into the groin is associated with heavier and longer term drug misuse.

Table 3.3. Frequency and site of injecting

<i>Injecting behaviour</i>	<i>N (%) Participants</i>
<i>Frequency of injection</i>	
Less than once a day	87 (24)
Once a day	108 (30)
2-3 times a day	127 (35)
4-5 times a day	36 (10)
More often	2 (1)
<i>Body part injected into*</i>	
Arm	217 (60)
Leg	70 (19)
Groin	140 (38)
Other	10 (3)

* Participants could cite more than one site.

Use of Needle Exchanges

The age at which the participants in this study had first used a needle exchange ranged from 15 years to 46 years, with the mean age being 23.6 years. As the mean age of initial injecting behaviour was 21.4 years, this seems to suggest that most users did not use needle exchanges as soon as their injecting career began. The length of time the IDUs had

been using needle exchange services ranged from 6 months to 18 years, with the mean length of time being 5.6 years. The number of years the participants had been using the needle exchange where the survey was carried out ranged from one month to 6 years, with the mean length of time being 1.5 years.

The frequency of the participants' use of the needle exchange where the interviews were carried out varied and is detailed in Table 3.4. Most users reported using the needle exchange between 1 and 3 times a week. There is also evidence that as the IDUs' injecting frequency increases, their use of the needle exchanges increases too ($\chi^2 = 807.6$; $df = 16$; $p < 0.001$). IDUs who reported that they injected cocaine more than any other drug used the needle exchange significantly more often than other participants ($\chi^2 = 44.4$; $df = 8$; $p < 0.001$). This is undoubtedly because they also inject more frequently than other IDUs. Only three of the IDUs who injected cocaine reported using the needle exchange less than once a week. Similarly, the IDUs who injected into their groin also used the needle exchange services significantly more than other IDUs ($\chi^2 = 60.3$; $df = 4$; $p < 0.001$). Again, this is probably because these IDUs inject most frequently.

Table 3.4. Frequency of using current needle exchange

<i>Frequency of using current needle exchange*</i>	<i>N (%) Participants</i>
Less than once a week	93 (26)
Once a week	126 (35)
2-3 times a week	113 (31)
4-5 times a week	27 (8)
More often	1 (<1)

**In the previous three months*

The estimated number of needles acquired from the exchanges over the course of the previous three months also varied greatly. The mean estimated number of needles obtained from needle exchanges in the previous three months was 168, but the individual figures reported ranged from 15 to 600. There was a positive association between the number of needles obtained in the previous three months and the frequency of injecting. The IDUs who obtained the greatest number of needles and syringes were also the IDUs who injected most frequently ($F(4, 352) = 209.6$; $p < 0.001$). Cocaine injectors obtained significantly more needles (Mean = 261) than other IDUs (Mean = 161; $t^{354} = -3.8$; $p < 0.001$). Similarly, IDUs who injected into their groin obtained significantly more needles (Mean = 229) than other participants (Mean = 129; $t^{355} = 8.2$; $p < 0.001$). Unsurprisingly, there was also a relationship between the number of needles obtained and the frequency with which the IDUs used the needle exchanges. The IDUs who used the needle exchange most often also obtained the greatest number of needles ($F(4, 352) = 134.9$; $p < 0.001$).

Reasons for using a particular needle exchange varied less than the other responses given by the participants. By far the most common reason cited for using a particular exchange (99%) was that it was close to where the IDU lived. Twenty IDUs (6%) also said they used their particular needle exchange because of the availability of the single use citric acid sachets. Six participants (2%) cited friendly staff having an influence in their decision to use a particular needle exchange, while 5 (1%) reported that the opening hours made it convenient for them to use that exchange.

Table 3.5. Reasons for using current needle exchange

<i>Reason*</i>	<i>N (%) Participants</i>
Close to home	355 (99)
Availability of citric acid sachets	20 (6)
Friendly staff	6 (2)
Convenient opening hours	5 (1)
Other	3 (<1)

* *Participants could cite more than one reason*

Sixteen IDUs (4%) reported that they had used another needle exchange in addition to the one in which they were interviewed in the previous three months. Ten of these participants had used this other needle exchange less than once a week, with the main reason for using it being because their partner or friend lived nearby or used that exchange. Other reasons for using another needle exchange included convenient opening hours. In particular, one IDU had used another needle exchange as it had been open at night.

Use of Acidifiers

Three hundred and forty (94%) of the IDUs interviewed reported using an acidifier to dissolve their drug of choice before injection. All twenty of the IDUs who did not use an acidifier were cocaine injectors. Of the 340 IDUs who did use an acidifier, almost all (99%) reported that in the previous three months they had usually used the single use sachets of citric acid given out at the needle exchange. (Reasons for choosing to use the single use citric acid sachets will be discussed in the next section "Using the Single Use Citric Acid Sachets".) Three IDUs had usually used packets of citric acid available to buy, while one IDU had used ascorbic acid.

Thirty-eight participants had used another acidifier as an alternative to their usual acidifier within the previous three months. Most of these IDUs had used either a box or packet of citric acid bought from a shop or pharmacy (53%) or processed lemon juice (35%). Finally, the participants were asked to list all the acidifiers they had ever used in their injecting careers. All of the 340 participants who reported that they used an acidifier had used the single use citric acid sachets and the majority (87%) had also used a packet or box of citric acid. Two thirds of the IDUs had tried processed lemon juice and nearly half (44%) had used vinegar to dissolve their drugs at some point in their injecting career. Male IDUs were significantly more likely to have used both processed lemon juice and vinegar than female IDUs ($\chi^2 = 5.0$; $df = 1$; $p < 0.05$; $\chi^2 = 4.5$; $df = 1$; $p < 0.05$). IDUs who reported injecting more frequently were significantly more likely to have used vinegar as an acidifier than IDUs who injected less frequently ($\chi^2 = 35.0$; $df = 4$; $p < 0.001$). Fewer participants had tried fresh lemon juice (20%) and ascorbic acid (15%). Interestingly, significantly more IDUs from Lanarkshire than from Greater Glasgow had tried ascorbic acid as an acidifier ($\chi^2 = 9.6$; $df = 1$; $p < 0.005$). A number of participants had also tried using "other" products to dissolve their drugs such as fresh orange juice, diluting orange juice, Irn Bru and Coca-Cola. One IDU admitted to having tried "just about anything with citric on the label". IDUs who injected into their groin had usually tried almost every acidifier. Also, the longer the injecting career of the IDU, the more likely they were to

have tried each of the acidifiers listed. The different acidifiers used by the participants are shown in Table 3.6.

Table 3.6. Acidifiers used by participants

<i>Acidifier</i>	<i>N (%) Participants</i>		
	<i>Most used acidifier in the last three months (N= 340)</i>	<i>Other acidifier used in the last three months* (N= 38)</i>	<i>Acidifiers ever used* (N= 340)</i>
<i>Single Use Citric Acid Sachets</i>	336 (99)	4 (11)	340 (100)
<i>Citric Acid (packet, not from the needle exchange)</i>	3 (1)	20 (53)	295 (87)
<i>Ascorbic Acid (Vit C)</i>	1 (<1)	-	52 (15)
<i>Processed Lemon Juice</i>	-	13 (35)	227 (67)
<i>Fresh Lemon Juice</i>	-	1 (3)	73 (22)
<i>Vinegar</i>	-	2 (5)	150 (44)
<i>Sterilising Crystals</i>	-	-	4 (1)
<i>Kettle Descaler</i>	-	-	1 (<1)
<i>Other</i>	-	2 (5)	12 (4)

* Participants could cite more than one acidifier

One hundred and twenty-nine (38%) of the 340 IDUs who reported using an acidifier to dissolve their drugs prior to injecting had experienced some sort of eye problem as a result. The greater the frequency with which the IDUs injected, the more likely they were to have experienced eye problems of some kind ($\chi^2 = 20.9$; $df = 4$; $p < 0.001$). In accordance with this finding, IDUs who injected into their groin were significantly more likely to have experienced eye problems than other IDUs ($\chi^2 = 20.4$; $df = 1$; $p < 0.001$). Also, those IDUs who had suffered some sort of eye problem had been injecting for significantly longer (Mean = 9.7 years) than IDUs who had not suffered any eye problems (Mean = 6.7 years; $t^{337} = 4.6$; $p < 0.001$).

The most common eye problem experienced was blurred vision with 78 participants (22%) having suffered it. Of these IDUs, the majority (68%) reported that they had used processed lemon juice as an acidifier when they had experienced the blurred vision. Eleven IDUs had used vinegar, while only 4 had used the single use citric acid sachets. Ten participants were unable to recall what acidifier they had used when they had experienced blurred vision. As before, the frequency of injecting was related to experiencing eye problems, with those IDUs who injected more often more likely to have experienced blurred vision ($\chi^2 = 25.6$; $df = 4$; $p < 0.001$). Similarly, those IDUs who injected into their groin were more likely to have suffered from blurred vision than IDUs who did not use this part of their body for injecting ($\chi^2 = 15.7$; $df = 1$; $p < 0.001$). Once again, those IDUs who reported having suffered from blurred vision after injecting, had been injecting for significantly longer (Mean = 10.14 years) than IDUs who had not suffered from this eye problem (Mean = 7.2 years; $t^{337} = 3.9$; $p < 0.001$).

The next most common eye problem associated with injecting reported by the participants in this study was severe headaches, with 39 (11%) of the IDUs having suffered from them. Once again, processed lemon juice was most frequently reported to be the acidifier associated with this problem, cited by 24 of the 39 IDUs (62%). Vinegar was cited by 11 participants (33%). One IDU reported that fresh lemon juice had led to their having severe headaches, while one IDU could not remember what acidifier they had used when they had suffered a headache.

Eighteen participants (5%) reported experiencing sore eyes following injection. Again, the main cause seems to be processed lemon juice, with 12 participants (67%) citing it as the acidifier used on the occasions they had had sore eyes. Once more, the other acidifiers associated with this problem were fresh lemon juice and vinegar. A few other, more serious eye problems were reported by the participants. These included temporary blindness, cataracts, and a range of "other" problems such as the total loss of an eye, tunnel vision and seeing white spots. A full breakdown of the problems experienced and acidifiers used are shown in Table 3.7.

Table 3.7. Eye problems experienced by participants

<i>Acidifier used when experienced eye problem</i>	<i>N (%) Participants (N=340)</i>					
	<i>Eye problem*</i>					
	<i>Blurred vision</i>	<i>Severe headaches</i>	<i>Sore eyes</i>	<i>Blindness (temporary)</i>	<i>Cataracts</i>	<i>Other</i>
<i>Single Use Citric Acid Sachets</i>	4 (1)	-	-	-	-	1 (<1)
<i>Citric Acid (packet, not from the exchange)</i>	-	-	-	1 (<1)	-	-
<i>Ascorbic Acid</i>	-	-	-	-	-	-
<i>Processed Lemon Juice</i>	53 (15)	24 (7)	12 (3)	1 (<1)	2 (<1)	2 (<1)
<i>Fresh Lemon Juice</i>	-	1 (<1)	1 (<1)	-	-	-
<i>Vinegar</i>	11 (3)	13 (3)	1 (<1)	2 (<1)	1 (<1)	2 (<1)
<i>Unknown</i>	10 (3)	1 (<1)	4 (1)	1 (<1)	-	-
<i>Total</i>	78 (22)	39 (11)	18 (5)	4 (1)	3 (1)	5 (2)

*Participants could cite more than one eye problem.

None of the participants reported experiencing eye problems when using ascorbic acid. As this acidifier is less acidic than citric acid, it may be that it is associated with fewer eye problems. However, with only 52 of the IDUs in this study having ever used it, and only one having used it in the previous three months, it is impossible to conclude from this study if it is any safer to use than citric acid. It is clear though that using either ascorbic acid or citric acid to dissolve drugs prior to injection decreases the risk of subsequent eye problems.

Use of the Single Use Citric Acid Sachets

All of the 340 IDUs who used an acidifier to dissolve their drugs prior to injecting, were aware of the provision of the single use citric acid sachets and had tried them. Indeed, the

vast majority (99%) reported that they usually used the single use sachets instead of other acidifiers; that they used the sachets "every time" (299, 89%) or "most of the time" (30, 9%) they had injected in the previous three months. Two participants (<1%) reported using the sachets about half the time they injected, while 4 participants (1%) reported using them only occasionally.

The date when the IDUs had first used the single use sachets varied depending on whether they were resident in Greater Glasgow or Lanarkshire. One hundred and ninety-seven (90%) of the 220 IDUs interviewed in Greater Glasgow had started using the sachets when the provision began there in December 2001, while 119 (99%) of the 120 IDUs interviewed in Lanarkshire had first started using the sachets when the provision began there in March 2002. The remainder of the IDUs had started using them in the months following initial provision. Therefore, almost all of the IDUs (323, 96%) had been using the sachets for at least 6 months at the time of being interviewed.

The most common reason cited by the participants for choosing to use the single use citric acid sachets was that it dissolved the drugs easily (292, 86%). Nearly two thirds of the IDUs interviewed (214, 63%) also cited safety as a reason for using the single use citric acid sachets. IDUs who injected less frequently and IDUs who did not inject into their groin were more likely to cite safety as a reason for using the single use sachets than other participants ($\chi^2 = 15.4$; $df = 4$; $p < 0.01$; $\chi^2 = 18.1$; $df = 1$; $p < 0.001$). Also, those IDUs who did cite safety as a reason for using the single use citric acid sachets had been injecting for significantly less time (Mean = 7.3 years) than those IDUs who did not (Mean = 8.8 years; $t^{337} = -2.2$; $p < 0.05$).

Only a few participants reported using the single use citric acid sachets because they are readily available (48, 14%) or because they are easy to use (7, 2%), and only 1 participant reported using them because they are free (<1%). It seems that for most IDUs the single use citric acid sachets are an attractive option for injecting purposes because they are effective dissolvers and are known to be a safer option than most of the other acidifiers available. A few IDUs also chose to use the single use citric acid sachets because they do not have the drawbacks associated with using alternative acidifiers – such as the smell caused by using vinegar or lemon juice. Twelve participants (4%) also cited using the single use citric acid sachets because they were unsure of what other alternatives were available to them:

That's all I know to use. (20 year old male, Lanarkshire)

Only thing I know. (22 year old female, Lanarkshire)

Didn't know you could use anything else. (33yr old male, Greater Glasgow)

Don't know what else to use. (28 year old female, Greater Glasgow)

It's all I've ever known to use. (26 year old male, Lanarkshire)

All of these participants had been injecting drugs for 2 years or less. This is encouraging and suggests that by providing the citric acid sachets, new IDUs are not choosing to experiment with other, less safe acidifiers. Moreover, the message that citric is best seems to be being passed on from user to user. Seven participants (2%) reported that they had been using the citric acid sachets following the advice of a friend or partner:

Shown by my girlfriend to use it. (28 year old male, Lanarkshire)

Everyone else uses it. (39 year old female, Greater Glasgow)

Told by other people to use it. (28 year old female, Greater Glasgow)

Shown to use it by my mate. (18 year old male, Lanarkshire)

Because that's what you're told to use. (24 year old male, Greater Glasgow)

That's what I learnt from my mates. (35 year old male, Greater Glasgow)

Seen others using it. (24 year old male, Greater Glasgow)

Almost all the IDUs interviewed (335, 99%) reported that they usually used no more than 1 sachet per injecting episode. Two hundred and three participants (60%) used 1 sachet per injection, 55 (16%) used three-quarters of a sachet, 74 (22%) used half a sachet, and 3 (1%) used less than half a sachet per injection. Two participants (<1%) reported using approximately 1.5 sachets per injection and 3 (1%) reported using 2 sachets per injection. These findings are very encouraging and suggest that the current provision of 100mg in the citric acid sachets is sufficient for most users' needs. The more frequently the IDUs injected, the more citric they used per injection ($\chi^2 = 51.6$; $df = 20$; $p < 0.001$). Male IDUs reported using significantly greater amounts of the citric acid than female IDUs ($\chi^2 = 9.8$; $df = 1$; $p < 0.1$). IDUs who reported injecting into their groin used significantly more citric per injection than other IDUs ($\chi^2 = 36.3$; $df = 5$, $p < 0.001$).

Virtually all of the IDUs interviewed (323, 95%) reported that they usually injected £10 worth of heroin each time (100mg). Six IDUs (2%) reported that they injected £5 worth (50mg) of heroin each time and seven IDUs (2%) injected £20 worth (200mg) each time. One participant reported injecting a "quarter gram" of heroin and another reported injecting "a half gram" of heroin each time.

One hundred and thirteen participants (33%) reported getting at least 1 citric bum while using the single use citric acid sachets in the previous three months. The number of bums estimated to have been experienced by these users ranged from 1 to 100, with the mean number of burns being three. Fifteen IDUs (4%) were unable to estimate the number of bums they had experienced over the previous three months as they reported that they got them every time they injected. Three IDUs (1%) reported experiencing a burning sensation as they injected, but they did not get actual bums as a result of using the single use citric acid sachets. IDUs who reported injecting into their groin (notably, often in addition to other sites on their bodies) suffered from significantly fewer bums in the previous three months (Mean = 2) than IDUs who only used parts of the body other than the groin for injection (Mean = 4; $t^{322} = -2.0$; $p < 0.05$).

The majority of participants (275, 81%) felt that the number of bums they experienced when using the single use citric acid sachets did not differ from the number they had experienced using other acidifiers. Thirty-seven participants (11%) perceived they had experienced "slightly more" burns when using the single use citric acid sachets compared with using other acidifiers, while 15 participants (4%) perceived they had experienced "a lot more" burns when using the single use citric acid sachets compared with using other acidifiers. Thirteen participants (4%) perceived they had experienced "slightly less" bums when using the single use citric acid sachets compared with using other acidifiers. A few of those participants reported that they had experienced more bums when they had used vinegar to dissolve their drugs prior to injection.

It would appear that using the single use citric acid sachets does not cause IDUs to experience more citric bums than they would with other acidifiers. It is important, however, to continue to stress to all IDUs to use as little citric acid as possible to keep the risk of burns as low as possible.

Relatively few of the participants (48, 14%) reported that they had experienced abscesses when they had used the citric acid sachets in the previous three months. Of those participants who did experience abscesses, the number suffered ranged from 1 to 20 with the mean number being 3. The individual who had suffered 20 abscesses commented that they had always suffered from them and that, in their opinion, it was not related to their drug misuse. It seems that abscesses are less common among IDUs than citric bums and

their occurrence does not seem to be related to using the single use citric acid sachets. Indeed 96% of the IDUs reported that they perceived no difference in the number of abscesses which occurred when they used the citric acid sachets compared with using other acidifiers.

While these findings are generally positive and suggest that the single use citric acid sachets are a popular and relatively safe acidifier to use for the purposes of injecting drugs, a few IDUs indicated that they either did not like or understand the idea of the sachets being for single use only. In particular, a few of the IDUs who used less than the full sachet per injection, reported saving the remainder for later or sharing it with their partner. One participant remarked that when she got her ten sachets home she emptied them all into a container for her and her husband to share. By and large, however, the vast majority of the IDUs interviewed indicated that they liked using the single use sachets and understood their benefits.

Despite the majority of participants using and liking the single use citric acid sachets, 109 participants (32%) reported that they ran out of them prior to their next visit to the needle exchange. As the single use sachets are provided one per one needle, it would appear that many IDUs are continuing to reuse their needles or borrow from others rather than use a clean one each time. This hypothesis is reinforced by comments made by a number of participants who suggested that they would prefer it if they could obtain the sachets *without* having to take needles at the same time:

Would like to be able to get the citric without having to get needles all the time. (35 year old female, Greater Glasgow)

Give out the citric acid sachets on their own. (31year old male, Lanarkshire)

Sometimes I give back clean needles just to get more citric. (31 year old male, Greater Glasgow)

We just want the citric. I've got about 100 spare needles in the house. (39 year old female, Greater Glasgow)

Would be good if you could get them without always taking needles. (25 year old male, Lanarkshire)

That some IDUs continue to reuse needles is clearly concerning and the findings have already been reported to the manufacturers of the single use citric acid sachets. As a result, they have now agreed to incorporate the additional message of using a clean needle each time as well as a new sachet of citric on the leaflets, boxes and sachets supplied to IDUs.

When they did run out of the single use citric acid sachets, the IDUs concerned used a number of alternative acidifiers. Sixty-two IDUs (17%) reported that they used someone else's single use citric acid sachets, 59 IDUs (16%) reported using their own box or packet of citric acid, and 24 IDUs (7%) reported using someone else's box or packet of citric acid. Eleven participants (3%) reported using processed lemon juice when they ran out of the single use citric acid sachets, while 2 participants (<1%) reported using fresh lemon juice.

Unsurprisingly, the 109 participants (32%) who reported running out of single use citric acid sachets prior to their next visit to the needle exchange also reported that they felt the current provision of one sachet per one needle was inadequate for their injecting needs. Eighty-six participants (24%) felt that 2 sachets per needle would be better, 14 (4%) would prefer 3 sachets per needle, and 2 participants (1%) wanted 4 sachets per needle. Clearly, if needle exchanges were to give in to these IDUs' requests, they would be encouraging the reuse of needles. Instead, there is a need for persuading these IDUs to

simply return to the needle exchange as soon as they start running low on needles and citric acid sachets.

User Preferences & Recommendations

Most participants' reported that their preferred acidifier is the single use citric acid sachets. That is, if they had a free choice of all the possible acidifiers (regardless of whether they are currently available or not), 304 participants (90%) would use the single use citric acid sachets. The reasons for this choice were the same as before – because the single use citric acid sachets dissolve the drugs easily and because they are relatively safe to use.

Twenty-four participants (7%) reported that they would prefer to use ascorbic acid to any other acidifiers. In addition to finding this acidifier an efficient dissolver of drugs, and safe to use, all 24 participants reported that they found it caused less pain and fewer bums when they injected with it. Indeed, a number of participants (in addition to those who reported a preference for using ascorbic acid) commented that they would prefer it if they felt less burning when they injected with the single use citric acid sachets:

The citric feels really burny. (20 year old male, Greater Glasgow)

Prefer it if it burnt less. (32 year old male, Greater Glasgow)

Prefer it if it didn't burn so much. (30 year old female, Greater Glasgow)

Make them less burny. (33 year old male, Lanarkshire)

Make it weaker, then it would burn less. (25 year old male, Lanarkshire)

Would prefer it less burny. (29 year old male, Lanarkshire)

Seven of the IDUs who would prefer to use ascorbic acid also felt that it was a healthy option. Eleven participants (3%) reported that they would prefer to use the box or packet of citric acid. Most of these participants reported that they found the citric in the box easier to use than the single use sachets. One participant (<1%) reported that she would prefer to use fresh lemon juice but added that while she found it less painful to inject with, she did not use it as she was aware of the health risks associated with using it.

Finally, the participants were invited to make general comments or suggestions for improvements to the needle exchange service available to them. A few suggestions for improvements were made such as requests for the provision of more needles, more information about drug treatment and safer injecting techniques, greater privacy in the needle exchange and improved accessibility. Some of these suggestions are listed below:

More syringes when you don't return used ones. (22 year old male, Greater Glasgow)

Would be good if they could give out more citric and needles on weekends and holidays. (27 year old female, Greater Glasgow)

Would be better if they gave out more needles at the weekend. (28 year old female, Lanarkshire)

More needles every time. (30 year old female, Greater Glasgow)

Would be better if they gave out more stuff like tourniquets. (23 year old male, Lanarkshire)

More leaflets about safer injecting. (31 year old male, Greater Glasgow)

More information about injecting safely and HepB etc. (25 year old male, Greater Glasgow)

More help to get treatment. More information. More trained staff in drug abuse to help us get off it quicker. (24 year old male, Greater Glasgow)

Improve the privacy within the pharmacy. (38 year old male, Greater Glasgow)

Better privacy. (42 year old male, Greater Glasgow)

More private area – can be embarrassing – everyone can see you are an addict. (37 year old male, Greater Glasgow)

Open more days. (35 year old male, Lanarkshire)

Opening times – Sunday opening would be good. (36 year old male, Greater Glasgow)

For the most part, however, the comments were mostly very positive.

Everything is great. (38 year old male, Greater Glasgow)

Quite content. Good staff. (46 year old male, Greater Glasgow)

Happy with the way things are. (30 year old male, Greater Glasgow)

Everything is brand new. (31 year old male, Greater Glasgow)

It's great the way it is. (37 year old male, Greater Glasgow)

Everything is brilliant. (38 year old female, Greater Glasgow)

The staff are really friendly. Everything is brand new. (26 year old male, Greater Glasgow)

I think it is great here, brilliant. (19 year old female, Lanarkshire)

This is one of the best needle exchanges. Nice people. (52 year old male, Lanarkshire)

It's a great chemist. (23 year old male, Greater Glasgow)

It's really good here. (22 year old female, Greater Glasgow)

Everyone here [in the needle exchange] is great. It's really good what they do – giving out all this stuff for free. (21 year old male, Lanarkshire)

I think it's great what they're doing – great that they're helping us. (26 year old male, Lanarkshire)

It certainly seems that most IDUs fully appreciate the provisions and service available to them at the needle exchange. More importantly, however, has the provision of the single use citric acid sachets actually led to an increase in the number of visits IDUs are making to the needle exchange? As the sachets have only been provided since December 2001 in Greater Glasgow and March 2002 in Lanarkshire, it is difficult to yet gauge the full extent of any impact on the number of visits being made to needle exchanges. The data available shows that while the number of client visits vary from month to month, there has been a general increase in the number of visits being made to needle exchanges in Greater Glasgow and Lanarkshire since the single use citric acid sachets were introduced. At one Lanarkshire exchange, the number of visits being made by IDUs, and in particular male IDUs, to the needle exchange has increased from 100 during the period of January to March 2002, to 132 during April to June 2002, and most recently 158 during July to September 2002. Similarly, there have been small but noticeable increases in the number of visits being made by IDUs to an exchange in Motherwell and almost all the other pharmacy exchanges in Lanarkshire and Greater Glasgow over the months following the introduction of the single use citric acid sachets. Anecdotally, it appears that the provision of the sachets has had a positive effect on the frequency with which IDUs have been using the needle exchange services. Though, of course, it is impossible to know for sure if this

rise in the number of visits is solely related to the introduction of the single use citric acid sachets or if other factors have been involved.

CHAPTER 4 CONCLUSION & RECOMMENDATIONS

The main aim of this study was to assess the acceptance, effectiveness and efficiency of the provision of single use citric acid sachets to IDUs in Greater Glasgow and Lanarkshire and overall, the findings have been extremely positive.

Firstly, the vast majority of participants in this study reported not only using the single use citric acid sachets, but also preferring them to all other available acidifiers. Moreover, a number of newer IDUs were not even aware that less safe alternative acidifiers exist, suggesting that the provision of the single use sachets is discouraging IDUs from experimenting with other acidifiers. Furthermore, as well as recognising the single use citric sachets to be an effective acidifier, most of the IDUs interviewed recognised the relative safety of using them compared with using other acidifiers and indeed reported that they had chosen to use them because of this.

Secondly, the current provision of 100mg of citric in each sachet seems to be adequate for most users' needs. Almost all participants found that one sachet or less was sufficient to dissolve the amount of heroin they usually injected. However, the reasoning behind the sachets being single use is not understood by all IDUs, with some saving the remainder of their sachet for their next injecting episode or sharing their sachets with their friends or partner. Clearly, there is still some work needed to stress the importance of users not sharing any of their injecting equipment and paraphernalia.

There is also a need to further educate IDUs about the importance of using a clean needle and syringe every time they inject. As a significant number of the participants in this study expressed a preference for the needle exchanges to provide more than one sachet of citric per needle, it is evident that many continue to reuse their needles. Furthermore, some IDUs continue to use less safe acidifiers when they run out of the single use citric acid sachets. It is vital that these IDUs are encouraged to return to the needle exchange as soon as they start to run out of clean needles and sachets. Part of this process should include continuing to educate users about the risks associated with using acidifiers such as processed lemon juice and vinegar.

Indeed, this study has confirmed that processed lemon juice and vinegar are the acidifiers most commonly associated with side effects such as blurred vision, severe headaches and sore eyes. Using the single use citric acid sachets, on the other hand, does not seem to lead to IDUs suffering from such afflictions. However, use of the sachets *can* still lead to citric burns, and although their use does not increase the number of burns in comparison to other acidifiers, it is important to stress that as little as possible is used to minimise any risk.

In addition to offering IDUs a safe method of dissolving their drugs, the provision of single use citric acid sachets seems to have increased the frequency of use of the needle exchanges. This increase in visits not only means IDUs are more likely to be using clean needles but also that they are returning used ones, increasing the public's safety as well as their own.

Given these findings, the following recommendations are made:

- All fixed site needle exchanges and pharmacy exchanges in Greater Glasgow and Lanarkshire to continue providing the 100mg single use citric acid sachets.
- Extend this provision across the UK.
- Repeal or change in the current law (Section 9A, Misuse of Drugs Act 1971) which forbids the supply of drug injecting paraphernalia (other than needles and syringes) to drug users. Since this research was carried out the Government has

proposed to amend the misuse of drugs legislation (Section 9A, Misuse of Drugs Act 1971) so that certain articles of drug paraphernalia (including single use citric acid sachets) can be provided to IDUs for the purposes of harm minimisation. This report supports these moves.

- Further educate IDUs on the importance of using a clean needle and syringe each and every time they inject and on the importance of not sharing any of their injecting equipment and paraphernalia.

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APPENDIX A: Information Sheet



Evaluation of the Provision of Single Use Sachets of Citric Acid to Injecting Drug Users Information Sheet

Background

Street heroin in the UK tends to be brown and is sold in poorly soluble base form. In order to make the heroin soluble, an acid must be added to convert the base into a salt. Acids that can be used to facilitate solubility include citric, ascorbic, acetic and lactic acids. Injecting drug users have tended to use readily available forms of these acids such as processed lemon juice, fresh lemon juice, vinegar and other household products. Although these products are used to promote solubility, they are in fact often a source of harm themselves, and can lead to eye and heart infections.

Due to the known risks associated with using more dangerous acidifiers, 100mg single use sachets of citric acid are now being offered at pharmacy exchanges in Greater Glasgow and Lanarkshire. Citric acid is believed to be the safest acidifier to use for the preparation of brown heroin for injection. It is hoped that providing citric acid sachets in this way will increase both the number of people attending and the number of visits to pharmacy exchanges.

The Effective Interventions Unit (Scottish Executive), Greater Glasgow NHS Board and Lanarkshire NHS Board have provided funding to:

- To assess if the amount of citric acid is sufficient to dissolve the amount of heroin used per injection.
- To assess if the provision of one sachet per one needle/syringe is adequate for the needs of injectors.
- To assess the number of citric burns experienced using the sachets.
- To assess if the uptake of needles/syringes from pharmacies has increased since the introduction of the sachets.

Methodology

Three hundred and sixty injecting drug users who attend pharmacy exchanges will be recruited to the study (120 from Lanarkshire NHS Board and 240 from Greater Glasgow NHS Board) over a three month period. Injectors will be interviewed by a trained researcher using a structured questionnaire. The schedule contains questions on respondents' demographic characteristics, drug injecting habits and use of the citric acid sachets. All interviews will be confidential and anonymous and should last no more than ten minutes. Respondents will be offered a chocolate bar and a can of juice for taking the time to complete the interview.

APPENDIX B: Structured Questionnaire

Needle Exchange:
Date of Interview:
Time of Interview:



Scottish Centre for Infection
and Environmental Health



CITRIC ACID SACHET SURVEY

ABOUT YOU

1. Are you male or female ?
2. What are your initials?
3. What is your date of birth? day month year
4. In the last 3 months, where have you lived most of the time?
Your own/partner's home Someone else's home (e.g. parents/relatives/friends)
No fixed abode Hostel/room rented on a daily basis
Other (Please specify) _____
5. What area of Glasgow/Lanarkshire do you live in? _____
6. What is the first part of your postcode?
7. What age were you when you first started using drugs? years
8. What age were you when you first started injecting drugs? years
9. In the last 3 months, what drug you have injected most often? (Do not read out the list of options. Tick one box only.)
Heroin Cocaine Heroin & Cocaine together Crack
Temgesic Temazepam Temgesic & Temazepam together Methadone
Diconal Palfium DFs Up-Johns
Valium Ketamine Ecstasy MST
LSD Sulphate Other (Please specify) _____
10. Please tell me all the drugs that you have injected at least once in the last 3 months. (Do not read out the list of options. Tick all that apply. Prompt with "anything else?")
Heroin Cocaine Heroin & Cocaine together Crack
Temgesic Temazepam Temgesic & Temazepam together Methadone
Diconal Palfium DFs Up-Johns
Valium Ketamine Ecstasy MST
LSD Sulphate Other (Please specify) _____

11. In the last 3 months, on which part(s) of the body have you usually injected? (Tick all that apply.)

Arm Leg Other (Please specify) _____

12. In the last 3 months, how often on average have you injected?

Less than once a day Once a day 2-3 times/day
4-5 times/day More often (Please specify) _____

I would now like to ask you some questions about your use of needle exchanges.

13. When was the first time you came to a needle exchange? year month

14. When was the first time you came to this needle exchange? year month

15. When you first started using this needle exchange, how often did you come for needles and syringes?

Less than once a week Once a week 2-3 times/week
4-5 times/week More often (Please specify) _____

16. In the last 3 months, how often have you come to this needle exchange for needles and syringes?

Less than once a week Once a week 2-3 times/week
4-5 times/week More often (Please specify) _____

If you now come more often, why is this?

17. Why do you come to this needle exchange for needles and syringes? (Do not read out the list of options. Tick all that apply. Prompt with "any other reason?")

Close to home Convenient opening hours
Friendly staff Anonymity
Availability of citric acid Other (Please specify) _____

18. In the last 3 months, have you gone to any other needle exchange for needles and syringes?

Yes No *If No, go to Question 21. If Yes, which one?* _____

19. In the last 3 months, how often have you gone to this other needle exchange for needles and syringes?

Less than once a week Once a week 2-3 times/week
4-5 times/week More often (Please specify) _____

20. Why do you go to this other needle exchange for needles and syringes? (Do not read out the list of options. Tick all that apply. Prompt with "any other reason?")

Close to home Convenient opening hours
Friendly staff Anonymity
Availability of citric acid Other (Please specify) _____

21. In the last 3 months, approximately how many needles/syringes have you obtained?

from this needle exchange

from another needle exchange

USING THE CITRIC ACID SACHETS

22. Do you add anything to your drugs to help them dissolve before you inject?

Yes No *If No, please go to Question 44.*

23. In the last 3 months, what dissolver have you used most often to help your drugs dissolve? (Do not read out the list of options. Tick one box only.)

Processed lemon juice	Fresh lemon juice
Sterilising crystals	Vinegar
Ascorbic acid	Kettle-descaler
Citric acid – from the exchange	Citric acid – <u>not</u> from the exchange
Other (Please specify) _____	

24. Why do you use this particular product to dissolve your drugs? (Do not read out the list of options. Tick all that apply. Prompt with "any other reason?")

Dissolves drug easily	Free/Low cost	Readily available
Easy to use	Safe to use	Other (Please specify) _____

25. In the last 3 months, have you used any other products to dissolve your drugs?

Yes No

If Yes, what dissolver(s) have you used? (Do not read out the list of options. Tick all that apply. Prompt with "anything else?")

Processed lemon juice	Fresh lemon juice
Sterilising crystals	Vinegar
Ascorbic acid	Kettle-descaler
Citric acid – from the exchange	Citric acid – <u>not</u> from the exchange
Other (Please specify) _____	

26. Have you ever used any of the following products to dissolve your drugs? (Tick all that apply.)

Processed lemon juice	Fresh lemon juice
Sterilising crystals	Vinegar
Ascorbic acid	Kettle-descaler
Citric acid – from the exchange	Citric acid – <u>not</u> from the exchange
Other (Please specify) _____	

27. Have you ever experienced any of the following problems with your eyes after injecting? If you have, what dissolver(s) were you using at the time? (Tick all that apply.)

	Yes	No	Dissolver used	
Conjunctivitis	1	2	3 4 5 6 7 8 9	Don't know
Sore eyes	1	2	3 4 5 6 7 8 9	Don't know
Blindness	1	2	3 4 5 6 7 8 9	Don't know
Blurred vision	1	2	3 4 5 6 7 8 9	Don't know
Severe headaches	1	2	3 4 5 6 7 8 9	Don't know
Cataracts	1	2	3 4 5 6 7 8 9	Don't know
Other	1	2	3 4 5 6 7 8 9	Don't know
(Please specify) _____				

If the participant has already reported that they use or have used the citric acid sachets from the needle exchange, go to Question 30.

28. Do you know that you can get citric acid sachets from the needle exchange?

Yes No *If No, please go to Question 42.*

29. Have you ever used the citric acid sachets provided at the needle exchange?

Yes No

If No, can you tell me why you haven't used them?

Please go to Question 42.

I would now like to ask you some questions about the citric acid sachets you have used.

30. When did you first use the citric acid sachets provided by the needle exchange?

year month

31. In the last 3 months, how often have you used the citric acid provided by the needle exchange when injecting?

Every time Most of the time About half the time
Occasionally Once or twice

32. Why have you used the citric acid sachets? *(Do not read out the list of options. Tick all that apply. Prompt with "any other reason?")*

Dissolves drug easily Free Readily available
Easy to use Safe to use Other (Please specify) _____

33. In the last 3 months, on average how many sachets of citric acid have you used per injection?

< 1/2 1/2 1 1 1/2 2 2+

34. In the last 3 months, on average how much (insert name of drug most frequently used) have you used per injection?

25mg 50mg (£5 bag heroin) 75mg 100mg (£10 bag heroin)
150mg 200mg (£20 bag heroin) 1/4 g 1/2 g 1g

35. In the last 3 months, approximately how many citric burns have you had when using the citric acid sachets from the needle exchange?

36. Compared with using other dissolvers, do you feel that you have had more or less burns since using the citric acid sachets from the needle exchange?

A lot less Slightly less No difference Slightly more A lot more

37. In the last 3 months, approximately, how many abscesses have you had when using the citric acid sachets from the needle exchange?

38. Compared with using other dissolvers, do you feel that you have had more or less abscesses since using the citric acid sachets from the needle exchange?

A lot less Slightly less No difference Slightly more A lot more

39. Does the number of sachets given to you at the exchange last you until your next visit?

Yes No

If No, what dissolver(s) do you use in the meantime? (Do not read out the list of options. Tick all that apply. Prompt with "anything else?")

Processed lemon juice	Fresh lemon juice
Sterilising crystals	Vinegar
Ascorbic acid	Kettle-descaler
Citric acid – <u>not</u> from the exchange	Someone else's citric- from the exchange
Someone else's citric- <u>not</u> from the exchange	Other (Please specify) _____

40. Do you think that being given one citric acid sachet per needle is enough?

Yes Unsure No

If No, how many citric acid sachets do you think should be given out per needle?

41. Is there anything you would change or improve about the citric acid sachets provided at the needle exchange? _____

42. If you had a free choice, which dissolver would you prefer to use? (Do not read out the list of options. Tick one box only.)

Processed lemon juice	Fresh lemon juice
Sterilising crystals	Vinegar
Ascorbic acid	Kettle-descaler
Citric acid – from the exchange	Citric acid – <u>not</u> from the exchange
Other (Please specify) _____	

43. Why would you prefer to use this dissolver? (Do not read out the list of options. Tick all that apply. Prompt with "any other reason?")

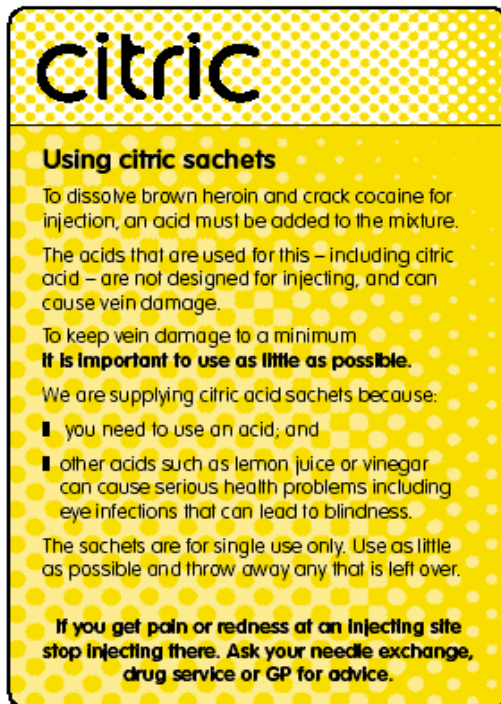
Dissolves drug easily	Free/Low cost	Readily available
Easy to use	Safe to use	Other (Please specify) _____

44. Is there anything (else) that would encourage you to come to the needle exchange more often? _____

Thank you for taking the time to complete this questionnaire.

Are there any other comments (good or bad) that you wish to add about any aspect of the service?

APPENDIX C: Citric Acid Leaflet



citric

Using citric sachets

To dissolve brown heroin and crack cocaine for injection, an acid must be added to the mixture. The acids that are used for this – including citric acid – are not designed for injecting, and can cause vein damage.

To keep vein damage to a minimum **it is important to use as little as possible.**

We are supplying citric acid sachets because:

- you need to use an acid; and
- other acids such as lemon juice or vinegar can cause serious health problems including eye infections that can lead to blindness.

The sachets are for single use only. Use as little as possible and throw away any that is left over.

If you get pain or redness at an injecting site stop injecting there. Ask your needle exchange, drug service or GP for advice.

Source: [Http://www.saferinjecting.org](http://www.saferinjecting.org)



citric

Safer injecting

Injecting is the most dangerous way to take drugs, the risks include:

- getting hepatitis or HIV from shared equipment;
- overdose; and
- damage to skin and veins.

Please think seriously about switching to a less risky way of taking drugs such as smoking.

If you are going to inject:

- use new sterile injecting equipment every time;
- don't share **anything** used to prepare drugs; and
- use different injecting sites – to help veins recover

Ask your needle exchange or drug service for further advice and information.

APPENDIX D: Citric Acid Sachet

Source: [Http://www.saferinjecting.org](http://www.saferinjecting.org)

