

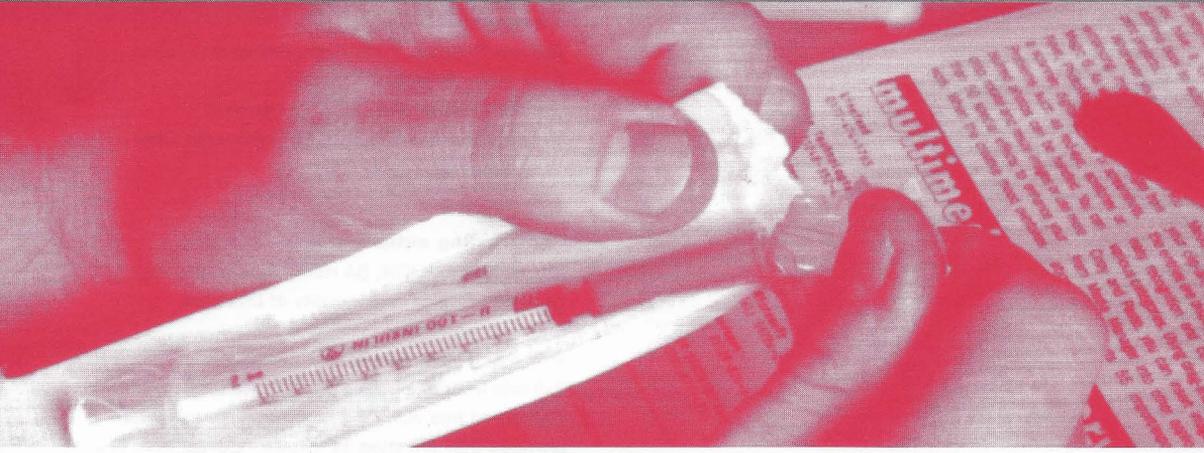


The Safer Injecting Briefing

An easy to use comprehensive reference
guide to promoting safer injecting

Jon Derricott Andrew Preston & Neil Hunt





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HIT was established in 1985 to provide drug training consultation and information services.

HIT has an international reputation for advocating and implementing a harm reduction approach to the use of drugs and is particularly committed to increasing the knowledge and health of injecting drug users.

HIT is also the:

- Organiser of The International Conference on the Reduction of Drug Related Harm
- Editorial office of *The International Journal on Drug Policy*
- Home of The International Harm Reduction Association.



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foreword

by Gerry V Stimson

Harm reduction works from straightforward assumptions. Many people do things that might cause harm to themselves or others. They might be persuaded to stop doing such things, or do them less often. But this is not always possible. The alternative then is to try to reduce the likelihood – or risk – that harm will follow.

In fact most people do things that might damage themselves or others. Driving cars, using electrical appliances, exercising, eating, drinking alcohol, and doing household DIY repairs can be hazardous. There are many things that we cannot or will not avoid. But there are usually ways to make them safer. Sometimes we control the ability to reduce risk. Sometimes we cannot reduce the risks because we do not have the means to do so.

Harm reduction is therefore a fundamental aspect of ensuring the health of populations. The public health task is to assess the hazards associated with the activity and the risk that harm will follow. The options are to reduce the frequency of the activity or to make it safer. Usually it is a combination of the two.

Harm reduction for people who inject drugs is no different. Given that some people want to inject drugs – or presently are unable or unwilling to stop injecting them – it is a public health obligation to help them reduce the risks from doing this.

Injecting drugs is a risky business. But there is now much experience of making it less so, mostly gained in the UK – which has been at the lead in the global effort to reduce drug-

related harms. That effort has been shown to be remarkably successful with respect to the prevention of HIV infection. Large numbers of infections – and deaths – have been avoided. More needs to be done to prevent other harms – as *The Safer Injecting Briefing* shows.

Harm reduction is a grass roots response. Although widely accepted, it has been only grudgingly tolerated by British governments. It was downgraded in the 1995 White Paper *Tackling Drugs Together*, as too in the 1998 White Paper *Tackling Drugs to Build a Better Britain*. More the pity: harm reduction has taken off globally, and the UK government has missed an opportunity to bring some pragmatism to international drugs policy.

The large body of harm reduction knowledge grew from practical needs and questions encountered by community-based drugs agencies. Until now it has rarely been seen in print. For the first time, *The Safer Injecting Briefing* provides a comprehensive manual of practical advice for people working on harm reduction with drug injectors. It will be valuable as a practical reference book – but it should also be read as a tribute to the unsung heroes who developed the harm reduction approach in front-line drugs agencies.

Gerry V Stimson

The Centre for Research on Drugs
and Health Behaviour
April 1998


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injecting and
needle
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Introduction

The risks of HIV and hepatitis infection to injecting drug users are present throughout the world. However, the services that exist to prevent infection amongst injecting drug users vary widely from country to country.

Starting with the development of the hypodermic syringe and injecting as a mode of drug administration, this section provides an historical perspective to responses to the injection of illicit drugs.

The way that injecting grew as a method for administering drugs is charted, with a description of how, when and why needle exchange services in the UK were developed.

Current service provision in the UK is then described and placed in a global context with descriptions of the position in the USA, Australia, European countries and Asia. This section is intended to give the UK reader an overview of the response in other countries and regions.

Development and use of the hypodermic needle and syringe

It is impossible to be precise about when injecting as we know it began. Clearly weapons such as blowpipes and poison-tipped darts were in use thousands of years ago to introduce substances into the body.

Intravenous injection was recorded as early as the 17th century.

Subcutaneous injecting did not begin until the mid to late 19th century, probably as an extension of the then new practice of inoculation against disease.

The invention of the syringe

Various people have been credited with the invention of the syringe including :

- Christopher Wren
- Robert Boyle¹
- Pascal²
- De Graaf³.

It is therefore difficult to establish that any one person was completely responsible and of what, in the context of these claims, a 'syringe' consisted: at its most basic it was a type of simple pump. The truth is probably that syringe-type devices were invented by many different people and then adapted by others.

Wren is the first person recorded to have employed intravenous injecting in Britain. In 1656 he experimented by injecting dogs with opium and other substances⁴. Wren's 'syringe' was a crude device, consisting of a quill attached to a small bladder and was known as a clyster (Figure 1.1). An incision in the skin had to be made in order to gain access to the vein. (Crude injecting devices still persist today; many self injectors do not have access to modern sterile equipment and manufacture their own from what is available. In the UK this is most likely to occur in prisons.)

Wren also attempted human experiments in intravenous injection. For this Macht reports that Wren used "the delinquent servant of a foreign ambassador", but the experiment was unsuccessful, as Macht observed: **"...the victim either really or craftily fell into a swoon and the experiment had to be discontinued."**⁴

It was at least 100 years before a syringe with an attached needle intended for puncturing the skin was first produced.

In 1807 *The Edinburgh Medical and Surgical Dictionary* defined a syringe as follows:

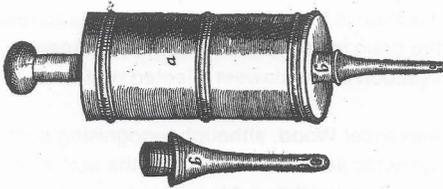
"A well known instrument, serving to imbibe or suck in a quantity of fluid and afterwards expel the same with violence. A syringe is used for transmitting injections into cavities and canals."⁵

However, the same source describes injection as being employed almost solely for injecting substances into the blood vessels of corpses for the purpose of enhancing anatomical study. Various developments towards the modern syringe were made as a result of the study and teaching of anatomy in 17th and 18th centuries.

In the 17th century, De Graaf made a device that closely resembled the modern syringe. Its purpose was to trace the blood vessels of corpses. His syringe had a metal barrel to which the needle was attached directly.

Figure 1.1: Clyster

M. CXXVI XXVII. LIVRE, DE LA FACVLTE' ET
Autre Syringue pour bailler clystere aux hommes.



Wellcome Institute, London

Early experiments

Intravenous injecting continued and was further developed in the 17th century. Numerous drugs were used to attempt to treat various conditions, particularly epilepsy and syphilis.

One of the first drugs injected in this way was opium⁴.

The use of this administration route declined however, probably as a result of the unsuitable substances injected (such as cinnamon, oil of sulphur and arsenic) and an unsurprising lack of encouraging results.

Absorption of drugs through the skin

At the beginning of the 19th century attempts were made to introduce drugs into the body via the skin itself. This initially took the form of variations on a general theme of blistering an area, removing the outer layer of skin and placing a poultice or plaster containing the active agent on to it. Lafargue developed this idea in 1836 by introducing morphine under the epidermis with a vaccination lancet, i.e. a solid needle dipped in morphine and then pushed under the skin⁵.

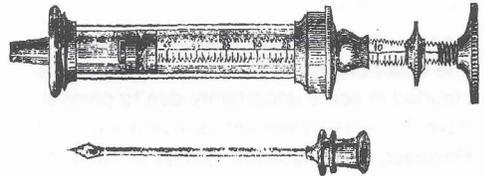
By the middle of the century Lafargue had developed a technique of placing solid morphine-based pellets under the skin. Initially this was achieved by simply making a hole with a large needle and pushing the pellet into the hole. Over time an instrument was devised to aid this procedure which Lafargue called the 'seringue seche' or dry syringe.

Other variations of this method included work by Crombie who, in 1873, used a technique of coating silk thread with morphia, puncturing the skin with a needle and then drawing the impregnated thread under the skin. Crombie developed this technique because he felt that the hypodermic syringe was expensive and easily damaged.

The development of injecting

Experiments with intravenous injection were revived at the end of the 18th century with important discoveries of the dangers of large quantities of air being introduced into veins and the similar dangers of oil-based intravenous injections.

Figure 1.2: Early hypodermic syringe



By permission of the Oxford University Press⁶

Intravenous injection continued throughout the 19th century but was overshadowed towards the end of the century by the introduction of techniques of subcutaneous injecting, which at the time was seen as more versatile and useful.

Kane, in 1880⁷, described intravenous injection principally as an unwanted consequence of subcutaneous injection and gave ways to avoid its occurrence. Macht writing as late as 1916 said:

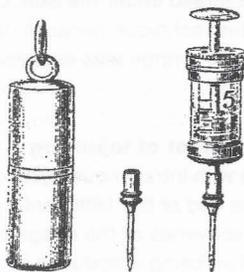
“However useful intravenous medication may be in special cases, its field of application is certainly more limited than that of hypodermic (subcutaneous) injection...”⁴

Figure 1.3: Watch chain syringe from the late 19th century

ARTICLE 2787.

A NOVEL SUBCUTANEOUS SYRINGE.

MESSRS. JOSEPH WOOD & CO., of York, are making an extremely neat and useful novelty in the shape of a watch-chain charm containing a subcutaneous syringe. The annexed diagram is of the actual size of the instrument. The syringe is graduated to



5 minims, and fits with its two needles into a neat gilt case, with double swivel ring to permit its being attached to the watch-chain. When in this position, it is ready for any emergency, and is not likely to be forgotten. Its moderate price should prove a recommendation.

By permission of Oxford University Press⁶

Development of the modern syringe

The exact origins of the modern syringe are clouded in some uncertainty due to parallel developments by numerous inventors. However, the Fergusson syringe of 1853 became a forerunner of the modern syringe when Alexander Wood used it for subcutaneous injection of opiates for the relief of pain⁵.

Injecting and drug dependence

The development of understanding of systemic action

Systemic, means, having an effect on the entire body. Early understandings of the pain relieving effects of opiates centred on the belief that most of the drug stayed at the site at which it was injected. In fact, drugs administered by any route of injection will permeate throughout the body. Intravenous injection is the fastest route for drugs to reach the brain in concentrated form, subcutaneous injection is the slowest injected route.

Alexander Wood, although recognising some systemic action, believed that the action of opiates administered by subcutaneous injection was mainly localised. The use of the syringe over previous methods was thought to allow greater accuracy in administering the drug in close proximity to a nerve, hence it was thought, facilitating better pain relief.

The belief in localised action influenced many doctors at the time. Dr Francis Anstie, editor of *The Practitioner*, wrote in 1868 that there was no danger associated with the hypodermic injection of remedies, and later:

“... it is certainly the case that there is far less tendency with hypodermic than with gastric medication to rapid and large increase of the dose when morphia is used for a long time together.”⁸

Charles Hunter, a house surgeon at St George's Hospital, made the connection that opiates administered by injection exert a systemic action when he was forced to move away from the original site of injection as a result of abscess formation and found that the patient still experienced similar relief from pain. This, as Berridge and Edwards have noted, “...led to a period of sustained and acrimonious debate between Wood and Hunter”⁹ about the existence or otherwise of systemic action.

Subcutaneous injecting with a syringe was initially described and popularised by Wood. It has been suggested that his fundamental misunderstanding that the effect was primarily local (and by implication that dependence could not occur), paved the way for the creation of a large number of patients dependent on morphine, described in the 19th century as 'morphinists'³ (Figure 1.4).

The growth of the medical use of opiates

A powerful influence in the development of widespread and repeated use of opiates by injection would have been the obvious and immediately beneficial effects of injected morphine, particularly to those experiencing chronic pain. Doctors at the time, with few truly effective treatments available, would have had difficulty in resisting the impulse to treat pain with something as powerful, fast and effective as injected morphine.

Courtwright, when discussing 19th-century opiate addiction in America, has said:

"The administration of opium and morphine by physicians was the leading cause of opiate addiction in the nineteenth century... case histories, clinical notes and remarks in the medical literature support the view that although opium and morphine were ultimately given for such unlikely disorders as masturbation, photophobia, nymphomania and 'violent hiccough' it was principally in those suffering from chronic ailments that the use of these drugs led to chronic addiction."¹⁰

The combination of the development and spread of injecting with the widespread availability of opiates and the easy legal availability of opiate-based patent medicines contributed to the increase in injectors of opiates in this period.

Figure 1.4: The final hours of a morphinist



Injecting in the 20th century

Non-medical injecting of drugs grew through the 20th century. Initially the preferred route of injection by non-medical users was subcutaneous injection. In the USA, between the first and second world wars¹¹, the preferred route gradually became intravenous injection. With a change of route of administration came a change in the medical problems commonly experienced by injectors. In the UK there were comparatively few injectors until the 1960s.

Needle sharing – early research into injecting practice and infection spread

In the 19th century there was only a slow dawning of the realisation of the implications for the spread of infection by injecting. The concept of anti-sepsis was introduced by Lister in 1867. One of the earliest recorded cases of infection following injection was the report, in *The Lancet* in 1876¹², of a drug injector becoming infected with tetanus. The risk of tetanus and similar infections remains current for some subcutaneous injectors.

Needle sharing was described as being associated with infection spread in the 1920s. Malaria was first reported as a result of intravenous drug use in Egypt in 1929¹³.

Crane¹⁴ summarises the recognition of various infections transmitted by injecting in the USA in the 1930s. At this time injectors of street drugs would probably have used a medicine dropper attached to a hypodermic needle with the aid of a cigarette paper in order to make a tight seal.

The role of needle sharing in the transmission of hepatitis A and B among injecting drug users was probably first described well, in an important American paper by Howard and Borges¹⁵ published in 1971.

Many of the infective complications of injecting drug use detailed in sections 6 and 7 of this book were recognised over the intervening years. In the early 1980s, the discovery of the

HIV virus and its routes of transmission, lent greater urgency to the study of injecting practice and infection spread. Almost a decade later, hepatitis C was identified as a risk for injectors.

The switch to disposable syringes and needles

Through the 20th century the production of precision-made glass syringes was gradually refined. The first major advance came with the manufacture of interchangeable parts, made to exact specifications, rather than as 'one-off' items.

Until the 1960s the majority of syringes and needles were re-useable and were supplied unsterilised. They had to be sterilised before each use.

Glass syringes could be re-sterilised approximately 20 times before they were in danger of breaking. Needles had to be re-sterilised and re-sharpened.

The 1950s was a period of transition, with 'hybrid' combinations of plastic and glass disposables.¹⁶

By the 1960s, glass syringes which were re-useable after sterilisation were being replaced with disposable plastic syringes and single-use needles.

However, at that time the concept of disposability was still new and manufacturers were concerned that attempts would be made to re-sterilise single-use equipment. To discourage re-use, the manufacturers experimented with materials for syringes that could not withstand the temperatures involved in heat sterilisation. The first type of plastic chosen for this use was polystyrene, but this was found to be vulnerable to chemical attack from the contents of the syringe.

Figure 1.5: Early advert for plastic disposable syringes (1961)

TO SAFEGUARD THE PATIENT TO SAVE TIME AND MONEY PLASTIPAK

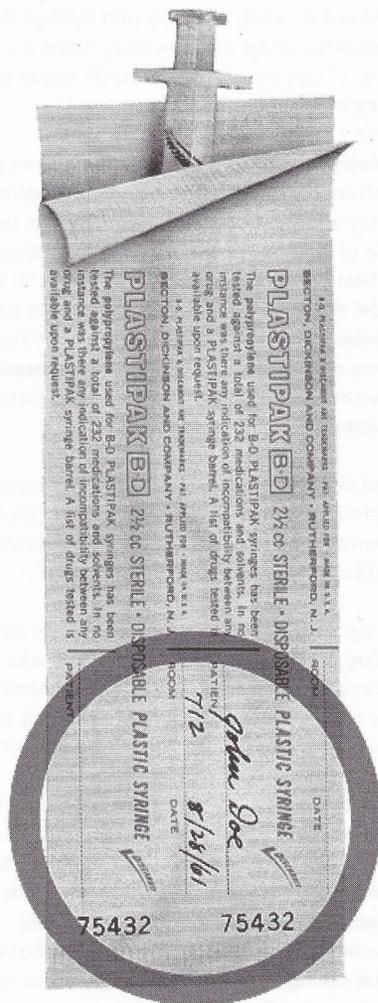
Infectious hepatitis, a growing health menace, has been traced in many instances to the re-use of syringes and needles believed to have been sterile.^{1,3} Other types of infections among hospitalized patients have also been attributed to the use of inadequately sterilized equipment.^{1,4} This indictment of hypodermic needles as a factor in the transmission of hepatitis and the growing conviction that other cross-infections may be incurred in the same manner, have cast serious doubts on the adequacy of conventional methods of sterilization¹ and on the wisdom of using syringes and needles more than once.^{1,4}

Moreover, hospitals today are confronted by mounting labor costs and a severe shortage of properly trained personnel at the very time that their facilities are most heavily taxed. Patient loads increase daily, and demands for more specialized and more exacting hospital care continue to grow.

These two vital considerations have made the use of disposable equipment almost mandatory practice. Patient safety^{1,4} and the inescapable dictum that 'time is money'^{1,5} have given rise to a particular demand for sterile disposable syringes and hypodermic needles, assembled as a unit in packages that are easy to store, easy to identify, and easy to handle.

Becton, Dickinson and Company was the first manufacturer – by many years – to enter the field of disposables. Its disposable syringe program began in 1944, and for the past 17 years B-D has supplied many millions of disposables, all manufactured to conform to exacting and unremitting standards.

Yet, it is only now that the company is introducing PLASTIPAK, the sterile disposable plastic syringe for medical use. Why? Previous disposable syringes made by B-D were glass, and glass was known to be safe. But B-D was not satisfied with plastic materials available at that time. It was not until a plastic which met every B-D safety test for injection use was developed that B-D undertook the manufacture of plastic disposable syringes.



Polypropylene disposable syringes began to revolutionise the syringe market from 1961 onwards. Latex has been used in syringe manufacture, but there are now latex-free syringes available because some people are allergic to it. Today almost all syringes and needles are disposable and intended for 'once-only use'.

Injection and dependent drug use today

The act of using a needle and syringe to introduce drugs into the body holds a great deal of cultural symbolism both inside and outside injecting networks.

Intravenous drug use is popularly seen as an end result of a career of drug use. Injecting drug users are often characterised as being out of control or controlled by their drug use. Whilst for some injecting drug users this is true, there are many injectors who do exercise control. It seems that the majority of injectors have a level of concern about their health and are prepared, given the means and instruction, to take precautions to maintain it¹⁷.

The subjective phenomena that differentiates injecting from other routes of taking drugs is the immediacy and strength of the onset of action and the experience of a 'rush'.

A significant factor in the numbers of people using heroin by injection in the UK, was the increase in availability of cheap smokeable heroin in the 1980s. Smoking was and still is seen as a much more accessible way of taking drugs than injecting, with its attendant taboos¹⁸. Although many people who initially smoked heroin continued to use that route even after establishing dependence, many heroin smokers certainly made the transition to injecting heroin. That some drug users continue to move between the two routes, after taking up injecting, is sometimes not well appreciated¹⁹.

The 'Edinburgh experience'

In 1986 it became apparent that Edinburgh had a serious problem with a high prevalence of HIV positive injecting drug users²⁰.

An influential paper published in the *British Medical Journal* in 1986 by Robertson *et al.*²¹ reported the testing for HIV of blood samples that had been systematically stored since 1982. These samples had been taken following the discovery of increasing numbers of hepatitis B positive heroin users. It later emerged that the cause of this increase was an acute shortage of injecting equipment following the closure of the main supplier, and a voluntary sales ban by local community pharmacists at the request of the police.

On testing the stored blood of this group of 164 injecting drug users for HIV, it was found that 51% of the samples were HIV positive. It was possible to pinpoint the time of seroconversion for 33 of the sample to a period between the end of 1983 and the beginning of 1984.

Extrapolating from these figures, Robertson *et al.* suggested that the true prevalence rate of HIV positive injectors in Edinburgh in 1986 could have been as high as 85%. From interviews with 40 of the group, it was possible to establish that as clean injecting equipment became harder to obtain, the group formed an intimate equipment-sharing community²¹, with reports of gatherings of 10–20 injectors using one syringe and needle. Comparisons were made by Robertson *et al.* with the similar 'shooting galleries' reported from the USA.

Figure 1.6: 1987 UK national poster campaign

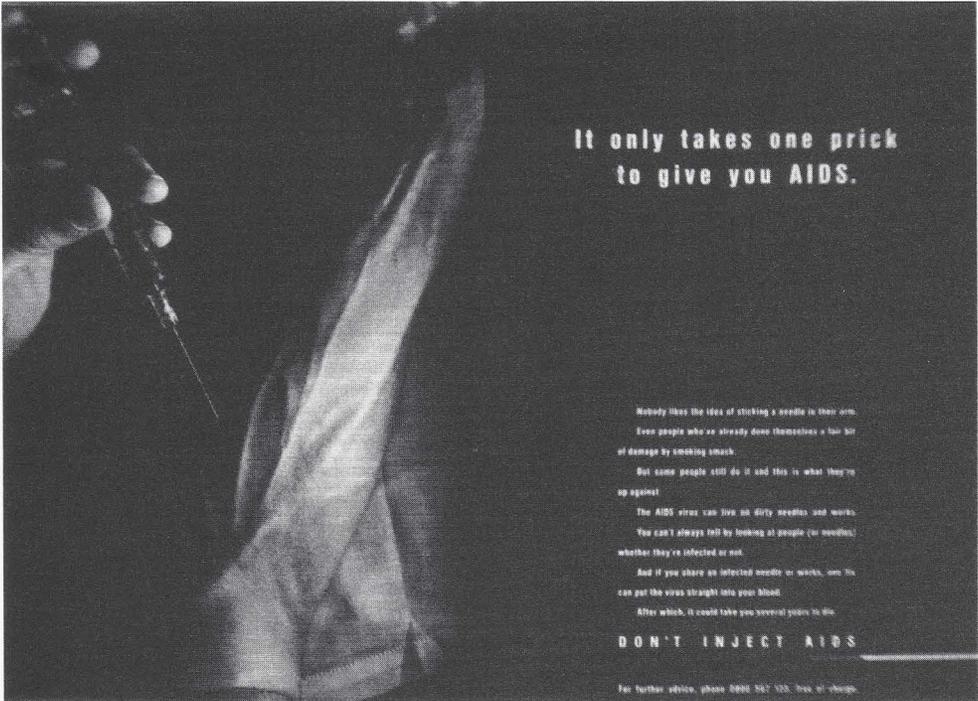
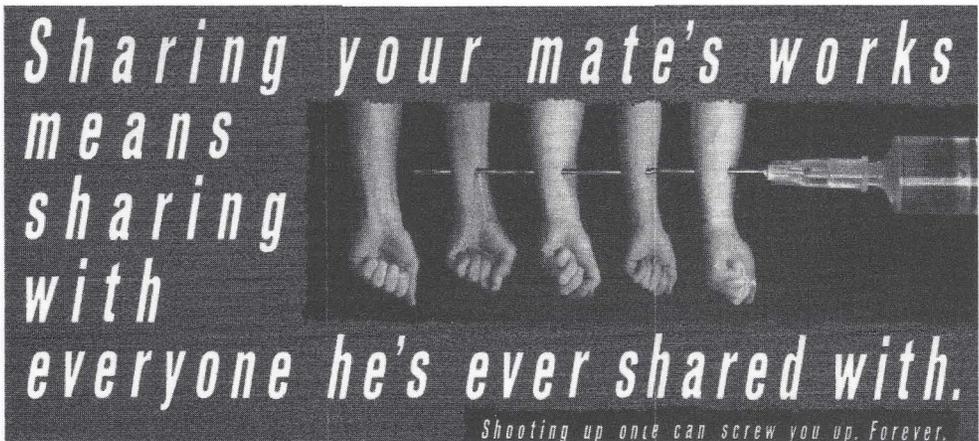


Figure 1.7: 1989 national poster campaign



The development of UK service provision

Clean injecting equipment for illicit drug users was first provided in the late 1960s to those few injectors who were given a prescription of injectable heroin or methadone.

Injecting equipment had been available for sale to injecting drug users since the late 1960s. Between 1982 and 1986 the Royal Pharmaceutical Society recommended that needles and syringes should only be sold to bona fide patients for therapeutic purposes. Although this policy was not adopted by all community pharmacists, it certainly reduced the overall availability of needles and syringes. The recommendation was withdrawn in 1986 because of concern about the spread of HIV.

Needle and syringe exchange services began officially in the UK in 1987, when the DHSS commissioned a pilot study to evaluate their effectiveness.

At the time that needle exchanges came into being in the UK, there was huge anxiety amongst the general population about the perceived threat of AIDS, fuelled by the media and by government sponsored advertising campaigns. Injecting drug use was identified early on as being one of the major potential risk behaviours for HIV infection.

Injecting drug users could hardly fail to know that they were at high risk of contracting a potentially fatal condition. The prevailing view of injecting drug users in the mid-1980s was that they were deviant, self-indulgent and often out of control; the idea that injecting drug users might alter their behaviour on a widespread basis to reduce their risks was fairly novel. Needle exchanges provided the means for many to reduce their HIV risk behaviour.

The first dedicated needle exchange to begin operating in the UK was in Peterborough in early 1986. The first pharmacy scheme began operation by Boots in Sheffield in the same year.

The Kaleidoscope needle exchange in South London began operating in September 1986 as part of a wider church-based project which was also involved in methadone prescription and other, non drug-related social problems. The project was established in purpose-built accommodation and was unusual for UK schemes in that it was open seven days a week from 7am to 11pm and remained open all night on Fridays.

The Maryland Street needle exchange in Liverpool began operating in October 1986 from a modified toilet within the Mersey Drug Training and Information Centre, sited next door to the drug dependency unit. The opening hours were 9.30–5.30, Monday to Friday.

The DHSS initially set the following criteria for pilot schemes; they should:

- Provide injecting equipment on an exchange basis to drug users already injecting and unable or unwilling to stop
- Provide assessment of and counselling for clients' drug problems
- Provide advice on safer sex and offer counselling on HIV testing
- Collect information on clients and collaborate with a monitoring and evaluation project.

At this time projects were largely staffed by nurses who received little specific training on the subject of safer injecting.

The DHSS simultaneously commissioned an evaluation of syringe exchange schemes nationally. Reporting on these, Stimson *et al.*²² concluded that needle exchanges reached:

- Considerable numbers of injectors
- Many injectors who were not in contact with any services.

They tended to attract:

- Opiate users primarily
- Older, long-term injectors
- Fewer females than males.

As needle exchange was seen to be effective, did not outrage public opinion or cause other anticipated potential problems, the network of needle exchange schemes expanded rapidly across the country, alongside a national expansion in the substitute prescribing of methadone.

A 'user friendly' approach

The term 'user friendly' to describe the philosophy of needle exchange was employed to make the distinction between needle exchange and the other, abstinence orientated services that were available for drug users in the mid-1980s.

This term, borrowed from the computer industry and applied to syringe exchange, encapsulated some of the fundamental principles underpinning successful exchanges, which still apply today:

- No waiting lists
- Required a minimum of information from clients
- No entry criteria apart from injecting drug use
- Easy access
- No requirement to change drug use i.e. stop injecting.

There was also a commitment to provide:

- Accurate information about the risks of injecting drug use
- Encouragement to adopt safer injecting practices.

The balance between being user friendly and providing the information that injecting drug users need to reduce the risks that they are exposed to is one that many services have struggled with. Difficult though this balance can be, being user friendly is not a good enough reason to fail to deliver essential harm reduction information.

The public health response

In the mid-1980s UK drug treatment services had become largely focused on the achievement of abstinence. Whilst this approach may have been appropriate for those drug users wishing to stop taking drugs, the evident public health threat from HIV meant that new approaches had to be found.

The objectives of a public health based approach were to:

- Make contact with the whole population at risk
- Maintain contact
- Encourage behaviour change.

The Advisory Council on the Misuse of Drugs presented the following hierarchy of goals in 1988:²³

- Reduce sharing of injecting equipment
- Reduce the incidence of injecting
- Reduce the use of street drugs
- Reduce the use of prescribed drugs
- Increase abstinence.

This approach became closely identified with what became known as the 'harm reduction model'. One of the driving forces behind the development of the harm reduction model on Merseyside was Howard Seymour. In a paper given in 1997²⁴, Seymour expressed his concern that:

"the population based public health response to high risk drug use, which characterised the 'Merseyside model', has been lost or diluted in many places in the UK, into a clinical, individually oriented model."

Current UK service provision

Current UK service provision for injecting drug users represents a major expansion in the number and type of schemes. Every area in the UK, with the possible exclusion of Northern Ireland, has at least some provision for the exchange of injecting equipment.

A 1997 survey by The Centre for Research on Drugs and Health Behaviour²⁵ suggests that there are approximately:

- 637 non-pharmacy exchange outlets
- 1695 pharmacy exchange outlets.

Non-pharmacy schemes include specialist schemes, mobile services, A&E departments and outreach projects.

The figure given for non-pharmacy schemes is an extrapolation from a 78% questionnaire return rate. The figure given for pharmacy based schemes is an extrapolation from a 62% questionnaire return rate.

This growth reflects the success of a combination of strategies in averting epidemic spread of HIV amongst injecting drug users including:

- Needle exchange
- Methadone prescribing
- Outreach services.²⁶

Centre-based needle exchange schemes

The majority of 'street agencies', whether statutory or non-statutory, incorporate needle and syringe exchange as part of their service provision.

The level of service on offer varies greatly from scheme to scheme. At one extreme administration and reception staff who have little or no training in safer injecting, simply offer a facility for clients to collect and dispose of equipment. At the other end of the spectrum there are many services solely designated to provide needle exchange which have facilities for seeing clients in private and which offer a wide range of services, advice and support from trained staff.

Community pharmacy needle exchange

Since 1986 there has been a great increase in the numbers of community pharmacists prepared to provide syringes and needles. According to a study by The Centre for Research on Drugs and Health Behaviour there are now about 1700 UK community pharmacists who are paid to dispense sterile equipment free to drug users and dispose of used equipment as part of the pharmacy needle exchange scheme. A survey of more than 2000 community pharmacies, commissioned by the Task Force to Review Services for Drug Misusers in England²⁷, found that:

- 19% of those who replied were involved in needle exchange
- Another 36% were prepared to be involved if a pharmacy exchange scheme was set up in their area.

The overall percentage of those prepared to be involved had not changed over the previous eight years.

Reasons given for not becoming involved in needle exchange were:

- Another needle exchange nearby
- Client behaviour
- Lack of time and space.

Community pharmacies are an important means whereby injectors can obtain clean injecting equipment. They are more widespread than specialist agencies, offering access to sterile equipment in rural settings. They have more flexible opening hours and can provide basic health advice. Also, they may be more attractive to some injectors not in contact with any specialist services, because they may more easily be able to maintain anonymity.

Although there is no formal recommendation to pharmacists, the limitations of working within a retail environment mean that pharmacy exchanges cannot provide specialist advice or services for those they know to be under 16 years of age. It would be impossible for them to undertake assessment procedures for under-age injectors (see page 100).

Community pharmacy sales of injecting equipment

As well as the widespread network of pharmacies offering a free exchange service, many pharmacies provide injecting equipment for sale. This has helped to plug some of the gaps in the provision of free equipment across the country.

Guidance to pharmacists, effective from April 1998, from the Royal Pharmaceutical Society, instructed them to sell equipment only in 'exceptional circumstances', if they did not have arrangements for the return of used equipment²⁸.

Since the majority of pharmacies that sell injecting equipment do not have such facilities, early indications are that this guidance will trigger a reduction in this important, informal part of the distribution network. In some areas it may mean the loss of the only provider of sterile equipment.

In Berkshire the pharmacy needle exchange scheme has been widened to include provision of disposal facilities to many pharmacies selling injecting equipment. Customers are also informed of sites which give free needle exchange.

A&E departments

Many A&E departments in the UK provide a limited range of injecting equipment, although few advertise the fact. Drug injectors are likely to attend A&E departments more than the norm because of:

- Not having a GP
- Drug-related injuries
- Overdose.

The Task Force to Review Services for Drug Misusers²⁷ recognised a potential for A&E departments to provide syringe exchange facilities.

General practitioners

General practitioners in the UK do not often give out injecting equipment to their patients. It is unlikely that many injectors would feel comfortable asking their GP for injecting equipment.

However, if a GP knows that a patient is injecting, it would be good practice to offer them clean injecting equipment, where appropriate, and to refer them to a pharmacy scheme or specialist syringe exchange where there are complicating factors, such as clients under 16 years of age.

Mobile exchanges

Mobile exchanges can represent a useful resource for those injectors who do not access existing services consistently. Mobile exchanges or exchanges by outreach workers can also be valuable in rural settings.

A good practice example of a successful mobile exchange service, which also provides a measure of primary health care for its users, is the MASH (Manchester Action on Street Health) trailer, which operates in the Greater Manchester area.

The main remit of the MASH trailer is to contact traditionally hard to reach groups such as:

- Women
- Male and female sex workers
- Young injectors
- Amphetamine injectors

in order to make injecting equipment, injecting advice, contraceptives and advice on safer sex and sexual health available to them. The van has a clinical examination room as well as exchange facilities and the services of a doctor, nurses and a drug liaison midwife.

Satellite schemes

Providing sterile injecting in settings such as users' houses, dealers' houses or 'shooting galleries', can help ensure that injecting equipment is not shared because of lack of immediate availability.

Dispensing machines

Dispensing machines are available commercially and may represent a useful addition to services. Although it would be desirable for all schemes to have clean equipment and secure disposal points available somehow outside normal working hours, dispensing machines are particularly useful for those services which have sporadic opening hours.

Most machines operate on a 'one for one' basis, i.e. a used syringe or a token has to be deposited for a sterile one to be dispensed. Some pilot prison needle exchange programmes operating in Europe use dispensing machines.

Current worldwide service provision

USA

Syringe and needle exchanges remain contentious in the USA, and in many states are run illegally. The US Government's antipathy to well-accepted public health measures against blood-borne disease transmission has its roots in their political and cultural response to illicit drug use.

The following list summarises the main reasons why harm reduction services are severely restricted in the USA:

- The absolute political dominance of a prohibitionist stance and commitment to the 'war on drugs'
- A belief that accepting needle exchange would imply acceptance of drug use and thereby undermine a prohibitionist stance
- Lack of political will – there are more votes in being seen to be hard on drugs
- Insistence that needle exchange has not been proven in clinical trials (despite the fact that a controlled trial would be impossible to conduct in this field)
- A belief (unsupported by the evidence) that the implementation of needle exchange, in removing some of the risks associated with injecting, encourages injecting
- A belief that the possible consequences of injecting drug use are known about by users, and they are therefore exercising informed choice.

In addition there has been an understandable suspicion amongst black communities that needle exchange services may be part of a racist public health policy designed to get and keep young black people on drugs. This suspicion is rooted in the historical fact that indefensible 'health' policies have previously been pursued in the USA. The most notorious example of this was the case of the 'Tuskegee experiment' which left many black syphilis sufferers untreated in order to examine the natural course of the disease – despite this being well documented already and treatments being available.

In 1995 John Watters, an American epidemiologist, wrote the following powerful indictment of the continued absence of adequate harm reduction services in the USA: **“Opponents of syringe exchange... insist on unrealistic and unfeasible standards for evaluating outcomes. In dismissing existing studies, resistance to syringe exchange sets criteria for evaluation that have not been required of a dizzying array of social programmes, surgical interventions and drug based therapies. Of course what is needed is the political will to make the public health decisions which hold out the greatest likelihood of reducing continued HIV contagion. Politics is however a short sighted profession. Its collective vision rarely extends past the next election. Consequently, resistance to syringe exchange in the United States continues to hold sway.”**²⁹

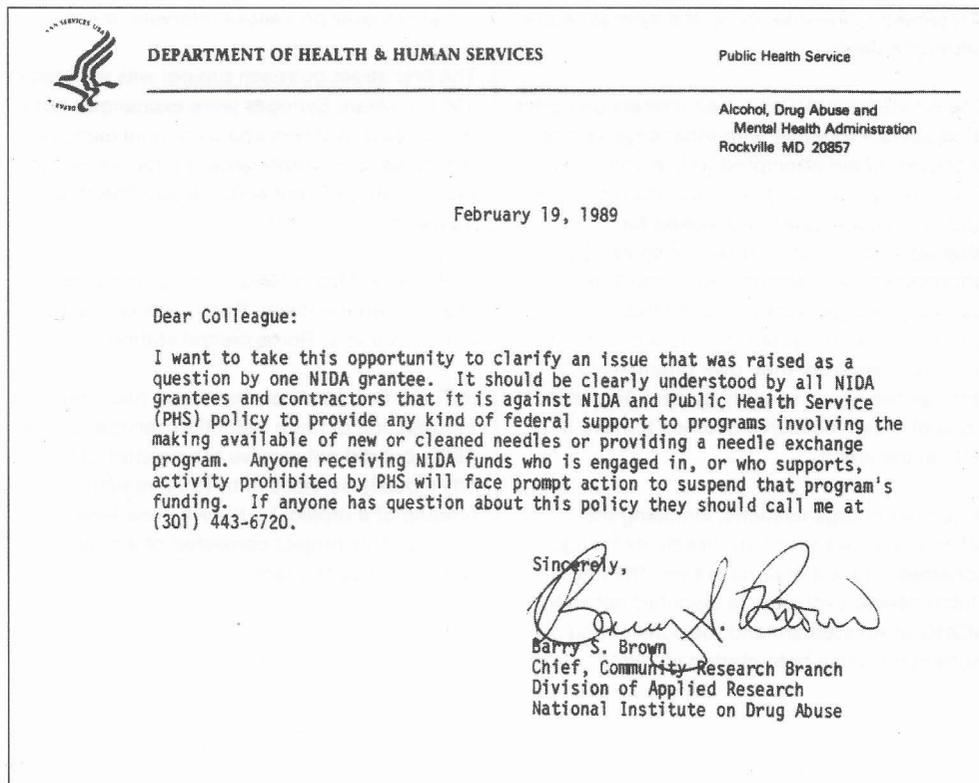
Numbers of exchanges and HIV prevalence statistics

The number of needle exchange programmes in the USA grew only to a meagre 87 in 1995/96, more than half of which were in California, Connecticut, New York and Washington state.

In 1995/96, around half of the needle exchanges were legal. Of the rest, half were illegal and the other half were against state law, but were locally approved.

Seroprevalence for HIV amongst injecting drug users in several large east coast cities on 1989 figures was in the 30–60% range. In most areas the prevalence was 5–20%³⁰.

Figure 1.8: Anti-needle exchange letter (National Institute on Drug Abuse) 1989



Based on conservative assumptions, Lurie and Drucker estimated that there would have been between 4400 and 10000 fewer HIV infections amongst injecting drug users if the USA had embraced needle exchange in 1987. They also concluded that if current policies are maintained there will be between 5150 and 11329 preventable further infections by the year 2000³¹.

The Netherlands

The availability of syringes in Amsterdam became problematic at the end of 1982 – before the advent of HIV – when one of the few pharmacies selling sterile equipment in the inner city, stopped, probably because of increasing demand and associated problems. A market for used syringes, sometimes selling for as much as 25 Guilders (almost £10), emerged rapidly.

The immediate, obvious consequences of this were:

- Unhygienic use resulting in abscesses and hepatitis
- Increased dependency on the syringe retailer (often the dealer).

The Amsterdam 'MDHG' – an interest group for drug users – together with other organisations in the drug field attempted to find solutions. They held discussions with the pharmacy that had suspended sales and looked for alternative distribution points such as other pharmacies, drug stores and shops. They took part in a 'syringe working committee' and started a referral system so users could get their syringes from their own pharmacies through the social security system. However, none of these measures seemed to have a noticeable effect.

A number of organisations, including the MDHG, decided to initiate needle exchange schemes. The claim to have been the first Dutch needle exchange is disputed between MDHG of Amsterdam and 'de Junkiebond' of Rotterdam which both started in 1984.

However there is also evidence that there was needle exchange provision as early as 1981 in the cities of Groningen and Den Helder.

Between 1984 and 1986 the MDHG learned some fundamental lessons in the effective provision of injecting equipment which continue to have resonance today. One of the most important of these was that the exchange of clean equipment alone was not enough. Establishing trusting relationships so that information about safer injecting techniques or health related issues could be discussed, was vital in order to make these initiatives successful. The Netherlands now has a widespread network of needle exchanges.

Italy

Needle exchange was introduced relatively late in Italy in comparison to much of Western Europe, although sterile injecting equipment has long been available through such unlikely outlets as supermarkets. The main reasons for this late start had to do with cultural barriers that favoured therapeutic abstinence-based initiatives over preventive interventions.

The first street outreach project was initiated in 1991 in Milan. Syringes were exchanged both by outreach workers and by needle exchange machines. Soon other areas in Italy including Genoa, Turin, Florence, Rome and Palermo followed.

In Rome, in March 1992, Fondazione Villa Maraini and the Italian Red Cross opened an outreach unit at Rome central station.

In Turin, Gruppo Abele had been planning the introduction of harm reduction services since 1990, but did not receive the support of the city's public services until 1994, resulting in the funding of a project by the Regione Piemonte in 1995. This project consisted of a mobile unit with an outreach team.

In 1993, the Regione Lazio funded the Integrated Harm Reduction Programme, in which both public and private services began to work together. Apart from drop-in centres, emergency services and methadone treatment, the project consisted of three street outreach units and needle exchange. Needles were exchanged both by outreach workers and by exchange machines.

Germany

Syringe exchange has existed in Germany since 1987, although it has only been legal since 1992. While established programmes are functioning successfully in large cities such as Hamburg, Bremen and Frankfurt, the demand for sterile needles and syringes remains poorly met in smaller cities and in the conservative governed states, where pharmacies remain the primary and often only legal supply source for syringes. Although injecting drug use is common in prisons, injection equipment is not legally available for the 10000 injecting drug users imprisoned at any given time. Two of Germany's 220 prisons started experimental syringe exchanges in 1996³².

Australia

Since the mid-1980s Australia has developed extensive free needle exchange provision which covers most of the urban areas of the country, although the numbers of exchanges vary from state to state. An important development was the Pharmacy Guild Fitpack Scheme which allowed injectors to buy special packs which held injecting equipment and doubled as a sharps container; once full this could then be exchanged free of charge for a new one.

A key feature of many Australian programmes has been the successful involvement of drug users – many projects are staffed and run by past or current drug users.

Another feature of Australian programmes that is by no means unique but perhaps more essential because of the rural nature of large parts of the country has been the development of mobile exchanges.

As is the case in other countries, self-reports of sharing of injecting equipment – the norm in the mid-1980s – had become comparatively rare by the mid-1990s.

Eastern Europe

There is little published information available about the numbers of injectors or the prevalence of HIV infection amongst them in Eastern Europe. Very few formal needle exchanges exist; the first in Russia were established recently in St Petersburg and Yaroslavl, funded by Medecin du Monde (France) and Echo (Connecticut, USA).

Reports from some areas of the high prevalence of HIV among large populations of injectors, and of widespread use of opiate preparations made from poppy straw and sold in or from pre-loaded syringes are worrying. In relatively poor countries with small health care budgets there is little or no funding available for the provision of sterile equipment, and the equipment that is available is likely to be re-used many times.

Asia

Sujata Rana wrote in 1997:

“...the HIV epidemic began in Asia years after this virus had been identified and at a time when effective ways of preventing the spread of HIV among drug injectors had become known in many developed countries around the world. However, despite this knowledge, it is estimated by the year 2000, there will be more people infected with HIV in Asia than all of Africa...”³³

However needle exchange is not absent from Asia. Nepal has been notable in its acceptance of the philosophies of harm reduction and effective needle exchange programmes have existed in Kathmandu and Pokhara for several years. The state of Manipur in North East India has also implemented needle exchange and other harm reduction measures following findings of overwhelming levels of HIV infection amongst injecting drug users there.

A situation assessment on drug use and HIV vulnerability in South east and East Asia prepared for the UNAIDS Asia Pacific Inter Country Team by the Asian Harm Reduction Network³⁴ included the following conclusions:

- HIV infection among injecting drug users in South East and East Asia is a major problem
- Few if any countries have responded to it effectively
- There are large gaps in information
- The situation is dynamic, new drugs are constantly appearing and new populations are becoming involved with drug use
- Explosive epidemics of HIV have occurred among injectors and will continue to happen if nothing is done.

International harm reduction movements

Recent international developments in harm reduction have included the development of the International Harm Reduction Association, the Asian, Central European, African and South American Harm Reduction Networks. These organisations exist in order to promote and develop the philosophies and principles of harm reduction worldwide.

Contact details for these organisations can be obtained from HIT, tel 0151 227 4012.

Key events in the development of injecting drug use

1656	Wren experiments with intravenous injecting
1850s	Fergusson syringe developed
1853	Fergusson syringe adapted and used by Wood for subcutaneous injection
1858	Hunter realises systemic action of subcutaneous injection
1867	Lister develops the concept of antisepsis
1860s	Subcutaneous injection of morphine 'popularised'
1874	Diacetyl morphine (heroin) synthesised
1876	Infection spread recognised as a complication of subcutaneous injecting (tetanus)
1920s	First reports of 'illicit' intravenous drug use
1930s	First reports of infective complications of intravenous drug use (malaria) Needle sharing recognised as a transmission route for disease
1940s/50s	Intravenous route becomes the norm for illicit injectors
1960s	Disposable plastic syringes and needles introduced Injection of crushed tablets first reported Hepatitis B transmission risk recognised
1980s	HIV transmission risk recognised pilot needle exchange schemes began in the UK
1990s	Hepatitis C identified and transmission risk recognised



keypoints

- The first intravenous injections probably took place in the 17th century.
- At first it was thought that injections only acted locally and that there was therefore little risk of dependence.
- The forerunner of the modern syringe was probably the Fergusson syringe of 1853.
- The modern disposable syringe was developed in the 1960s.
- The provision of syringe exchange to prevent the spread of HIV has been strongly resisted in some countries – including the USA.
- Syringe exchange exists in all areas of the UK, with the probable exception of Northern Ireland.

section

2

The research

basis for

promoting safer

injecting

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Introduction

There is a great deal of research evidence, from many countries, which supports the effectiveness of needle exchange programmes in helping to prevent the spread of HIV.

Needle exchange appears to be most effective in combination with other interventions such as substitute prescribing and outreach programmes. Although it is impossible to evaluate the separate contributions of individual interventions, needle exchange appears to have comprehensively demonstrated its effectiveness in helping to decrease the risk – particularly of HIV infection – associated with injecting drug use.

For workers to engage successfully with injectors, there has to be an acceptance of injecting as simply another lifestyle choice, albeit one that contains many risks.

Research is now showing that avoidance of blood-borne hepatitis viruses requires more comprehensive behaviour changes than have been necessary to limit the spread of HIV. It is important that the success of syringe exchange in slowing the spread of HIV amongst injecting drug users is not allowed to breed complacency.

Research on the prevalence of injecting in the UK

Drug injecting and HIV infection are increasingly global issues. The number of countries reporting drug injection in 1997 was 121, and the number reporting injecting related HIV infection was 82³⁶.

Because of its illicit nature, injecting drug use tends to be hidden and difficult to quantify. It is therefore impossible to give a definitive figure of the number of injectors in the UK.

The 'prevalence' also depends on the definition adopted. For example, different figures will be obtained depending upon whether prevalence is defined as people who have injected in the last:

- Month
- Year
- Five years

or, in their lifetime.

Several sources of information about the prevalence of injecting in the UK exist. The now discontinued Home Office Addicts Index provided national data on the number of people in treatment who injected a restricted range of drugs (including heroin and cocaine). Commonly injected drugs like amphetamine sulphate were not notifiable and the Index only identified between a fifth and a tenth of users of the notifiable drugs.

In the National Sexual Attitudes and Lifestyle Survey in 1992, Johnson *et al.* estimated that 100 000 people in England and Wales had injected in the previous five years and 175 000 had injected in their lifetime³⁸. National surveys which sample the whole population may under-report injecting prevalence because of non-disclosure of injecting and sample bias. They can nevertheless provide a useful guide to the minimum injecting population size.

Within individual localities, the 'capture-recapture' method has been used as an alternative way of estimating the size of the drug injecting population.

This is based on a widely used method for estimating the size of wild animal populations within a particular habitat. A sample of animals is 'captured', marked and then released. Another group is then captured and the overall population size is worked out from the percentage of the second group that is recaptured.

This technique has been applied to drug injectors by 'capturing' them in two or more sets of data, for example by comparing drug agency data to police arrest data. This technique has its own limitations as the samples need to be independent, and this is rarely possible.

A forthcoming publication from the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) is expected to give practical guidance for people who wish to estimate prevalence in their own localities.

The contribution of ethnographic research

In order to understand how to intervene to reduce the risks from injecting, it is necessary to understand the practices that people use and the contexts in which they occur. Ethnographic research methods have been used to investigate these questions among people who inject.

Ethnography was developed by anthropologists to study other cultures. Its methods are now used to study sub-cultures – such as drug injecting – within the developed world. Ethnography produces rich descriptions of what people do in natural settings and has proved invaluable in examining what actually happens in the injecting process.

Ethnographic research is useful when examining areas of behaviour about which little is known. The findings are often later used to develop questions in larger scale surveys. As Lambert and Wiebel have said: **"It is at this exploratory stage of research that ethnographic and qualitative methods can make significant contributions to the knowledge and understanding of problems and to the formulation of subsequent questions for quantitative research."**³⁹

Many fundamental understandings of injecting behaviour, such as the identification of frontloading and backloading, have been identified through ethnographic research (see page 48).

The similarities between ethnographic methods and aspects of outreach work have been noted. This has led to its incorporation within some outreach work and the development of models of practice that integrate ethnography and outreach^{40,41}.

The spread of HIV within injecting communities

In a comprehensive and succinct review, Bloor⁴² has summarised the spread of HIV among injectors internationally. Key points include:

- HIV infection is thought to have first occurred amongst drug injectors in 1975 in New York, in 1978 in Italy and in 1980 in Amsterdam
- About half of the cumulative cases of HIV in Europe are amongst injectors
- The heaviest concentrations of HIV positive injectors in Europe are in Italy, Spain, Southern France and Scotland
- The prevalence of HIV differs between countries and within countries
- The epidemic amongst drug users is fairly independent from that among men who have sex with men
- Most American studies show considerably higher HIV prevalence amongst black injectors
- Although studies show fewer female injectors, they may be more likely to be HIV positive.

Preconditions for rapid HIV spread

Gerry Stimson⁴³ has identified three conditions necessary to produce an HIV epidemic amongst injecting drug users:

- 1 A substantial population of injectors
- 2 The potential for HIV transmission i.e. equipment sharing as a cultural norm
- 3 The presence of HIV.

These preconditions are present in locations all over the world. In many countries where there were few if any measures such as needle exchange to help prevent the spread of HIV, it has spread extremely rapidly amongst injecting drug users.

Table 2.1 gives a clear indication of what can happen when harm reduction measures are not in place. This pattern has been, and continues to be, replicated in many countries across the world.

Table 2.1: Prevalence of HIV and restricted availability of sterile injecting equipment

Place	Early % of IDUs tested HIV positive	Time span (years)	% of IDUs tested HIV positive after time
New York City	10	5	50
Edinburgh	0	1	40+
Bangkok	2	1	40
Manipur (India)	0	1	50

(Adapted from Des Jarlais *et al.*⁴⁴)

The impact of needle exchange services

International findings

In a review of studies conducted in five cities that all had a low baseline of HIV positive injecting drug users, and implemented large-scale availability of sterile injecting equipment, Des Jarlais *et al.*⁴⁴ observed that the high rates of HIV seroconversion (see Table 2.1) do not occur. Under these circumstances, prevalence can be stabilised or decrease, as shown in Table 2.2.

Table 2.2: Prevalence of HIV and wide availability of sterile injecting equipment

Place	Early % of IDUs tested HIV positive	Time span (years)	% of IDUs tested HIV positive after time
Glasgow	4	6	1
Lund (Sweden)	less than 2	6	less than 2
Sydney	4	7	4
Tacoma (USA)	0.4	5	3
Toronto	0	5	2

(Adapted from Des Jarlais *et al.*⁴⁴)

Studies showing rising HIV seroprevalence, after the introduction of needle exchange

In Vancouver and Montreal high levels of HIV have developed among injecting drug users in spite of established needle exchanges in both cities. Strathdee *et al.*⁴⁵ suggest that in Vancouver this may be because:

- The predominance of cocaine injectors, who are likely to inject much more frequently than heroin injectors, may have meant that not enough equipment was supplied
- There is a lack of a range of accessible harm reduction services – for example, methadone treatment places are scarce.

This Canadian evidence is unusual and has been seized on by critics of needle exchange. Rather than showing that needle exchange is ineffective, it may best be taken as a reminder that needle exchange alone is not necessarily enough. Aspects of the way the service is provided, and the availability of complementary services, such as methadone maintenance, can make it more (or less) effective.

UK HIV prevalence rates

In terms of the three preconditions for an HIV epidemic identified by Gerry Stimson, in 1984, the UK had:

- An estimated 100 000 injectors
- A mobile injecting population in which sharing of equipment amongst single or multiple sharing partners was normal and widespread
- HIV present to varying degrees in all health regions.

This being the case the continuing low prevalence of HIV among injectors during the 1990s represents a significant success for harm reduction interventions. However, as the preconditions for an epidemic still exist we cannot be complacent. As Stimson has said: **“the HIV epidemic has been averted, not prevented.”**³⁵

The consistent prevalence rate of HIV amongst injecting drug users tested by the Public Health Laboratory Service in England and Wales (excluding London) is about 1%⁴⁶. The prevalence rate in London is thought to be about 7% or less⁴⁷.

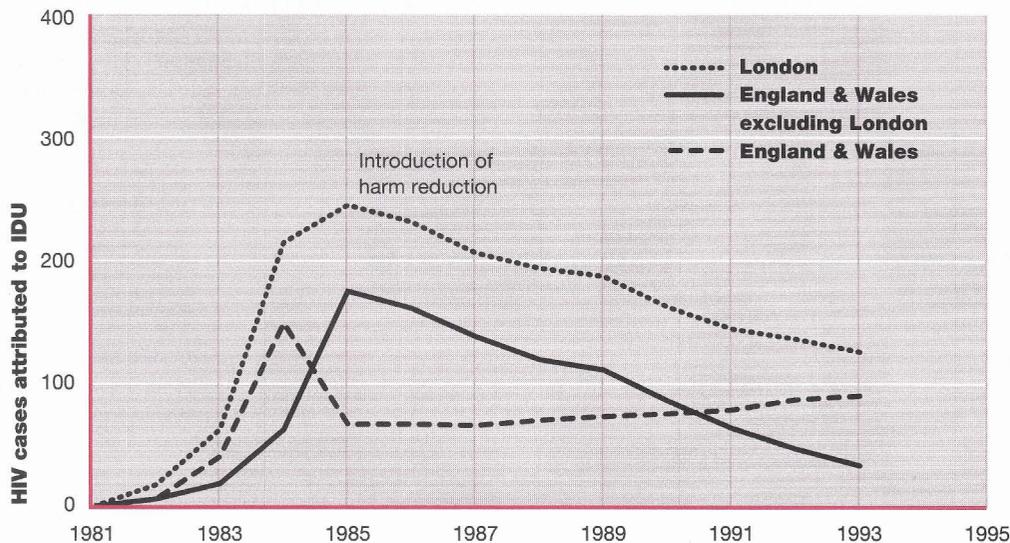
In Scotland the prevalence of HIV infection in Edinburgh in the mid-1980s of 50% or more amongst injectors tested, is now running at around 20%. In Glasgow, the rate is similar to England and Wales at around 1%.

The total number of AIDs cases related to injecting drug use in the UK to the end of 1997 is 945⁴⁸. The cumulative number of HIV cases between 1985 and 1997 attributed to injecting drug use is 3147 out of a total of 31 001, or about 10% of cases. The incidence of new HIV infections is low, about 130 cases per year in England and Wales, with about 75% of these cases being in London.⁴⁸

The pattern of the English HIV epidemic

Epidemiologists have shown that the peak and subsequent decline of incidence of HIV infection amongst injecting drug users in London occurred between 1983 and 1986 (Figure 2.1).

Figure 2.1: Estimated annual HIV incidence from IDU. Adapted from A Sexual Health Ready Reckoner⁴⁹



Interventions such as needle exchange came into being slightly after the peak, which suggests that whilst needle exchange and associated interventions are very likely to have assisted in the decline in incidence of HIV amongst injectors, other factors may be involved.

These other factors are likely to have included behaviour changes triggered by HIV public information campaigns and reinforced by the introduction of formal needle exchange facilities.

Harm caused by needle exchange

Some concerns about risks from the introduction of needle exchange have been voiced. These include:

- Injecting drug use might increase amongst long-term injectors as a result of an increased supply of equipment
- Initiation of new injectors might increase.

A report prepared for The Lindesmith Centre in 1997 cites six previous reports prepared for the American government, that all concluded that access to sterile injecting equipment does not increase injecting. They also noted that in American needle exchange programmes the minimum age of injectors had remained stable, while in Amsterdam, the average age of injectors is increasing⁵⁰.

It is possible that the absence of widespread availability of sterile injecting equipment might lead some injectors to decrease or abandon injecting as a preferred route. When imprisoned, some injectors stop injecting. Regrettably, others move towards higher risk forms of injecting, resulting in outbreaks of HIV and hepatitis B infection⁵¹.

Furthermore, evidence from around the world suggests that in times of needle and syringe scarcity, many injectors simply adopt riskier practices that involve sharing more often, and with more people – such as in shooting galleries.

Promoting safer injecting practice

The promotion of safer injecting practice forms a cornerstone of needle exchange policy and community interventions.

Formal needle exchange, and community interventions should consist of much more than the basic requirement of providing appropriate clean equipment to injectors.

Raising the topic of safer injecting and providing appropriate understandable information to clients and into injecting networks is an essential part of the process.

Evidence for behaviour change

A 1988 study by Power *et al.* examined a group of 127 regular drug users between 1986 and 1987; 115 of whom had injected at some time in their life. Of this 115, 12% ceased injecting during the time of the study – around 65% of these said this was because of concerns about AIDS. Forty-two percent of the 115 were still injecting but said they were no longer sharing, although less than half of these said this was because of concerns about AIDS. Reasons given by those who were no longer sharing, but not because of concerns about AIDS, includes easy availability of equipment and concerns about hepatitis⁵².

Before the widespread introduction of needle exchange, the level of equipment sharing was relatively high. Sharing has reduced but persists, particularly among sexual partners and close friends (see Section 3: Viral transmission, drugs and their preparation).

There are now many reports^{53,54} of injecting behaviour change, including changes in the:

- Use of sterile equipment
- Frequency of sharing of injecting equipment
- Number of sharing partners
- Cleaning of syringes.

Des Jarlais *et al.* reviewed studies on syringe exchange attenders in the five cities described in Table 2.2. This showed that between 73% and 87% of those interviewed in the different sites had changed their behaviour in some way because of concerns about AIDS.⁴⁴

Injecting and risk

Injecting drug use is by far the most hazardous way of introducing drugs into the body. A large body of research shows that it creates a risk to health from:

- Blood-borne viruses
- Bacterial infections
- Fungal infections
- Damage to the circulatory system
- Increased likelihood of overdose
- Increased dependence.

It is obvious to suggest that the best way of reducing the harm associated with injecting will always be to stop injecting. However, it is now well established that many injectors do not want to stop and also do not want to be offered 'treatment' for their injecting.

It is evident that needle exchange is an effective way to reduce the sharing of needles and syringes. Particularly in light of our current understanding of the hepatitis C epidemic, there is a need for further development and evaluation of interventions which are focused on reducing the risks from injecting.

Increasing the effectiveness of needle exchange

It is widely believed that the effectiveness of needle exchange is increased because of the opportunities it offers for one-to-one, brief interventions with people who inject. These represent the 'added value' of specialist syringe exchange over other forms of provision such as pharmacy exchange. There has however been little published work on this aspect of needle exchange.

Interventions may focus on information and awareness of unconsidered risks – such as 'backloading' or needlestick injuries. They may involve the development of skills to manage particularly persistent and difficult situations such as sharing between sexual partners. They can give guidance on the prevention and management of overdose and can also involve the provision of low-threshold access to a range of other primary care services such as viral testing, sexual health promotion, hepatitis B vaccination or general health checks.

Contact with needle exchange workers can also enable referral to treatment services. Interventions can even have a role in the prevention of injecting.

Needle exchange provides valuable contact with a socially excluded group. Further research is needed into the true extent of the largely unrecognised 'added value' of the work that is conducted and the ways that it can be further increased.

Making appropriate contact

For needle exchanges to be effective, they have to make and maintain contact. Successful projects have achieved this by being easily accessible, welcoming and by treating drug users with respect.

There have been examples of unsuccessful projects, which may have failed to make contact with many injectors because of a combination of:

- A hostile local community
- Unsuitable staff or staff attitudes
- Restrictive practices such as strict 'one for one' exchange policies
- Erratic or inadequate opening times
- Unsuitable sites.

The effect of different intervention strategies

There has been considerable attention paid to researching the extent and nature of risk behaviours among people using syringe exchange and those who are 'out of contact'.

By contrast, there has been less focus on the detailed practice of syringe exchange work such as:

- The impact of different forms of service organisation (e.g. a stand-alone exchange or one attached to a treatment service)
- The particular strategies used by specialist workers with drug users in the promotion of safer health behaviour.

Some information giving is generally presumed to accompany the dispensing of clean equipment. This process has however received comparatively little attention. Work by Speed and Bennett⁵⁵ in 1997 suggests that it may be a mistake to presume that some of these basic activities occur in the way that is commonly supposed.

Variations in the context, philosophy and organisation of specialist services mean that specialist syringe exchange work is conducted in different ways. The lack of systematic study of the communications and intervention strategies, or the scope of work, means that we have relatively little understanding about how these variations affect outcomes, or even the range of strategies used.

Especially in the light of concerns about HCV, there is an evident need within syringe exchange services to evaluate the effectiveness of different approaches to the achievement and maintenance of health behaviour change related to injecting risk.

In doing so, it would seem useful to follow Pawson and Tilley's⁵⁶ approach to evaluation. This examines the influence of both 'contexts' and 'mechanisms'.

'Contexts' influencing syringe exchange

Factors involved in the context of a service include whether the service setting is:

- Rural
- Urban
- Inner city.

Other factors include the level of:

- Syringe exchange activity (number of clients)
- Specialist knowledge and skills of the staff.

And whether the service is:

- Stand alone or linked to drug or other services
- Statutory or non-statutory.

In addition to the above, an important factor is the operating philosophy of the service which could include:

- Expectations regarding syringe returns
- The degree of user involvement
- The level of anonymity.

'Mechanisms' used to promote change

The mechanisms deployed to achieve change include:

- The extent to which a client relationship with an identified worker is encouraged or enabled
- The conducting of systematic risk assessments.

If systematic risk assessments are conducted, are they assessing risk of:

- Blood-borne virus transmission
- Overdose
- Physical damage
- Drug problems
- Sexually transmitted disease?

Other mechanisms include:

- The ways in which posters and leaflets are used
- The provision of allied health and social services such as hepatitis B vaccination or benefit advice.

Targeted interventions and campaigns can either be aimed at specific risk behaviours, for example:

- Backloading and frontloading
- Paraphernalia sharing
- Needlestick injuries
- Sharing between sexual partners

or at specific populations, for example:

- Black and other visible minorities
- Non-literate users
- Homeless users.

Opportunities to prevent initiation into injecting

Syringe exchange was originally developed to perform a secondary prevention role, namely, avoiding the acquisition of HIV infection among people who have begun injecting. This remains its key objective.

However, it is increasingly clear that:

- Other primary health care activities can also be performed as part of syringe exchange
- It is feasible to conduct primary prevention work – which prevents the initiation of non-injectors – as part of syringe exchange.

Consequently, where it is possible to prevent people beginning to inject, this will be a valuable goal. In an evaluation of a brief intervention used with current injectors, Hunt *et al.*⁵⁷ describe how such prevention work can be undertaken.

The intervention is based on the following insights from research:

- Existing injectors initiate the majority of new injectors
- Observing injecting is very influential in moving non-injectors from disapproval towards trying injecting
- Frequently, injectors are unaware of the impact of injecting in front of non-injectors
- Injectors generally prefer not to initiate non-injectors
- A proportion of injectors lack the skills to manage requests to initiate a non-injector, even though they would prefer not to do so.

The intervention had five main objectives:

- To raise the topic of initiation and allow the initiation of others to be better considered and anticipated
- To increase participants' awareness of risks to themselves as initiator and the person being initiated
- To reduce the occurrence of activities that may inadvertently increase initiation of others into injecting
- To increase competence in managing some commonly occurring scenarios where initiation is requested
- To increase disapproval of initiation and reluctance to initiate others.

The intervention was brief and consisted of:

- A review of the participant's own initiation
- A review of his/her initiation of others
- Discussion of the risks from initiation for him/herself and the person being initiated
- Identification of behaviour that may inadvertently promote injecting
- Generation and rehearsal of responses to a series of vignettes describing common initiation scenarios.

The outcomes of Hunt's study were encouraging: the intervention was successfully delivered and was acceptable to both injectors and drug workers, and at a three-month follow-up in a sample of 73 people:

- Participants used in front of half as many non-injectors, from 97 down to 49
- Disapproval of injecting in front of non-injectors increased significantly
- Initiation requests fell to fewer than half, from 36 to 15
- Ability to manage initiation requests improved for over half the sample
- Disapproval of initiation increased and willingness to initiate others decreased significantly
- The participants initiated six new injectors in the three months prior to the intervention and only two in the three months after it.

Primary prevention within needle exchange

Syringe exchange is a successful example of secondary prevention. When people have begun injecting, syringe exchange acts to prevent potential harm. There are however, opportunities for primary prevention as part of syringe exchange, as have just been described.

Such interventions would give added value to syringe exchange in a way that will be increasingly sought by purchasers. With the growing calls for ways of preventing injecting, this type of intervention offers part of a possible solution.

By adopting such work and seeking similar opportunities, it is possible to achieve an important public policy objective, and also put specialised harm reduction services on a more secure footing by adding to the value of the service.

It is important to clarify that such work is not an argument for prevention evangelising within syringe exchange. It is essential that the accepting, non-judgemental ethos of syringe exchange, which underpins its success, is not jeopardised. If someone chooses to inject, a syringe exchange is definitely not the place where they should feel admonished or overly pressurised to stop.

Nevertheless, injectors will sometimes choose not to inject someone else, choose not to promote injecting, or choose to use other routes of administration. Supporting people in these choices seems a practical and legitimate activity within syringe exchange services which may have an important preventative function as well as buttressing the position of harm reduction services.

Audit

Audit involves measuring the performance of services against a standard. It could be a valuable tool for measuring the effectiveness of particular aspects of needle exchange schemes. The absence of any comprehensive audit tool for needle exchange has hindered the development of services.

In a rare exception to this, an audit of risk behaviours amongst injecting drug users attending syringe exchanges in North West England took place in six exchanges in 1997⁵⁵. The great majority of the 96 injecting drug users interviewed were primarily heroin injectors for whom injecting was their primary or only route of use. This audit found that sharing of paraphernalia (spoons, water and filters) was extensive.

Over 50% of the sample said that they had never received information about the risks of sharing paraphernalia. Only 4.2% said they had received information about risks associated with paraphernalia from a drug worker.

Spoons were the item most frequently used at the same time or after someone else. Worryingly, over half of those interviewed said that they did not know of any risks associated with these practices. About 33% mentioned the potential risks of HIV, hepatitis or both.

In contrast, a low number (8.2%) of the subjects reported using a syringe and needle after another person.

The recommendations of the audit were that drug service commissioners should:

- Encourage providers to assess, through audit, the current state of risk taking amongst their injecting clients
- Include financial support to develop new ways of getting messages across to users
- Set realistic targets for improvement which take into account the profile of the local service, the level of risk the clients are engaging in and the skill mix of the local provider unit
- Fund further research and audit through central organisations
- Fund training and information services which are responsive to the needs of the specific area.

Drug service managers should:

- Examine and review the work of syringe exchange staff and their interventions with clients and develop local systems of recording
- Encourage staff to develop a comprehensive understanding of the injecting process
- Invest in training and skills' development, which enables staff to confront clients' behaviour in an atmosphere of support
- Encourage an atmosphere of change and adaptation based on continuous audit and research
- Set local targets for change
- Develop a system of clinical and managerial supervision which enables staff to discuss the positive and negative aspects of their work and potential barriers to effectiveness.

Drug workers should:

- Adapt and develop their knowledge of the injecting process and develop skills in encouraging dialogue about risk behaviours and risk taking
- Keep abreast of recent research and information about the injecting process
- Develop skills in health promotion techniques and procedures, thereby developing interesting and exciting methods of getting messages across to service users
- Develop methods of evaluating the success of their own interventions with clients
- Communicate with other similar units which achieve good practice with the aim of replicating effective work.

Key questions

Wodak⁵⁸ has identified several key unanswered questions that must be addressed in order to prevent the continued global rise of HIV infection amongst injecting drug users:

- How to convince policy makers of the value of needle exchange in countries such as the USA, where needle exchange does not exist, or exists at minimal levels
- How to best ensure adequate dissemination of sterile injecting equipment in different settings and different injecting cultures
- How to maximise the benefits of needle exchange in situations where the primary injected drug is not heroin
- What to do in developing countries, where adequate sterile supplies may not be available for general health care needs.

In countries such as the UK, where injecting equipment and harm reduction services are available, the key question for the future is probably how can the spread of hepatitis B and C through the sharing of injecting paraphernalia be prevented?



keypoints

- A considerable body of evidence shows that the health behaviour of people who inject can change when they are aware of the risks from shared needles and syringes and have access to clean injecting equipment.
- The effectiveness of syringe exchange and related harm reduction policies has almost certainly been crucial in keeping HIV prevalence rates among injectors in the UK as low as they are.
- In countries where effective harm reduction strategies are not implemented, HIV prevalence rates amongst injectors can rise to over 50% in only a few years.
- There has been relatively little research conducted into how workers interact with clients and the effectiveness of different approaches. Further work is needed to develop a better understanding of what constitutes 'best practice'.
- Research into an intervention to prevent the initiation of new injectors suggests that significant primary prevention gains can also be achieved within needle exchange services. Further development of this aspect of syringe work is necessary.
- Audit is an important means of promoting and encouraging effective interventions. There is a need to develop a comprehensive audit tool for needle exchange and increase the way that audit is used to improve services.

section

3

Viral transmission, drugs and their preparation

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Introduction

The preparation and sharing of drugs have tended to be overlooked as potential points of transmission for blood-borne disease.

The singular focus on needles and syringes in the messages given to drug injectors, although valuable in shaping behaviour, has also encouraged the erroneous belief amongst users that, as long as needles and syringes are not directly shared, then they are safe.

The risks posed to injecting drug users from hepatitis infection are such that all workers they come into contact with need to feel confident about discussing the detail of the injecting process, to enable clients to make changes to protect themselves.

There is also a need for an understanding of the ease by which any of the equipment involved in the preparation of an injection (including lighters, knives, etc.) may transmit hepatitis C. Simple changes to the practice of preparation, such as using a personal area and washing hands before and after injecting, will significantly lower the risk of bacterial and viral infection.

This section describes the injecting process and the equipment used in detail. The potential infection and other risks involved at each stage are examined. It also addresses the risks that are specific to particular substances.

Transmission of blood-borne viruses

Blood-borne viruses are transmitted when blood cells from an infected individual are passed into the bloodstream of another person.

The infective dose for hepatitis B may be 0.00004 mL of blood⁵⁹, i.e. less than one five hundredth of a drop of blood.

Hepatitis and HIV can potentially be passed on by any equipment which has been in contact with an infected person's blood.

The understanding that many things in addition to syringes and needles may be involved in the transmission of blood-borne viruses has increased since the late 1980s.

Ethnographic research into injecting behaviour has developed understanding of the potential for transmission of blood-borne viruses. It has brought to light previously unrecognised risk practices in the injecting process which may facilitate transmission of infections, that have a social element which involves the sharing of drugs rather than just the sharing of injecting equipment.

The range of behaviours that may be employed for the sharing of drugs, including frontloading and backloading (which are discussed on page 48), is so wide as to preclude any simple messages for avoiding risk.

Rather than long lists of things they should or should not do, drug injectors need information on how cross infection may occur, so that they can work out risks and ways of minimising them for themselves.

In 1997 Timothy Moore summed this up saying:

“Simplistic health messages are inappropriate for the complexity of hepatitis C. Messages such as ‘Just say no to sharing’ do not provide enough information to provide guarantees of safe practices. Injecting drug users need to be provided with sufficient information, opportunity and equipment to carry out aseptic injecting technique at each injecting event... The fact that drug use and the learning of ritual and practice occurs in cultural and social contexts provides an avenue for public health measures to be incorporated into the behaviour of drug users.”⁶⁰

For these more complex messages to be conveyed effectively a range of health information will need to be presented in a variety of culturally appropriate ways.

In Australia, a key to getting complex information into injecting networks has been to help facilitate and support drug user forums and support systems. In contrast, UK drug user organisations have tended to receive little support from drug services or drug service purchasers.

Factors associated with continued sharing of syringes and needles

Although the sharing of syringes and needles has been substantially reduced as a result of increased knowledge amongst injectors about the transmission risks of HIV, Power⁶¹ suggests several reasons why it may continue to occur:

- High-risk situations – street purchases, prison
- High-risk circumstances – withdrawal, intoxication, initiation
- Stigmatisation of injectors
- Isolation from networks.

And most commonly:

- Sharing with sex partner.

Drug workers need to raise these issues with injectors and help them identify where and when sharing may occur, and develop strategies for avoiding such situations.

Injecting paraphernalia

Apart from syringes and needles, other paraphernalia associated with injecting includes:

- Spoons or other containers (for mixing drugs)
- Water
- Water containers
- Alcohol swabs
- Filters
- The preparation surface
- Acidifiers
- Tourniquets
- Other utensils, such as lighters, knives, etc.

All these paraphernalia are associated with the transmission of blood-borne viruses, most notably hepatitis B and C, although HIV transmission is a possibility.

The risk of infection from separate injecting events is likely to be low, but repeated exposure to low-risk events may result in infection.

Drug workers need to discuss all types of paraphernalia and the environment in which they are used, with injectors. Many are dealt with in detail in the following pages.

Spoons

Spoons are often used as a receptacle in which to mix drugs prior to injection.

Contact of the spoon with another person's needle which has been previously used (e.g. when drawing up communally), may be enough to transmit some infections, such as hepatitis C.

Injectors should be encouraged to mark their spoons for easier identification and keep them for sole personal use in a place to which other injectors do not have access.

Spoons should be cleaned with bleach and rinsed thoroughly before use. Similar precautions should be taken with other receptacles used for drug preparation, such as the bases of soft drink cans.

Lending and borrowing of spoons amongst injectors appears to be a common behaviour, at least amongst those attending needle exchange schemes in the North West of England.⁶⁵

Ensuring that drug users are educated about the risks of this behaviour is one of the key tasks for needle and syringe exchanges for the future.

Water

Sterile water for injection is the ideal option where it is available. This should be for personal use only and discarded afterwards.

Once opened it should not be kept for subsequent injection, as it will contain bacteria from the air, and may have been used by another person.

Many UK projects do not give out sterile water because of legal restrictions (see page 108) and budget constraints.

Water that has been boiled for five minutes and allowed to cool in a covered pan is sterile. It must be reserved for personal use and discarded after a single injecting session.

Water that has been boiled in a kettle and allowed to cool is unlikely to contain any living bacteria and, given that nearly all the components of the injecting process (other than a new needle and syringe) are not sterile, it is usually 'clean enough'.

Water drawn straight from the tap is better than bottled water, distilled water or 'pure bottled water' which may have been exposed to bacteria in the air and kept warm for some time, and are therefore likely to contain far more organisms.

Drawing up from a communal pot of water represents a risk behaviour for the transmission of hepatitis and HIV if another person's used needle and syringe come into contact with the water source. Very small amounts of blood which will not be visible to the naked eye can transmit infection.

Filters

Filters are used by injecting drug users to minimise the risks associated with injecting undissolved particles which may be contained in the drug solution.

Ways in which filters can be associated with harm include:

- They can be saved after injecting as they will contain a small amount of drug residue and then be reused later by the original injector or by others⁶¹ and thus spread blood borne viruses and/or serious bacterial infection
- Filters can also have contact with multiple needles if more than one injector draws up from the same spoon
- Loose fibres can be drawn up into the syringe, causing circulatory problems if injected. This is most likely to happen when cotton wool or clothing fibres are used. Clean, unused cigarette filters, especially those intended for hand rolling, are probably the best option, but even these can cause problems if broken open.

In important research examining a previously neglected area, Scott *et al.*⁶² explored how effective different types of filter were at removing particulate matter from the solution when preparing different drugs.

As Scott *et al.* comment:

"In the microcirculation of the body, the smallest vessels are the capillaries, which are approximately 8 microns in diameter. Next are the terminal arterioles which are between 20 and 50 microns. The more particles there are (in a solution for injection) and the bigger they are, the greater the risk to health."⁶²

Their initial work has concentrated on the effects of filters on tablets and street heroin prepared for injection. The results are not directly applicable to the street, because wide variations in preparation practice occur, which will result in differing amounts of particles in the solution prior to filtering and therefore after filtering as well. However there are some broad indications from this work which are useful.

They tested a variety of filters – cigarette filters, Rizla, cotton buds and a commercial syringe filter called an Acrodisk. These filters were tested on drug solutions prepared from Physeptone (methadone) 5 mg tablets, Diconal, Temgesic and street heroin.

Although all filters reduced the number of particles in the solutions, the Physeptone tablets formed a slurry at the bottom of the syringe, causing loss of 10% of the active drug and also representing a risk if injected. Scott *et al.* found that none of the filters was effective with the Physeptone solution:

“The Physeptone solutions were thick and did not pass through the filters quickly or easily. Several filters had to be used as they clogged and it took longer than was deemed acceptable to the IDU.”⁶²

All other injections were able to be filtered.

The most effective filter was perhaps, unsurprisingly, the commercially produced Acrodisk. Of the makeshift filters, the most effective was the Rizla, for both the tablets and the street heroin.

An important point was the necessity of handling the filter as little as possible prior to use, to minimise the potential for contamination with bacteria.⁶³

There are several different types of commercial syringe filters on the market. Some of these are designed to filter out the bacteria which can cause skin infections and abscesses.

Although these filters may prove to be valuable, they should be viewed and employed with caution as they may:

- Create a false sense of confidence among users, i.e. that they will filter out all blood-borne infection – they won't: viruses cannot be filtered out as they are inside blood cells
- Be reused or shared in a similar way to home-made filters
- Be so fine that injectors consider them to be either too slow or so effective that they are removing too much of the drug from the solution
- Block and burst under pressure because of the very small pore size.

Acidifiers

Acidifiers are used to enable brown heroin – which is manufactured principally for smoking – to be more easily dissolved into a solution for injecting.

They do not need to be used with the more refined hydrochloride form of heroin (as it is highly soluble in water) or in the preparation of other drugs such as cocaine (except in the form of crack) or amphetamine for injection.

Various acids such as lemon juice and vinegar are used for heroin preparation. Any substance already in liquid form may contain bacteria or become contaminated with hepatitis or HIV viruses.

Lemon juice, whether fresh or bottled, has been associated with thrush and other fungal infections within the body, which have been reported to cause loss of vision and blindness due to retinal damage (candidal endophthalmitis)^{64,65}. It has also been associated with endocarditis and other conditions.

Ascorbic acid (vitamin C) or citric acid are thought to be the safest options. These can cause irritation to veins and tissues, so the smallest amount possible should be used. The more acid the solution, the more irritant it will be. Ascorbic acid is probably less caustic than citric acid and may therefore cause less irritation. Injectors may find difficulty in obtaining ascorbic or citric acid from pharmacists as their supply is illegal under Section 9a of The Misuse of Drugs Act 1971 if they know or suspect the person requires them for injecting (see page 108).

Environment

The environment in which injecting takes place can be a factor in the transmission of blood-borne viruses.

The risks associated with injecting will be reduced if there is adequate:

- Privacy
- Time
- Lighting
- Running water
- Sterile injecting equipment.

For homeless injectors, few if any of these may be available. For these injectors at least, there is an argument for the provision of safer injecting rooms.

Injecting with another person present lowers the risks of an undetected overdose, but will increase the risk of viral transmission if any equipment is shared.

Surfaces

If a surface used to prepare injections is contaminated with blood or with water from flushing out syringes, there is a risk of transmission of infection. Ideally surfaces should be cleaned with bleach before injecting. A more practical approach for many injectors would be to prepare an injection on something disposable such as a newspaper or magazine. This will also serve to mark out a 'personal area' for injecting.

Tourniquets

Tourniquets should only be used if they are really needed. Many injectors, at least early in their injecting careers, will be able to access superficial veins without using tourniquets. If left in place for too long they can cause a limb to be deprived of its blood supply and eventually, cause gangrene.

If a tourniquet is not loosened prior to injection, excess pressure has to be used to get the solution into the vein which can lead to leakage of the drug into the tissues or to rupture of the vein. If an injector is frequently complaining of 'missed hits' (see page 79), check that they are releasing the tourniquet before injecting.

If tourniquets are contaminated with blood and subsequently shared, they represent a hepatitis C transmission risk.

Raising veins without using tourniquets

Various techniques can be used to help superficial veins become more accessible, including:

- Clenching and re-clenching the fist
- 'Windmilling' the arm
- Any vigorous exercise
- Letting the limb hang down
- Bathing the arm in warm water.

When working with people who inject depressants (usually opiates) it is important to point out the dangers of injecting in a bath – a period of unconsciousness could easily result in drowning.

Preparing different drugs for injection

Heroin

Heroin bought on the street in the UK usually comes as a brown powder of varying purity. It is mixed with water in a suitable receptacle, usually a spoon. An acidifying agent is then added.

The solution is heated to help the heroin dissolve, allowed to cool and then drawn into a syringe, usually through a filter to attempt to remove any insoluble particles.

The following field note from Jean-Paul Grund's research illustrates a typical heroin injecting process:

"The man starts to prepare a shot. He puts his spoon on the table and throws in a knife tip of heroin. He adds some lemon juice and with his syringe he gets some water which he carefully squirts in the spoon, around the heroin powder just under the edge of the spoon. He heats the spoon and when the stuff has dissolved he stirs and draws the solution into the syringe through a piece of cotton. After checking the syringe for air bubbles, he puts his syringe on the table. Then he takes his belt and puts it around his left arm. Making a fist he pumps up his veins. He looks carefully at his arm and then sticks in the needle. When he pulls the piston back, blood immediately runs into the syringe, then he pushes the piston about halfway. Then he draws up some blood and pushes the mixture into his vein. He moves the syringe a little, draws plus or minus 1.5 cc blood and pushes it in again. All the time his hand is a fist. Then he unties the belt, pulls the needle out, puts it down and waits about two minutes, concentrating on the rush."⁶⁶

The subject in the above process has exposed himself to additional risks by using lemon juice to acidify the solution and by not releasing his tourniquet until after he has injected (indeed until after he has flushed his works through with blood). Not releasing the tourniquet raises the pressure in the vein whilst injecting and will significantly increase the likelihood of vein damage and of the drug flowing out of the vein into surrounding tissue – the consequent 'bump' often being called a 'miss'.

Amphetamine

Amphetamine sulphate powder does not need to be heated or acidified in order to dissolve it for injection. The preparation process is otherwise similar to that of heroin for injection, although it may also be mixed in the syringe.

Cocaine

The preparation of cocaine hydrochloride for injection is similar to that of amphetamine, although some cocaine injectors may mix the solution in the syringe. An acidifier is needed to prepare crack cocaine for injection.

Using injecting equipment to share drugs

The sharing of drugs is also associated with cross infection risk. The following are the main sources of risk.

Frontloading and backloading

Frontloading and backloading are terms that describe methods of sharing drug solutions using the syringe as a measuring device. It should be noted that frontloading and backloading are sociological terms coined by the researcher who first observed and recorded the practice.⁶⁶

It may be necessary for workers to describe the processes, rather than use terms which may be unfamiliar to injectors who are nevertheless engaging in the process. Terms used by users themselves include dividing, splitting, halving and slurping.⁶⁷

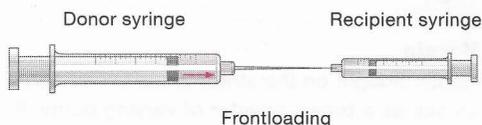
Neither frontloading nor backloading increase the risks of transmission of blood-borne viruses if all the equipment involved is sterile and previously unused. However it is difficult for drug injectors to be certain that this is the case, in what can be a busy and confused environment. For this reason education around this issue would aim to discourage these practices.

Frontloading

Frontloading is the practice of drawing up a drug solution into a 'donor' syringe, and then measuring out appropriate amounts into one or more other syringes (Figure 3.1).

It is termed 'frontloading', because the solution is squirted through the hub or front of the syringe. Frontloading is done with syringes which have detachable needles: the donor syringe has a needle attached, the 'recipient' syringes do not.

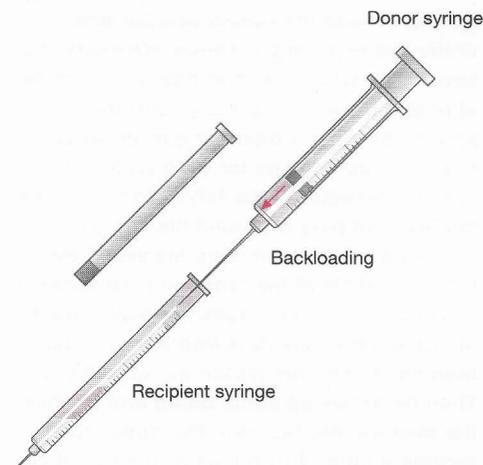
Figure 3.1



Backloading

Backloading differs from frontloading in that it is done with insulin type syringes with fixed needles (Figure 3.2). The plunger is removed from the recipient syringe and the drug solution squirted in through the back opening. It requires considerably more dexterity than frontloading, as an air gap has to be allowed between the drug solution and the front of the syringe, to allow for the reintroduction of the plunger without pushing out the drug solution.

Figure 3.2



Sharing from the spoon

Sharing from the spoon simply involves drawing up directly from the spoon used for preparing the solution. Again, this should not increase the risks of virus transmission as long as new sterile equipment is used once only by all participants.

If a previously used spoon, syringe or needle is employed, then everyone who subsequently draws up from the spoon is at risk of contracting whatever blood-borne viruses that equipment may be carrying. Others at risk include those who might reuse the filter.

Because it is so easy for these risk events to occur, it is simpler and better if drug users have a rule for themselves that they will never share (lend or borrow) spoons or filters.

Substance-specific risks

There are a number of risks of injecting which are unique to particular substances and many that apply to some substances but not to others. These are important areas of safer injecting information to be given to users and are now discussed in detail.

Opiates

Heroin

Drug-specific risks of injecting street heroin are surprisingly few and include:

- Overdose
- Reactions to the heroin or the 'cut'
- Rarely, kidney damage.

The other risks such as transmission of viruses or bacteria are not confined to heroin injecting. Other bodily reactions to opiates such as pinpoint pupils and constipation are not dependent on injecting as the route of administration. The transmission of tetanus and botulism has been associated with the use of 'black tar' heroin in the USA.

Oral methadone

There is clear anecdotal evidence that some people in the UK inject oral methadone mixture 1 mg/1 mL, the psychoactive effect of which is likely to be minimal as even 10 mg is a very small dose for an opiate user with tolerance to the drug; and 10mLs is a large amount of fluid to inject, especially as it is a thick, often sugary liquid.

The usual thick green syrup formulation is likely to cause slowing of the blood and rapid vein collapse. This is an instance where, if harm reduction is the aim, there is little that can be done to make the practice safe.

Workers should strongly discourage this practice. Attempts, such as those in Australia, to make the practice safer by providing specific equipment are misguided as they are unlikely to reduce drug-related harm.

In some centres people are prescribed methadone, usually for supervised consumption, in a more concentrated 10 mg/1 mL form. Clearly if unsupervised this is more likely to be injected than 1 mg/1 mL.

In Australia, Darke *et al.*⁶⁸ conducted one of the few studies of oral methadone injectors.

The formulation of oral methadone in Australia (5 mg/1 mL) is more concentrated than that usually available in the UK (1 mg/1 mL) and injectable preparations are not prescribed to drug users.

Darke *et al.* observed in their study that injection of oral methadone was common and was associated with more likelihood of:

- Abscesses and infections
- Deep vein thrombosis
- Heroin overdose
- Poorer general health
- Higher levels of psychological distress.

Methadone ampoules

Approximately 10% of methadone prescriptions in the UK are for injectable methadone⁶⁹, which has been little researched.

The ampoules come in various strengths, the weakest of which is 10 mg/ 1 mL. The strongest – 50 mg/1 mL – is only manufactured on the instructions of some doctors for their patients.

There have been reports of significant injection site 'burning' and other damage from the highly concentrated 50 mg/1 mL solution. As clients may be reluctant to show this damage to their prescribing doctor for fear of 'losing their script', workers should be alert to the problem.

The only things that can be done to reduce such damage are for clients to rotate sites and/or ask their doctor for a less concentrated form, or to transfer to oral methadone either on a temporary or permanent basis.

'Homebake'

'Homebake' is a phenomenon that appears to be limited to Australia and New Zealand. It refers to the practice of using home chemistry to remove codeine from 'over the counter' and 'prescription only' drugs, and subsequently converting the codeine to morphine and then to heroin⁷⁰.

It seems to have arisen as a response to a lack of heroin in Australia in the early 1980s, probably as a result of effective enforcement of drug supply restrictions.

'Homebake' also sells more cheaply than alternatives such as heroin, which has helped to maintain its presence in the Australian drug scene. The lack of consistency and precision inherent in a home-produced drug means that the strength is often uncertain and many of the agents or by-products of manufacture are left in the finished product. These agents, such as chloroform, pyridine, hydrochloric acid and acetic acid may cause significant damage.⁷⁰

The use of homebake seems to be closely associated with localised injection related damage, such as skin rashes and abscesses.

Perhaps the most worrying aspect of homebake use is that it has often been sold in ready loaded syringes. Obviously, since the sterility of the syringes cannot be guaranteed, this method of supply represents a considerable risk for transmission of blood-borne viruses.

Kompot

Kompot is found in many parts of Central and Eastern Europe. It is made by various methods which often involve boiling up poppy straw and distilling the residue until left with a dark brown liquid.

It is very cheap to produce and buy, although it tends to be a seasonal product so the price rises substantially in the winter.

The problems associated with the use of kompot are similar to those already described for homebake. It is often sold in or from pre-loaded syringes, which brings with it an increased risk of the spread of blood-borne viruses.

Stimulants

All stimulants have an effect of enhancing confidence and altering judgement about risk. In circumstances where people are injecting while intoxicated they may be less cautious about infection and other risks.

Workers can address this issue with people when they are not intoxicated, by helping them to develop strategies for ensuring that they do not place themselves at risk when they are intoxicated. An important factor is the necessity to have sufficient injecting equipment for their needs: in some cases this may mean users taking large numbers of syringes away from the needle exchange.

The use of considerable quantities of stimulants increases the likelihood of development of psychosis⁷¹.

Amphetamine

After preparation on a spoon, the solution is usually drawn through a filter. Any residue should be discarded or swallowed rather than injected.

King *et al.* studied the constituents of UK street amphetamine in 1993 and found that the majority of amphetamine sulphate powder was of very low purity (on average about 5%). The bulk of the powder is probably made up of 'fillers' such as caffeine, dextrose and other sugars. By comparing police and customs seizures they found that:

"...nearly all the amphetamine in the UK had been imported from The Netherlands."⁷²

The low purity may lead those who use amphetamine in quantity to become more likely to inject it, in order to maximise the effect, and when they do, to inject large quantities.

In an Australian study of amphetamine users, Hall *et al.* found that injecting of amphetamine was significantly related to the experience of hallucinations, violent behaviour and paranoia⁷¹.

Amphetamine 'base' has become more widely available in the UK recently. This is usually of greater purity than amphetamine powder. It is an irritant to the veins when injected.

Cocaine

Cocaine injecting is associated with higher rates of HIV infection than other drugs⁷³ and with significantly more localised tissue damage than heroin injecting. There may be several factors causing the tissue damage. Cocaine's duration of effect when injected is very short and can be measured in minutes rather than hours. This means that cocaine injecting is likely to be more frequent for those who use it as a primary drug. Also, cocaine has been employed for centuries for its anaesthetic properties. Deadening of pain at the injection site may lead the user to inadvertently cause more injury whilst injecting. Cocaine has a constricting effect on peripheral blood vessels and therefore the healing of injuries associated with cocaine injecting may be delayed⁷⁴. It may also be toxic to local blood vessels⁷⁵.

Cocaine stimulates the cardiovascular system, raising the heart rate and blood pressure, so users are at an increased risk of circulatory problems such as strokes or heart attacks.

There is also an increased risk of seizures for cocaine users.

Drugs with local anaesthetic properties such as lidocaine may be used to adulterate cocaine⁷⁶.

Since cocaine injecting is likely to occur very frequently, this should be taken into account when issuing injecting equipment.

Sedatives

Temazepam

Temazepam comes in several forms:

- Tablets
- Liquid-filled capsules that are easily injectable – the Home Office requested withdrawal of these capsules in the late 1980s because they were being widely injected
- Gel-filled capsules – introduced as a response to the problem of the injecting of liquid-filled capsules. Often referred to as ‘jellies’ or Gelthix these were withdrawn from NHS prescription in 1996, and are no longer manufactured in the UK, but may still be available occasionally on the street
- Elixir, which is in liquid form and has a low concentration of temazepam. There are only occasional reports of this being injected.

In a 1992 study, Ruben *et al.*⁷⁷ found that reasons given for using temazepam included:

- The ‘buzz’ associated with injecting
- Its sedative/relaxing effect
- Increased confidence when engaging in crime or prostitution
- Self-medicating opiate withdrawal
- Heroin not available
- Taking it with heroin for the combined effect.

Because of the particular formulation, Temazepam, when injected, can cause severe problems. It is highly irritant to the veins and when intoxicated, people can become very reckless in their behaviour.

Temazepam injectors often quickly damage the peripheral veins in their arms and legs to the point that they are no longer usable. This may lead them to look for alternative deeper veins, often in the groin.

Gelthix temazepam causes particular problems because it is warmed to make it liquefy. After injection it cools in the body and resolidifies, leading to vein blockage.

Injecting temazepam into the femoral vein increases the likelihood of deep vein thrombosis in the legs. Other problems associated with injecting temazepam include:

- Accidental injection into an artery
- Irritation of blood vessels
- Irritation/infection of tissues at the injecting site.

Arterial injection of temazepam will often lead to amputation of the whole or part of a limb.

The following experience of a vascular surgery unit is not unusual, or confined to Merseyside.

“Of particular concern recently in the Merseyside area is the increasing prevalence of disastrous complications arising from the intra-arterial injection of soluble temazepam...”⁷⁸

This report written in 1993 resulted from the admission of 11 injectors with complications from arterial injection of temazepam within a six-month period. More worryingly, this report noted that although six of the 11 had apparently injected into the femoral artery by mistake, five had apparently injected into the radial artery in the arm, because of mistaken instruction from their peers! In all of these five cases this resulted in varying degrees of gangrene in the fingers.

Barbiturates

Barbiturates are now rarely injected in the UK. This mirrors the decline in general prescribing of barbiturates. Their place in medicine began to be taken by benzodiazepines in the 1960s.

Injecting injuries associated with barbiturates are similar to those found with benzodiazepines, except that there tends to be more local tissue damage when injected subcutaneously; tissue dies and sloughs off around the injecting site. Older textbooks refer to these injuries as ‘barb burns’.

Barbiturates are also associated with a high overdose risk, especially when used in combination with other drugs. Withdrawal from dependent use can cause seizures which can be fatal.

Alcohol

The injecting of alcohol seems to be something that occurs occasionally, either as an experiment or as a feature of chaotic, compulsive drug use. The substance injected is usually a spirit such as vodka. Alcohol injected intravenously is highly irritant to the veins and has little psychoactive effect, except in volumes that will cause great damage.

Other injected drugs

Steroids

In the past steroid injecting was confined to sport – particularly body building. However, now other groups, most notably young men, are using steroids to develop muscle for more cosmetic reasons.

Steroid injectors often perceive themselves as being 'different' to other injectors of illicit drugs. This may be true in that rather than using their drug of choice for any specific immediate psychoactive effect, they are injecting steroids as part of their pursuit of 'fitness'.

However, steroid injectors run the same risks of transmission of blood-borne viruses as any other injecting drug users who may share their equipment or paraphernalia. In fact the relative risk may be greater, as practices such as different people drawing up from 'multi-dose' vials may occur⁷⁹.

The attraction of steroid injectors to generic agency needle and syringe exchange may be made more difficult because of an unwillingness to be associated with the stigma surrounding the injection of drugs such as heroin, cocaine and amphetamines.

Other risks associated with steroid injecting centre on overuse and the fact that there are many fake or mis-described 'steroids' available on the illicit market.

Although their use can incur cardiovascular and liver problems, the health risks of using steroids, such as liver cancers and psychological problems, tend to have been over emphasised. Perhaps this is an attempt to discourage their use. Also, research reports tend to concentrate on cases that have developed severe problems.⁸⁰ The value of giving accurate, credible information is as important in this area of drug use as it is in any other.

Steroids are usually injected intramuscularly.

Cyclizine

Cyclizine is an antihistamine with an anti-emetic effect (i.e. intended to help prevent sickness). It is recommended for the treatment and prevention of motion sickness, post-operative vomiting and Menières disease.

Use of cyclizine in the UK by opiate users probably resulted from 'home psychopharmacology' experiments. Drug injectors were trying to recreate the effects of injecting Diconal, a tablet containing 30 mg of cyclizine and 10 mg of dipipanone.

Cyclizine is no longer available as an 'over the counter' item, as pharmacists are now not allowed to break down dispensary stock and repackage it for over the counter sale, and there is no commercially available 'over the counter' cyclizine pack⁸¹.

Cyclizine was previously a constituent of Marzine. The formulation of Marzine has been changed so that it includes a different anti-emetic which does not produce the same psychoactive effects, if injected, as cyclizine.

Drug users using cyclizine almost invariably inject it. Its use is closely associated with injecting injuries, which may be as a result of:

- Injecting crushed tablets
- Poor technique
- Frequency of injecting.

There is a lack of research into the exact nature of the physical and psychoactive effects of cyclizine when used in conjunction with illicit drugs, but it does appear to enhance some of the effects of opiates and opioids⁸².

This enhancing effect appears to be particularly pronounced in the case of methadone and has been described as lasting between 30 minutes and six hours. Users reported various, mostly positive effects at the time of taking the drug, but all reported feelings of depression afterwards and most described cravings to use the drug again.⁸²

It is not possible to offer advice that can reduce the risk of injecting cyclizine. Workers need to guide and support clients towards stopping, by helping them weigh up the pros and cons of continuing and giving them clear reasons as to why they should stop.⁸³

Drug preparations containing cyclizine are:

- Cyclimorph injection (cyclizine and morphine)
- Diconal tablets (cyclizine and dipipanone)
- Migril tablets (an anti-migraine drug containing cyclizine, ergotamine and caffeine)
- Injectable cyclizine.

Although widespread availability of the injectable form of cyclizine would not alter the problems of behaviour associated with its use if taken by opiate users, it has been suggested that it could eliminate much of the physical damage associated with the injection of crushed tablets. This is a complex ethical dilemma for clinicians. However, it would be very difficult to be certain that you were complying with the first principle of medicine – to do no harm – in prescribing injectable cyclizine.

Cutting agents

It is commonly believed that drugs are often bulked out with substances which may be very injurious to health, such as brick dust, scouring powder, rat poison, etc. Whilst it is not possible to assert that this has never happened, it is certainly a widely propagated myth that it takes place on a widespread and regular basis⁸⁴.

Where harmful adulteration does occur it is likely to be as a result of accident rather than design.

Perhaps the origins of this belief are bound up in attempts to dissuade people from beginning injecting, whilst at the same time furthering familiar stereotypes of disgust for injectors and injecting behaviour.

It does not appear to make economic sense for a drug dealer to bulk out the product with dangerous substances which would endanger the lives of customers. Where cutting does occur, it tends to be with substances which are (or at least are intended to be) inert.

Coomber, in a survey of drug dealers undertaken via the internet, found that almost none of them indulged in bulking out of drugs by cutting them with other substances, cutting usually having taken place further up the supply chain, often before importation.⁸⁵

This finding has been supported by analysis of seized street heroin, nearly half of which had not been cut at all⁸⁶. Of those seizures that had been diluted, the most common diluent was paracetamol, closely followed by caffeine. These are used because they melt at a similar temperature to heroin. Caffeine actually helps to give a higher yield of heroin vapour than would be possible were it not present, acting like a flux to help the heroin vaporise⁸⁷.

Recent seizures in Merseyside of paracetamol that had been baked in an oven to use as a cutting agent for heroin demonstrate that cutting does happen further down the supply chain.⁸⁸

Average UK purity levels

According to the Institute for the Study of Drug Dependence⁸⁹, average purity for different drugs in the UK in 1995 was as follows:

- Heroin – 42.5%
- Cocaine – 53%
- Crack cocaine – 80% plus
- Amphetamine – 10%.



keypoints

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- Rather than long lists of things they should or should not do, drug injectors need information on how cross infection may occur, so that they can work out risks and ways of minimising it for themselves.
- Workers need a good understanding of the injecting process so that they can discuss individual risks such as backloading, and offer advice.
- Repeated exposure to 'low-risk events' such as sharing spoons, increases the likelihood of eventual infection.
- Spoons used for preparing injections should be marked for identification and kept for sole personal use in a place to which other injectors do not have access.
- Water drawn straight from the tap is better than bottled water and distilled water (even if it says 'pure water') which are likely to contain far more organisms.
- Of the injecting paraphernalia, it is probably hardest to discourage people from re-using filters. The fact that they represent a real risk of viral transmission means that users must be alerted to the dangers of sharing them.
- Different drugs may present particular risks for injectors; they need to be given enough information about their drug of choice in order to minimise those risks.

section

4

Routes of administration

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Introduction

This section looks at routes of drug administration. Although many of the injecting drug users who use needle exchange do not wish to stop, some do, and promoting alternatives to injecting can be an important part of working with them.

The section also looks at the alternative methods of drug use and the pros and cons that they hold for different people using different substances.

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Intravenous injection is the most prevalent injecting route amongst heroin, cocaine and amphetamine injectors. This is because:

- Intravenous injecting is the quickest route for getting large amounts of the injected drug to the brain, thereby maximising the immediate effect
- It is associated with less acute local infections and irritation than other routes of injection.

It is therefore covered in detail.

Needle exchange workers should have a good understanding of all the different routes of injecting, as well as being able to promote alternatives to injecting.

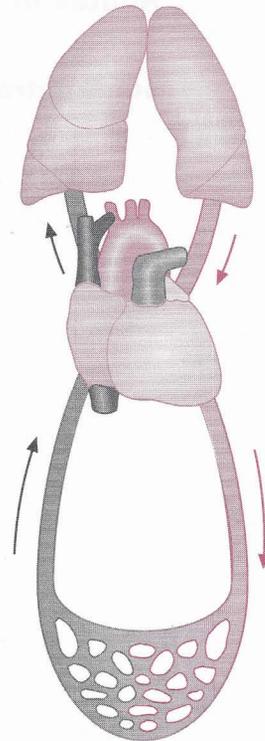
Workers must know how the circulatory system works in order to be able to explain it to their clients so that they in turn have a basic understanding to help them avoid or delay some of the potential harms associated with injecting. This is therefore described first, prior to the discussion of sites and injecting technique.

How veins collapse is described in detail in Section 5: Vein and other local damage.

The circulatory system

The circulatory system exists to facilitate the flow of blood to all tissues in the body (Figure 4.1). The transfer of oxygen and nutrients between the cells and the blood takes place from microscopic vessels called capillaries.

Figure 4.1: Schematic illustration of the circulatory system



The heart is the pump that drives this flow of blood to the capillaries in the tissues of the body to facilitate oxygen transfer and then back to the lungs to be re-oxygenated.

Arteries and veins

Arteries take oxygenated blood from the lungs to the rest of the body (Figure 4.2). They progressively branch out, diminishing in size, until they reach the capillaries.

Figure 4.2: Artery construction



Artery

The blood then passes through the capillaries in the tissues, releases its oxygen, and is collected in small veins (Figure 4.3), which by joining together progressively increase in size. The arteries return de-oxygenated blood to the lungs via the heart.

Figure 4.3: Vein construction



Vein

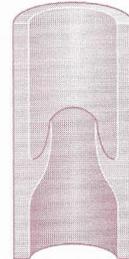
Accordingly, all drugs injected into veins must follow a route back – through veins of increasing size – to the heart.

From the heart the drugs are pumped the short distance to the lungs where the blood passes through the capillaries of the lungs to be re-oxygenated, and then they return to the heart to be pumped to the brain.

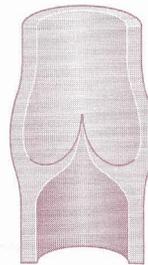
When a drug is injected into a vein, it reaches the brain via the lungs in a matter of seconds. The drug is not significantly diluted: hence the experience of the 'rush' or 'hit' as the brain becomes rapidly intoxicated.

The exception to this description is the pulmonary artery, which is unique because it carries de-oxygenated blood from the heart to the lungs. All other arteries carry oxygenated blood. Similarly the pulmonary vein is unique because it carries oxygenated blood from the lungs to the heart.

Figure 4.4: Valves



Valve open



Valve closed

Valves are only present in veins, and assist the flow of blood back to the heart by preventing back flow.

Differences between arteries and veins

The ways in which veins and arteries differ have been summarised in Table 4.1 adapted from *Getting to the Point* – a set of Health Education Authority training manuals for staff working with drug users – *Volume 2: Health and Safer Injecting*.⁹⁰

Table 4.1: Comparing the characteristics of arteries and veins

Arteries	Veins
Carry oxygenated blood	Carry de-oxygenated blood
Carry blood away from heart	Carry blood towards heart
Hold bright red blood	Hold dark red blood
Blood at high pressure	Blood at low pressure
Bleed profusely – spurt blood	Do not bleed profusely – ooze blood
Served by many nerves	Served by few nerves
Thick walls	Thin walls
Very elastic/muscular	Not elastic/muscular
No valves	Valves
Less numerous	More numerous
Recognisable pulse	No pulse
Mostly deep	Deep and superficial

The fact that all venous blood must pass through capillaries in the lungs before going to the arteries means that solid matter and air bubbles that are injected into veins cannot reach the brain (except in exceedingly rare circumstances – it is only possible if someone has a hole between the chambers of the heart); they will instead get trapped in the capillaries of the lungs. The idea that they can cause strokes (damage to the blood vessels in the brain) is untrue for the vast majority of people.

Blocked arteries and veins

There tends to be only one major arterial route to each area of tissue in our bodies. If an artery is blocked all the tissue it supplies can die.

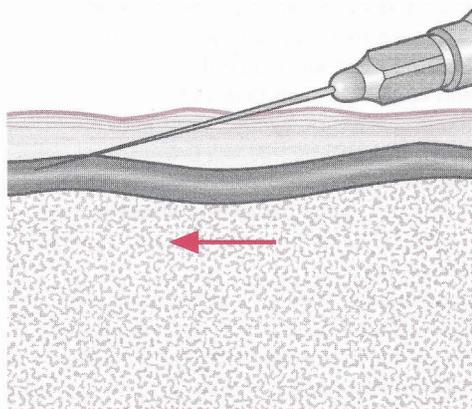
Venous blood return tends to be more adaptable: veins form a complex network with many junctions. If a vein becomes blocked, blood can find its way through a smaller vessel further back down the system. It is when these smaller vessels become overloaded with blood that swelling occurs in the hands or feet. The effects of blocked arteries and veins are detailed in Section 5: Vein and other local damage.

Intravenous injection

Intravenous injecting is a highly efficient way of introducing drugs into the body.

However, when drugs are injected, the filtering and delaying mechanisms that protect us when things are absorbed via the gastro-intestinal tract, lungs or skin are bypassed. The potential for infection and overdose are much increased.

Figure 4.5: Diagram of an intravenous injection



Correct intravenous injection technique

Many problems can be caused by incorrect injecting technique. Below are some guidelines for a safer and more effective technique of superficial intravenous injecting.

1. Prepare drugs for sole personal use using equipment that is only used by the injector.
2. Identify the vein to be used – in some people this is straightforward, others may have to palpate (feel for) veins. Veins feel like a piece of rubber tubing under a sheet.
3. Always inject with the blood flow, i.e. towards the heart.
4. Choose the smallest possible bore and length needle for the site – for superficial veins this will be a short orange or brown one.
5. Clean the site – with soap and water, or an alcohol swab.
6. Introduce the needle into the vein at a shallow angle, a change in resistance is felt as the needle enters the vein.
7. Pull back the plunger to identify that the needle is in a vein – a small amount of dark red venous blood should trickle into the syringe. If a tourniquet is used it should be loosened immediately after accessing the vein.
8. Inject slowly to reduce the likelihood of damage to the vein and to lower the overdose risk. Do not flush out – this will significantly increase trauma to the vein.
9. Remove the needle slowly – if the needle is removed too quickly, the vein may collapse.
10. Immediately apply pressure to the site – bruising is caused by bleeding into the surrounding tissues. Immediate firm pressure will limit the amount of bruising caused.

Sites for intravenous injection

Generally, the arms are the least risky place to access veins for injecting. The main aim of advice given to injectors, after prevention of spread of blood-borne viruses, should be to maximise the length of time they are able to use the veins in their arms.

When the arm veins can no longer be used, injectors should consider, and workers should promote, switching to a non-injecting route of drug use.

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Irreversible damage to the veins can occur where there is:

- Repeated use of the same injecting site
- Poor technique
- Injection with blunt needles
- Injection with needles that are too large
- Injection of irritant substances.

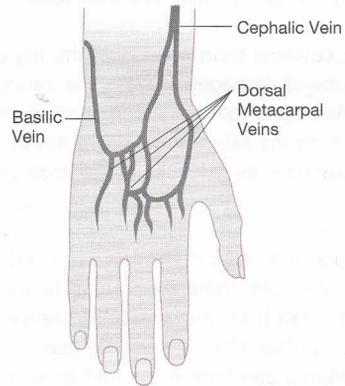
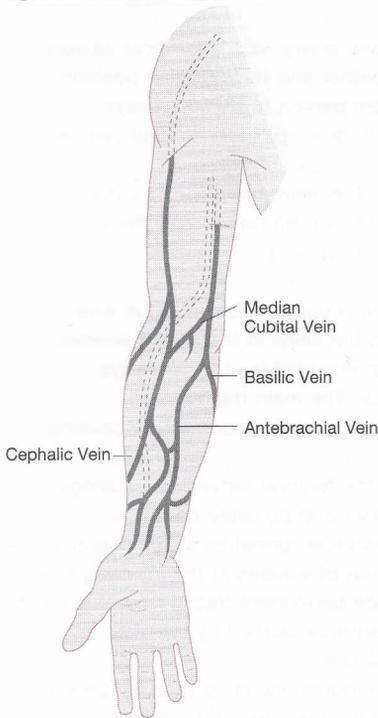
Arms

The arms are the site of first choice for intravenous injecting, the superficial veins on the inside of the elbow being the most accessible. Using these sites is least likely to result in inadvertent damage to surrounding tissues and body structures, providing a good hygienic injecting technique is used.

The loss of usable arm veins will leave the injector with stark choices: either to stop injecting and switch to smoking or sniffing, or to move to another site on the body with greater inherent risks.

It is for this reason if no other that injectors should be encouraged to use the least damaging techniques to access veins, in the hope that this will enable them to use their arm veins until such time as they no longer want to inject, or want to stop using drugs entirely. Measures that will help to keep veins and skin healthy include:

- Washing hands before and after injecting
- Introducing and removing needles gently
- Injecting slowly
- Alternating injection sites, allowing veins to rest and recover
- Smoking rather than injecting at times in order to rest veins
- Becoming ambidextrous so that they can inject in both arms – it is best to encourage this before the onset of any problems, as it is much easier to practise new techniques when relaxed and the outcome is not crucial
- Making sure that clients understand the proper use of tourniquets, and release them prior to injecting
- Staying away from sites that have become infected
- Using sterile needles and syringes only once.

Figure 4.6: Arm veins

Adapted from *Getting Off Right. A Safety Manual for Injection Drug Users*. Harm Reduction Coalition, New York.

Hands

The veins on the backs of the hands can be highly visible, although they tend to be small and fragile.

As it can be difficult to hide the evidence of injecting here, many avoid these sites. Furthermore, if complications such as infection or cellulitis occur, they are likely to be much more disabling in the hand than in the arm and lead to severe problems, especially if rings are left in place on the fingers.

Fingers should be avoided as the veins are very small. If clients insist on injecting in their fingers, they should understand the vital importance of removing rings prior to injecting. If a finger starts to swell with a ring in place, it can quickly obstruct the blood flow leading to loss of the finger. The artery that supplies the finger lies just below the vein, if the artery is damaged the finger can 'die'.

Legs

The superficial leg veins are unlikely to be viable long-term prospects for injecting. They contain more valves (see Figure 4.4) which increases the likelihood of problems as injecting at or around a valve causes more turbulence and can damage the valve. The blood flow in the veins is slow, they are superficial and tend to wobble.

As the flow of blood in the leg veins is upwards (i.e. towards the heart) it can be difficult to self inject in the correct direction in the legs i.e. with the needle pointing up towards the top of the leg.

Because they are furthest from the heart, and due to gravity, blood flow through the leg veins is slow. If drugs are injected too fast, the veins will be unable to cope. When this happens, fluid escapes from the vein, around the needle, causing a 'miss'. The only way to avoid this is to inject as slowly as possible.

Healing of injection site damage and resistance to infection are less reliable because the blood flow is slow. Abscesses and other infections are therefore a greater risk for those injecting into their legs.

Varicose veins form, usually in the leg veins, because of damaged valves. The varicose vein has tight, thin walls and is often raised, stretching the skin. They should not be injected into, as they can bleed profusely.

Feet

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Although the veins in the feet are used by some injectors, there are several factors which make them an unsuitable choice for anything other than occasional use:

- Venous blood flow in the feet is slow
- If local infection occurs, this can lead to loss of mobility
- Injury to the feet may be slower to heal than in other areas, especially in individuals with already damaged circulation
- Fungal infections of the feet are common – there may be an increased risk of introducing these into the body
- In the UK, for most of the year there is a need to wear shoes and socks which may encourage or compound problems of infection.

As with the legs, injections in the feet should be done as slowly as possible to prevent overloading the vein.

Femoral injecting

The femoral artery, vein and nerve lie very close together and their relative position varies from person to person. *Grays Anatomy*⁹¹, describes the femoral vein as follows:

“The femoral vein accompanies the femoral artery through the upper two thirds of the thigh”. (Figure 4.7)

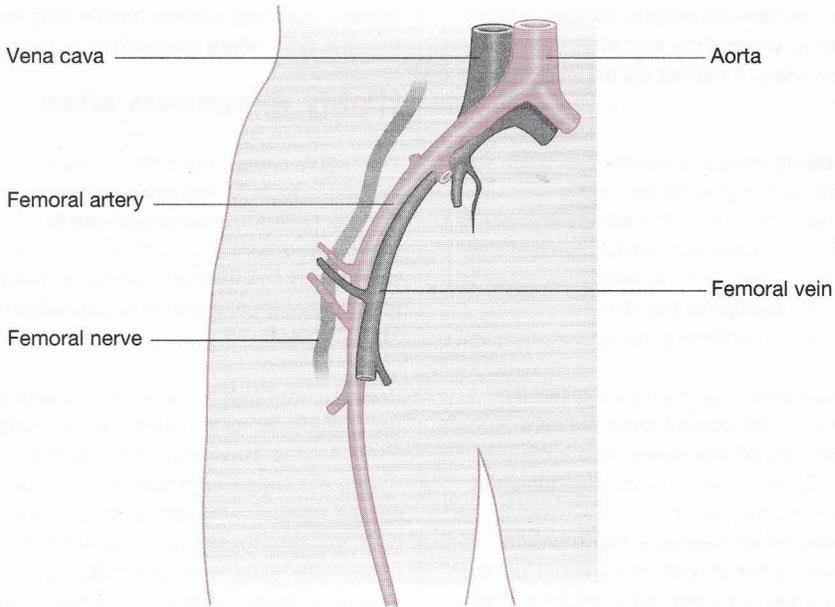
Femoral injecting is usually begun when access to the veins in the arms becomes difficult or impossible, and is always dangerous. The main dangers are:

- Injecting into the femoral artery causing damage
- Hitting the femoral nerve and causing intense pain and possible paralysis
- Abscess/ulcer formation at the injecting site
- Formation of sinuses at the injecting site – sinuses are permanent tracks from the vein to the skin surface caused by infection or persistent use
- Fistulae (communicating tunnels) between the femoral artery and vein are also a possible complication of injecting into the femoral vein
- Circulatory damage to the leg, including deep vein thrombosis
- Varicose ulcer in the lower part of the leg – caused by damage to the leg veins.

Rozler *et al.* in America in 1988 noted seeing an increase in the number of complications associated with femoral injecting. As well as many of the above, these also included mycotic aneurysm and pseudoaneurysm.⁹²

Just how dangerous and damaging femoral injecting will be on any one occasion is affected by:

- The understanding the injector has of their underlying structures
- The dexterity of the injector
- The state of mind of the injector (e.g. intoxicated or not)
- The substance being injected
- Luck.

Figure 4.7 Representation of the relative positions of the femoral vein, artery and nerve

This diagram should in no way be interpreted literally – each individual's internal anatomy is different

Of the dangerous sites, femoral injecting is the most frequently practised. It has to be acknowledged that some individuals with good technique use this site for many years before they experience problems.

Working with femoral injectors

For workers the question that should be asked is: how far should I engage or help with a potentially very dangerous behaviour, and in what ways can I reduce harm? There is a very fine line to be found between sensible information and collusion. For the worker where that line falls will depend on:

- Background and training
- What they are employed to do
- Agency policy.

It is impossible to remove the risk from injecting into the femoral vein. It is however, possible to increase the knowledge level of many injectors about their own anatomy, without encouraging or helping with femoral injecting. By increasing the knowledge of the risk simply by using the diagrams included in this book (with the clear understanding that these diagrams are only representative and each individual's anatomy will in reality be somewhat different) some injectors may choose not to use this site.

Many will not change their behaviour and choose to continue femoral injecting, sometimes requiring treatment for the results of poor injecting technique.

For those agencies who prescribe injectable drugs, it would be unethical to do so to known groin injectors without confirming that their understanding of femoral injecting is sound and their technique good.

An agency policy and adequate staff training on the level of advice it is acceptable to give femoral injectors will help to remove a lot of the existing uncertainty and stress for workers – unfortunately, it cannot do the same for injectors.

The following advice is sometimes given to groin injectors. It should be clearly understood that whilst this advice is likely to help injectors avoid accidental injection into the femoral artery, it in no way guarantees a successful injection in the femoral vein, or avoidance of the femoral nerve.

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It is advice that should only be given by workers who are trained and confident in their understanding of the issues, and have the support of their agency to do so. The client needs to be advised to:

- Use the correct needle (either a blue or green hub, depending on the amount of fat and tissue between the skin surface and the femoral vein)
- Find the femoral pulse
- Keeping the fingers on the pulse, move two fingers' breadth away towards the centre line of the body (it is important to be very clear about which direction to move in, as movement in the wrong direction will increase the chance of hitting the femoral nerve)
- Push the needle in straight (i.e. at a 90° angle with the skin surface)
- Pull back the plunger to establish that the needle is in the vein
- Inject slowly
- Apply pressure to the site for at least one minute following removal of the needle.

This instruction should be given on the clear understanding that the worker is offering no guarantees for the safety of the procedure, which is carried out at the client's own risk. If the injector accidentally hits the femoral artery they should:

- Discontinue the injection
- Remove the needle
- Apply firm pressure to the site for at least 15 minutes
- Seek medical advice.

When discussing 'groin' injecting, clarification should be given that the conversation is about femoral injecting – some people may think that the term refers to injecting in the penis.

Highly dangerous sites

The highly dangerous sites included in this section – such as the neck and penis – are not discussed to enable workers to recommend their use to clients. It is not possible to ensure that the use of these sites is safe enough to make their promotion an ethical option.

Workers may well be faced with users who are already using, or talking about using these sites. As it is often impossible to make these dangerous behaviours safe enough, workers should advocate the use of other, safer sites or routes of administration. Where the use of other, safer sites is not a possibility, workers should be heavily encouraging these injectors to:

- Move to another safer route of drug taking such as smoking
- Take a break from injecting
- Contemplate community or inpatient drug treatments.

Breasts

Although there are usually small veins visible in the breasts, especially in pregnancy, it is dangerous to try and inject into them because they are very small and liable to break. They are also next to milk ducts which can be accidentally filled with fluid. Because there is no direct blood supply to the inside of the ducts, the fluid stays there and the risk of developing mastitis, infections or abscesses is high.

Deep veins

When searching desperately for a usable vein, some injectors will look for deep veins, by simply 'digging around'. Where this is because of a lack of awareness of available sites, supplying relevant information may be useful. For those who have limited knowledge of their body structures, education about the risks of hitting arteries, nerves or bones should be offered.

Axilla (armpit)

The armpit is a dangerous site for injecting because of the close proximity of arteries and nerves to the subclavian vein.

Neck

Self injecting in the neck is extremely dangerous, difficult to do and should be strongly discouraged. Arteries, veins, tendons and nerves are all very close together. Engaging in discussion about ways to 'make it safer' should not detract from the central message that it is too dangerous.

Part of the risk arises from the fact that for self injectors, self injection in the neck requires the use of a mirror. This difficulty may lead injectors to ask others to attempt neck injection for them, thereby increasing the chances of both viral transmission and local injury, and removing all personal control over the process. It may also lay the injector open to at least a manslaughter charge if the person dies – even if they requested the injection.

The common complications of neck injecting may be similar to those in other areas, such as cellulitis and abscess formation⁹⁹, but have even more devastating effects. An abscess or cellulitis in the neck can cause dangerous pressure on nerves or obstruct the airway.

Other problems include:

- Accidental injection into an artery – if this occurs, then the drug and any other matter contained in the solution will go directly to the brain, potentially causing a range of neurological problems, including strokes
- Aneurysm (weakening of a blood vessel wall)
- Nerve damage, including vocal chord paralysis.

Penis

Injecting in the penis is sometimes attempted when other possible sites are no longer available.

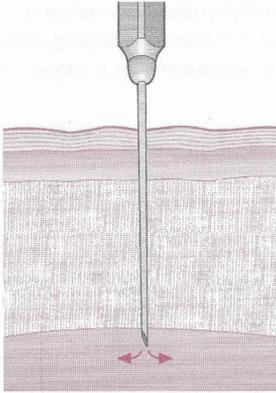
The penis is dangerous for injection and complications such as local infection are almost inevitable.

A condition known as priapism – a permanent, painful erection – is a possible consequence of penis injecting. This is because an erection is caused by the veins becoming smaller and restricting the flow of blood out of the penis. For the penis to return to its normal size the veins must be able to re-open. If this is not possible because of damage, the erection will not subside.

Some injectors mistakenly think that 'groin' injecting refers to injecting in the penis. When talking about groin injecting it is vital to clarify that you are referring to femoral injecting.

Intramuscular injection

Figure 4.8: Intramuscular injection



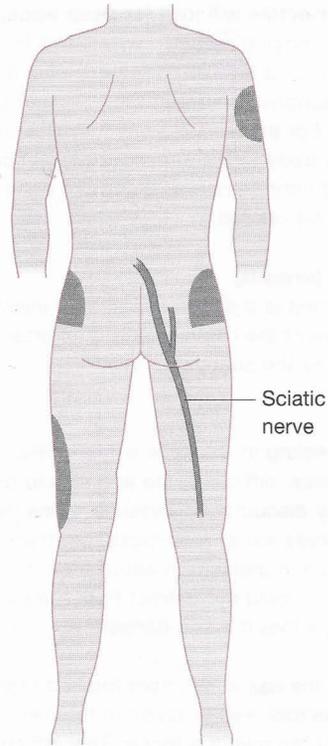
Intramuscular injection is used to administer some medicines (Figure 4.8). It is not an ideal route for injection of most illicit drugs as it often leaves the muscle stiff and sore. The exception to this is steroids which are almost invariably injected in this way and are usually formulated for the purpose.

While intramuscular injecting may be acceptable for occasional injecting, for frequently repeated doses of illicit drugs that have been acidified, it can quickly become impractical.

The relatively poor blood supply to the muscle means that absorption is likely to be slow. Furthermore the fluid that has been injected can easily cause severe local infection.

If injectors are injecting into muscles because they have 'run out' of superficial veins, workers need to address the issue of supporting the person in giving up injecting.

Figure 4.9: Intramuscular injection sites



Equipment and technique

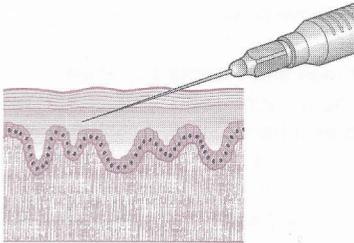
The equipment required for an intramuscular injection is usually:

- A syringe with detachable needle (1 or 2 mL)
- Green 21 g x 1.5" or blue 23 g x 1.25" needles
- Enough needles to allow a change of needle after drawing up, especially if drawing up from a vial, as this will often blunt the needle, causing more trauma to the skin
- Alcohol swabs.

2 mL should be the maximum put into a muscle at one time.

Subcutaneous injection

Figure 4.10: Subcutaneous injection



Subcutaneous injection is often referred to by injectors as skin popping. It may be done by those who are having short- or long-term difficulties in accessing veins. It has been associated with injecting injuries since the 19th century, when it was by far the most common route of injection.

Subcutaneous injecting of illicit drugs tends to be more damaging to the surrounding skin than other routes of injection. The principle reasons for this are:

- Of all the methods of injection, absorption into the bloodstream is slowest
- Irritant substances will remain at the injecting site for much longer
- Infection-causing organisms will remain at the injecting site.

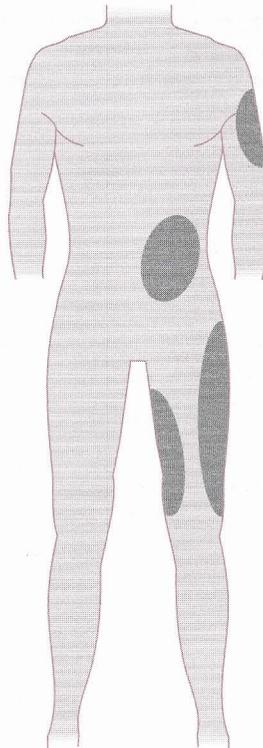
In the case of the last point, of particular concern for subcutaneous injectors is the possibility of acquiring infections such as tetanus and botulism. Although these infections are rare amongst injectors in the UK, increasing numbers of cases of both have been observed in California in the 1990s. Skin popping is more common there, and also there are suggestions that 'black tar' heroin may be sometimes contaminated by the spores of these infections.^{94,95} Tetanus and botulism are anaerobic bacteria (do not require the presence of oxygen) that thrive best in situations where oxygen concentrations are low, such as just under the skin surface.

Tetanus is almost entirely preventable by vaccination.

Skin popping is not a long-term alternative to intravenous injecting of drugs such as heroin or cocaine because of the combined effects of probable frequency of injection and irritation caused by the injected solution. One or two subcutaneous injections of street heroin will almost invariably lead to local irritation and possibly infection.

Blood-borne viruses such as hepatitis and HIV can be introduced by subcutaneous injection.

Figure 4.11: Subcutaneous injecting sites



Arterial injection

All drug injectors should be warned that they should never inject into a blood vessel in which they can feel a pulse.

Occasionally people attempt arterial injection deliberately – this should be strongly discouraged.

For those who hit an artery by mistake or otherwise, advice should be to:

- Immediately withdraw the needle – do not complete the injection
- Put strong pressure on the site for at least 15 minutes
- If possible raise the affected limb
- Seek medical advice.

Arterial injection can sometimes cause weakening of the artery wall (pseudoaneurysm) or fungal infection of the artery wall (mycotic aneurysm). Both conditions can lead to life-threatening arterial bleeding.

Most arterial injections are accidental.

Alternatives to injecting

Smoking or chasing heroin

Smoking heroin clearly offers lower risks than injecting, both in terms of viral transmission and risk of overdose.

As Southwell and Picorne say when discussing the promotion of chasing over injecting as a harm reduction strategy:

“Chasing should not be viewed as a substitute for injecting, but as an alternative way of enjoying heroin. Acknowledgement should be made at the beginning that the effect does not offer the same intensity as injecting but that it does offer a gentler and less risky form of use with the added benefit of extending using episodes.”⁹⁶

When compared with injecting, chasing heroin will offer:

- No risk of viral transmission
- A lower risk of overdose
- Lower health risks
- An alternative for those who are finding venous access difficult
- An alternative route whilst injection sites are allowed to rest.

There is a potential value in using carefully thought-through campaigns promoting the smoking of heroin. It must be borne in mind that not all injectors know how to smoke it – it is a difficult task requiring skill, dexterity and practice.

Rectal

Taking drugs into the body via the anus is occasionally practised – particularly by stimulant and ecstasy users. It has been suggested by the East London and City Drug Team that drugs such as heroin might be introduced into the rectum by the anus using a syringe without a needle.

If accepted by injectors it could be an alternative to injecting for some. Because of the large number of blood vessels to absorb the drug, introducing a drug into the body in this way retains some of the rush associated with intravenous drug injecting, and lowers the risks associated with sharing of equipment.⁹⁷

Sniffing

Sniffing drugs is usually safer than injecting them in terms of the relative danger of transmission of blood-borne viruses. Viral transmission can occur if straws etc. are used by two or more people.

As with injecting, it is best for each user to have separate equipment for the sniffing of drugs. Prolonged frequent sniffing of drugs (especially cocaine) can lead to damage to the mucous membranes in the nose and cause, or exacerbate, sinus problems.

Swallowing

Of the commonly injected drugs, swallowing is most effective for amphetamines, which are often taken in this way, either by mixing the powder in a drink or by 'bombing' (wrapping it in a cigarette paper to reduce the unpleasant taste).

If an injector is contemplating using a 'risky' substance, e.g. what is left on a spoon after filtering, swallowing usually represents the safest way of getting it into the body.

For those using benzodiazepines by injection – often as crushed tablets – taking them by mouth is by far the safer alternative and the effect, although slower to 'come on', will ultimately be much the same.



keypoints

- Intravenous injecting is the most common way to inject drugs.
- It is important that injectors and workers have at least a basic understanding of the circulatory system.
- The arms are the safest site for intravenous injection.
- Highly dangerous sites such as the neck are not viable alternatives to injecting in the arms and should not be promoted by workers. Any advice given about the use of such sites must not give the impression of endorsement or recommendation.
- Intramuscular injection is not a long-term option for most illicit injectors. The clear exception to this is for steroid users.
- Subcutaneous injecting often causes significant local tissue damage.
- Promotion of alternatives to injecting should be considered with existing injectors.
- Promotion of the benefits of continuing to smoke heroin should be considered for non-injecting heroin users.

section

5

Vein and

other local

damage

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Introduction

This section looks at damage to veins and infections of injecting sites. Vein blockage is discussed, as are the consequences of poor circulation such as ulcer formation.

Evidence suggests that most injectors experience at least some of these complications and tend not to access appropriate treatment for them unless or until they have reached crisis point. This is likely to result in greater levels of permanent damage and the client requiring much more intensive and expensive treatment.⁹⁸

It would be desirable to have staff with nursing and medical expertise available within all syringe exchanges. However, in reality this is not possible for many services. Some drug services have few, if any staff with a medical or nursing background.

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Vein blockage and collapse

Veins may become temporarily blocked if the internal lining of the vein swells in response to repeated injury or irritation. This may be caused by the needle, the substance injected, or both. Once the swelling subsides the circulation will often become re-established.

Permanent vein collapse (see Figure 5.1); occurs as a consequence of:

- Long-term injecting
- Repeated injections, especially with blunt needles
- Poor technique
- Injection of substances which irritate the veins.

Smaller veins may collapse as a consequence of too much suction being used when pulling back against the plunger of the syringe to check that the needle is in the vein. This will pull the sides of the vein together and, especially if they are inflamed, they may stick together causing the vein to block. Removing the needle too quickly after injecting can have a similar effect.

Thrombosis

If the smooth blood flow through the vein is disrupted, clots can form on the lining of the vein. This process is called thrombosis. Over time, continuing to inject and the clots themselves will encourage further clotting. Eventually the vein can become completely blocked by the clot.

Wherever blood clots in a vein (or elsewhere) it will eventually be transformed into scar tissue. Scar tissue forms to pull the edges of a wound together – when it occurs on the inside of a vein the contraction leads to narrowing and blockage of the vein. Following this process the vein appears to collapse (Figure 5.1).

A vein that is filled with scar tissue seldom recovers its ability to carry blood.

Collateral circulation

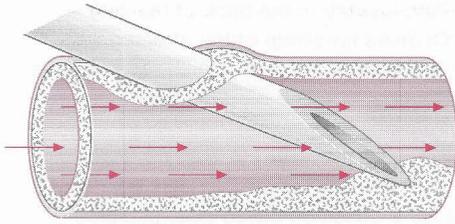
When a vein becomes thrombosed or obstructed, blood can no longer flow through it to return to the heart. The blood will therefore take an alternative route, using other smaller blood vessels to get around the blockage. This diversionary circulatory route is called 'collateral circulation'.

This process may result in the appearance of 'new' superficial veins on or near the skin surface. Injectors should be discouraged from attempting to use these veins, as they are likely to be small veins that have become engorged by the necessity for them to carry more blood. They will therefore be under greater pressure than normal, so that injecting into them carries a greater risk of damage to the vein.

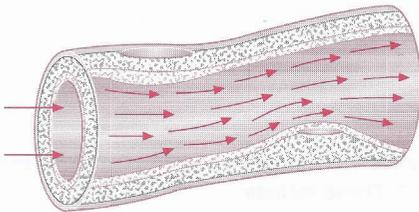
The usual consequence of injecting into such veins is that within a few injections the vein becomes damaged and is no longer viable.

If the collateral circulation becomes damaged, then the return of venous blood from the affected limb is likely to be even more severely restricted.

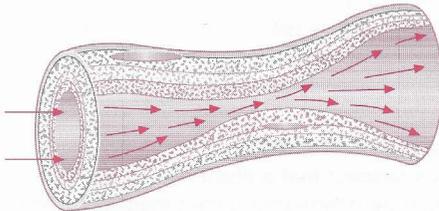
Figure 5.1: Collapsing and collapsed vein



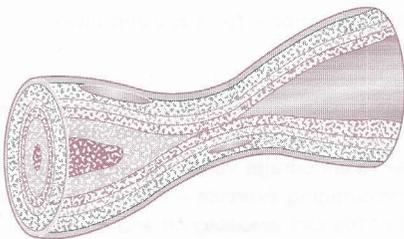
1. Injection damages the inside lining of the vein – repeated injection at the same site increases the likelihood of problems.



2. Clots form in the turbulent blood around the site.



3. As the vein becomes narrower the turbulence increases and clots form more quickly.



4. Finally, the sides of the vein heal together and the vein collapses as the scar tissue draws the sides together.

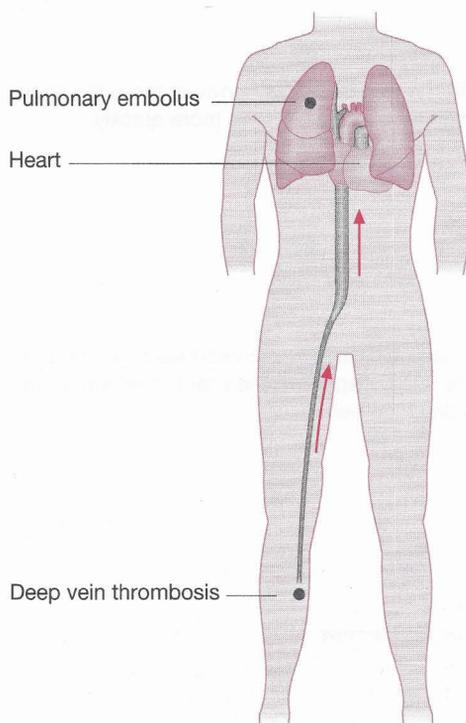
Deep vein thrombosis (DVT)

A DVT is a clot which completely or partially blocks a deep vein. Initially the clot consists of dense layers of platelets and fibrin; later it becomes a jelly-like mass of fibrin and red cells which may detach to form an embolus. This may result in a pulmonary embolism (see page 90).

The most common site for a DVT is in the lower limbs, usually in the deep veins at the back of the calf (Figure 5.2). More rarely, it can also occur in the arms.

The range of symptoms that can be produced by a DVT is wide, from no obvious ones at all to tissue breakdown and ulcer formation.

Figure 5.2: Position of a DVT and route to pulmonary embolus



Symptoms of the presence of a DVT can include:

- Pain (usually in the back of the calf)
- Oedema (swelling) of the affected limb
- Cyanosis of the limb (bluish discoloration indicating impaired blood supply)
- Pulmonary embolism.

A DVT which is not treated can, over time, cause a condition called post-phlebotic syndrome. The blockage of the vein and the destruction of valves leads to raised pressure in the remaining veins which may lead to:

- Chronic pain
- Oedema
- Eczema
- Ulceration.

A number of factors can increase the risk of a DVT. These include:

- Femoral 'groin' injecting
- Obesity
- Smoking
- Pregnancy
- Contraceptive pill
- Lack of exercise
- Recent surgery (particularly abdominal).

Treatment of a DVT

If you suspect that a client has a DVT, they should be referred for urgent medical advice.

Immediate treatment may include:

- Hospitalisation – for X-ray and other screening
- Bed rest
- Raising the affected leg above the level of the heart when seated or lying down, in order to encourage venous return
- Discouraging exercise – this could lead to part of the clot breaking off and causing a pulmonary embolus
- Anticoagulant (blood thinning) therapy with heparin to dissolve the clot.

For up to three months following discharge, warfarin treatment (an oral alternative to heparin) may be prescribed and closely monitored to prevent recurrence. Injecting should be discouraged if anticoagulant treatment is taking place, as the likelihood of direct complications related to slower blood clotting is raised.

Avoidance of a DVT

For those who are at risk of a DVT, or have already experienced it, the possibility of further problems may be reduced if they are encouraged to:

- Appreciate practices which increase the risk of a DVT, such as femoral injecting
- Identify ways of reducing the risk of developing a DVT, such as changing injecting sites or method of using drugs
- Change their route of administration to one that does not involve injecting.

Long-term consequences of vein collapse

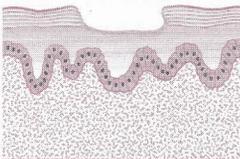
When the flow of blood through the limbs has been severely affected, there are a number of problems that can arise. These include:

- Ulcers
- Gangrene
- Local infection.

They are now discussed in detail.

Ulcers

Figure 5.3: Cross-section of an ulcer



Severely reduced flow of blood through the tissues leaves them vulnerable to infection and with a reduced healing capacity.

The result of this process can be that painful areas of broken skin known as ulcers often form (Figure 5.3) following progressive damage to the veins from repeated and inexpert injecting.

Once localised damage has occurred, the impaired venous return in the area, coupled with the fact that blood flow in the lower legs is slow, combines to make prompt healing of an injury less likely than it otherwise would be. This can then be compounded by infection.

Ulcers can form either as the direct result of an injecting injury, or as a result of accidental injury after the veins have been damaged by injecting.

Factors affecting healing

Factors which may affect healing of injecting injuries include:

- Diet and nutrition
- Stress
- Poor accommodation
- Drug and alcohol use.

Treatment of ulcers

Unless a project is specifically set up to provide primary health care to clients, the client should be referred to either their general practitioner or an A&E department for assessment and treatment.

Ulcers take many months to heal and may require frequent attendance for treatment.

There are strong arguments for advocating that these and other health care needs will best be met within drug treatment and needle exchange services, because:

- Users of drug treatment agencies may not attend if referred to other agencies
- Drug users may tend to believe health problems are to be expected and therefore do little about them
- They are less likely to receive discriminatory treatment.

Local infections

As well as risks of systemic infections such as hepatitis and HIV, injecting carries the risk of introducing bacterial and fungal infections to the tissue surrounding the injection site. Often local infections are caused by bacteria which live harmlessly on the skin being picked up by the needle and forced below the skin where they multiply.

The risks of local infection will be increased by:

- Sharing of needles and syringes
- Reuse of unsterile equipment
- Sharing of paraphernalia
- The use of contaminated equipment in the sharing of drugs
- The use of non-pharmaceutical medication
- Unhygienic preparation of drugs
- Poor personal hygiene.

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Providing injectors with an understanding of the ways in which infection may be introduced is crucial. Ideally, they should be aware of the risks they may be exposed to and how to reduce them.

Beneficial actions which can be taken by injectors range from the simple but effective, such as hand washing prior to injecting⁹⁹ (where adequate facilities are available), to an elaborate aseptic ('germ free') injecting technique. Local infections include:

- Abscesses
- Ulcers
- Cellulitis.

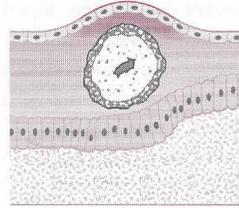
These are now discussed in detail.

Abscess

An infected abscess is a localised collection of pus that is encapsulated within inflamed tissue (Figure 5.4). It can be caused by a wide range of bacterial and fungal infections.

An abscess is different from cellulitis in that it has a defined edge and shape.

Figure 5.4: Abscess



An abscess is characterised by:

- Raised skin surface
- Localised heat
- Tenderness and pain
- Redness of the skin (in white people)
- Pus formation
- A foul smell if it has begun to discharge.

People with abscesses should be referred for medical advice and treatment. The abscess will require antibiotic treatment and/or lancing to release the pus.

Injectors should be told never to try to lance or puncture abscesses themselves. This can spread infection and without appropriate antibiotic cover they can quickly develop septicaemia (blood poisoning). They should be encouraged to alternate injecting sites as this will lessen the risk of localised inflammation, infection and abscess formation.

Phlebitis

Phlebitis is irritation of the smooth inner lining of a vein (tunica intima). The roughening of the vein lining can encourage the formation of clots. The vein is reddened or inflamed and can sometimes be felt as a thick cord beneath the skin.

Phlebitis can occur as a result of:

- Injecting irritant substances such as Temazepam
- Poor injecting technique
- Infection
- Accidental injury (i.e. knocks or blows).

An important complication of phlebitis is deep vein thrombosis leading to pulmonary embolism.

If phlebitis is suspected the person should be referred for immediate medical advice. Treatment includes resting and raising the affected limb, antibiotics and anti-inflammatory drugs.

Cellulitis

Cellulitis refers to a painful spreading inflammation of the skin, which appears red and swollen with fluid (this is known as oedema).

Cellulitis can occur as a result of:

- Irritant substances lodged in body tissues
- Infection.

It is usually the result of a 'missed hit' and/or poor circulation.

Where cellulitis is suspected the client should be referred for immediate medical advice. Treatment includes resting and raising the affected limb, and treatment with antibiotics and anti-inflammatory drugs.

Advice for people who have had cellulitis would include the following measures to prevent reinfection:

- Using sterile injecting equipment
- Using sterile water where available and discussing alternatives where it is not
- Avoiding the injection of irritant or heavily adulterated drugs
- Removing rings prior to injecting if injecting in the hands.

'Missed hits'

'Missed hit' is a phrase used to describe swelling which appears around an injection site during or immediately after injection.

It may be caused by fluid entering the tissue surrounding the vein because the needle has:

- Not entered the vein properly
- Entered the vein and slipped out again
- Entered the vein and gone through the opposite wall
- Entered the vein correctly but excess pressure caused the vein to split.

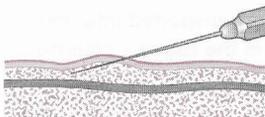
These problems can be prevented by encouraging injectors to:

- Check that the needle is in a vein by gently pulling back on the plunger to see that venous blood enters the syringe
- Always releasing the tourniquet before injecting
- Maintain a steady hand whilst injecting
- Smoke a small amount of heroin before injecting, when in opiate withdrawal
- Use the smallest possible needle and syringe barrel
- Inject at the correct angle
- Inject the fluid slowly.

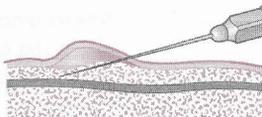
A missed hit will mean that the drug is absorbed much more slowly by the body, so that the effect will be less pronounced. It can also lead to other problems discussed in this section such as:

- Abscesses
- Cellulitis
- Cutaneous foreign body granulomas.

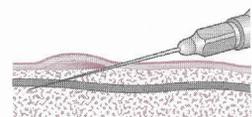
Figure 5.5: 'Missed hits'



Needle did not enter vein



Needle entered vein and slipped out again



Needle went right through the vein

'Lumps and bumps'

Injectors often have various 'lumps and bumps' on their skin. These have differing causes.

Blocked veins can leave hard 'knots' under the surface of the skin. Developing abscesses may first appear as a raised bump, although this is often accompanied by localised tenderness and heat. Other possible causes of 'lumps and bumps' are detailed here.

Sterile abscess

A sterile abscess occurs as a result of injecting irritant substances such as crushed tablets and possibly as a consequence of a missed hit. It will often disperse without treatment but, over time, a granuloma may form around it.

Cutaneous foreign body granulomas

Granulomas are benign growths of scar tissue that are associated primarily with subcutaneous injecting or 'missed hits', where the solution has by accident or design ended up in the surrounding tissue. In such cases a residue may stay for many years, eventually leading to granuloma formation¹⁰⁰.

Many of the common cutting agents for injectable drugs, such as quinine, mannitol, dextrose and lactose, are not thought to cause foreign body granulomas. However the injection of crushed tablets will increase the risk. The principle filler of the tablet is often hydrogenous magnesium silicate, frequently referred to as 'chalk' by users.

It should be noted that 'successful' intravenous injection of crushed tablets does not remove the risk of granuloma formation. It simply changes the place that they may be found, to the lungs.

In Australia, attempts have been made to supply tablet injectors with commercially produced filters (Millipore filters) which are intended to remove the chalk from the solution. If beneficial and practical (they are relatively expensive), then this may be a rare example of a successful harm reduction strategy for those injecting tablets. However, there is the potentially much greater problem of transmission of blood-borne viruses if these filters are reused or shared.

Because of this, the best harm reduction intervention is likely to remain clear advice not to inject crushed tablets.

Gangrene

Gangrene is the death of body tissues caused by impaired or absent blood supply. Gangrene can occur as a result of arterial or serious venous damage.

The effect of gangrene can be disastrous, leading to loss of limbs. It can also cause the products of tissue breakdown to enter the bloodstream causing blood poisoning and threatening life.

Arterial damage

Gangrene as a result of arterial damage occurs when an artery is injected into instead of a vein. Often this is as a result of injecting irritant drugs such as Temazepam into the femoral artery rather than the femoral vein. However, it can occur when people inject into the smaller arteries in the arm.

Gangrene as a result of injecting into an artery can occur in the following ways:

- The artery can go into spasm and interrupt the supply of oxygenated blood to the tissues
- The injected substance can block the artery, interrupting the blood supply to the tissues
- Small particles of the injected substance (micro-emboli) can be transported into and block the capillaries in the tissue – causing their breakdown.

Venous damage

Gangrene following venous damage may be slower to develop, and results when damage to the veins is such that the return of venous blood from the affected limb is no longer adequate; blood gets into the tissues at a faster rate than it can get out. In the end the reduced flow of blood through the tissues is inadequate to sustain them and they die.

Signs and symptoms

Signs and symptoms of gangrene include:

- Pain
- Loss of feeling and control in an area of skin
- Swelling and discolouration of affected limb
- Affected extremities i.e. fingers or toes
- Affected tissues initially becoming white
- Affected tissues eventually blackening
- If untreated, affected tissues dropping off.

Prevention and treatment

Injecting drug users need to be given advice on the following subjects to enable them to prevent gangrene occurring:

- The dangers of arterial injection
- The signs and symptoms of injecting into arteries
- First aid treatment following accidental arterial injection
- Discourage injection of crushed tablets especially Temazepam tablets, Temazepam Gelthix capsules and Diconal.

In the event of symptoms of gangrene occurring injectors must be aware that:

- This is a serious complication that will not go away unless they get medical help
- They must get urgent medical treatment – if the onset is sudden they should call an ambulance.



keypoints

- Irritation and infection can cause veins to block temporarily.
- Vein collapse occurs as a consequence of long-term injecting. Repeated injections, especially with blunt needles, poor technique and of substances which irritate the veins, encourage vein collapse.
- Permanent vein blockage results from the formation of scar tissue in the vein, following blood clotting.
- Severely reduced flow of blood through the tissues leave them vulnerable to infection and with reduced healing capacity.
- All drug injectors should be warned that they should never inject into a blood vessel in which they can feel a pulse.
- Injecting in the hands and fingers should be discouraged – those who insist on these sites should be warned to remove rings prior to injecting.
- Injectors should be warned of the symptoms of gangrene and advised to seek urgent medical advice if they suspect that it may be occurring.
- If in any doubt, get medical advice immediately.

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The Safer Injecting Briefing

The Safer Injecting Briefing is an essential, easy to use reference guide for everyone in contact with injecting users.

For the first time, The Safer Injecting Briefing provides a comprehensive manual of practical advice for people working on harm reduction with drug injectors. It will be valuable as a practical reference book - but it should also be read as a tribute to the unsung heroes who developed the harm reduction approach in front line drug agencies.

Professor Gerry V Stimson

The Centre for Research on Drugs and Health Behaviour

This book brings together in a single volume, practical guidelines on the provision of advice and services; anatomical and physiological information on injecting illicit drugs; the research basis for promoting safer injecting and the history of injecting from the earliest recorded attempts.

The Safer Injecting Briefing is designed to complement and support written safer injecting information resources for injectors including 'The Safer Injecting Handbook' and the HIT leaflets 'A Guide to Safer Injecting' & 'not just syringes'.

For practioners new to the field and for experienced workers **The Safer Injecting Briefing** is an invaluable reference enabling you to respond clearly and authoritatively to all the questions asked by clients, colleagues and purchasers.

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