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Update of NICE Guidance PH18 on 'Needle and syringe programmes'

PIEDs Review

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Glossary

Cross-Sectional Study	Examination of the relationship between disease and other variables of interest as they exist in a defined population at one particular time.
Drug schedule	Relates to the cycle or pattern of PIED use by a PIED drug user.
Harm reduction	Activities, interventions or techniques aimed at reducing the harms associated with unsafe drug use.
Injection Risk Behaviours	High risk behaviours related to injection drug use, such as receptive and distributive sharing, sharing paraphernalia and syringe re-use.
Needle disposal	Method of discarding of injecting equipment following use.
Safer injecting	A form of harm reduction relating specifically to injecting equipment, such as reducing needle sharing.
Stigma	An attribute or status that is generally seen as unacceptable that can lead to prejudice or discrimination.

Abbreviations

A&E	Accident and emergency department
ACMD	Advisory Council on the Misuse of Drugs
BBV	Blood borne virus
HCV	Hepatitis C virus
HBV	Hepatitis B virus
HIV	Human immunodeficiency virus
IDU	Injecting drug user
NICE	National Institute for Health and Care Excellence
NSP	Needle and syringe programme
PIEDs	Performance and image enhancing drugs

Executive summary

Background

Needle and syringe programmes (NSP) in England are based across a range of services including specialist services, pharmacies, outreach/mobile services, custody suites and A&E departments. In the UK, people who inject performance and image enhancing drugs (PIEDs), including steroids, growth hormone and other novel drugs, are believed to represent a significant and increasing proportion of all NSP users. PIED users are likely to have very different needs than other injecting drug users (IDUs). Following a review by NICE of NICE guidance on the optimal provision of NSP first issued in 2009 (National Institute for Health and Clinical Excellence, 2009), it was concluded that guidance regarding NSP provision for PIED users was required.

Objectives

The purpose of the review was to examine the evidence regarding the optimal provision of NSP for reducing the prevalence of blood borne viruses (BBVs) and morbidity and mortality relating to injecting drug use for people who PIEDs. The review aimed to examine effectiveness and cost-effectiveness data and views and perspectives regarding:

- The level of coverage of needles, syringes and other injecting equipment
- Types of NSP that are effective and cost-effective
- Additional harm reduction services offered by NSP

Methods

The methods of the effectiveness and cost-effectiveness review followed NICE protocols for the development of NICE Public Health Guidance. Eighteen databases were searched for effectiveness and cost-effectiveness studies published since 1990. All data extraction and quality assessment was undertaken by one reviewer and checked for accuracy by a second reviewer. Each study was also graded (++, + or -) based on the extent to which the design and execution of the study minimised the potential sources of bias. Results of the data extraction and quality assessment for each study were presented as a narrative summary.

Due to the limited evidence identified, the objectives of the review were re-evaluated and changed to more broadly examine:

- The profile of PIED users
- The impact of services on health and behaviour
- Influences on the uptake of NSP services
- How NSP services can reach PIED users

Findings

One qualitative study and six studies based upon surveys were identified for inclusion in this review. Five studies were from the UK and two studies were from Australia. The qualitative study investigated experiences of and attitudes towards stigma in IDUs including four steroid injectors. Of the six studies based upon survey methodology, two studies investigated steroid use and adverse effects amongst steroid users and two studies primarily reported outcomes relating to risky injection behaviours and BBVs. One study examined the attitude of injecting steroid users towards factors associated with steroid use including media influence, masculinity and health outcomes. No cost-effectiveness studies were identified. Following a call for information, two unpublished reports evaluating a PIED clinic in Glasgow were identified, evidence from which was considered alongside the included studies.

Summary of results

What is the profile of PIED users and how do they differ from other IDUs?

Six studies included outcomes that help build a picture of the profile of PIED users. Evidence from one study suggested that PIED clients attending NSP are more likely to be male and younger in comparison to other IDUs. Across studies steroid users were likely to be aged between 26 and 32 years. Evidence from four studies suggested that the employment rate amongst steroid users is higher than the typical employment rate for other IDUs.

Two studies examined outcomes relating to injecting behaviour and BBV rates. One study reported lower rates of risky injecting behaviour and lower rates of HIV (0%) and HCV (10%) amongst steroid users in comparison to other IDUs. Two studies reported rates amongst steroid users of needle-sharing and needle re-use, and reported rates of BBV including HIV (12%), HCV (5%) and HBV (3%). One study reported low rates of condom use by steroid users with regular and casual partners.

What impact does access to services have on the health and behaviour of PIED users?

No studies were identified that examined the effectiveness of NSP provision on rates of HIV or other BBVs, or morbidity and mortality relating to injecting drug use in people who inject PIEDs. Evidence from one study suggested that some steroid users will use an NSP to dispose of needles, but that other disposal methods are preferred. Evidence from the unpublished evaluations of the Glasgow PIEDs clinic suggested that clinic attendance had benefits for safer injecting, reduced frequency of drug use, NSP attendance and diet and exercise.

What influences the uptake of services amongst PIED users

There was evidence suggesting that a high proportion of steroid users in Australia obtain needle and syringes from an NSP, and that steroid users in the UK have positive attitudes towards attending a free NSP. Unpublished evidence from the evaluation of the Glasgow PIEDs clinic suggested that the vast majority of clients were very satisfied with the clinic and

services provided. Evidence from one qualitative study suggested that stigma associated with attending NSP may be a barrier to steroid users accessing services. In one study it was reported that female steroid users believed a desirable service would include health checks and advice from health professionals as well as practical information about steroid use. Evidence from the Glasgow PIEDs clinic suggested that a desirable service may include PIED specific needle packs and offer services including blood testing and harm reduction advice including alternatives to PIED use, such as diet and exercise regimes.

How can services reach PIED users to raise awareness about a service and attract clients?

Six studies included outcomes relating to promoting services and information seeking behaviour. One study identified that female steroid users believe that advertising services in drug centres or gyms would attract clients, but one qualitative study reported that participants believed large gyms would not want to promote NSP due to the potential association of steroid use with that gym. Evidence across three studies suggested that steroid users know other steroid users and consider them a source of information about their drug use. The unpublished evaluations of the Glasgow PIEDs clinic revealed that gyms, a drugs centre and friends were all sources of information about the clinic for participants. Despite the service being widely advertised in gyms, surgeries, pharmacies and drug services the majority (62%) of participants had not seen any advertisements with the gym the most common location (37%).

Discussion

Over the last 20 years services providing NSP have observed a change in the profile of their clients, with increasing numbers of people identifying as users of steroids and other PIEDs attending such services. There is evidence that people who inject PIEDs use NSP differently to other client groups. They are likely to have different motivations for using drugs and different service needs and perceptions about services.

This review identified a distinct lack of literature on delivery of harm reduction services to people who inject PIEDs. In addition, all the research identified refers to steroid use and associated drugs, with no research identified in relation to users of other PIEDs (e.g. the melanotans). It has been recognised that people who inject PIEDs tend to be, but are not exclusively, male and generally of younger age. There is evidence of sharing and reusing needles and syringes and other injection equipment, suggesting that although people who inject PIEDs have a different risk profile to other people who inject drugs, they are nevertheless at a higher risk of infection than non-injectors.

There is an absence of published evidence on the impact of harm reduction services on the health and injection risk behaviours of people who inject PIEDs. However, there is some evidence to suggest that provision of NSP is desired in this population. Current service configurations, primarily structured to the needs of opiate and stimulant injectors, have been

shown to be a barrier to attendance by PIED injectors. Although based on a fragmented evidence base, the studies reviewed suggest that multi-faceted services are required to appeal to PIED injectors. Services should be PIED injector specific, and offer additional services alongside needle and syringe distribution such as advice and information, health expertise on diet and exercise, sexual health services, health monitoring including blood testing and vaccinations and information on high risk drugs and practices.

There was no evidence identified in this review that directly supports the existence of secondary exchange in this population, but studies suggest that PIED users see PIED using friends and acquaintances as a reliable source for the acquisition of and information about PIEDs.

1 Introduction

1.1 Aims and objectives

This review was undertaken to support the update of guidance on the optimal provision of needle and syringe programmes (NSP) for people who inject performance and image enhancing drugs (PIEDs). We adopted a broad perspective on the evidence examined, seeking to incorporate qualitative and quantitative evidence, examine successes and barriers to implementation, and assess the applicability and transferability of diverse evidence.

1.2 Research questions

For the review of quantitative evidence, the following key research questions were addressed:

1. What level of coverage of needles, syringes and other types of injecting equipment are most effective and cost-effective for reducing the prevalence of HIV and hepatitis C infection in people who inject PIEDs?
2. What types of NSP are effective and cost-effective for reducing the prevalence of HIV, hepatitis C and other blood-borne viruses (BBVs), and morbidity and mortality relating to injecting drug use in people who inject PIEDs?
3. Which additional harm reduction services offered by NSP are effective and cost-effective for reducing the prevalence of HIV, hepatitis C and other BBVs, and morbidity and mortality relating to injecting drug use in people who inject PIEDs?

For the review of qualitative evidence, the key research questions were, among people who inject PIEDs and practitioners involved in their care:

1. What do they identify as suitable types of NSP, and what do they believe to be a suitable level of coverage of needles, syringes and other types of injecting equipment?
2. What are their views and perspectives on, and experiences of, different types of NSP?
3. What are their views and perspectives on, and experiences of, additional harm reduction services offered by NSP?

2 Background

2.1 Previous NICE guidance

Needle and syringe programmes in England are based across a range of services including specialist services, pharmacies, outreach/mobile services, custody suites and A&E departments. NICE guidance on the optimal provision of NSP was first issued in February 2009 (National Institute for Health and Clinical Excellence, 2009). Prior to this a joint report by the Healthcare Commission and the NTA (Healthcare Commission/National Treatment Agency, 2008) had concluded that generally, pharmacy and specialist needle exchanges provided a wide range of harm reduction information and advice. However, the report also highlighted that there was a national shortfall in the provision of out-of-hours needle exchange, and that vaccination for hepatitis B (HBV), and testing and treatment for hepatitis C (HCV) was not provided widely enough by local drug treatment partnerships. The NICE guidance recommended that action was taken to increase access to and availability of sterile injecting equipment based on local needs. They also recommended that action was taken to increase the proportion of people with 100% coverage of sterile injecting equipment and the proportion of people from different groups of injecting drug users in contact with NSP. Areas were encouraged to provide a balanced mix of different levels of service and to coordinate services to ensure injecting equipment was available at all hours. The Advisory Council on the Misuse of Drugs (ACMD) report (2010a) on 'The primary prevention of hepatitis C among injecting drug users' was published concurrently with the NICE guidance and emphasised that on their own, NSP were insufficient to prevent hepatitis C, and that they should be commissioned as a component part of a comprehensive service. The report recommended that NSP provide or ensure access to a range of other services including HBV vaccination, referral to opiate substitution therapy, BBV antibody testing, and referral for HCV treatment. The impact of these policy developments on the commissioning and provision of NSP has yet to be reviewed but data on General Pharmaceutical Services in England shows a year on year increase on the number of community pharmacies in contract with PCTs to provide needle and syringe exchange; with an increase of 11% between 2009-10 and 2010-11 (The NHS Information Centre, 2011).

2.2 People who inject performance and image enhancing drugs

There is limited information available regarding the number of people using performance and image enhancing drugs (PIEDs). Only the use of anabolic steroids has been well documented, and their use has been shown to be relatively widespread with an estimated 70,000 people aged 16-59 year olds in England and Wales having used steroids in the past year (Home Office, 2012). Data from the UK suggests that the majority of users inject anabolic steroids (Advisory Council on the Misuse of Drugs, 2010b), putting them at risk of bacterial and fungal infections and the transmission of BBVs. While the risk of BBV transmission in anabolic steroid users has been suggested to be low compared to other

groups, such as those injecting opiates and stimulants, the practices and risks associated with the injection of anabolic steroids and other enhancement drugs remain poorly characterised (Evans-Brown et al., 2012). Evidence from a recent study reported rates of HIV (1.5%), exposure to HCV (5%) and exposure to HBV (9%) amongst PIED injectors (Hope et al., 2013). Further evidence suggests that PIED users may be more likely to have multiple sexual partners than non-IDUs and that condom use may be infrequent (Midgley et al., 2000).

Research from the UK has found that steroid users and users of other PIEDs may represent a significant proportion of NSP users (Lenehan et al., 1996). Between 1991 and 2006, the number of new steroid-injecting clients attending agency-based NSP in Merseyside and Cheshire increased seven-fold, whilst overall during this period there was a 2000% increase in the number of steroid injectors attending exchanges (Evans-Brown & McVeigh, 2008). There is evidence that steroid injectors use NSP differently to other client groups; making fewer visits per year and collecting large numbers of syringes in a single visit (McVeigh et al., 2003). Interviews with steroid injectors themselves indicate extensive peer distribution of injecting equipment (McVeigh et al., 2007).

In addition to anabolic steroids, in recent years injectable products for use as enhancement drugs have become increasingly available on the illicit market. An increasing range of drugs including insulin, growth hormone and novel drugs (such as those that stimulate secretion of growth hormone, IGF-1 and analogues, and Human Chorionic Gonadotrophin) are being injected to enhance physical performance (Evans-Brown et al., 2012). The melanotans, products that claim to contain melanotan II (and to a lesser extent melanotan I), are injected by users to get a cosmetic skin tan and, in the case of melanotan II and bremelanotide for their effects on sexual behaviour and function. Although the prevalence of use is not known, researchers have been alerted to their use in the general population through NSP seeking information after clients reported injecting these types of drugs (Evans-Brown et al., 2009a). It is not known how many people in the United Kingdom use drugs such as botulinum toxin or dermal fillers to treat wrinkles and lines but a number of factors suggest that there may considerable interest in these types of products among the general population (Evans-Brown et al., 2012).

2.3 Findings from the previous evidence reviews

The previous review of effectiveness and cost-effectiveness (Jones et al., 2008) identified 10 systematic reviews and meta-analyses, 24 primary studies and 13 economic evaluations for inclusion. The qualitative review (Cattan et al., 2008) identified 40 studies. The previous reviews found that there was limited evidence to determine the optimal provision of NSP, especially in a UK context, and that PIED users were underrepresented in the literature. Following a review of guidance PH18 by NICE it was concluded that guidance regarding NSP provision for PIED users was required, and it was agreed to develop supplementary guidance for this population.

3 Methods

3.1 Search strategy

The search approach taken for the reviews of effectiveness and cost-effectiveness was comprehensive and aimed to identify all the potentially relevant studies. All searches were conducted in accordance with the third edition of *Methods for the development of NICE public health guidance*.

3.2 Electronic sources

The following electronic sources were searched:

- ASSIA (Applied Social Science Index and Abstracts) via Proquest
- CINAHL (Cumulative Index of Nursing and Allied Health Literature) via EBSCOhost
- Cochrane Library via Wiley (CENTRAL, CDSR, DARE)
- EMBASE via NHS Evidence Health Information Resources
- EPPI Centre databases
- IBSS (international Bibliography of the Social Sciences) via Proquest
- MEDLINE via EBSCOhost
- PsycINFO via EBSCOhost
- Social Care Online via www.scie-socialcareonline.org.uk/
- Social Science Citation Index via Web of Science
- Sociological Abstracts via Proquest
- Sozial Medizin
- Sports Discus via EBSCOhost

The search strategy developed for the effectiveness review was adapted for use in the following major health economics databases:

- NHS Economic Evaluation Database (NHS EED)
- Health Economic Evaluation Database (HEED)
- EconLit via EBSCOhost
- EconPapers
- Tufts Cost-Effectiveness Analysis Registry

Search strategies were developed for each database using a combination of free text and thesaurus terms as appropriate. An example Medline strategy is presented in Appendix 1.

3.3 Additional sources

Further references were identified using a snowball approach whereby references of references and electronic citation tracking were used as a means of identifying further sources of evidence. A parallel call for information was also used as a means of identifying further sources of published and unpublished (‘grey’) literature. The snowballing technique incorporated searches of:

- Reference lists of retrieved articles meeting the inclusion criteria;
- Bibliographies of relevant literature;

- Key publications in the field;
- Reference lists of previous systematic reviews, review articles and other literature summaries; and
- Citation tracking tools e.g. the cited reference search tool on Web of Science.

Inclusion in the review was limited to English language studies and search limits were applied so that only studies published since 1990 were retrieved for screening.

3.4 Call for information

A joint call for information was sent out to researchers, practitioners and personal and institutional contacts known to the project team and to stakeholders registered with NICE. The call emphasised on the retrieval of unpublished data.

3.5 Inclusion and exclusion criteria

Two reviewers independently screened all titles and abstracts. Any discrepancies were resolved through discussion. Full titles of any titles/abstracts that were considered relevant by both reviewers were obtained for further screening. The relevance of each article was originally assessed according to pre-defined criteria (see Appendix 2). However, following screening it was apparent that very few if any studies would meet the full inclusion criteria

3.5.1 Revised inclusion and exclusion criteria

Due to the limited amount of relevant data contained in the one study eligible for inclusion, it was not possible to answer the research questions identified for this review through any synthesis of the evidence. Following discussions between the researchers and NICE the inclusion criteria was broadened to allow the inclusion of studies that included a broader focus on PIED users and service provision.

3.6 Revised research questions

New research questions were developed to draw out evidence that will inform the provision of NSP to PIED users. There were four new research questions identified:

1. What is the profile of PIED users and how do they differ from other IDUs?
2. What impact does access to services have on the health and behaviour of PIED users?
3. What influences the uptake of services by PIED users?
4. How can services reach PIED users to raise awareness about a service and attract clients?

3.7 Data extraction and quality assessment

Data relating to both study design and quality were extracted by one reviewer into a predesigned table in Word. All extraction was independently checked for accuracy by a

second reviewer. The same reviewer who undertook the extraction assessed the quality of the individual studies and this was checked by a second reviewer for accuracy. Disagreements were resolved through discussion. A data extraction table was designed following the methods outlined in the *Methods for the development of NICE public health guidance*, further details of the information extracted is provided in Appendix 3.

The quality of the studies was assessed according to criteria set out in *Methods for the development of NICE public health guidance* (National Institute for Health and Clinical Excellence, 2012a). This information was tabulated (see Appendix 4) and summarised within the text of the report. Each study was graded using a code, ++, + or – based on the extent to which the potential sources of bias had been minimised, as outlined in the methods guide.

4 Summary of evidence identified

4.1 Summary of study identification

The database searches located 3,711 records. Following title and abstract screening, 76 references were identified as potentially relevant and eligible for further screening. In addition, three references were identified from the update review searches. Of these 79 references, 72 were available and screened against the revised inclusion and exclusion criteria. Of these, one qualitative study and five studies based upon surveys were considered eligible for inclusion. Through reference screening, one further study based upon survey data was identified that met the inclusion criteria and was included in the review. No cost-effectiveness studies were identified that met the inclusion criteria.

4.2 Call for information

Two unpublished reports were identified through the call for information. Evidence from these two evaluations of one PIED user clinic is presented throughout the findings, and used to build upon the published evidence in the seven studies identified through database searching and reference screening. Relevant findings from the two reports are reported in text boxes following the evidence from the identified studies under each heading.

4.3 Study selection flow chart

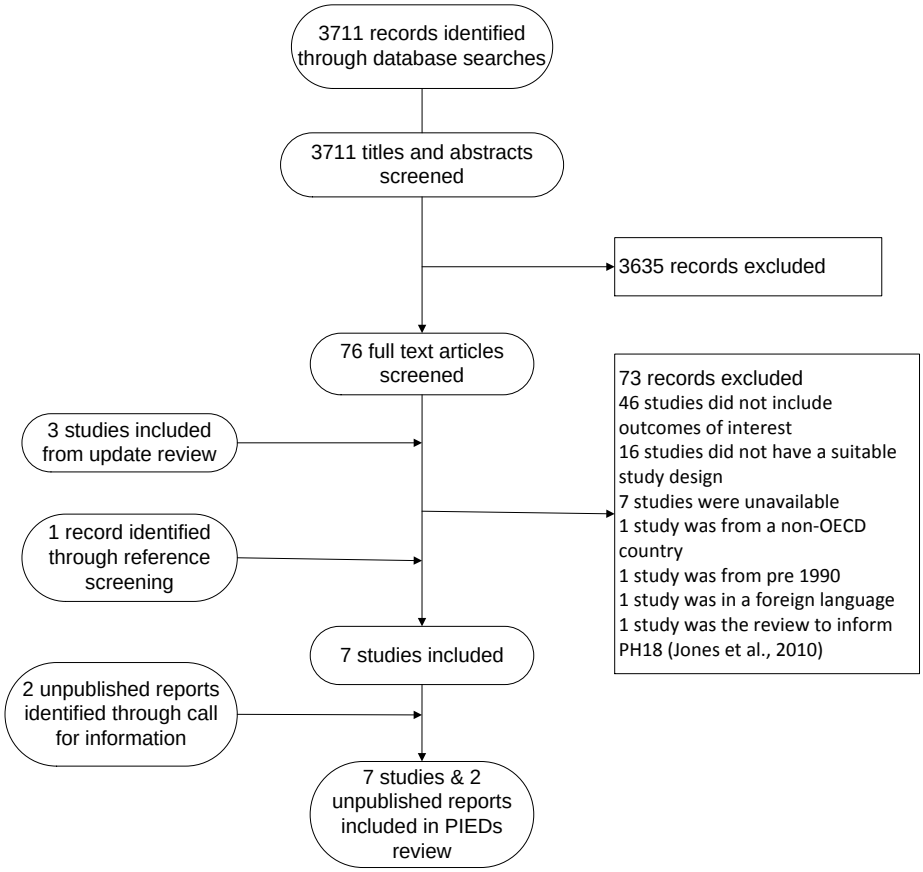

Figure 1. Flow chart of study selection process

5 Findings

5.1 Evidence identified through database searching and reference screening

5.1.1 Overview of included studies

In total, seven studies were identified that met the inclusion criteria for this review. This included one qualitative study (Simmonds & Coomber, 2009) and six studies based upon questionnaires and surveys carried out with PIED users (Burton, 1996; Day et al., 2008, Korkia et al., 1996; Larance et al., 2008; Lenehan et al., 1996; Walker & Joubert, 2011). Five of the studies were from the UK (Burton, 1996; Korkia et al., 1996; Lenehan et al., 1996; Simmonds & Coomber, 2009; Walker & Joubert, 2011) and two studies were Australian (Day et al., 2008; Larance et al., 2008).

5.1.2 Study aims and objectives

The qualitative study (Simmonds & Coomber, 2009) investigated experiences of and attitudes towards stigma in IDUs including four steroid injectors. Of the six studies based upon surveys, three studies (Burton, 1996; Korkia et al., 1996; Lenehan et al., 1996) investigated steroid use and adverse effects amongst steroid users. One study (Walker & Joubert, 2011) examined the attitudes of injecting steroid users towards factors associated with steroid use including media influence, masculinity and health outcomes, and two studies (Day et al., 2008; Larance et al., 2008) primarily reported outcomes relating to risky injection behaviours and BBV.

5.2 Evidence identified through the call for information

Two unpublished evaluations of the Glasgow PIEDs Clinic were sent to the review team following the call for information. This included an evaluation carried out in 2009 of service user attitudes towards and experiences of the Clinic, and a report providing an overview of one year of the Clinic from 1st April 2011-31st March 2012 including Clinic costs, and feedback concerning blood testing and other experiences in the Clinic.

Case study: evidence from the Glasgow PIEDs Clinic

The service was introduced in 2009 after data revealed that while PIED use was high amongst clients attending the Glasgow Drugs Crisis Centre there was very low usage of pharmacy-based NSP in the area by this client group. The clinic is held on one day per week for four hours from 6pm and is located at the Drug Crisis Centre.

Aims of the service include:

- To increase engagement of PIED users with harm reduction and needle exchange
- To provide PIED users with needle packs suitable to their drug use
- To provide advice on diet, exercise, safer injecting, drug dosage, drug schedules and blood borne viruses
- To increase awareness and use of pharmacy needle exchange services

5.3 Quality assessment

5.3.1 Qualitative studies

One study was based upon a qualitative design (Simmonds & Coomber, 2009) and was rated '+' for quality. For this study the analysis was well reported and adequate, but the study was limited in particular by issues identified with context bias and methods, and lacked information about the role of the researchers and ethical issues.

5.3.2 Cross-sectional studies

Six studies were based upon survey data (Burton, 1996; Day et al., 2008, Korkia et al., 1996; Larance et al., 2008; Lenehan et al., 1996; Walker and Joubert, 2011) and were classed as having a cross-sectional design. Five of these studies were rated '+' for quality (Burton, 1996; Korkia et al., 1996; Larance et al., 2008; Lenehan et al., 1996; Walker & Joubert, 2011) and one study was rated '-' for quality (Day et al., 2008). All six studies were limited through the study design and reliance upon self-report data. For five studies rated '+' for quality (Korkia et al., 1996; Larance et al., 2008; Lenehan et al., 1996; Walker & Joubert, 2011), study methodology suggested that the risk of bias was minimised across studies but the limitations due to study design meant that not all items on the quality checklist could be met. The study by Day and colleagues (2008) was a brief article reporting findings from the Australian NSP survey, and lacked detail throughout. In particular, the reporting of methods of analysis was inadequate in this study.

5.4 What is the profile of PIED users and how do they differ from other IDUs?

5.4.1 Study participants' method of PIED administration

In four of the seven included studies (Day et al., 2008 [CS -], Larance et al., 2008 [CS +]) Simmonds & Coomber, 2009 [+]; Walker & Joubert, 2011 [CS +]) steroid using participants who all reported administering their steroids via injection. In three studies (Burton, 1996 [CS

+]; Korkia et al., 1996 [CS +]; Lenehan et al., 1996 [CS +]) participants included individuals who reported either injecting steroids or administering them orally.

5.4.2 NSP use amongst study participants

NSP use among participants varied by study; with two studies (Day et al., 2008 [CS -]; Walker & Joubert, 2011 [CS +]) including only participants who used NSP. In studies where participants were recruited from other settings, the use of NSP as a source of needles and syringes was reported to be high amongst participants in two studies (71%, Larance et al., 2008 [CS +]; 'second highest source of needles', Lenehan et al., 1996 [CS +]) but was not reported in two studies (Burton, 1996 [CS +]; Korkia et al., 1996 [CS +]). Evidence from the wider literature suggests that PIED users differ from other IDUs in their use of NSP. Analysis of NSP use in Cheshire and Merseyside suggests that steroid users make fewer visits per year to NSP than other IDUs, averaging approximately two visits per year (Beynon et al., 2007, McVeigh et al., 2003).

5.4.3 Age

Evidence from the one study, that included male and female NSP users, suggests that the vast majority of PIED users attending NSP are male, and that as a proportion of clients, PIED users are more likely to be male than other drug users (Day et al., 2008 [CS -]). PIED clients attending NSP were reported to be younger (mean age 27 years) than other IDUs (mean age 30 years). In four further studies that reported mean age of PIED users (Korkia et al., 1996 [CS +]; Larance et al., 2008 [CS +]; Lenehan et al., 1996 [CS +]; Simmonds & Coomber, 2009 [+]) participants were between 28 and 32 years, and in one study (Walker & Joubert, 2011 [CS +]) the most frequent age group for NSP using participants was 26-30 years. However, one study (Burton, 1996 [CS +]), which investigated the age at which participants first used steroids, reported that the majority (61%) had first used steroids before the age of 20. This might suggest that PIED users start using PIEDs earlier in life and only come in to contact with services once they are established users.

Case study: evidence from the Glasgow PIEDs Clinic

In one year at the Glasgow PIEDs Clinic (1st April 2011 – 31st March 2012) there were 400 transactions at the clinic with 284 clients. The majority of clients were male (97%) and aged between 20 and 35 (77%). A small number of clients were aged 15-19 (1%).

5.4.4 Sexuality

Evidence from one study (Larance et al., 2008 [CS +]) suggested that gay and bisexual PIED using men were less likely to access an NSP to acquire equipment than heterosexuals, although it was not clear why this is the case. Day and colleagues (2008 [CS -]) reported that steroid injectors using NSP were more likely to be heterosexual than other IDUs.

5.4.5 Sexual health behaviour

Burton (1996 [CS +]) examined condom use amongst steroid users in Wales. The majority of participants never used condoms with a regular partner (78%) or with a casual partner (62%), with one quarter (24%) reporting using a condom “always”, “often” or “sometimes” with a casual partner.

5.4.6 Employment status

Evidence from one study (Simmonds & Coomber, 2009 [+]) suggested that rates of employment are greater in PIED users than other IDUs, which could impact on this population’s ability to access NSP during the day. Lenehan and colleagues (1996 [CS +]) and Burton (1996 [CS +]) reported low unemployment rates (89%, 94% respectively) amongst steroid users and Koria and colleagues (1996 [CS +]) reported high employment rates amongst female steroid users (73% in full or part time work, or self-employed).

5.4.7 Injection risk behaviours

Three studies reported outcomes relating to risky injecting behaviour (Burton, 1996 [CS +]; Day et al., 2008 [CS -]; Larance et al., 2008 [CS +]). Day and colleagues (2008[CS -]) examined differences in injecting behaviour between steroid users and other IDUs, and reported that steroid users report less needle sharing (OR 0.18, 95% CI 0.09-0.36) and less frequent injecting (OR 0.14, 95% CI 0.10-0.19). Larance and colleagues (2008 [CS +]) and Burton (1996 [CS +]) reported rates of needle sharing ever amongst PIED users (5%, 16% respectively) and of needle re-use (13%, 37%). A higher proportion of PIED users reported ever sharing other injecting equipment including bladders or vials[1] in the same two studies (29%, 59% respectively). A 2010 report by the ACMD details needle sharing rates amongst PIED users as being between 0% and 20% across studies in the UK, and rates of reuse slightly higher at 4%-37% (Advisory Council on the Misuse of Drugs, 2010b).

5.4.8 Rates of BBV

Two studies examined rates of BBV amongst PIED users (Day et al., 2008 [CS -]; Larance et al., 2008 [CS +]). Larance and colleagues (2008 [CS +]) report that of their steroid using participants, 3% were HBV positive, 5% HCV positive and 12% HIV positive. Day and colleagues (2008 [CS -]) report that in their survey no steroid injectors were HIV positive and 10% were HCV positive, which was a lower proportion than in other injecting drug users (OR 0.10, 95% CI 0.07-0.15). In the same study steroid users were less likely than other IDUs to have been screened for HCV (OR 0.17, 95% CI 0.13-0.22) and HIV (OR 0.21, 95% CI 0.17-0.26).

5.5 What impact does access to services have on the health and behaviour of PIED users?

No studies were identified that examined the effectiveness of NSP provision in terms of impact on rates of HIV or other BBV or morbidity and mortality relating to injecting drug use

[1] Containers used for the storage of drugs that can be drawn out with a needle or syringe.

in people who inject PIEDs. Consequently there is an absense of published evidence on the impact of services on the health and behaviour of PIED users. However, there was evidence from one study (Burton, 1996 [CS +]) on the impact of NSP provision on needle disposal behaviours.

5.5.1 Impact on needle disposal

Analysis of methods of needle disposal in one study (Burton, 1996 [CS +]) found that one quarter (26%) of survey respondents reported using NSP for this activity, with more frequent methods of disposal including using a dustbin (37%) and passing the equipment on to someone else (34%).

Case study: evidence from the Glasgow PIEDs Clinic

Findings from the 2009 report of the impact of the Glasgow PIEDs clinic suggested clinic attendance had positive impacts on safer injecting practices (72%), frequency of drug use (55%) and clients' diet and exercise regimes (59%). Some clients may have decided against injecting steroids following harm reduction discussions, and appeared to make changes to their diet and exercise regimes as an alternative. Use of pharmacy needle exchange increased from 35% to 70% of respondents following a visit to the clinic.

5.6 What influences the uptake of services amongst PIED users?

5.6.1 Service uptake amongst PIED users

Data from the wider literature suggests that NSP clients in Merseyside and Cheshire, where monitoring of steroid user attendance has been in place since the 1990s, include a large proportion of steroid users (Beynon et al., 2007). It is reported that attendance at NSP in this population has greatly increased over the past 20 years (Advisory Council on the Misuse of Drugs, 2010b). Evidence from one study in the North West of England (Lenehan et al., 1996 [CS +]) suggests that the vast majority of participants (92%) would attend a free NSP for steroid users. This suggests that the provision of services for PIED users is desired in this population and the availability of services supports this: the ACMD identified four examples of services for PIED users in the annexes to their 2010 report (Advisory Council on the Misuse of Drugs, 2010c). Services included the Drugs in Sport Clinic and Users' Support in Durham, the Wirral Harm Reduction Service, Smart Muscle in London and the Surrey Harm Reduction Outreach Service. There was evidence from one study in Australia of NSP use amongst steroid users, with 71% participants obtaining needles and syringes from an NSP but only 7% reported seeking information from the same service (Larance et al., 2008 [CS +]).

Case study: evidence from the Glasgow PIEDs Clinic
In the 2009 survey clients reported positive feedback about the clinic with the vast majority of clients "very satisfied" with the service (93%) and rating the advice they received at the clinic as "very good" (88%) and helpful (94%). All but one client (98%) stated they would or had already used the service again and all clients (100%) stated that they would recommend the clinic to friends.

5.6.2 Stigma associated with NSP attendance

One study included outcomes relating to the attitudes of PIED users towards NSP. One qualitative study of four PIED users (Simmonds & Coomber, 2009 [+]) reported that stigma associated with attending an NSP may be a barrier for this population to accessing services. Steroid users distanced themselves from other IDUs and wanted to be recognised as a steroid user by both other IDUs and health professionals. Steroid users were concerned about being mistaken for street drug using IDUs; they saw themselves as being very separate to that population and did not want to be connected with the negative assumptions associated with IDUs. Burton (1996 [CS +]) suggests that participant survey responses "perceived themselves as being different to stereotypical drug users" but did not elaborate upon this finding in the article.

5.6.3 Female PIED users

It is likely that male and female PIED users' needs are likely to differ due to gender specific barriers and stigmatization associated with the use of PIEDs (ACMD, 2010b) and differing side effects and consequences of PIED use for males and females (Burton, 1996 [CS +]; Lenehan et al., 1996 [CS +]). One study (Korkia et al., 1996 [CS +]) examined attitudes of female PIED users towards desirable services. Korkia and colleagues (1996 [CS +]) reported that female PIED users believed that a desirable service would include both health checks and advice provided by health professionals and practical information about PIED use.

5.6.4 Range of services offered

In one study, not formally included in this review, Pates and Barry (1996)[2] reported that advice, testing for counterfeits and blood testing were all mentioned by steroid users in Cardiff as being help they would like to receive. Articles in the wider literature suggest that adulteration and contamination of PIEDs is likely to be commonplace (Evans-Brown et al., 2009b; McVeigh et al., 2012) and offering testing of PIEDs or information and advice on products may be useful for clients who are purchasing products illegally or over the internet.

[2] There was insufficient detail within the study relating to the research questions identified for this review for the study to be included.

Case study: evidence from the Glasgow PIEDs Clinic

The 2009 and 2012 reports into the Glasgow PIEDs Clinic examined four areas of services that the Clinic provided to clients: PIED specific needle packs, blood testing, harm reduction advice and information and referral on to other services.

Needle packs

Needle packs provided by pharmacies to IDUs may be opiate specific, which may be a barrier to uptake of this service by PIED users (see discussion of stigma in 6.6.2). A typical pharmacy needle pack includes equipment for the injection of opiates such as citric acid and spoons and opiate specific information that is not relevant to PIED users and their needs. A specific PIED user needle pack is available at the Glasgow PIEDs clinic containing needles and safer injecting information in a discreet case. The 2009 survey of clinic users provided positive feedback, with over 3/4 (77%) participants saying they liked the packs. Other options are available at the Clinic for clients for whose needs the new pack does not meet.

Blood testing

Feedback from PIED users in 2009 suggested that amongst those who had not used the clinic, the vast majority (80-90%) stated that they would be more likely to attend the clinic if blood testing was offered for health conditions commonly associated with PIED use including cholesterol, liver function tests and testosterone levels. Subsequently, blood testing was introduced to the clinic and is offered to clients for analysis of conditions where risk may increase due to PIED use including BBV, liver function, kidney function, hormone levels and cholesterol. In the 2012 report it was reported that between August 2011 and March 2012 there were 36 cases of blood testing at the clinic which revealed zero cases of BBV, 31 (86%) abnormal hormone results, 14 (39%) abnormal liver results, 8 (22%) abnormal cholesterol results and 7 (19%) abnormal kidney results.

Harm reduction advice

Clients receive harm reduction advice to promote safer injecting practices and alternatives to PIED use through making changes to diet and exercise. Some clients were reported to take away only the personalised diet and exercise plans rather than any injecting equipment including nearly one third (29%) of clients over one three month period. Dawson (2001) suggests that harm reduction for PIED users should include advice on training and diet to promote behavioural changes as an alternative to PIED use.

Referral to other services

Discussions between Clinic staff, the client and a nurse take place about health issues that clients present at the Clinic with. This includes injury or side effects related to injection of PIEDs such as infected abscess, deep vein thrombosis and steroid acne. Referral is made to additional services where necessary.

This evidence suggests that multi-faceted PIED specific services that offer services such as advice and information, health expertise, testing for contaminants and blood testing may appeal to PIED users. The UK PIED services identified in 5.6.1 typically offered a variety of services for PIED users including testing for BBV, vaccination for hepatitis A and B, sexual health screening, referral to other services where necessary, advice on diet and training, practical advice regarding the use of steroids and harm reduction (Advisory Council on the Misuse of Drugs, 2010c).

5.7 How can services reach PIED users to raise awareness about a service and attract clients?

There was evidence from six studies relating to sources of information regarding PIED use, including beliefs about promoting PIED services and where PIED users acquired information.

5.7.1 Promoting services in gyms

Korkia and colleagues (1996 [CS +]) reported suggestions by female steroid users to use a local drugs centre or advertising in gyms to attract clients to a service. In their qualitative study, Simmonds and Coomber (2009 [+]) reported a belief amongst the four participants that large gyms might not want to promote needle exchange due to the association with steroid use in that gym.

5.7.2 Information seeking behaviour

There is evidence that PIED users actively seek information relating to their drug use, but the evidence in three studies (Burton, 1996 [CS +]; Larance et al., 2008 [CS +]; Lenehan et al., 1996 [CS +]) is mixed as to where this information seeking takes place. In the study of steroid users in Sydney (Larance et al., 2008 [CS +]), fewer participants reported their gym as a source of information (18%) with more participants seeking information from the internet (62%), friends (55%) and doctors (22%). Lenehan and colleagues (1996 [CS +]) reported that 43% of steroid using participants in their study in North West England had sought advice from a doctor about medical issues relating to their drug use. Burton (1996 [CS +]) however reported that just one participant in that study had used their GP as a source of information, with friends (57%), books and magazines (28%) and gym owners (11%) more frequently used. It is unknown however whether the increasing accessibility of information on the internet would impact upon these participants' information seeking.

Walker and Joubert (2011 [CS +]) state that the vast majority (93%) of steroid NSP users who responded to their survey knew at least one other steroid user, while two fifths (42%) knew 10-12 users. The authors also report that all but one participant (98%) trusted their source of steroids with one third (34%) of participants' source being someone at their gym.

Case study: evidence from the Glasgow PIEDs Clinic

The 2009 survey of the Glasgow PIEDs Clinic revealed that four in ten participants using the Clinic (41%) heard about the Clinic at the gym. One third (33%) learned about the Clinic at the city's Crisis Drugs Centre and one quarter (23%) from a friend. The survey revealed that six in ten participants (62%) had not seen a poster for the Clinic despite it being widely advertised in gyms, doctor's surgeries, pharmacies and drug services. Of those who had seen the Clinic advertised, the gym was the most common location (37%).

5.7.3 Alternative settings in which to promote services

The 2010 ACMD report states that settings in which to engage steroid users in harm reduction could include primary care settings such as outreach services in gyms, NSP, pharmacies and GP surgeries (Advisory Council on the Misuse of Drugs, 2010b). The evidence reported here suggests that PIED users use these settings as a source of information, but that efforts to promote services and reach more PIED users may need to include tapping into resources such as the internet and peer networks.

6 Discussion

This review examined evidence on the optimal provision of NSP to people who inject PIEDs. NSP are a fundamental component of harm reduction services and provide access to sterile injection equipment for people who inject drugs. Primarily developed as a preventative measure for the spread of HIV among people who inject opiates and stimulant drugs (so called 'street drugs') over the last 20 years services providing NSP have observed a change in the profile of their clients, with increasing numbers of people identifying as users of steroids and other PIEDs attending such services. There is evidence that people who inject PIEDs use NSP differently to other client groups. They are likely to have different motivations for using drugs and different service needs and perceptions about services. As such there is a need to identify how best to deliver services to this population.

This review identified a distinct lack of literature on delivery of harm reduction services to people who inject PIEDs. In addition, all the research identified refers to steroid use and associated drugs, with no research identified in relation to users of other PIEDs (e.g. the melanotans). It has been recognised that people who inject PIEDs tend to be, but are not exclusively, male and generally of younger age. In comparison to people who inject opiates and stimulants, injection risk behaviours have been less extensively explored among people who inject PIEDs; with estimates of needle and syringe sharing varying between 0 and 20% across UK studies. There is evidence of sharing and reusing needles and syringes and other injection equipment, suggesting that although people who inject PIEDs have a different risk profile to other people who inject drugs, they are nevertheless at a higher risk of infection than non-injectors. There is some evidence available that PIED users engage in risky sexual behaviours (Baron, 1996; Midgley et al., 2000; Hope et al., 2013), and there may be a need to increase PIED user engagement with sexual health services.

There is an absence of published evidence on the impact of harm reduction services on the health and injection risk behaviours of people who inject PIEDs. However, there is some evidence to suggest that provision of NSP is desired in this population. Current service configurations, primarily structured to the needs of opiate and stimulant injectors, have been shown to be a barrier to attendance by PIED injectors. Studies suggest that PIED injectors perceive themselves to be separate to other population of PWIDs and wish to avoid such associations, which they perceive negatively. Although based on a fragmented evidence base, the studies reviewed suggest that multi-faceted services are required to appeal to PIED injectors. Services should be PIED injector specific, and offer additional services alongside needle and syringe distribution such as advice and information, health expertise on diet and exercise, sexual health services, health monitoring including blood testing and vaccinations and information on high risk drugs and practices.

During consultation on the public health guidance PH18, secondary exchange amongst PIED users was highlighted as being an opportunity to promote the safe distribution of

injecting equipment through peer networks (National Institute for Health and Clinical Excellence, 2012b). There was no evidence identified in this review that directly supports the existence of secondary exchange in this population, but studies suggest that PIED users see PIED using friends and acquaintances as a reliable source for the acquisition of and information about PIEDs. Additionally, examination of the number of syringes taken from NSP in Merseyside and Cheshire (McVeigh et al., 2003) has revealed that in 16.5% of transactions with steroid users in one year between 100 and 1000 syringes have been provided. This suggests that secondary exchange amongst PIED users may be viable and already on going, but more research is needed to examine how to utilise these networks to promote safer injecting behaviours and harm reduction services.

7 References

7.1 Included studies

Burton, C. (1996). Anabolic steroid use among the gym population in Clwyd. Pharmaceutical Journal 256(6888): 557-559.

Day, C.A., Topp, L., Iversen, J. & Maher, L. (2008). Blood-borne virus prevalence and risk among steroid injectors: Results from the Australian Needle and Syringe Program Survey. Drug and Alcohol Review, 27: 559-561.

Korkia, P., Lenehan, P. & McVeigh, J. (1996). Non-medical use of androgens among women. The Journal of Performance Enhancing Drugs, 1 (2): 71-76.

Larance, B., Degenhardt, J.C. & Dillon, P. (2008). Injecting risk behaviour and related harm among men who use performance- and image-enhancing drugs. Drug and Alcohol Review, 27: 679-686.

Lenehan, P., Bellis, M. & McVeigh, J. (1996). A study of anabolic steroid use in the North West of England. The Journal of Performance Enhancing Drugs, 1 (2): 57-70.

Simmonds, L. & Coomber, R. (2009). Injecting drug users: A stigmatised and stigmatising population. International Journal of Drug Policy, 20: 121-130.

Walker, D & Joubert, H.E. (2011). Attitudes of injecting male anabolic androgenic steroid users to media influence, health messages and gender constructs. Drugs and Alcohol Today, 11 (2): 56-70.

7.2 Excluded studies

Anon. (1996). "Beyond the syringe." Ultra-Fit Magazine 6(1): 58-59.

Anon. (1998). Addictions and problem drug use: issues in behaviour, policy and practice, Jessica Kingsley.

Anon. (2003). Enhancing drug services. Drugscope.

Aitken, C. and C. Delalande (2002). "A public health initiative for steroid users in Victoria." Australian Journal of Primary Health 8(2): 21-23.

Aitken, C., C. Delalande, et al. (2002). "Pumping iron, risking infection? Exposure to hepatitis C, hepatitis B and HIV among anabolic-androgenic steroid injectors in Victoria, Australia." Drug and Alcohol Dependence 65(3): 303-308.

Aspinall, E., Hutchinson, S.J., Taylor, A., Palmateer, N., Hellard, M., Allen, E. & Goldberg, D. (2012). Uptake of paraphernalia from injecting equipment provision services and its

association with sharing of paraphernalia among injecting drug users in Scotland. Drug and Alcohol Dependence 126: 340-346.

Bardick, A. D., G. Nixon, et al. (2008). "More than meets the eye: weight lifting and steroid use in men." Journal of Social Work Practice in the Addictions, 8(2), 2008, pp.208-227.

Beel, A., B. Maycock, et al. (1998). "Current perspectives on anabolic steroids." Drug & Alcohol Review 17(1): 87-103.

Bolding, G., L. Sherr, et al. (2002). "Use of anabolic steroids and associated health risks among gay men attending London gyms." Addiction 97(2): 195-203.

Bolding, G., L. Sherr, et al. (1999). "HIV risk behaviours among gay men who use anabolic steroids." Addiction 94(12): 1829-1835.

Bravo, M. J., L. Royuela, et al. (2009). "Use of supervised injection facilities and injection risk behaviours among young drug injectors." Addiction 104(4): 614-619.

Broadhead, R. S., Y. van Hulst, et al. (1999). "The impact of a needle exchange's closure." Public Health Reports 114(5): 439-447.

Bryant, J., L. Topp, et al. (2010). "Is point of access to needles and syringes related to needle sharing? Comparing data collected from pharmacies and needle and syringe programs in south-east Sydney." Drug and Alcohol Review 29(4): 364-370.

Carrier, N. and P. Lauzon (2003). "Shooting-Up in the Presence of Care-Givers!? The Drug User's Point-of-View on the Possible Establishment of a Supervised Injection Facility of Illicit Drugs in Montreal." Drogues, sante et societe 2(1): 119-174.

Christensson, B. and B. Ljungberg (1991). "Syringe exchange for prevention of HIV infection in Sweden: practical experiences and community reactions." International Journal of the Addictions 26(Dec 91): 1293-1302.

Crampin, A. C., T. L. Lamagni, et al. (1998). "The risk of infection with HIV and hepatitis B in individuals who inject steroids in England and Wales." Epidemiology & Infection 121(2): 381-386.

Delalande, C. L., C. K. Aitken, et al. (1998). "Risky practices among people who inject steroids." Medical Journal of Australia 169(1): 62.

Des Jarlais, D. C., N. Braine, et al. (2007). "Unstable Housing as a Factor for Increased Injection Risk Behavior at US Syringe Exchange Programs." Aids and Behavior 11: 78-84.

Dickinson, B. P. and J. D. Rich (1996). "Infections secondary to anabolic steroid misuse and their prevention." Journal of Performance Enhancing Drugs 1(4): 146-150.

Dobbins, B. (1996). "Steroids are they heaven...or are they hell?" Joe Weider's Muscle & Fitness 57(10): 106.

Dowler, C. (2012). "Drug workers need new skills to address rise in steroid use." Nursing Times 108(29): 6.

Durant, R. H., C. S. Ashworth, et al. (1994). "Stability of the relationships between anabolic steroid use and multiple substance use among adolescents." Journal of Adolescent Health 15(2): 111-116.

Elford, J., L. Sherr, et al. (2002). "Peer-led HIV prevention among gay men in London: Process evaluation." AIDS Care 14(3): 351-360.

Evans-Brown, M. and J. McVeigh (2009). "Injecting human growth hormone as a performance-enhancing drug-perspectives from the United Kingdom." Journal of Substance Use 14(5): 267-288.

Evans, N. A. (1997). "Gym and tonic: a profile of 100 male steroid users. / "Gym and tonic": portrait de 100 consommateurs masculins de steroides." British Journal of Sports Medicine 31(1): 54-58.

Franques, P., M. Auriacombe, et al. (2001). "Sports, use of performance enhancing drugs and addiction. A conceptual and epidemiological review." Annales De Medecine Interne 152: S37-S49.

Gannon, J. and K. E. Kewming (2000). "The misuse of insulin by body builders: Raising awareness of the dangers of this practice and the need for education resources." Australian Journal of Primary Health - Interchange 6(1): 105-110.

Gordon, D. (2002). "It's a botox blast: are dangers getting overlooked as we flock to the needle?" Men's Fitness 18(9): 78-79.

Grace, F., J. Baker, et al. (2001). "Anabolic androgenic steroid use in recreational gym users: a regional sample of the Mid-Glamorgan area." Journal of Substance Use 6(3): 189-195.

Henrion, R., L. Mandelbrot, et al. (1992). "Contamination par le VIH a la suite d'injections d'anabolisants. / HIV contamination after injections of anabolic steroids (letter)." Presse Medicale 21(5): 218-218.

Iriart, J. A. and T. M. Andrade (2002). "Body-building, steroid use, and risk perception among young body-builders from a low-income neighborhood in the city of Salvador, Bahia State, Brazil. [Portuguese]

Jones, L., L. Pickering, et al. (2010). "Optimal provision of needle and syringe programmes for injecting drug users: a systematic review." International Journal of Drug Policy 21(5): 335-342.

Kordi, R. and W. A. Wallace (2004). "Blood borne infections in sport: Risks of transmission, methods of prevention, and recommendations for hepatitis B vaccination." British Journal of Sports Medicine 38(6): 678-683.

Korkia, P. and G. Stimson (1994). "Steroids: use, users and responses." Druglink 9(4): 14-16.

Kraska, P.B., Bussard, C.R. & Brent, J.J. (2010). Trafficking in bodily perfection: examining the late-modern steroid marketplace and its criminalization. Justice Quarterly 27(2): 159-185.

Langan, E. A., Z. Nie, et al. (2010). "Melanotropic peptides: more than just 'Barbie drugs' and 'sun-tan jabs'?" British Journal of Dermatology 163(3): 451-455.

Langan, E. A., D. Ramlogan, et al. (2009). "Pursuit of a tan through internet-sourced injectable melanotropic peptides: Association with darkening of melanocytic naevi." British Journal of Dermatology 161: 128-129.

Lenaway, D. D., A. Guilfoile, et al. (1992). "Multiple HIV-risk behaviors among injection-steroid users." AIDS and Public Policy Journal 7(3): 184-186.

Mahony, C. (1999). "Muscling in at the gym." Nursing Times 95(20): 28-29.

Maycock, B. and P. Howat (2005). "The barriers to illegal anabolic steroid use." Drugs: Education, Prevention & Policy 12(4): 317-325.

Maycock, B. R. and P. Howat (2007). "Social capital: implications from an investigation of illegal anabolic steroid networks." Health Education Research 22(6): 854-863.

McCoy, H. V., D. D. Chitwood, et al. (1997). "Skills for HIV risk reduction: evaluation of recall and performance in injecting drug users." Substance Use and Misuse 32(3): 229-247.

McLean, K. (2012). "Needle exchange and the geography of survival in the South Bronx." International Journal of Drug Policy 23(4): 295-302.

McVeigh, J., C. Beynon, et al. (2003). "New challenges for agency based syringe exchange schemes: Analysis of 11 years of data (1991-2001) in Merseyside and Cheshire, United Kingdom." International Journal of Drug Policy 14(5-6): 399-405.

Midgley, S. J., N. Heather, et al. (2000). "Risk behaviours for HIV and hepatitis infection among anabolic-androgenic steroid users." AIDS Care 12(2): 163-170.

Monaghan, L., M. Bloor, et al. (2000). "Drug-Taking, 'Risk Boundaries' and Social Identity: Bodybuilders' Talk about Ephedrine and Nubain." Sociological Research Online 5(2).

Monaghan, L. F. (2002). "Vocabularies of motive for illicit steroid use among bodybuilders." Social Science and Medicine 55(5): 695-708.

Montigny, L. d., A. Vernez Moudon, et al. (2011). "A spatial analysis of the physical and social environmental correlates of discarded needles." Health and place 17(3): 757-766.

Morrison, C. (1994). "Harm reduction with AS users: experiences in running a well user service." Relay(2): 16-18.

Morrison, C. L. (1994). "Anabolic steroid users identified by needle and syringe exchange contact." Drug & Alcohol Dependence 36(2): 153-155.

Murphy, T. and S. Murphy (1998). AIDS Prevention: Ancillary Services and Needle Exchange. Society for the Study of Social Problems.

Parkinson, A. B. and N. A. Evans (2006). "Anabolic androgenic steroids: a survey of 500 users." Medicine & Science in Sports & Exercise 38(4): 644-651.

Plowright, S. (1993). Harm minimisation and anabolic steroids : results and recommendations of DRIC injecting steroid user survey. Canberra; Australia, Assisting Drug Dependants Inc.

Reddon, H., E. Wood, et al. (2011). "Use of North America's first medically supervised safer injecting facility among HIV-positive injection drug users." Aids Education and Prevention 23(5): 412-422.

Reif, C. J. and A. B. Elster (1998). "Adolescent preventive services." Primary Care - Clinics in Office Practice 25(1): 1-21.

Rich, J. D., B. P. Dickinson, et al. (1999). "The infectious complications of anabolic-androgenic steroid injection." International Journal of Sports Medicine 20(8): 563-566.

Rich, J. D., B. P. Dickinson, et al. (1998). "Hepatitis C virus infection related to anabolic-androgenic steroid injection in a recreational weight lifter." American Journal of Gastroenterology 93(9): 1598.

Rich, J. D., C. K. Foisie, et al. (1999). "Needle exchange program participation by anabolic steroid injectors, United States 1998." Drug and Alcohol Dependence 56(2): 157-160.

Roberts, C. and N. Crofts (2000). "Hitting up in the Top End: Characteristics of needle exchange clients in Darwin." Australian and New Zealand Journal of Public Health 24(1): 82-85.

Salmon, A. M., H.-H. Thein, et al. (2007). "Five years on: What are the community perceptions of drug-related public amenity following the establishment of the Sydney Medically Supervised Injecting Centre?" International Journal of Drug Policy 18(1): 46-53.

Scherbaum, N., M. Specka, et al. (2009). "Drug consumption facility as part of a primary health care centre for problem drug users - which clients are attracted?" International Journal of Drug Policy 20(5): 447-449.

Scott, M. J. (1989). "HIV infection associated with injections of anabolic steroids." JAMA: Journal of the American Medical Association 262: 207-208.

Shapiro, H. (1992). "Adjusting to steroid users." Druglink, September/October 1992, pp.16-17.

Taylor, N. and S. Bagshaw (1997). "Needle exchange service." New Zealand Medical Journal 110(1043): 174.

Thompson, J. K. and G. Cafri (2007). The muscular ideal: Psychological, social, and medical perspectives. Washington, DC US, American Psychological Association.

Topp, L., J. Iversen, et al. (2008). "Prevalence and predictors of injecting-related injury and disease among clients of Australia's needle and syringe programs." Australian and New Zealand Journal of Public Health 32(1): 34-37.

Tucker, R. (1997). "Abuse of anabolic-androgenic steroids by athletes and body builders: A review." Pharmaceutical Journal 259(6954): 171-179.

Tyndall, M. W., T. Kerr, et al. (2006). "Attendance, Drug Use Patterns, and Referrals Made from North America's First Supervised Injection Facility." Drug and Alcohol Dependence 83(3): 193-198.

Ward, P. (2010). "HIV prevention and sexual health promotion with gay and bisexual men involved in esoteric sexual practices - The HardCell web site." HIV Medicine 11: 53.

Williamson, K., M. Davies, et al. (1993). A well-steroid user clinic: a drug team's experience of running a specialist needle exchange for steroid users. In, Shapiro, H. (ed.), The steroid papers, London, Institute for the Study of Drug Dependence, 1993, p. 27-29. United Kingdom.

Witteveen, E., E. J. C. Van Ameijden, et al. (2006). "Motives for and against Injecting Drug Use among Young Adults in Amsterdam: Qualitative Findings and Considerations for Disease Prevention." Substance Use & Misuse 41(6-7): 1001-1016.

Wright, J. (1996). "Raging bull." Joe Weider's Muscle & Fitness 57(2): 136.

Wright, S., S. Grogan, et al. (2001). "Body-builders' attitudes towards steroid use." Drugs: Education, Prevention and Policy 8(1): 91-95.

7.3 All other references

Advisory Council on the Misuse of Drugs. (2010a). The primary prevention of hepatitis C among injecting drug users. London: Advisory Council on the Misuse of Drugs.

Advisory Council on the Misuse of Drugs. (2010b). Consideration of the anabolic steroids. London: Advisory Council on the Misuse of Drugs.

Advisory Council on the Misuse of Drugs. (2010c). Annex for the ACMD Anabolic Steroids Report, A-F. Advisory Council on the Misuse of Drugs, London.

Benyon, C.M., McVeigh, J., Chandler, M., Wareing, M. & Bellis, M.A. (2007). The impact of citrate introduction at UK syringe exchange programmes: a retrospective cohort study in Cheshire and Merseyside, UK. Harm Reduction Journal, 4: 21.

Cattan, M., Bagnall, A. M., Akhionbare, K. & Burrell, K. (2008). Injecting equipment schemes for injecting drug users: qualitative evidence review. Leeds: Faculty of Health, Leeds Metropolitan University.

Dawson, R.T. (2001). Drugs in sport – the role of the physician. Journal of Endocrinology, 170: 55-61.

Evans–Brown, M., Dawson, R. T., Chandler, M. & McVeigh J. (2009a). Use of melanotan I and II in the general population. BMJ, 338: b566.

Evans-Brown, M., Kimergard, A. & McVeigh, J. (2009b). Elephant in the room? The methodological implications for public health research of performance-enhancing drugs derived from the illicit market. Drug Testing and Analysis, 1(7): 323-326.

Evans-Brown, M., McVeigh, J., Perkins, C. & Bellis, M. A. (2012). Human enhancement drugs: the emerging challenges to public health. Liverpool: North West Public Health Observatory, Centre for Public Health, Liverpool John Moores University.

Healthcare Commission/National Treatment Agency. (2008). Improving services for substance misuse: commissioning drug treatment and harm reduction services. London, Commission for Healthcare Audit and Inspection.

Home Office. (2012). Drug misuse declared: findings from the 2011/12 British Crime Survey for England and Wales. London: Home Office.

Hope, V., McVeigh, J., Marongiu, A., Evans-Brown, M., Smith, J., Kimegard, A., Croxford, S., Beynon, C., Parry, J.V., Bellis, M. & Ncube, F. (2013). Prevalence of, and risk factors for, human immunodeficiency virus, hepatitis B and hepatitis C infections among men who inject image and performance enhancing drugs in England & Wales. 19th Annual Conference of the British HIV Association, Manchester April 2013. HIV Medicine, 14(S2): 1-10.

Jones, L., Pickering, L., Sumnall, H., McVeigh, J. & Bellis, M. A. (2008). A review of the effectiveness and cost-effectiveness of needle and syringe programmes for injecting drug users. Liverpool: Centre for Public Health, Liverpool John Moores University.

Lenehan, P., Bellis, M. A., & McVeigh, J. (1996). A study of anabolic steroid use in the North West of England. Journal of Performance Enhancing Drugs, 1: 57–70.

McVeigh, J., Beynon, C. & Bellis, M.A. (2003). New challenges for agency based syringe exchange schemes: analysis of 11 years of data (1991-2001) in Merseyside and Cheshire, United Kingdom. International Journal of Drug Policy, 14: 399-405.

McVeigh, J., Chandler, M., Beynon, C., Evans-Brown, M. J. & Bellis, M. A. (2007). The injectors that harm reduction forgot. Poster session presented at the 18th International Conference on the Reduction of Drug Related Harm, Warsaw, Poland.

McVeigh, J., Evans-Brown, M. & Bellis, M.A. (2012). Human enhancement drugs and the pursuit of perfection. Adicciones, 24(3): 185-190.

Midgley, S. J., N. Heather, et al. (2000). "Risk behaviours for HIV and hepatitis infection among anabolic-androgenic steroid users." AIDS Care 12(2): 163-170.

National Institute for Health and Clinical Excellence. (2009). Needle and syringe programmes: providing people who inject drugs with injecting equipment. London: National Institute for Health and Clinical Excellence.

National Institute for Health and Clinical Excellence. (2012a). Methods for the development of NICE public health guidance (third edition). London: National Institute for Health and Clinical Excellence.

National Institute for Health and Clinical Excellence (2012b). Review of the public health guidance (PH18): Optimal provision of needle and syringe programmes (NSPs). Review decision. London: National Institute for Health and Clinical Excellence.

Pates, R. & Barry, C. (1996). Steroid use in Cardiff: A problem for whom? The Journal of Performance Enhancing Drugs, 1(3): 92-97.

The NHS Information Centre. (2011). General Pharmaceutical Services in England 2001-02 to 2010-11. London: The NHS Information Centre.

Appendix 1. Example search strategy

Ovid MEDLINE®

#	Search terms
1	exp Needle-Exchange Programs/
2	((needle* or syringe* or inject*) adj3 exchange).tw.
3	shooting galler*.tw.
4	harm reduction/
5	(harm adj reduc*).tw.
6	or/1-5
7	((needle* or syringe* or inject* or citric acid* or foil or steril* or bleach* or disinfect*) adj3 (suppl* or access* or provision or provid* or distribut* or dispens* or pack*)).tw.
8	((needle* or syringe* or inject*) adj3 (program* or service* or center* or centre* or scheme* or facility or facilities or area* or prison* or pharmacy or pharmacies or unit or units or room*)).tw.
9	((needle* or syringe* or inject*) and (steril* or bleach* or disinfect* or clean* or safe*)).tw.
10	(nsp or nep or nsep or nsps or neps or nseps or sep or seps).tw.
11	or/7-10
12	((needle* or syringe* or inject* or slot or dispensing or vending) adj3 (machine* or (peer adj distrib*))).tw.
13	(electronic adj dispens*).tw.
14	((needle* or syringe* or inject* or sharps or cin or "drug-related litter") adj3 (dispos* or bin* or container*)).tw.
15	(disposal adj3 (bin* or container* or safe*)).tw.
16	(fitpack* or distribox* or steribox* or fitbin* or (drop adj box*)).tw.
17	or/12-16
18	Risk-taking/
19	(risk* adj3 behavio?r*).tw.
20	(inject* adj3 (behaviour* or behavior* or practic* or pattern* or risk* or unsafe* or harm* or hazard* or frequenc*)).tw.
21	Needle Sharing/
22	((needle* or syringe* inject*) adj3 (sharing or share* or reusing or reuse* or re-using or re-use or return*)).tw.
23	or/18-22
24	6 or 11 or 17 or 23
25	Performance-Enhancing Substances/
26	(PIED or PIEDs).tw.
27	((performance OR image) adj5 drug*).tw.
28	Steroids/
29	Anabolic agents/
30	((anabolic or androgenic) adj4 (steroid* or agent*)).tw.
31	ergogenic.tw.

32	Doping in Sports/
33	Human Growth Hormone/
34	Growth Hormone-Releasing Hormone/
35	(growth hormone or HGH).tw.
36	alpha-MSH/
37	(melanotan or bremelanotide).tw.
38	(dermal filler* or cosmetic filler*).tw.
39	or/25-38
40	exp Botulinum Toxins/
41	(botulinum or botox).tw.
42	Beauty/ or Beauty Culture/ or Cosmetics/ or Cosmetic Techniques/ or Skin Aging/ or Rejuvenation/ or Facial Expression/
43	(cosmetic* or beaut* or wrinkle* or aesthetic* or esthetic* or face* or facial* or image*).tw.
44	(40 OR 41) AND (42 OR 43)
45	39 OR 44
46	24 AND 45
47	animals/ not humans/
48	46 NOT 47
49	**limit 48 to yr=1990-current**

Appendix 2. Inclusion and exclusion criteria

Inclusion and exclusion criteria

Two reviewers will independently screen all titles and abstracts. Full titles of any titles/abstracts that are considered relevant by both reviewers will be obtained for further screening. The relevance of each article will be assessed according to the criteria set out below. Any discrepancies will be resolved by consensus or, if necessary, by consulting a third reviewer.

Types of studies

For the assessment of effectiveness; good quality systematic reviews of experimental and observational studies, randomised controlled trials, controlled non-randomised studies, controlled and uncontrolled before and after studies, cross-sectional studies, cohort studies, case-control studies and ecological studies. For the assessment of cost-effectiveness; economic evaluations conducted alongside trials, modelling studies and analyses of administrative databases. Only full economic evaluations that compare two or more options and consider both costs and consequences (including cost-effectiveness, cost-utility and cost-benefit analyses) will be eligible.

For the review of qualitative literature; studies of any qualitative design will considered for inclusion, for example, ethnographic studies, studies that use a phenomenological or grounded theory approach, or participatory action research. For studies based on mixed methods research, both the qualitative and quantitative elements will be screened for inclusion.

Types of interventions

Interventions involving the supply of needles, syringes and other injecting equipment (e.g. filters, mixing containers and sterile water) and harm reduction interventions provided by NSP will be eligible.

Types of participants

People who currently inject non-prescribed anabolic steroids and other performance and image enhancing drugs (PIEDs). Inclusion of studies in the review will be based on a broad definition of injectable enhancement drugs that takes into account their range of uses for both enhancement and self-treatment of medical problems.

Types of outcome measure

Qualitative studies of relevance include those on the views, experiences and attitudes of people who inject PIEDs in relation to the supply of needles, syringes and other injecting equipment through NSP and harm reduction interventions delivered via NSP. In addition to views and experiences, studies of perspectives on barriers to, and opportunities for, changing behaviour in relation to PIED use in the context of NSP are also of relevance.

For effectiveness studies, those reporting changes in behaviour relating to injecting drug use will be eligible, including:

- Incidence and prevalence of blood-borne viral infections, primarily HIV and hepatitis C, but also hepatitis B;
- Morbidity and mortality relating to PIED use, e.g. injecting site bacterial infections;
- Self-reported injecting risk-behaviour (e.g. sharing or re-using injection equipment, frequency of injection);
- Additional outcomes of interest will include utilisation of other health care services.

For cost-effectiveness studies, those reporting both costs (regardless of how estimated) and outcomes (regardless of how specified) will be eligible. Outcomes of interest are likely to include, but will not be limited to:

- incremental costs per case of HIV infection prevented
- incremental costs per case of hepatitis C infection prevented
- incremental costs per additional QALY gained

Appendix 3. Evidence Tables

Study details	Population and setting	Results
Burton, 1996 **Country**: UK **Objectives**: **Funding source**: Clwyd social services department	**Entry criteria:** Anabolic steroid users recruited through gyms **Participant characteristics** **Number of participants:** 70 **Males (%)** 62 (89%) **Ethnicity:** NR **Mean age:** NR **Outcomes and methods of analysis** **Outcomes measured:** steroid use, needle sharing and disposal, adverse effects, sources of information **How measured:** Survey **Methods of analysis:** descriptives **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of service users** First used AS: 61% before 20 years Employment: 64% FT employment, 30% PT employment, 11% students, 1% unemployed Method of administration: 79% injected, including injection and oral method (67% total). Needle sharing: 16% shared injecting equipment; 59% shared a multi dose vial; 37% re-using needles. Sexual health: 78% never used a condom with regular partner, 62% never used a condom with a casual partner. 24% always/often/sometimes used a condom with a casual partner. **Impact of NSP on health and behaviour** Disposing of needles: most common methods included passing onto someone else (n=24), put them in a dustbin (n=26), NSP (n=18). Additionally n=3 disposed of them down a drain, n=3 left them lying around. **Uptake of services** States that “Further questioning revealed that… AS users perceived themselves as being different from stereotypical drug users. This clearly has implications for service provision for this client group”. **Accessing and reaching steroid users** Source of advice and information: 57% friend or training partner; 11% gym owner; 28% books and magazines

NR=not reported; NA=not applicable

Study details	Population and setting	Relevant findings
Day et al., 2008 **Country**: Australia **Objectives**: to examine risk behaviours among steroid injectors **Funding source**: Australian Government Department of Health and Aging; National Health Medical Research Council Public Health Post-doctoral Fellowship	**Entry criteria:** Steroid injecting respondents among NSP Survey participants **Participant characteristics** **Number of participants:** 318 **Male (%):** 306 (96%) **Ethnicity:** NR **Mean age:** 27 years **Outcomes and methods of analysis** **Outcomes measured:** risky injecting behaviour, BBV prevalence **How measured:** survey **Methods of analysis:** NR **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of NSP clients** Mean age 27 years; 16 (1%) homosexual or bisexual. More likely than other drug users to be male (OR 16.04, 8.54-30.15), younger (27 vs 30 years) and heterosexual (OR 3.70, 2.23-6.13). Steroid users are less likely to screen HCV positive (OR 0.10, 0.07-0.15); Steroid users are less likely to have risky injecting behaviour: needle sharing (OR 0.18, 0.09-0.36); daily or more frequent injecting (OR 0.14, 0.10-0.19). Steroid injectors less likely to report a history of screening for HCV (OR 0.17, 0-13-0.22) or HIV (OR 0.21, 0.17-0.26) **Impact of NSP on health and behaviour** NR **Uptake of services** NR **Accessing and reaching steroid users** NR

NR=not reported; NA=not applicable

Study details	Population and setting	Relevant findings
Korkia et al., 1996 **Country**: UK **Objectives**: To find out about patterns of steroid use amongst women, health effects and information about services that would be acceptable to them **Funding source**: NR	**Entry criteria:** Female anabolic steroid users recruited through gyms **Participant characteristics** **Number of participants:** n=15 **Male (%):** n=0 (0%) **Ethnicity:** NR **Mean age:** 28 years (21-43) **Outcomes and methods of analysis** **Outcomes measured:** steroid use, sources of information, ideal service provision **How measured:** Structured interviews **Methods of analysis:** Descriptives **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of service users** Employment: 5 FT, 3 PT, 3 SE, 4 unemployed **Impact of NSP on health and behaviour** NR **Uptake of services** Two women received medical monitoring of steroid use – through GP and a private lab. Ideal service provision: information wanted – how to combat side effects, testing for counterfeits, advice from a doctor and on safe yet effective dosages. Ideal service should cope with both health issues and efficacy of anabolic steroids – so would involve a qualified doctor, health checks and also general advice about anabolic steroid dosage, administration and counterfeits. Suggested settings for service provision – local drugs centre, gyms. 8/15 would be prepared to pay for the service between £10-£20 a time. **Accessing and reaching steroid users** Three most important sources of information were friends, anabolic steroid handbooks and the gym manager

NR=not reported; NA=not applicable

Study details	Population and setting	Relevant findings
Larance et al., 2008 **Country**: Australia **Objectives**: To examine patterns of use, risk behaviours and related harm associated with PIEDs injections and the ways in which users seek injecting equipment and harm-reduction advice **Funding source**: Australian Ministerial Council on Drug Strategy	**Entry criteria:** 17 years and older, had used anabolic substances for non-medical purposes in the past 6 months, resident in Sydney for past 12 months. Participants were recruited via advertisements through settings including NSP, internet forums and gyms. **Participant characteristics** **Number of participants:** 60 **Male (%):** 60 (100%) **Ethnicity:** NR **Mean age:** 32 years **Outcomes and methods of analysis** **Outcomes measured:** patterns of PIED use, injecting behaviour, BBV status, correlates of risky injecting, information seeking and service utilisation **How measured:** structured questionnaires through interview **Methods of analysis:** descriptives, t-tests, Mann-Witney U test, OR, Fisher's exact test, logistic regression analysis **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of clients** Ever shared needles: 5%; shared in last month 2% Ever re-used needles: 13% Ever shared vial/bladder/container: 29% BBV status: 3% HBV positive; 5% HCV positive; 12% HIV positive **Impact of NSP on health and behaviour** NR **Uptake of services** A significantly smaller proportion of gay/bisexual men reported obtaining equipment from NSP (39%/ 79%, p=<.01) Obtaining of needles and syringes from: NSP (71%), chemist/pharmacy (14%), doctor (11%), friend (2%), other (2%). **Accessing and reaching steroid users** Most common sources of information about PIEDs were internet sites (62%), friends (55%), doctor (22%), gym (18%). Regular information seeking about PIEDs: 17% every day, 27% weekly or more, 26% 2-4 weeks, 23% every 6 months.

NR=not reported; NA=not applicable

Study details	Population and setting	Relevant findings
Lenehan et al., 1996 **Country**: UK **Objectives**: To provide detail on prevalence and patterns of steroid use in the North West of England **Funding source**: NR	**Entry criteria:** Gym users **Participant characteristics** **Number of participants:** n=386 **Male (%):** n=379 (98%) **Ethnicity:** White 84%; 14% Afro-Caribbean, 2% Asian. **Mean age:** 28 years (17-56) **Outcomes and methods of analysis** **Outcomes measured:** side effects, steroid use **How measured:** Structured interviews **Methods of analysis:** Descriptives **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of service users** 89% in employment; 2% in competitive sport **Impact of NSP on health and behaviour** NR **Uptake of services** 97% did not experience problems gaining access to injecting equipment 92% would attend a free NSP for steroid users **Accessing and reaching steroid users** 22% had sought medical intervention for side effects GP (n=49), NSP (n=5), Hospital (n=4). Acquired equipment from in order: gym owner, NSP, friends, dealer, chemist, trainer, doctor

NR=not reported; NA=not applicable

Study details	Population and setting	Relevant findings
Simmonds and Coomber, 2009 **Country**: UK **Objectives**: examines the way that social stigma impact on IDU populations and within them, and the consequences for prevention and harm reduction **Funding source**: NR	**Entry criteria:** Injecting steroid users, recruited from gyms. The wider study included injecting drug users recruited from safer injecting facilities. **Participant characteristics** **Number of participants: n=**91 (4 steroid users) **Male (%):** n=66 (73%) **Ethnicity:** n=87 (96%) white British **Mean age:** 32 years **Outcomes and methods of analysis** **Outcomes measured:** topics relating to stigma **How measured:** interviews **Methods of analysis:** thematic analysis **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of NSP clients** Higher rates of employment in comparison to other IDUs They feel different from other injecting IDUs: do not want to be misconstrued as a "junkie" by health professionals or peers. Instead they perceive themselves as more ordinary as they do not experience dependence or withdrawal. 3 out of the 4 (75%) steroid users were employed. **Impact of NSP on health and behaviour** NR **Uptake of services** Stigma a particular problem for AS users regarding NSP use – being recognised was a particular problem; were concerned about what others thought of them and did not wish to be seen as a "junkie" – keen to distance themselves from heroin users. **Accessing and reaching steroid users** Steroid users sceptical about involving gyms in needle exchange: "big fitness health clubs are not going to advertise the fact they allow steroid people to use their gyms but a lot of smaller ones would"

NR=not reported; NA=not applicable

Study details	Population and setting	Results
Walker & Joubert, 2011 **Country**: UK **Objectives**: To gain understanding about the attitudes of AAS users towards the media and towards health information **Funding source**: NR	**Entry criteria:** English speaking injecting male steroid users aged 16+, registered at two NSP **Participant characteristics** **Number of participants:** 41 **Male (%):** 41 (100%) **Ethnicity:** Caucasian n=34 (83%) **Mean age:** NR; aged 20-30 n=25 (61%) **Outcomes and methods of analysis** **Outcomes measured:** steroid use; perceptions of media influence; health; gender constructs **How measured:** survey **Methods of analysis:** descriptives **Length of follow-up:** NA **Number of participants lost to follow-up:** NA	**Profile of service users** Age: 26-30 years most popular age group (37%); majority of participants aged 20-30 (61%) **Impact of NSP on health and behaviour** NR **Uptake of services** NR **Accessing and reaching steroid users** 38 participants (93%) knew at least one other user; 17 (42%) knew between 10-12 users. 14 (34%) indicated they get steroids from someone at the gym, 30 (98%) trust their source.

NR=not reported; NA=not applicable

Appendix 4. Quality Appraisal Checklist Tables

	Burton, 1996	Day et al., 2008	Korkia et al., 1996	Larance et al., 2008	Lenehan et al., 1996	Walker and Joubert, 2011
	CS	CS	CS	CS	CS	CS
1.1	+	NR	NR	NR	+	+
1.2	NR	-	NR	+	+	-
1.3	+	+	NR	+	+	-
2.1	NA	NA	NA	NA	NA	NA
2.2	NA	NA	NA	NA	NA	NA
2.3	NA	NA	NA	NA	NA	NA
2.4	NA	NA	NA	NA	NA	NA
2.5	++	+	++	+	++	++
3.1	-	-	-	-	-	-
3.2	++	NR	+	+	+	+
3.3	+	+	+	+	+	+
3.4	NA	NA	NA	NA	NA	NA
3.5	NA	NA	NA	NA	NA	NA
4.1	NA	NA	NA	NA	NA	NA
4.2	+	+	+	+	+	+
4.3	+	NR	+	+	+	+
4.4	NA	++	NA	++	NA	NA
5.1	+	-	+	+	+	+
5.2	+	+	-	+	+	-

	Simmonds and Coomber, 2009
	Qualitative
1	Appropriate
2	Mixed
3	Not sure
4	Appropriate
5	Not described
6	Unclear
7	Not sure
8	Not sure/not reported
9	Rich
10	Not reported
11	Convincing
12	Relevant
13	Adequate
14	Not reported
Overall	+

CS=cross sectional study; NR=not reported; NA=not applicable