

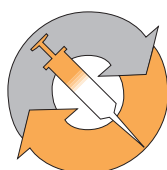
hepatitis C and needle exchange

Six case studies show how the complex balance of needle exchange services can be disrupted, leaving hepatitis C and HIV spreading rapidly. Common themes are resource starvation, local hostility, counterproductive restrictions and a non-interventionist ethos.

by **Mike Ashton**

editor of *Drug and Alcohol Findings*,
phone/fax 020 8888 6277,
e-mail da.findings@blueyonder.co.uk.

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In the last issue of **FINDINGS** we established that hepatitis C is still spreading rapidly due to continued sharing of injecting equipment and that needle exchange is the key to curbing the epidemic. This issue investigates what it will take for exchanges to match up to the challenge. The focus is on *case studies of failures: case studies* because these best portray the interacting variables which combine to affect infection control; *failures* because these throw into relief the conditions for success. That there can be success even against hepatitis C is shown by the Tacoma case study.

Though we hope you will, there is no need to read all the studies – each is a self-contained story. Use the clipboarded ‘case notes’ to pick and choose, but, we suggest, don’t miss out on Vancouver.

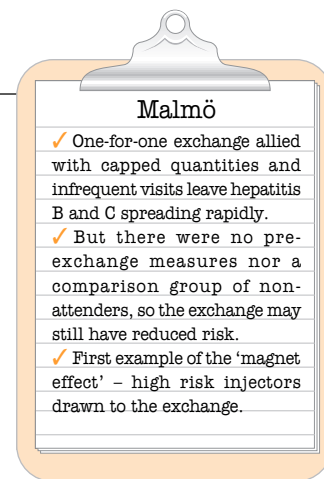
In later issues we’ll draw together the themes from these and other studies and from UK work, but one theme should be mentioned up front – the ‘magnet effect’ ▶ p. 28. Perversely, needle exchanges which attract high-risk injectors risk being seen as actually having *caused* them to be at greater risk. Exchanges in the case studies often suffered from this illusion, but rarely was it the whole story. The deeper cause of poor results is that exchanges often operate under crippling “restrictions that condemn the programmes to fall far short of the needs of the persons for whom they were designed”.¹²⁹ By under-resourcing and under-valuing this work, sceptical authorities create the conditions which seem to justify their misgivings.

Trickle-feed exchange no match for hepatitis

Our Swedish case study directly confirmed fears that syringe exchanges may not adequately prevent hepatitis C infection.⁶¹ For two years the Malmö exchange tracked new HIV and hepatitis infections among 515 callers who initially tested negative for one or more of the viruses and were re-tested at least six months later. Over a typical follow-up period of 31 months, there were no new cases of HIV but a quarter previously free of hepatitis B became infected (about 1 in 8 per year) and over half with hepatitis C (about 1 in 4 per year).

Whether these rates were less than they would have been without needle exchange is impossible to say, but they are worryingly high. Since the exchange virtually eliminated the local illicit market in injecting equipment, sharing injecting paraphernalia and/or sharing the exchange’s own needles and syringes must have caused hepatitis to spread. The same high-risk practices might also have spread HIV were it not that the few infected injectors in the city were known to other users.

Constricted equipment supply seems the most likely explanation. Shortfalls should have been eased by the fact that the great majority of attenders were amphetamine rather than heroin users. Still, the deficit must have been substantial. Typically attenders visited about once every six weeks but could collect at most three syringes and six needles, all to be returned next time. Shortfalls could not be made up from elsewhere since the exchange was




the sole legitimate source of injecting equipment.

Other features of the exchange may have contributed to sporadic attendance and disease spread. It was open only during working hours and sought a potentially off-putting amount of information from callers at their first visit. Strict one-for-one exchange meant that in order to be re-supplied, injectors had to hang on to used equipment until their next visit. Yet they may also have been deterred from making frequent visits because carrying syringes in the street risks detection. The net result could have been to extend the interval used equipment was kept in circulation, just what the exchange should have been avoiding.

Malmö is also our first example of the magnet effect. Counter-intuitively, relatively frequent



exchange attenders were slightly but significantly *more* likely to become infected with hepatitis B or C. Rather than regular attendance increasing risk, this was almost certainly because those at higher risk in the first place

tried to mitigate this by attending regularly. They tended more often to be primary heroin users for whom even twice the typical attendance rate would not come close to satisfying their needs. 

First hard evidence that needle exchange can work against hepatitis C

From Malmö we know that (highly re-stricted) needle exchange can leave hepatitis spreading rapidly, but not whether the spread was *less* rapid than it would otherwise have been. US teams led by the same researcher directly addressed this issue with conflicting results: at best zero impact in Seattle, but a large positive impact in Tacoma.

Tacoma’s exchange was the first in the USA to gain public funding. From a shoe-string operation it grew into a well-resourced HIV prevention centre offering a comprehensive service.¹²⁰ Activist leadership and the fact that it started with a ‘clean slate’ and local support meant that ‘Point Defiance’ was free to offer a user-centred service untrammelled by the concerns and restrictions which tied the hands of other schemes.¹⁹⁴ At the time of the study little else was available to help the city’s injectors avoid infection, so if the exchange worked, there should have been clear benefits from attending. For both HIV and hepatitis C, exactly what was found.

Point Defiance operated from three fixed sites and also ran a mobile exchange available by phoning to arrange a time and place to meet. Apart from the pharmacy site, which accounted for relatively little business, there was no limit on supplies at any one time and exchange on behalf of others was encouraged. There was, however, a strict one-for-one policy. Staff spent considerable time educating and counselling callers and delivering on-site health and welfare services. Callers were turned into long-term clients via the case management service which organised housing and health care. The exchange also became the largest local recruiting agent for methadone treatment.

Studies strongly suggest that opening the exchange reversed an epidemic of hepatitis B among injectors, and helped hold HIV down by roughly halving risky sharing among attenders compared both to non-attenders and to their own pre-exchange behaviour. However, risk remained high. Before attending, customers had averaged 56 injections a month with a syringe used by someone else, after attending this dropped to 30; from 58%, the proportion injecting in ways which could spread disease fell to a third.

Benefits extend to hepatitis C

The chance to test whether these behaviour changes also curbed hepatitis C arose because the surrounding county was one of four designated nationally to monitor new infections. The system depended on patients

showing symptoms and only a minority do, but there was no reason to believe that this fraction would differ between exchange attenders and non-attenders.

If the exchange had reduced the spread of hepatitis C, then newly infected injectors should include relatively few exchange attenders. To assess this, researchers compared them with injectors who had *not* become infected.¹⁴¹ After adjusting for other influences, an injector was seven times more likely to become infected with hepatitis C if they had not used the exchange, for hepatitis B, nearly six times.

The study was far from ideal. It relied on data collected for other purposes, did not establish new infections by re-testing injectors, and used a comparison group unrepresentative of the local injecting population.

Pharmacy sales dilute impact


Just north of Tacoma on the USA’s north west coast lies Seattle, where the fixed-site exchange was located near the city’s main drug market. If current provision is a guide, it operated on a strict one-for-one basis¹⁴² and was open for just a few hours daily and not every day.¹⁴³ It seems to have done little to stem the spread of hepatitis B or C.

Researchers tracked what happened to injectors seen at local treatment and other agencies in 1994–1996 who at first tested negative for the viruses.⁶³ Thousands were tested, but the sample was small because 86% were already infected with hepatitis C. Continuing injectors were re-tested a year later when 39 out of 187 had become infected with hepatitis C, 19 of whom had sourced at least half their new needles/syringes from the exchange. After accounting for some prior risk factors, these regular customers were no more protected from the virus than people who had never used the exchange or had used it only as a minor source of equipment. Though not statistically significant, all the differences (with respect to hepatitis B as well as C) were in the wrong direction, linking *increased* risk with exchange use.

Again the magnet effect was implicated. Unmeasured risk variables found in greater abundance among regular attenders might account for the findings. Higher risk injectors certainly tended to be the ones who both started to use Seattle’s exchange and who continued to attend.¹⁴⁴ Unlike Tacoma,

Tacoma


- ✓ Convincing demonstration that needle exchange can curb the spread of hepatitis C.
- ✓ Important factors probably include local support enabling comprehensive services, and the lack of ‘competing’ outlets.
- ✓ Shows that one-for-one exchange need not be counter-productive if quantities are uncapped and supplies taken to the customers.
- ✓ Still high level of sharing.

However, the benefits of exchange attendance were so clear cut that only unrealistic assumptions would have rendered them insignificant. For experts convened by the US National Academy of Sciences, it constituted evidence of a “powerful retardant effect of needle exchange program attendance on infection with [hepatitis B and C]”.¹²⁰ 

Seattle

- ✓ No evidence that a limited service with one-for-one exchange did anything to stem the spread of hepatitis B or C.
- ✓ Half the attenders were still sharing needles and syringes and most were sharing other equipment.
- ✓ Key difference from Tacoma may be that there were alternative sources of sterile equipment in the city, diluting the impact of the exchange.

alternative sources of sterile equipment such as pharmacies also meant that risky sharing could be avoided without attending the exchange, diluting its impact.¹⁴⁵

Such considerations probably mean that the impression of increased risk is unreliable. But equally there is no evidence that attending the exchange *decreased* risk, and regular attenders exhibited high levels of risk behaviour. Over the follow-up year, nearly half had shared syringes and half of these had done so with two or more people. Some sharing of other equipment was the norm as was measuring out drugs by backloading. Attending the exchange may (we don’t know – there were no pre-exchange measures) have reduced these risk behaviours, but in the context of a heavily infected local injector population, any continued sharing was likely to transmit hepatitis C – and did. 

Cocaine and housing crisis overwhelm North America's largest exchange

Gravitation of high-risk injectors to exchanges also partly accounted for negative findings in two Canadian cities – but only partly. Studies of exchanges in Vancouver and Montreal also revealed a disturbing inability to counter the spread of HIV and hepatitis C as an upsurge in cocaine injecting overwhelmed constricted services.⁶³

Only in Vancouver was hepatitis C recorded,⁶⁵ an offshoot of a series of studies prompted by an outbreak of HIV. This work provides the most graphic account yet of how good intentions can be derailed by a restricted service and a bleak, risk-generating environment. Because these are the findings which did most to undermine confidence in needle exchange, we examine them in depth.

HIV rings the alarm

Alarms had rung when Vancouver's low HIV rate among injectors more than tripled over 18 months to reach 7% in 1995. The outbreak was a shock because the city hosted the largest-volume needle exchange on the North American continent. In 1997, it exchanged over 2.5 million needles.¹⁴⁶

Vancouver's main needle exchange operated from a fixed site in Downtown Eastside, the city's drug injecting centre and the poorest district in Canada.¹¹³ Though the office closed at 8pm, vans operated from one in the morning until after it re-opened at 8 am.^{146 147} Exchange was strictly one-for-one and the number of syringes handed at any one time was at times tightly capped.¹⁴⁸ Locally, cocaine was the main injected drug.¹¹³

Working in the same district, in May 1996 the Vancouver Injection Drug User Study started to investigate the HIV outbreak. Their earliest finding (of which more below) was that attending the exchange was associated with a much *higher* risk of HIV infection. Later the project set out to discover if this applied also to hepatitis C.

Hepatitis C also alarming

The study recruited injectors who were interviewed and tested for HIV and hepatitis C and then re-contacted every six months to undergo the same investigations.¹⁴⁸ By late 1999, 1345 had been interviewed of whom initially over 8 in 10 were infected with hepatitis C and a fifth with HIV.

Of the 155 injectors who were negative for hepatitis C and returned to be re-tested, 62 – exactly 4 in 10 – had become infected over on average 16 months; 93 had so far avoided it.⁶⁵ Over the previous six months, activities significantly related to infection included prostitution, having multiple sexual partners, needle sharing, daily injecting, injecting cocaine or cocaine/heroin 'speed-balls', and addiction treatment other than in a methadone programme. Disturbingly, infection was also more common in injectors

who had attended an exchange at least weekly: over half had become newly infected but only a quarter of less frequent attenders.

Some of these behaviours may have been linked to infection simply because they were associated with other behaviours. For example, non-methadone treatment was unlikely to have *caused* infection. Probably it was just that frequent cocaine injectors were more likely to enter this treatment *and* more likely to become infected. The same might be true of weekly needle exchange attendance. But even after taking other factors into account, frequent attenders remained two to three times more likely to become infected.

Was it the magnet effect?

Still the researchers cautioned against concluding that frequent attendance *caused* more infections. The same kind of result had previously been found for HIV and on closer inspection had proved a red herring.¹⁴⁸ However, HIV had been different: once other risk factors had been taken into account, there was no case left for needle exchange to answer; for hepatitis C, excess risk remained substantial.

Still there remained the possibility that a basket of *unmeasured* or imperfectly measured risk factors were more common in frequent attenders, making it look as if attendance itself was a risk – the magnet effect.

Unmeasured behaviours such as sharing equipment other than needles and syringes might have greatly increased the risk of hepatitis C infection but not HIV, helping to explain the disparity. Others behaviours were represented only by broad yes/no categories. For example, injection frequency was divided into either at least once a day or not, yet *very* frequent injectors were far more likely to regularly attend exchanges, and probably also to become infected.¹⁴⁸ Especially for women, markers of a highly risky and unstable life-style (frequent injecting, crime, prostitution, resort to shooting galleries) were more common in weekly attenders,¹⁴⁹ an array not fully captured by the hepatitis C analysis.

The likelihood was that, rather than

Vancouver

- ✓ Findings from this city did most to undermine confidence in needle exchange provision.
- ✓ Local hostility led the service to adopt a defensive posture.
- ✓ Strict one-for-one exchange and capped quantities were adhered to in the face of a cocaine injecting epidemic.
- ✓ Net result – despite handing out millions of syringes, major HIV and hepatitis C epidemics.
- ✓ Lack of decent affordable housing was a key factor.

needle exchange, it was this inadequately measured risk which caused the infections. One report directly confirmed that injectors who primarily sourced equipment from the exchange engaged more often in more risky behaviours than pharmacy users.¹⁵⁰

Exchange did not cause HIV outbreak

Vancouver's hepatitis C study was a continuation of the study which documented a similar picture with respect to HIV. Despite the seemingly damning findings of the first HIV report,¹¹³ a later study¹⁴⁸ confirmed what had been hinted at earlier: that needle exchange looked like a risk factor because the most infection-prone injectors regularly sourced their equipment from the exchange. New infections were linked to unstable housing, occupying hotel rooms in the deprived Downtown Eastside neighbourhood, injecting cocaine four or more times a day, and needing help from others to inject. Once these factors had been taken into account, infections were no more likely to occur in frequent than infrequent attenders. Years earlier a different kind of study had reached a similar conclusion.¹⁵¹

Among these ifs and buts, there was one unpalatable certainty. Even if attending the exchange at least weekly did not heighten viral risk, neither did it do anything noticeable to prevent risk continuing and culminating in infection. Each year probably about 40% of frequent visitors became infected with hepatitis C⁶⁵ and nearly 12% with HIV.

Preview of conclusions

In later articles studies *from Britain* will be examined and found to provide limited evidence for the effectiveness of exchanges in reducing risk behaviour or curbing infection. The early pilot studies were flawed and since then there has been no comparable investigation. Rather than casting doubt on needle exchange, the overriding *conclusion* will be that we need far *more* – more exchanges, more syringes, better resourced services. More resources could also pave the way for a proactive working style which maximises opportunities for intervention. Attention could then be turned to extensions which harness drug user networks and take exchanges closer to the model of a one-stop, comprehensive harm reduction service.

▮ ▮ ▮ *Downtown Eastside was a sink into which the city's poor single population descended*

Four in 10 had recently injected in shooting galleries and probably a similar proportion had re-used someone else's needle.^{113 148} Over the course of attending, risk profiles changed little and not in ways which could be attributed to the influence of the exchange.¹⁴⁸

Why so little impact?

Why Vancouver's exchanges failed to prevent the epidemics is one of the most contested topics in the addictions field.¹⁵² One possible explanation¹⁴⁹ can be discounted. Local sharing networks were fluid and new sharing partners were commonly acquired – but not by meeting at the exchange.¹⁴⁸

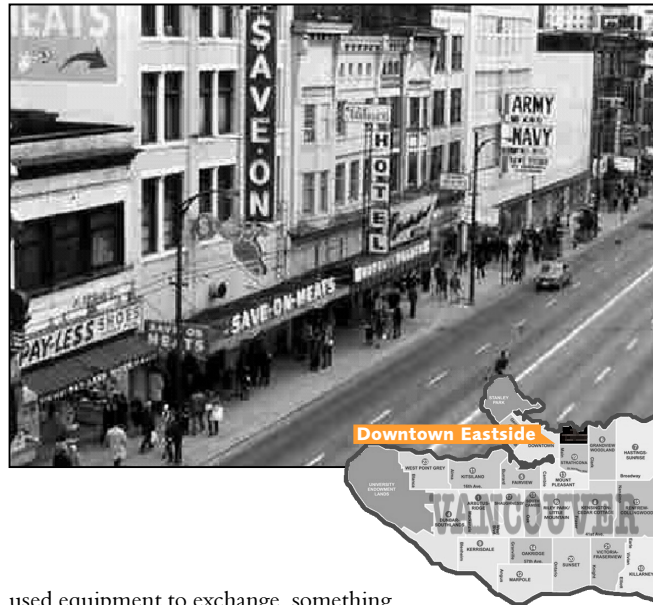
Another possible explanation lies in the methodology of the studies. Essentially they rested on comparisons between frequent and less frequent attenders. These differed by definition in how often they used the exchange, but not necessarily in how adequately it met their needs for injecting equipment, perhaps the more important variable.⁷⁶ Infrequent attenders probably collected fewer syringes per week but also needed fewer because they injected far less often and topped up from pharmacies.¹⁴⁸ If anything, weekly attenders were more likely to experience difficulty in obtaining sterile syringes.^{149 153} Equality of ease in obtaining equipment translated into equality of risk.

Inadequate distribution

Despite having North America's most prolific exchange on their doorsteps, for both frequent and infrequent attenders, infection risk remained extraordinarily high. The exchange, it seems, was not prolific enough. It handed out two million needle/syringe sets a year, but up to ten million were needed to give each injector a fresh set each time.¹¹³

Frequent (especially cocaine) injecting and 'bingeing' created difficulty in obtaining sufficient sterile syringes.¹⁵³ Experiencing this difficulty was in turn linked to a tripling in the chances of someone sharing needles or syringes.⁷⁹ The upshot was that injectors who injected over four times a day were three times more likely to risk infection by using needles after other people.¹⁵⁴ Sharing was also associated with multiple re-use of one's own needles,^{113 148} confirming the impression that it arose due to demand outstripping supply.

Quantity caps and one-for-one exchange could not have helped. On average just six syringes/needles were handed out at each visit.^{155 156} Even a typical customer would have to visit at least three times a week, but a quarter injected over six times a day.¹¹³ Their weekly needs will often have exceeded the exchange's quantity limit,¹⁴⁶ requiring several visits to the office carrying a basket full of



"I think that with a stable house, if the person was on some kind of opiate therapy, if we gave them some real things to do that gave them some kind of life, that they would buy into it in a second. We're not animals. This isn't a party down here. It's a very shitty life ... they'd change it if they could. Some innovative programming could really change things down here."¹⁹³

'Sid', a 40-year-old drug user from Downtown Eastside

used equipment to exchange, something most Vancouver injectors would wish to avoid.¹⁵⁷ Most had been stopped by the police and had needles confiscated.¹⁵⁴

Users who needed the most equipment (frequent cocaine injectors) tended to rely on the vans, the source least able to supply in bulk¹⁴⁶ and one easily missed as they parked a short time in each location. As a result, van users had the greatest difficulty in meeting their needs.^{150 153} Still, some may have preferred the vans to the office, where they feared police surveillance.^{153 154} The police presence had been stepped up in response to the area's drug problem; personal experience of this pressure was linked to a near doubling in the odds of sharing needles.⁵⁰

Risk-generating environment

Inadequate distribution was not the whole story. For example, 1 in 5 local injectors shared needles even when they had no problems getting fresh supplies⁵⁰ and though daily cocaine injecting and 'bingeing' did exacerbate equipment shortages, these behaviours also seemed to directly contribute to needle sharing.^{79 158} The exchange in Downtown Eastside failed to prevent the epidemics not just because of its restricted service, but also because this became no match for the risks generated by the advent of cocaine injecting in a troubled population poorly served by welfare, housing and economic systems.

Some risk-generating factors were personal. Experiences such as sexual abuse, suicide attempts, and depression were associated with continued resort to other people's injecting equipment despite the exchange.¹⁵⁴ Such histories were common among local injectors,^{113 149 151 154} as was mental illness.⁵⁰ This vulnerable population also endured depressing living conditions and unenviable lifestyles featuring prison, crime and prostitution.^{65 113 148} Exchange attenders were generally poorly educated^{50 113} and very poorly housed, mostly in 'welfare' hotels.^{50 113 148} To extricate themselves from equipment sharing and a drug-centred lifestyle, a third had to overcome the pull of a sexual relation-

ship with another injector.^{113 154}

At the heart of the problem was the loss of affordable and social housing in the city.¹⁴⁸ In the small Downtown area, thousands of tiny but relatively cheap, single-occupancy hotel rooms filled the housing gap, a sink into which the city's poor single population descended – "people who have few other choices", said a housing director.¹⁵⁹ In 1994, the year HIV took off, into this environment came an upsurge in cocaine injection.¹⁴⁸ Local drug users often injected it several times a day for days at a time,^{155 153} an experience likely to disrupt rational decision-making in the most balanced of people. Not surprisingly, the cocaine roller-coaster was associated with high-risk sharing.⁷⁹

A peculiarity of the area's housing set the seal on the epidemics. Commonly hotel managers locked buildings at night and charged for re-entry, encouraging residents to stay inside. Communal binge injecting developed, especially when the injectors (the same day for them all) received their welfare cheques.¹²³ The tiny rooms were transformed into ad-hoc shooting galleries.^{113 151} Sterile needle/syringe stocks would have become rapidly depleted at a time when access to fresh supplies was obstructed.^{123 148} In any event, often the only source would have been the exchange's vans, whose schedules may not have coincided with need and which would not normally have dispensed enough equipment to keep the 'party' going safely. The ill-served rooms with no bathrooms or cooking facilities¹⁵⁹ also made hygienic injecting difficult. Augmented by the effects of the drugs, they also lent themselves to confusion over whose syringe was whose.¹⁵⁷

Supported housing for substance misusers and replacing single-occupancy hotel accommodation with low-cost social housing are now firmly on Vancouver council's agenda. Progress is being made, but slowly and resources remain tight.^{159 160}

Counterproductive exchange restrictions leave HIV spreading

Across the other side of Canada, however they analysed the figures, studies in the mid-90s found that attending Montreal's needle exchange was linked to much *higher* levels of HIV infection and to an *increased* chance of becoming infected. Rather than an indictment of needle exchange, Montreal is another example of what can go wrong when equipment supplies are limited and the trickle allowed out from an exchange feeds rather than floods high-risk sharing networks. It also confirms that simply making syringes and needles available does not transform high risk injectors into low-risk.

More exchange, more infection

The key study was based on a sample of injectors recruited mainly through their own social networks.¹⁷⁴ Nearly 1000 were at first HIV negative. At issue was whether those who used the exchange would be protected from becoming HIV positive over follow-up periods ranging from three months to five years. The opposite seemed the case. However, in statistically evening out all other risk factors, the first analysis also eliminated some

of the mechanisms through which exchanges might have had a beneficial effect.

A later analysis¹⁷⁵ fixed this problem but still the outcome was alarming: the more someone relied on the exchange for injecting equipment, the more likely they were to become infected. At the apex, injectors who consistently attended the exchange were six times more likely to become infected than those who had never attended.

Technical problems might partly explain the results.^{120 175} Foremost was a possible failure to fully adjust for the fact that the exchange attracted very high risk injectors. The vital missing ingredient was the infection rate among attenders *before* they started attending. Conceivably this was much higher than among non-attenders and then began to fall under the exchange's influence, but at first not down to the level of non-attenders.¹⁷⁶ The fact that by the last year of the study attenders were no longer at higher risk of HIV infection hints at such a process.¹⁷⁴

A further analysis reinforced this impression.¹²³ It was based on the observation that the exchange's night-time opening hours¹²⁰

Montreal

- ✓ No hepatitis C data but for HIV same story as Vancouver: more exchange use linked to more infection.
- ✓ Magnet effect at work – risk may have been reduced but not to the level of non-attenders.
- ✓ Shows again what can happen when cocaine injecting takes off but exchanges maintain equipment supply restrictions, in this case partly to encourage frequent visits.

and the profiles of its attenders indicated that they formed a social network distinct from that of non-attenders, and one at far greater risk of HIV infection. Over the course of the study this should have resulted in five times more seroconversions than in the less risk-prone non-attenders. In fact, the figure was half this, suggesting that the exchange *had* reduced risk – not by reducing sharing, but by cutting the time infected needles and syringes remained in circulation.

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Poor treatment access

Recurrent themes in the Vancouver reports are the need to connect the city's injectors to addiction treatment and the failure to do so.^{113 148 149} Though willing to refer, the area's main needle exchange soon found itself blocked by two-month waiting lists and by the lack of programmes suitable for young people or for cocaine users.¹⁶¹ Ten years and

more later the "woefully inadequate"¹⁴⁸ access to treatment had improved little.^{146 162}

But even had there been a cocaine clinic on every corner, the exchange may not have made the most of them. Management¹⁶¹ and funders¹⁴⁶ saw its role as expediting "requests" for help "when a client is ready", not prompting them. While waiting for this change of heart, injectors became infected

with life-threatening diseases. In retrospect, it seems clear that these depressed, mentally ill, often suicidal cocaine injectors, trapped in a destructive environment, were in no position to prompt their own recovery.

At first medical and treatment referrals were made very rarely¹⁶¹ and though these later picked up,¹³⁶ only a small proportion resulted in treatment entry¹⁶² or HIV test-

The 'magnet' effect

Perversely, if an exchange succeeds in attracting people at high risk of contracting disease, this desirable feature can make it look as if it is responsible for their heightened risk – the 'magnet effect'.¹²⁰ In fact, attending the exchange may have reduced their risk of infection but not yet down to the level of injectors who do not attend [chart](#).

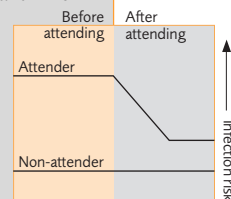
Studies consistently find that higher risk injectors are drawn to exchanges.^{32 63 76 120 126 140 144} When statistical techniques are used to counter this bias, generally exchange use is found to have had a positive impact. For example, in a multi-site US study exchange attendance was typically sporadic, yet despite this and despite the magnet effect, attendance was linked to a reduction in the use of previously used syringes, in turn linked to a reduction in the incidence of HIV.¹²⁶ In New York, injectors who were increasing their injection rate tended to visit exchanges more regularly, but regular attenders were three times less likely to become infected with HIV than non-attenders.¹⁹¹

The definitive confirmation of the magnet effect came from San Francisco. Here at last was the missing ingredient – evidence that *even before they attended*, injectors who later went on to use the newly opened exchanges were ten times more likely to become HIV positive than those who did not.¹⁷⁸ They injected more frequently and were more chaotic and destitute than non-attenders. High risk carried

through to exchange attendance would have made it look as if the exchange was exacerbating the situation, even if the opposite was the case.¹⁷⁶ This is exactly what happened.¹²⁰ After attending, at most 3% a year became infected with HIV compared to under 1% of non-attenders, but *before* they had attended, 8% a year became infected.

Once other risk factors had been accounted for, another study confirmed that compared to non-attenders, San Francisco's exchange users were much less likely to have recently shared needles⁷⁵ and when they did, they shared with fewer people.¹⁷⁹ They were also less likely to re-use their own syringes and more likely to have a stock of fresh equipment.^{180 181} As elsewhere, risk-reducing behaviour change had been masked by the magnet effect; also as elsewhere, it was still not enough to prevent the spread of HIV, let alone hepatitis C.^{76 178 64 179}

There is another reason why exchanges may wrongly seem ineffective. A study in Baltimore found that people who say they attend when they do not are very likely to become infected. They will wrongly be counted as needle exchange 'failures'. The reverse deception (denying attendance) was far less common.¹⁹² The net result was an 18% underestimation of the degree to which attending an exchange protected injectors against becoming infected with HIV.




Exchange attendance can reduce risk but still leave it higher than among non-attenders

Misguided attempt to increase visits

Whether Montreal's exchanges increased or decreased risk – and the latter is the more probable – they did not reduce it enough to prevent rapid spread of HIV. Potential explanations echo findings elsewhere.

At the time Canadian pharmacists were reluctant to sell syringes to addicts.¹²⁹ In 1994 the total supply from Montreal's exchanges and pharmacies would have provided fresh equipment for just three out of every 100 injections.¹⁷⁷ The exchange was not geared up to addressing this shortfall: cocaine was the dominant drug among its visitors and a quarter injected over 100 times a month, yet it set a limit of 15 syringes at any one time in a one-for-one exchange. The limit was an attempt to induce frequent attendance but in 1995 was recognised as counterproductive and abandoned.¹⁷⁴

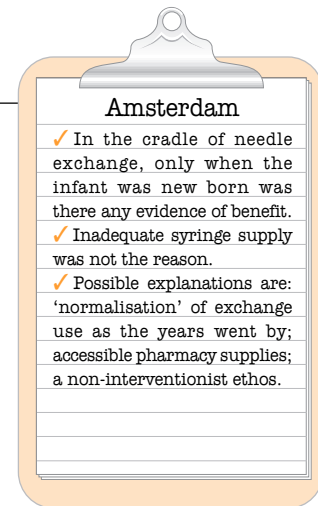
One-for-one exchange may also have impeded equipment supply because it meant users had to risk frequently carrying needles to and from the exchange in order to get sufficient new supplies.^{140 157 175} As in Vancouver, extended availability of used syringes, more sharing, and more infections, were the likely and unwelcome results. 

Early impact fades in Amsterdam

Amsterdam is the cradle of needle exchange, started there in 1984 to combat hepatitis B.¹ Yet the city's extensive methadone and needle exchange provision has not prevented high levels of infection with hepatitis C, and any beneficial impact at all on infection transmission has been hard to pin down.

'Low threshold' was and remains the ethos of Amsterdam's drug services including its exchanges.^{182 183} The concept means not only easy access but also that care is taken not to deter attenders by making demands (for information, service engagement or commitment to change) or intervening in ways which might be interpreted as 'pressure'.

The exchange programme rapidly grew until by 1988 perhaps two-thirds of the city's injectors exclusively sourced their equipment from exchanges.¹⁸⁴ By 1990 these were giving out a million syringes from 14 sites. Large amounts could be supplied at each visit.¹⁸³ By 1997 the outflow had halved, but only because the number of injectors and injections also had fallen. The supply from exchanges alone remained enough to provide a fresh needle/syringe for every injection.^{93 182}



Hepatitis C spread sounds a warning

From 1985 the Amsterdam Cohort Study tracked developments in disease transmission and risk behaviour among drug users, each year recruiting subjects from methadone clinics, an STD clinic for drug using prostitutes, and by word of mouth, an unusually long-term data series. Each recruit was asked to return every four months to be re-interviewed and retested for infection.

The study first threw up warning signs in

ing.⁵⁰ Relatively few dependent drug users – cocaine users in particular – follow through on referral unless access to treatment is rapid and easy:^{163 164 165 166} in Vancouver, it was neither. They can be supported and shepherded to the door,^{167 168 169} but this was a role the exchange was neither resourced for nor inclined towards.

Defensive posture limits risk reduction

The exchange might have done more, but was itself tied by funding constraints and by rules which left it unable to meet its customers' needs. To appease hostility, effectively it prioritised community concerns and the very distant prospect of needle stick infection over the lives of injectors. Perhaps this was the only way to stay open. Perhaps, too, its 'light touch' was ill-suited to a situation which cried out for energetic intervention.

The emphasis was on attracting customers and gaining trust by being "accepting" and "non-intrusive" and by creating a "milieu in which the [injector] can feel free to function as he would".¹⁶¹ It was hoped that customers would respond by becoming more responsible in their drug use. 'Responsibility' was, it seems, unachievable by this subtle route.

Very soon, even if the exchange had wanted to do more, it would have been held back by the combination of escalating client numbers and resource constraints.¹⁶¹ Budgets and staff were stretched and client contacts were "cursory and on-the-run".¹⁷⁰ The vans saw in some ways the most needy injectors yet were least able to respond. Drivers spent

barely more than a minute with each contact in an exchange centring on the negotiation of the one-for-one rule, concluded by a well-meaning (but clearly often ineffective) injunction not to share.¹⁵⁵

Budget restrictions limited opening hours,¹⁵³ forced cutbacks in the mobile service, and partly accounted for the cap on supplies.¹⁴⁸ The effect was to impede access to equipment and to prevent visitors passing on sterile syringes.¹⁴⁹ Under-resourcing reflected public and political opposition to the service but it was not the only problem. Limited hours were also a response to community concerns about drug users converging on the site late at night. Through these mechanisms, hostility to the exchange helped clear the way for the viruses.

The exchange sought to deflect hostility (of which it was acutely aware¹⁶¹) by actively choosing to restrict its service. As often the case in Britain, it was pressured into operating on the basis of worst case scenarios.¹⁷¹ A "constant concern" was that users would resell its equipment, so at first usually just two syringes were handed out at each visit. The limit was later raised but not abandoned for many years. The one-for-one rule was at first flexibly implemented but later hardened, partly due to concerns over syringes being left in public.¹⁴⁶ There were also worries that supplying lots of free equipment would enable more frequent injecting.


Lessons could have been learnt earlier

Perhaps the most dispiriting thing about

Vancouver is that the lessons could have been learnt much earlier by just talking in depth to a few representative local injectors.

This is exactly what the researchers did before starting work in earnest.¹⁷² Factors found later to elevate risk clearly emerged from the interviews. Oppressed, depressed, fatalistic and trapped in a skid-row environment, the 16 injectors were not well placed to value their lives and health sufficiently to prioritise these over immediate relief, and lacked the material and social supports to actualise health improvement.

High-volume, right-time, right-place equipment supplies flooding rather than trickling into their hotel rooms and alleyways might have made a difference, and beyond this a concerted attempt to improve housing and to address medical, psychiatric, welfare and addiction treatment needs. Two at a time one-for-one exchange completed in a minute or two was never going to be enough. By the time this lesson had sunk in, many young people were heading for an untimely death.

Given the limitations of needle exchange in this environment, local experts have called for supervised injection rooms. In these Vancouver's addicts could receive not just needle exchange but also counselling, health care, drug treatment and practical services such as showers and laundry, promoting sustained contact with staff.^{50 170} Just before Christmas 2002 local drug users and Vancouver's newly elected mayor met national health officials to plan such a facility, but political opposition remains strong.¹⁷³ 



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▼ **A worker carefully counts returned needles. Insisting on strict one-for-one return is one way exchanges deflect community hostility but it can also mean supplies fall short.**

1990 when the new test for hepatitis C revealed that it had been infecting about 1 in 10 “hard” drug users (70% of them injectors) each year from 1986 to 1989.^{13 14} HIV and hepatitis B too were spreading at rates consistent with high levels of risk behaviour.

Analyses to establish the causes found that, unlike HIV, acquiring hepatitis C was not related to the number of times injectors had borrowed used needles or syringes.¹⁴ As elsewhere, perhaps ease of transmission through occasional needle sharing and through sharing paraphernalia masked any extra impact of more frequent sharing.^{13 23 45 56 65 66 69} The implication was that even if Amsterdam’s exchanges had cut re-use of other people’s needles and syringes, this might not have stopped the virus spreading. In fact, there were doubts over whether sharing had been reduced. If it had, the effect should have been to reduce the incidence of HIV among exchange attenders; in most years there was not even a hint of this happening.

The evidence came from 31 injectors who had become HIV positive between 1985 and 1991.¹⁸³ They were compared with randomly selected injectors who had remained HIV negative. Over 4 in 10 of the seroconverters had been relying on exchanges for all their needles and syringes, a reliance associated with a slightly *higher* chance of becoming infected. The margin for error was great and the results were not statistically significant, but certainly there was no indication that reliance on exchanges *reduced* risk.

However, this average hid a significant trend for the impact of exchanges to change over the years. In the early years (1986–1987), exclusively sourcing your needles from an exchange *was* associated with a reduced chance of becoming infected with HIV. Only in later years did this reverse into increased risk among exchange attenders.

Early infection impact fades

A later analysis using more sophisticated statistical techniques confirmed that needle exchange attendance had become less protective over the years.⁵¹ The main advance was an adjustment for the effect of repeated interviews which made it possible to use data from all relevant subjects, not just those new to the study – 879 injectors, most of whom mainly injected heroin/cocaine speedballs.

An initial steep drop in HIV incidence over the first three years of the needle exchange era was followed by a stabilisation at

about 4% a year, still too high. There was a parallel trend in the proportion of injectors who had recently shared syringes. Among new recruits to the study, unaffected by being repeatedly tested, counselled and interviewed, the proportion who had recently borrowed levelled out at 30%.

When these trends were averaged out over the full period of the study, using an exchange was not associated with less borrowing or lending of syringes. In fact, the relatively rare practice of sourcing some but not all of your equipment from an exchange was linked to a significant *increase* in both. The more meaningful comparison was between people who only sourced their equipment from exchanges (the majority) and those who never did. This too was not reassuring. Exchange devotees borrowed and lent just as much as the rest.

Again, this relationship changed significantly over time. At first far fewer exchangers shared, but over the years they made no further improvements, while among non-attenders syringe borrowing fell. By 1992 almost exactly the same proportions were borrowing in each group.

Impact on risk behaviours also fades

Other Cohort study reports confirmed that, after the first few years, using exchanges did not reduce needle/syringe sharing. Between 1985 and 1988 exchanges came to dominate syringe supply in the city yet the proportion of injectors who had recently borrowed used equipment remained static.¹⁸⁴ Data from 1989 and 1990 also indicated that injectors who relied on exchanges were now no less likely to re-use used needles and syringes than those who relied on other sources.⁷¹ Where exchange users did seem to benefit is in not having to re-use their *own* syringes.

This too was the conclusion reached by a study outside the Cohort series.¹⁸⁵ In 1987, heavy exchange users among a sample of injectors were compared to the remainder,

most of whom barely used exchanges. Exchangers were clearly more adequately supplied. Compared to 29% of the rest, during the previous six months over 80% could afford to use a needle only once. Just 3% daily found themselves with drugs but without clean needles, 27% of the remainder.

During this early period, enhanced supply also seemed to feed through to reduced borrowing of used equipment. In the past month, 10% of the injectors who relied on exchanges had borrowed compared to 23% of the rest. Still the possibility remained that, rather than exchanges fostering risk avoidance, people who were *already* more careful tended to be the early visitors to the exchanges, a possibility supported by an analysis which took into account other risk factors.

Risks knowingly taken

In 1992 to 1993 the Cohort study probed the reasons for risk behaviour among injectors who agreed to this extended interrogation.⁹³ Attention focused on the 96 who were HIV negative so could still become infected. Many were at substantial risk. Over the past five months at least a quarter and perhaps nearly 40% had re-used a syringe after someone else, each on average 19 times. Often they had done so without knowing that the donor was HIV-negative and without (though most tried) adequately cleaning the equipment.

Once other factors had been taken into account, how much they used needle exchanges made no difference to how often they knowingly borrowed used needles and syringes. There was one finding exchanges could cheer: sourcing all one’s equipment from exchanges was associated with a greatly reduced risk of *accidental* re-use. This could simply mean that more organised injectors both planned their equipment supply better and were better at avoiding mishaps. Even if it was a real benefit of exchange attendance, the impact on infection would have been minimal. 48 injectors became HIV positive

Case studies not isolated examples

The case studies are atypical only in the degree of investigation. Across the world, needle exchange services leave a residue of needle and syringe sharing and more frequent sharing of other equipment.^{32 42 45 58 63 68 74 80 86 104 111 115 116 117 120 123 186 187 188 189 190} This residue is sufficient to form a perfectly adequate transmission route for viruses such as hepatitis C which are prevalent in the injecting population.

One of the few studies to directly relate hepatitis C to needle exchange was conducted in Chicago in the late 1990s.⁶⁸ Injectors were tested for hepatitis C and asked about risk behaviour in the past six months. Half had begun injecting in the last two years and a third within the last year, so for many their recent behaviour was relevant to their infection status. The minority who had attended needle exchanges were significantly *more* likely to be infected. When other risk factors were taken into account, the tendency remained but was no longer statistically significant – the mark of the magnet effect, in this case perhaps due to frequent injectors being more likely to use the exchange and more likely to be infected.¹²⁰ However, as in some of the case studies, there is no indication that attending exchanges *reduced* the chances of hepatitis C infection.

during the study. Most admitted risky injecting with someone they *knew* to be infected. Accidental sharing was at best a minor factor.

Few injectors had re-used equipment while experiencing serious withdrawal symptoms. Perhaps related to the dominance of cocaine/heroin mixtures in this sample, a more common prompt was the urgent desire to experience the next hit. At the time they re-used over 70% were within 30 minutes of an exchange. Sharing often occurred during office hours so at least some of the services must have been operating at the time.

So what *does* work?

Though it was unable to show that needle exchanges curbed syringe sharing, by chance the Cohort study threw up an idea about what might – its own research interviews.

The finding emerged from analyses of the progress made by Cohort subjects who had returned for two or three follow-up interviews.¹⁸⁴ Effectively these were a thorough HIV risk assessment coupled with HIV testing and counselling.⁷¹

Before their first interview, half had borrowed used needles or syringes. After being interviewed once, this fell to a quarter, after two interviews, to 16%. Some of these falls may have been due to increasing reluctance to admit to ‘misbehaviour’,¹⁸³ but this could not account for the entire effect: a substantial drop in borrowing still seems to have occurred as research assessments were repeated.⁵¹ Similarly, passing on syringes fell far more steeply among returning interviewees than among new recruits to the study, from 44% to just 8% after two interviews. This early data was confirmed by an analysis covering over a decade from 1986 to 1997.⁵¹

Why the diminishing impact?

What happened in Amsterdam will be familiar to the marketing experts of Intel and Microsoft. Like the ‘early adopters’ of any new technology, injectors who sought out the exchanges in the early years were an atypical minority particularly motivated to reduce risk. Later a pincer movement narrowed the gap between exchange users and non-users. As exchanging became commonplace, attenders came to differ little from other injectors in their desire or (given good supplies from pharmacies) their ability to reduce risk.¹⁸⁴ Exchanges became just another source of needles and syringes.¹⁸³ Simultaneously, the anti-sharing ethos spread to people who did not use exchanges, bringing them up to speed with the vanguard who had sought out the first services.⁵¹

As a result, the exchanges came to have no noticeable extra impact on risk behaviour or infection rates. After 1991, whether someone re-used used equipment seemed related to factors other than their source of new needles and syringes. Sourcing adequate supplies from exchanges eliminated some reasons for

borrowing (shortage of equipment or shortage of money to buy equipment) but left enduring factors such as personality, housing and drug use patterns to be tackled.⁷¹

Neither the pharmacies (they could not) nor the exchanges (energetic intervention was not their style) did much to address these influences. Equality of non-intervention led to equality of risk. What neither routinely provided – intensive and repeated risk assessment and HIV counselling – came instead from the Cohort study, and did seem to create added risk-reduction value.

Equality of supply in relation to need

Exchange and pharmacy users may also have differed little in the adequacy of their equipment supply. Pharmacy users injected less often so were more able to buy enough needles and syringes for their needs, matching the adequacy of the supplies given to more frequent injectors by the exchanges.

The context here is vital. As in the UK, in Amsterdam pharmacies were willing to sell syringes to injectors, providing a high background availability which exchanges were hard put to improve on. Elsewhere the mere fact of making syringes available through an exchange could have had an impact, regardless of whether more deep-seated influences were also addressed.¹⁴⁰


In later years, the very ubiquity of exchanges could have masked their benefits. Non-attenders may have profited from their supplies in the form of sterile needles passed on by attenders. With the main load of heavy injectors diverted to exchanges, pharmacists were probably more willing and able to meet the remaining demand. Exchanges probably also contributed to a general awareness of HIV risk and how to avoid it. In these ways they could have reduced the risk profile of non-attenders as well as attenders, contributing to the ‘no-difference’ findings when the two were compared.

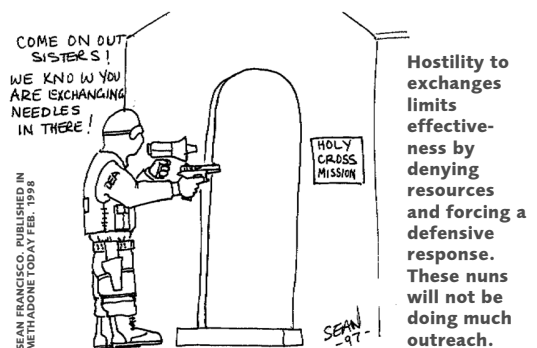
LESSONS FROM THE CASE STUDIES: IT'S THE SYSTEM THAT COUNTS

What can we take from these six case studies? The most important lesson is to appreciate that needle exchange is a *system*, no one element of which is good or bad in itself. It all depends on how it relates to the other elements of the service and to the environment within which it operates.¹⁴⁰

For example, strict one-for-one exchange can constrict supplies and counterproductively extend the circulation time of used syringes, but is less of a problem if large amounts can be handed out, and if the exchange is taken to the customer rather than the customer having to risk frequent return visits carrying used equipment. Long interval visits are not necessarily indicative of a poor service if enough supplies are given to bridge the gap and if injectors securely

dispose of used equipment. It is also worth speculating what might have happened without the exchanges. In this scenario heavy injectors (not universally welcome in retail premises) may not have been willing or able to pay for their supplies from pharmacies, and pharmacists may not have been willing to serve them, leading to even more sharing and more infections. The same speculation may also be applicable to Vancouver and other areas where, by relieving pressure on pharmacies, exchanges make themselves look ineffective in comparison.

But the bottom line is that Amsterdam's exchanges could not be shown to create extra benefit where it should have been most apparent – among the injectors who used them. Before accepting this verdict, we should acknowledge one limitation to all the studies: methadone programmes were their prime recruiting grounds. In Amsterdam this is less of a limitation than probably anywhere else on earth because such a high proportion of opiate injectors are in methadone treatment. Still, the samples must have been skewed away from stimulant-only injectors, from foreigners (who have limited access to Dutch methadone services), from younger and newer initiates to opiate use, and from injectors who did not wish to cross even the low threshold of the city's services. 




dispose of used equipment.

How these internal procedures relate to the customers and to the locality is also critical. In a city where opiate injecting dominates and injectors have stable accommodation, a 24-hour exchange located close to the drug use epicentre would be an ideal intervention; in another, it might fail to tempt cocaine injectors out of their locked hotels. Motivated, risk-conscious injectors will make good use of services which confine themselves to the simple exchange function, but much more intervention will be needed to stop others simply feeding the exchange's supplies into continued high-risk injecting. An upsurge in cocaine injecting can overwhelm exchange provision, demanding a rapid upgrade to much more active and

extensive distribution. Where supplies cannot be had from elsewhere, an exchange which does nothing more than hand out large quantities can make a substantial difference, but if the reverse is the case it will need to do more to justify its existence.

The availability of treatment services to refer to can also be a make or break issue. Similarly, where multiple deprivation obstructs positive behaviour change, the exchange will need housing, psychiatry, medicine and vocational rehabilitation all to pull their weight. On its own it may prove too little to make a difference.

In turn these considerations dictate that exchanges have systems which enable them to closely monitor what is happening in the locality and that they forge good links with treatment and other support services. Forming good relationships is, of course, a two-way responsibility. It will not help if exchanges are denigrated as supportive of continued drug abuse. 

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
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OFFCUTS

Recently published British studies linking release from inpatient **detoxification** and **prison** to **overdose deaths** will come as no surprise to **FINDINGS** readers – these were among the risk factors highlighted in our review  **Links**. What they have in common is that abstinence and loss of tolerance occur in a protected environment which leaves the user vulnerable to overdose if they resume drug use on re-entry into their normal environment. The implication of both is that intensive follow-up care is needed in the aftermath of more or less 'enforced' tolerance reduction.

LINKS
Overdosing on opiates part I: causes, issue 4

The first study followed up 137 opiate detoxification patients released from the Bethlem's inpatient unit. All three overdose deaths in the following four months were among the 37 who had 'successfully' detoxified; none occurred among patients whose 'unsuccessful' detoxifications meant they had maintained a degree of tolerance.¹

The second study estimated that 1 in 200 young adult injectors released after at least a fortnight in Scottish prisons died from drug-related causes within the following two weeks.² The estimate derived from a study of 20,000 releases which showed that drug-related deaths were seven times more likely in the two weeks after leaving prison than at later times. The startling 1 in 200 estimate assumes that all these deaths were of injectors – perhaps a slight overestimate, but not so great as to vitiate the conclusion that leaving prison is a highly risky period for previously drug dependent inmates.

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