Performance and Image Drugs

Resource Pack
2016

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Learning of Substance

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Contents

1: INTRODUCTION:.....8

2: REASONS FOR USE 11

3 TRENDS AND ATTITUDES TO STEROID USE: 15

4 ARE ANABOLIC ANDROGENIC STEROIDS NEEDED? 20

5 PERFORMANCE & IMAGE DRUGS & WIDER DRUG USE.....23

6 PERFORMANCE AND IMAGE DRUGS AND THE LAW 25

CHANGES TO THE LAW ON ANABOLIC ANDROGENIC STEROIDS: 28

7 MANUFACTURE, SUPPLY, SOURCES AND QUALITY 30

8 HOW STEROIDS WORK.....34

9 OESTROGEN AND AROMATISATION 40

10 SHUT DOWN AND POST CYCLE TREATMENT 45

11 CYCLES 51

12: ROUTE OF ADMINISTRATION: ORAL V INJECTABLE 55

13 ESTERS, DURATION OF EFFECT AND HALF-LIFE 57

14 FACTORS INFLUENCING AAS SELECTION 60

15 OTHER SUBSTANCES USED.....62

16 INJECTING PERFORMANCE AND IMAGE DRUGS.....71

17 INJECTING-RELATED COMPLICATIONS: 82

18 KEY HEALTH PROBLEMS RELATED TO PID USE: 85

19 DEPENDENCY 92

20 WOMEN AND PID USE 95

21 YOUNG PEOPLE AND PIDS: 96

22 SERVICES FOR STEROID USERS: 98

23 LOOK UP CHARTS FOR AAS & OTHER PIDS 102

WEBSITES: 126

LEAFLETS/BOOKLETS: 127

BOOKS 128

Performance and Image Drugs

Glossary:

AAS	abbreviation used to refer to Anabolic Androgenic Steroids.
AI	Aromatase Inhibitors: family of drugs that prevent the enzyme aromatase converting testosterone to oestrogen
Anabolic:	processes that promote muscle or tissue growth
Androgenic	androgenic effects are those that relate to the masculinizing effects of hormones – such as growth of hair or behavioural changes; from a PIDs point of view the sought-after effects are increased strength, muscular hardness
Aromatase	AKA Oestrogen Synthase; enzyme responsible for the process of aromatisation
Aromatisation	conversion of a testosterone-type compounds in to Oestrogen by the enzyme aromatase
Catabolic	Promoting the breaking down of muscles or tissue; opposite of anabolic
C-17 Alpha Alkylated	Chemical treatment of a steroid's molecular structure inhibit break-down in the liver and so allow them to be taken orally; increases liver toxicity
DHT	Dihydrotestosterone: produced naturally by enzyme action on testosterone; powerfully androgenic. Used as building block for several AAS
Ester	Chemical chain to added to a compound to adjust the half-life and speed of release in to blood.
Esterification	Adding an ester to a compound such as a steroid, changing its half-life

FSH	Follicle-stimulating hormone: released by pituitary gland; regulates sperm production
GnRH	Gonadotrophin-Releasing Hormone. Released by the Hypothalamus; controls release of Luteinising Hormone, which in turn regulates Testosterone Production
Gynaecomastia	Development of breast tissue in men; result of action of hormones.
Hormone	A biochemical substance that is produced by a specific cell or tissue and causes a change or activity in a cell or tissue located elsewhere in an organism.
HPTA	Hypothalamic-Pituitary-Testicular Axis: pathway that controls testosterone production in men
IM	Intramuscular: injection in to a muscle
LH	Luteinising Hormone: released by Pituitary gland; triggers production of testosterone
Oestrogen	Hormone found in both men and women, but present in much higher levels in women. Responsible for female sexual characterisation. Also spelt <estrogen>.
PCT	Post-cycle treatment; course of drugs intended to restore testicular function to normal after using AAS
PIDs	Performance and Image Drugs
Progestins	Family of hormones which are used as a "building block" for AAS. Can have feminising effects on male users
SARMS	"Selective Androgen Receptor Modulators:" emerging family of performance drugs claimed to offer muscle development but with less side effects.

SERMS	"Selective Estrogen Receptor Modulators:" Family of drugs that affect the receptor sites where oestrogen (estrogen) works
Steroids	Naturally-occurring chemicals that function as hormones in plants and animals; steroids share a common molecular core structure. Not all are used as performance or image drugs.
SC	Subcutaneous: injection below skin, into fatty tissue
Testosterone	Hormone found in both men and women. Much higher levels found in men. Has strongly anabolic and androgenic properties – the physical characteristics of masculinity.
Virilisation	Process of developing male secondary sexual characteristics in women

1: Introduction:

This resource pack is about the use of drugs in the context of physical training and development. This includes the use of drugs in body-building and athletic settings and other performance and image settings.

The pack looks at the main compounds used, effects and risks, methods of use and harm reduction information.

The resource pack is primarily aimed drugs workers and other health workers who need to understand Performance and Image drugs in order to engage with, advise and support clients who use them. Hopefully, it will also be of interest to users too.

Terms and Concepts:

The key family of drugs of interest are the **anabolic androgenic steroids.** As these substances are used alongside other drugs, these will need to be considered too.

Steroids are naturally-occurring chemicals produced in both plants and animals. They function in Humans as **Hormones**. That means they act as chemical messengers that work around the body.

Anabolic Androgenic steroids exercise an **Anabolic Effect** on the body. **Anabolic** indicates a process of growth or development. With reference to steroids, it means that they trigger or increase the growth of muscles and other tissues.

This is the opposite of **Catabolic** which refers to the process of breaking down muscles or tissue. For athletes seeking to build muscle growth, increasing anabolism and reducing catabolism is a key aim.

Anabolic steroids are therefore mostly used outside of medical settings because they can cause an increase in the size of muscle tissue, or speed up the process of muscle repair.

Androgenic hormones are responsible for the development of male sexual characteristics. This includes things like deepening of the voice, growth of chest and facial hair. From an athletic and body-building perspective, the sought-out androgenic effects are an increase in strength and development

of muscle tissue, the mental drive to train harder and the increased aggression that may come with this.

Terminology:

AAS: Amongst many users and some professionals, the abbreviation **AAS**, for **Anabolic Androgenic Steroids** is widely used. There are lots of different sorts of steroids, many of which have get used medically but aren't used for muscular development. Cortisteroids, for example, are part of the wider steroid family but don't share the anabolic androgenic properties which are of interest here.

It is always preferable therefore to make it explicit that we are referring to AAS rather than the more general steroid family. For educators it is essential: telling young people that "*steroids could cause breast development*" in a setting where some will, for example be prescribed Cortisteroids for asthma is misleading and unhelpful. For people with a serious interest in AAS, the misuse of terminology can be read as a lack of understanding.

Why not Anabolic Steroids? Despite research, it has not yet proved possible to create compounds that are exclusively anabolic; instead there is a ratio between anabolic and androgenic effects within most drugs. A drug will be described in terms of whether it is strongly anabolic, strongly androgenic, or a balance between the two. Testosterone is used as a benchmark against which other compounds are compared.

The preferred term Anabolic Androgenic Steroids rather than just Anabolic Steroids, although the shorter term is widely used.

Performance Enhancing Drugs: Not all the compounds used are anabolic or androgenic, nor are they all steroids. So the term Performance Enhancing Drugs (PEDs) emerged to cover a wider range of substances than AAS. A compound such as EPO for example is not an AAS but is clearly a Performance Enhancing Drug. Other drugs could enhance other aspects of "performance" such as sexual performance or improve memory.

Performance and Image Enhancing Drugs: At the risk of becoming pedantic, some commentators noted that compounds such as fat burners or tanning agents were image rather than performance related and so advocated the term "Performance and Image Enhancing Drugs (PIEDs)."

Performance and Image Enhancing Drugs and Ancillary Compounds:

There are a range of compounds that, in their own right are neither performance nor image related, but are used to prevent or reverse side effects of other drugs. For example, Human Chorionic Gonadotrophin (HCG) is used to help restart testicular function post AAS use. So it is part of a spectrum of substances used – an "ancillary compound."

Enhancement?

Language reinforces attitudes and concepts. The use of the term "enhancement" is very value laden. It reinforces the idea that larger muscles or a leaner physique is an enhancement.

The word "enhancement" isn't essential and we could just refer to "Performance and Image Drugs." However, the wider field invariably includes the word "enhancement."

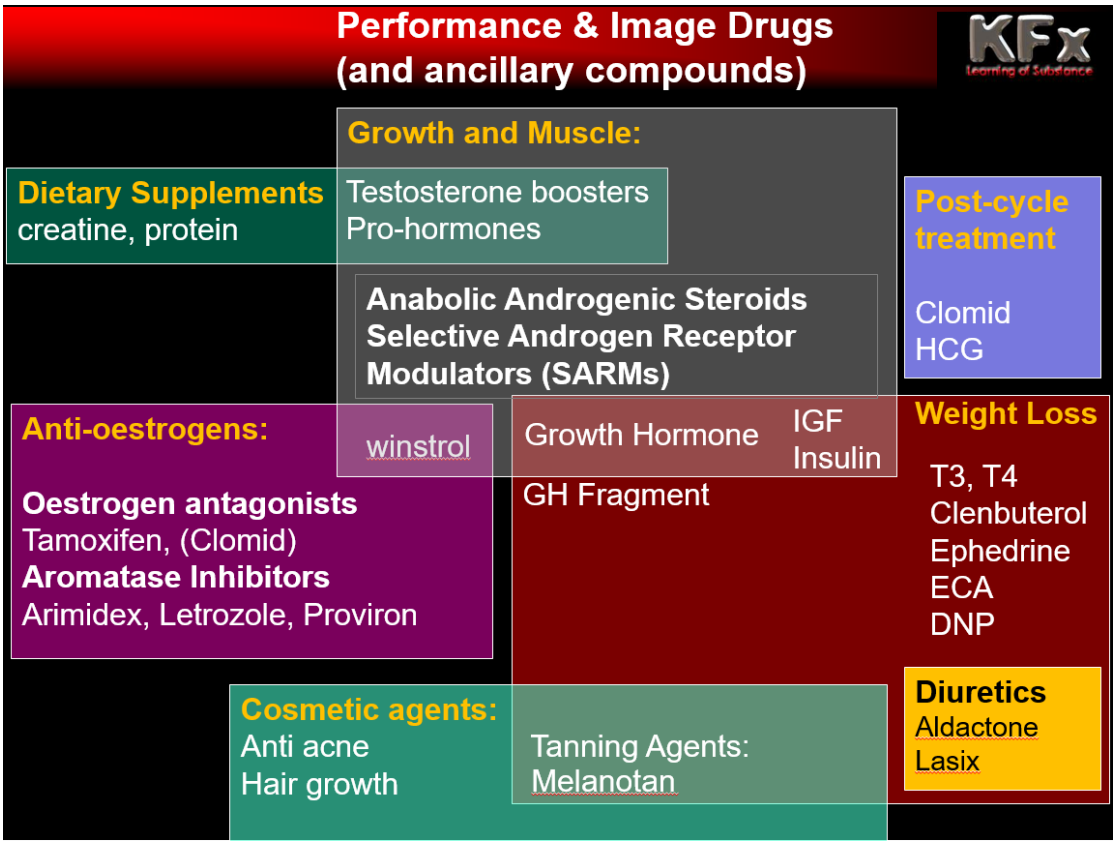


Figure 1: Schematic of Key Performance and Image Drugs, And Related Compounds

2: Reasons for Use

The use of PIDs takes place in a variety of different contexts and so we can't talk about a "typical" user.

High-end athletes: more likely to be more informed user with access to high quality drugs and medical advice. Combinations will be taken to maximise physical gains and minimise obvious signs of use and chances of detection. Such users are likely to be in receipt of the most recent developments and be "ahead of the curve" in terms of drugs and patterns used.

Competitive body-builders: People who are competing at all levels in body-building and weight-lifting may use AAS to bulk out and increase strength. While not all competing in such activities use AAS, it is a key group where such use takes place.

Aesthetic use: The use of AAS or other drugs in the wider is an aid (or a shortcut) to developing a perceived aesthetic look. This might mean increased musculature, more defined muscles, more prominent veins, reduction of body fat, darker tan or other changes.

Image: Some substances, such as fat-burners and tanning agents are linked much more to fashion and trends – and may not be linked at all to sports or athleticism. As such use of these compounds may be much wider than those using in gym or athletic settings.

Functional use: For some trades and activities, use of steroids might be useful. Door staff and private security workers may use steroids to help increase bulk and strength. Occupations including emergency services, armed forces and prison settings also see more than their fair share of AAS use. Similarly, young people may take up use of steroids to reduce bullying or harassment. Such a trend has been reported amongst young Asian men for example.

Peer pressure and Peer Influence: Body building environments are highly competitive while at the same time provide a strong sense of group identity. They offer a classic example of a closed sub-group with its own language, rituals, norms and behaviours. As use of PIDs has become more widespread, this has become partially accepted as a norm and so, while frowned upon by "natural trainers" will be accepted and acceptable to many others.

Further, non-users may feel pressured to start using because they see newcomers and younger people arrive, equal and then exceed their own achievements in a relatively short time frame. This can influence a decision to start using steroids.

Young People's AAS Use: Increasingly, some drugs agencies are seeing more young people – in late teens, using PIDs. This use may be taking place alongside training and diet work, where it fits in to the peer influence/short-cut models discussed above.
However, some use takes place alongside other substances such as cannabis, alcohol, ecstasy, and cocaine. There may be little or no attention to training or diet.
This pattern of has more in common with polydrug use than being specifically about performance and image. Some of this use appears to be seasonal and image related: a chance for young men to "bulk up" quickly for the summer and a spell on the beaches of the Med.

Transferring from other Drug Use: Worryingly, some agencies are seeing a growing number of AAS users who have migrated from other drugs, including opiates or stimulants. Some of these have become drug free in the community, started using gyms to "get healthy" and moved towards AAS. Others have got off opiates in prison and got on to AAS at the same time. At this point the routines, rituals, and possibly the injecting aspects may end up reinforcing old patterns of behaviour but with new substances.

Prison use: Significant levels of steroid use are noted amongst prisoners. Some of this is historic where people were using AAS before entering prison. Some is acquired whilst in prison where access to gym, contact with other users, and safety from physical strength can be drivers for use. AAS can and do enter prisons, though it is more difficult to ensure that the consistency and range of compounds are available. Access to injecting equipment is especially problematic.

Sexual Identity: A small number of people may use AAS for hormonal aspects of gender reassignment – for example use of testosterone in order to develop male sexual characteristics. This would typically take place under medical supervision but people may source drugs illicitly and use without supervision.

Scene: Some "scenes," especially the Gay muscle scene, fetishizes certain aesthetic looks and so some people may use PIDs to achieve this appearance.

Self-perception and body dysmorphia: Some PID users may have underlying psychological issues that encourage more extreme behaviours and patterns of use and training.

Just as eating disorders and extreme weight loss may stem from a search for a perceived perfect figure and weight, so the use of AAS may stem from a similar dissatisfaction with the users body and a quest for "perfection."

By society's standards there is a narrow band of male physical perfection: too little muscle is not satisfying. Too much can start to look gross and distorted. In between is the perceived male ideal, well developed arm and chest muscles, and firm stomach muscles.

It can be argued that some gym-related behaviours such as excessive training may stem from dependencies towards physical training and some dissatisfaction with the current form. There comes a point where benefits have ceased to be to do with improved fitness and has more in common with a dysfunctional behaviour.

There are further issues that need to be explored here, such as the extent to which body-builders may have experienced bullying or assault, and the extent to which sexual identity and sexuality influences body reshaping behaviours.

At its most extreme end, body-builders may have a more defined body dysmorphia. Numerous workers report seeing clients who are absolutely huge in terms of their build, but still see themselves as being small and poorly developed.

While it would be unfair to assume that the majority of people who use PIDs regularly have poor self-esteem and self-image, the conscientious worker will build a relationship with their client which allows this issue to be explored.

Dependent Use: Use of Anabolic Androgenic Steroids can lead to dependency; this is discussed in more detail in Chapter 19.

Workplace Implications and Practice Issues:

Supervision and Training: Workers and organisations should ensure that, through training and supervision, stereotypes and assumptions about why people use PIDs are explored and challenged.

Distinctive group: To an extent, SID users have some key needs which are not easily met through mainstream drug provision. As such some specially tailored services may be required which use targeted publicity, out-of-hours provision, specific equipment and literature and specifically trained staff. However, the point below about diversity should also be borne in mind.

Diversity: As with any other population of drug users, PID users are not a homogenous group and are a broad church. As such, stand-alone services aimed at one part of this population (e.g. body-builders using AAS) may not appeal to or be accessible to other PIDs users (e.g. young polydrug users). Service publicity and development should ensure as accessible a service as possible for all PID users.

Therapeutic Interventions:
Some SID users may want or could benefit from more therapeutic interventions to help manage their use of PIDs, or to deal with dependency or underlying issues. While not wishing to assume all PID users have some underlying pathology, some may have and ensuring access to services beyond needle exchange will be a key tool in addressing these issues.

Services will need to ensure that there is a clear care-pathway for PID users, that increases their access to therapeutic interventions such as counselling.

Ex-heroin and crack users: Given the increasing number of former Class A drug users presenting with steroid use, workers may want to be more circumspect as to promoting gym attendance as a path to recovery. Assessment of gyms, messages about addictive and dependent behaviours, and awareness raising about risks of steroid use should be in place for former heroin or crack users being directed towards exercise. Highly competitive arenas with a high incidence of AAS will be less appropriate for people in early recovery. Stress the value of less competitive forms of exercise which promote deferred gratification and mindfulness.

Young poly-drug users: Specific services and messages will need to be developed for young polydrug users who are starting to use steroids. This message will need to be further tailored for those young people who may have a genuine interest in gym work, and whose SID use is premature, as opposed to those who have little or no interest in training healthily and whose use is exclusively cosmetic.

3 Trends and Attitudes to Steroid Use:

Steroids in recent history:

Since testosterone was first isolated in the 1930s the use of it and a growing number of compounds has escalated despite the efforts of sports regulatory bodies to curtail their use.

Prior to this, other substances had been widely used in sport, including cocaine and amphetamine to enhance speed and energy.

Steroid use by Russian weightlifters in the 1952 Olympics saw a substantial medal haul, and American athletes sought to match this advantage. This led to the development of new anabolic androgenic steroids, licensed by Pharma companies. The production and promoting of these compounds lead to the legitimate, widespread and endorsed use of AAS by athletes.

Initially popular amongst weight lifters relying on strength and bulk, use spread to athletes who sought the extra “edge” that steroids seemed to offer.

Whilst still limited to these high-end athletes, steroid use spread in to more amateur settings, becoming more widespread in gyms and training arenas. The growth in America of an interest in body-building saw a big spread from competitive sports in to an interest in muscular development. Mr Universe, established in 1959 became a showcase for this.

Most recently, the growth of the Internet has made access to steroids and interest in steroids more widely available than ever before. This has mean that non-professionals have had greater access to more real steroids (and more fake steroids) than ever before, with a resultant growth in interest and use across the UK.

A BRIEF HISTORY OF DOPING IN SPORT [1]

In the 19th century stimulant use was common among endurance athletes and cyclists.

1928	International Amateur Athletic Federation ban the use of stimulating substances. Other federations follow, but the bans are ineffective due to lack of tests.
1930s	Synthetic hormones invented.
1950s	Synthetic hormones used for doping purposes.
1960	Danish cyclist Knud Jensen dies at the Rome Olympics; an autopsy reveals traces of amphetamines.
1966	International cycling (UCI) and football (FIFA) federations test for drugs at their world championships.
1967	International Olympic Committee (IOC) draws up the first list of prohibited substances.
1968	Drug tests first introduced to the winter (Grenoble) and summer (Mexico) Olympic Games.

The early 1970s sees marked growth in use of anabolic steroids due to lack of a reliable test.

1974	Reliable test for anabolic steroids introduced.
1976	IOC bans use of anabolic steroids.
1986	IOC bans blood doping as a method.
1988	Ben Johnson, the 100 metre champion, disqualified at the Seoul Olympics after testing positive for stanozolol.
1989	Confirmation of state-sponsored doping in the German Democratic Republic during 1970s/80s.
1990s	New doping agents developed (eg EPO, hGH); anti-doping efforts restricted by lack of tests.
1998	Large quantities of prohibited substances found during the Tour de France. The scandal highlighted the need for an independent international agency.
1999	World Anti-Doping Agency (WADA) established.
2003	WADA adopts the World Anti-Doping Code to harmonise anti-doping measures.

[1] http://www.parliament.the-stationery-office.co.uk/pa/cm200304/cmselect/cmcumeds/499/499we10.htm

Trends: UK

The key research on drug trends in England and Wales is the **Crime Survey of England and Wales** (formerly the British Crime Survey.) It is an annual study that has taken place over two decades. Its reporting of AAS is however at odds with the picture seen by drug projects.

According to the CSEW, the number of people under 25 who have used AAS in the last yr is less than 0.5% and is lower now than it was five years ago.

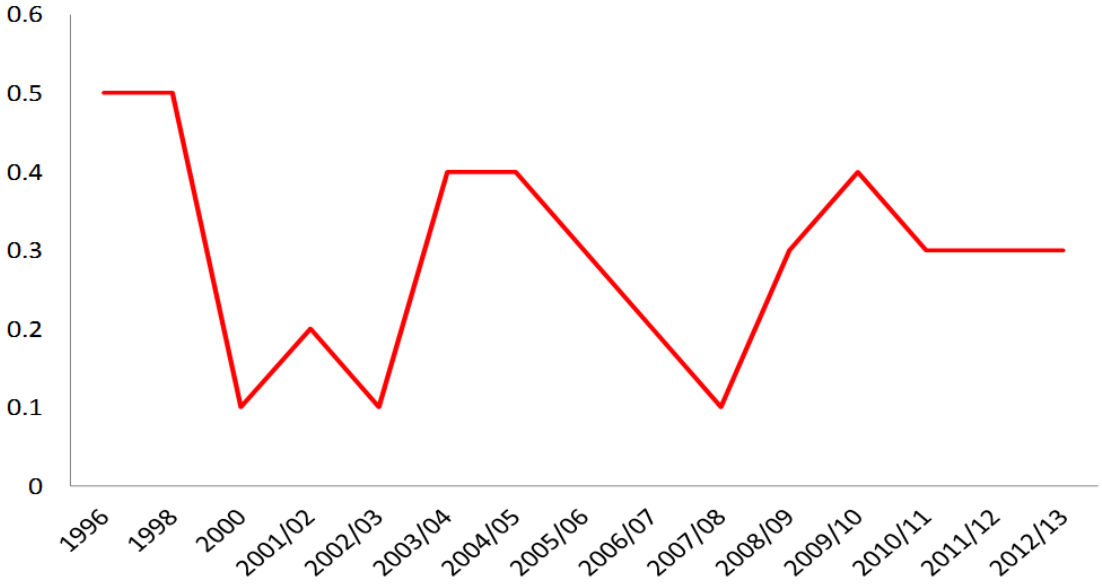


Figure 2: CSEW: use of AAS in last Yr amongst 16-25 yr olds

Of all the drug trends in the UK, AAS use is probably the most poorly reported. Reasons for this include:

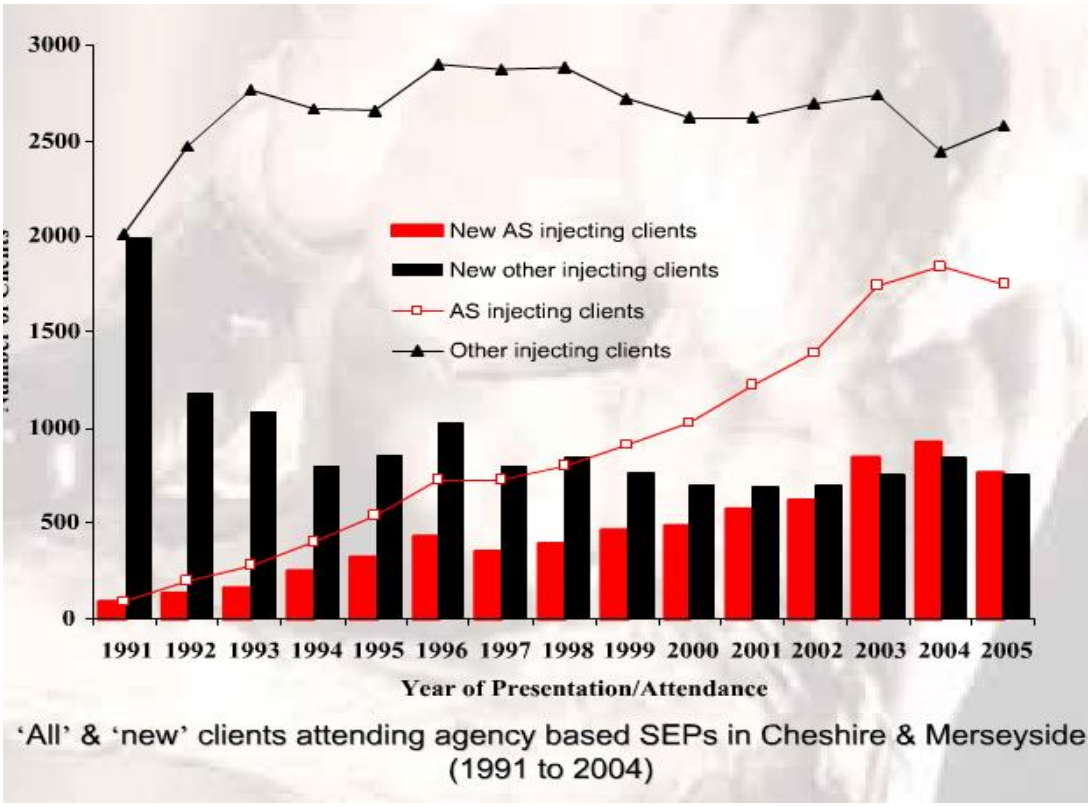
- AAS not tested on arrest;
- AAS users not routinely committing "trigger offences" which would trigger a screen for Class A drugs;
- Users proactive in wishing to see AAS remain Class C, Schedule 4ii, and so keen to see AAS kept off the Government's radar;
- Users not typically presenting for structured treatment;
- Users may only come in to contact with drugs agencies via needle exchange; some may choose not to you this service as they are (a) not injecting or (b) source equipment from commercial or peer sources.

As such the CSEW figures should be treated with caution and are likely to underestimate the extent of AAS use in the UK.

A House of Commons report on AAS reported that, in 1993, around 5% of gym users reported some steroid use. Revised figures put that higher at between 25% and 50% of people who used gyms equipped for competitive body building.[2]

Anecdotally, needle exchanges are seeing increasingly large numbers of steroid users, suggesting a dramatic upsurge in steroid use.

This is borne out by research from Jim McVeigh, one of the UK's leading researchers with an interest in Performance Enhancing Drugs. In a 2006 presentation he presented the following trends[3]:



'All' & 'new' clients attending agency based SEPs in Cheshire & Merseyside (1991 to 2004)

While levels of injecting amongst other drug users have remained level and dropped marginally, the trend line amongst SID users is resolutely upwards. While some of this may be attributable to new attendees at a service rather than evidence of new users, it does suggest the CSEW picture is erroneous.

Using Google Trends is imprecise in exploring queries relating to AAS. There are too many potential search terms to get a clear trend line. Use of the term

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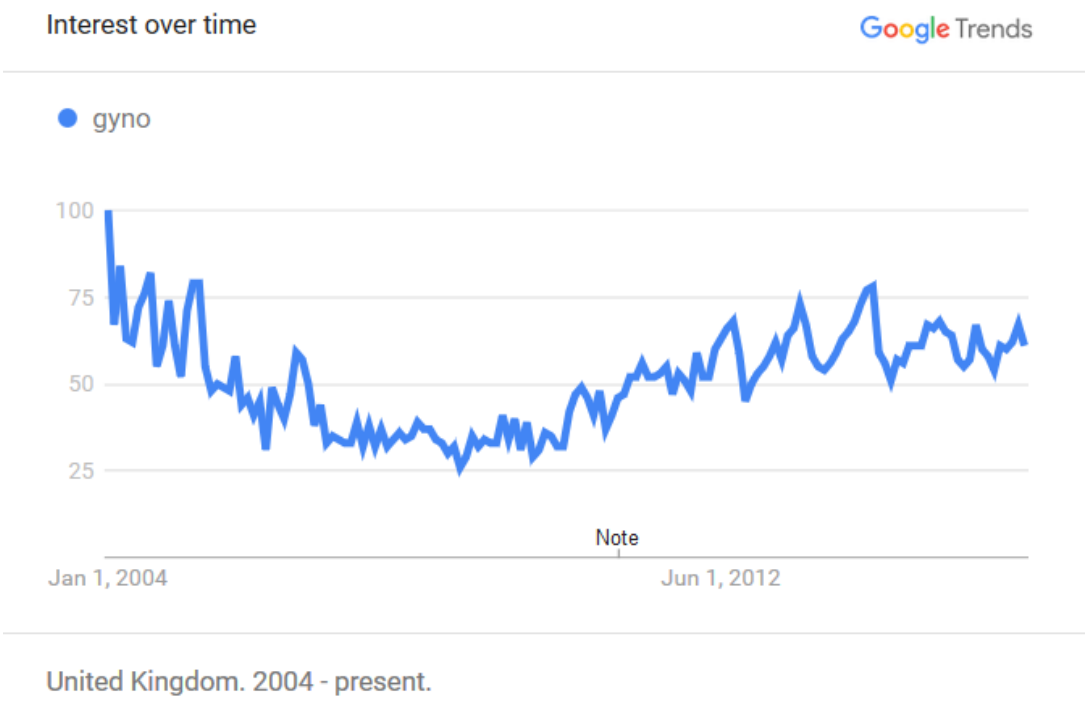
[2] Drug and Therapeutics Bulletin, 42, No1, January 2004,

[3] Presentation by Jim McVeigh: NCIDU 2006

"gyno" (commonly used slang amongst body-builders for steroid-induced gynecomastia) shows an increase in searches for the term over the past decade, but lower levels than in 2004.



Why an upward trend?

The internet has increased awareness of and access to PIDs. This permeates every aspect of the market place, from a globalised supply chain, on-line purchasing, and information on websites and forums.

Previously informed users at gyms acted as gate-keepers but this role has to an extent been diminished by the internet.

When this pack was first prepared in 2006 a Google search for "Anabolic Steroids" threw up some 237,000 references to Anabolic Steroids. In 2009, there were 1,920,000 references and in 2016 there are in excess of 3 million.

In addition to increased availability and access, demand has been stimulated by a growing interest and market for male fitness and image products. Driven by music, film, sports, magazines and popular culture, it has contributed to a shift in aesthetics, where big muscles and lean build is increasingly desirable.

Examples of this in media are far reaching from "reality TV" shows such as Geordie Shores to blockbuster films such as Star Wars. The example of how toys of leading characters have become more muscled over time are used to illustrate how pervasive the trend has become.

A quest for "maleness?" Another driver for increased AAS use may also be the erosion of other demonstrations of "masculinity" in some communities. Traditional industries such as mining, steel fabrication and ship-building were male-dominated activities and conferred recognition and respect on employees. With the erosion of these industries, it could be that AAS has become a new way of achieving the same status.

Workplace implications and practice issues:

- Monitoring:

Organisations should ensure that they have effective monitoring in place to assess levels of SID use. This should include routine monitoring of "substance used" at all Needle Exchange provision.

Organisations may find that the term "substance injected" meets with less resistance than the term "drug injected" as some steroid users may not consider their steroids use as being a "drug."

Organisations should not base their monitoring on proxy indicators such as type of equipment distributed as this may not give an accurate picture of local trends.

4 Are Anabolic Androgenic Steroids needed?

The argument between "natural" athletes and those who use AAS are hard-fought and passionate. Those who use steroids argue that it is only possible

to get past a certain point with Steroids, and that those who claim to have achieved similar results "naturally" have used some sort of chemical.

Natural trainers would in turn argue that permanent gains can only be made through appropriate diet and training regimes and that top level builds and performances can be achieved without recourse to anabolics.

Some companies and competitors argue that there are a range of protein, dietary and supplemental preparations which are not steroids and are not banned but can achieve results which are as good as (if not better than) steroids.

Essentials regardless of Steroids:

Regardless of whether they are pro- or anti- steroids, nearly everyone agrees that steroid use on its own is of limited value. Without proper diet, training and rest, muscular development won't happen regardless of chemical use. Poorly executed steroid regimes, mean any gains are likely to be short lived, and hard to retain.

The requirements of any sort of development are the same regardless of whether steroids are used or not including:

Careful diet management and planning

Depending on the person's aims, diet will be carefully planned to ensure that there is sufficient protein to support muscle development, with enough carbohydrates to provide energy and ensure muscle isn't broken down for fuel.

Anyone with an interest in muscular development should explore the huge range of resources available on sports nutrition. If someone does not have the discipline or knowledge to maintain a very strict nutritional regime, then the effectiveness or need for steroids will be questionable.

Rigorous planned exercises

The correct type of training, correctly executed is a pre-requisite for muscular development. By slightly over-stressing muscles, a small amount of muscular damage happens, triggering a repair process. The use of steroids

may allow someone to train harder and longer, and increase the increase the process of muscular repair but correct training remains essential.

Proper rest cycles

Muscles will need to be rested after training to allow for proper healing and a training regime will plan not just working muscles but resting them properly afterwards.

On balance, many people who use AAS (especially those who use them badly) could get similar or better results, with greater safety, by reviewing diet and exercise regimes. For them, use of AAS may seem like a faster way to get striking results but will ultimately not result in long-term gains.

Workplace implications and practice issues:

- When working with those contemplating AAS, explore and stress the importance of proper diet and training
- Referral routes and sources of credible information about sports nutrition and training could help people realise gains without recourse to AAS.
- For people with low income, it's worth noting that AAS bought in place of food won't achieve results, whereas ensuring proper diet will.
- Where people aren't getting hoped-for results from their AAS use, the risk is that they will increase doses or duration of use. It's more likely that the training, diet or rest are flawed.
- Finishing a course of AAS is as important as any other aspect. Failure to finish a course properly can leave a person in a catabolic state, losing muscle gained during the cycle and possible muscle that was there pre-cycle too.

5 Performance & Image Drugs & Wider Drug Use

Many people who use AAS view themselves as different to users of other drugs. While some AAS users do use other drugs recreationally (e.g. cocaine for clubbing) others don't, perceiving them as unclean and illegal.

This division has partially been undermined as a growing cohort of young polydrug users have added steroids to their repertoire, and a significant number of ex-heroin or ex-crack users have moved to steroid use.

This perception can reduce access to services as AAS users may be reluctant to access drug-treatment agencies as they do not wish to associate, or be associated with other drug users.

In part this may stem from the function of PEDs to improve performance and shape; they are perceived to be scientific, refined and a tool for the skilled athlete. This self-perception is wholly at odds with the self-perception of many illegal drug users. Most heroin users recognize at some level that their use is harmful and damaging and their health would be better if they could stop using. AAS users perceive the situation differently. By the careful use of suitable chemicals, they take an imperfect body and improve it.

PEDs occupy a semi-legal netherworld. The products are widely produced illegally, with potentially poor standards of sterility and quality. However, although the supply of them may be illegal, possession is not and so people who purchase and use such drugs will generally not be breaking the law.[4]

As a result, AAS use is less "underground" than other types of drug use. It ends up with a veneer of acceptability and legitimacy not shared by other drugs. You can see adverts on the internet, buy magazines, purchase relatively easily on-line and discuss with peers on the many bulletin boards.

Most body-builders would not consider their steroid use as a drug of abuse. And they would not widely consider it to be something that they could seek help from via a drugs agency.

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[4] See LAW section: Chapter 6

Similarly, from the drugs agency point of view, PED users do not conform to the classical drug-agency client and so agencies are under skilled and under confident in engaging with and responding to such clients.

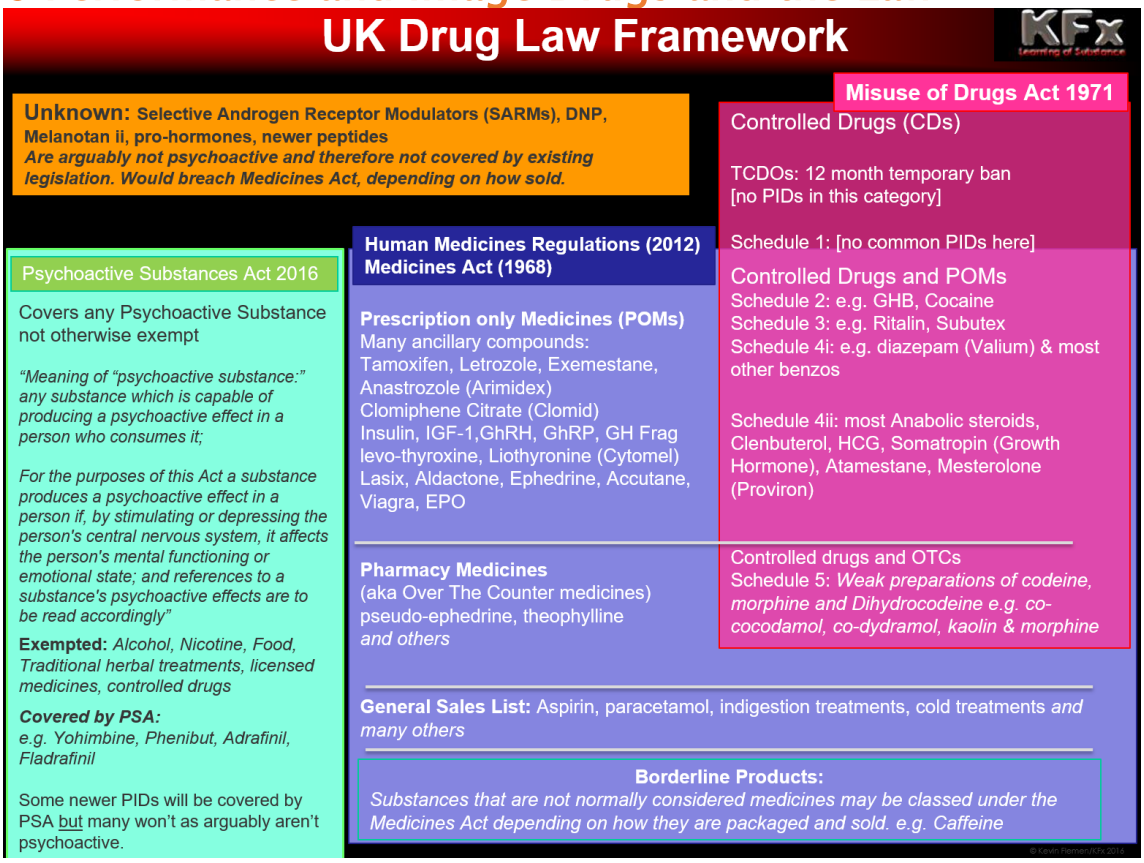
Despite these perceptual differences, there are significant similarities which should not be overlooked:

- AAS and other PID users are exposed to contaminated, fake and adulterated drugs as are other drug users;
- Those who inject PIDs are exposed to injecting-related complications
- As a sexually-active cohort, messages about safe sex and STIs remain essential
- Although slang and jargon can present a veneer of understanding, many AAS users still need information and assistance to reduce risks
- Polydrug use amongst AAS users is the norm; whilst it may not typically include "traditional" recreational drugs, some do use cocaine, cannabis, ecstasy and other substances. Those who do not still use a wide range of compounds within the PID "family."
- PID users may share some of the same underlying drivers for use as other drug users – peer pressure, esteem, identity and as a "quick fix."
- PID users experience problems in relation to physical and mental health, financial, social and legal problems. Some will become dependent.

Workplace implications and practice issues:

- Organisations should be sensitive to the differences between AAS and other drug users, but confident about the similarities and where the same skill-set is useful.
- Workers will need training to enhance confidence and knowledge when working with PID users.
- Commissioners need to be aware of the similarities and shared needs of PID users, rather than viewing them as a wholly different cohort
- Where differences do exist, services will need to adapt to provide an appropriate service. This could include:
    - Specific opening times (e.g. evening/weekends)
    - Tailored assessment and care-planning tools
    - Correct equipment
    - Ensuring that services are visually and practically inclusive – e.g. are all the posters in a building about Class A dependency and recovery?

6 Performance and Image Drugs and the Law



Summary

The drugs of most interest, Anabolic Androgenic Steroids, are covered by the Misuse of Drugs act and Medicines Regulations. They are Class C Controlled Drugs. Since the penalties for class C drugs were revised following the reclassification of Cannabis, **supply** of Class C drugs, including anabolic steroids carries a maximum penalty of 14 years, though such large penalties are very rare.

However, the Anabolic Androgenic Steroids occupy Schedule 4ii under the Misuse of Drugs Regulations 2001.

This means that possession is not a criminal offence, unless there is an intent to supply it.

Premises (such as gyms) that knowingly allow supply of steroids will be committing an offence under Section 8(b) of the Misuse of Drugs Act 1971.

Other products used may be covered under the Medicines Act and may be Prescription Only medicines, making supply outside of medical settings an offence.

Legislative Framework

As PIDs are a large group of drugs, they are covered by several pieces of legislation. As it is also an area of drugs that develops rapidly, the legal status of newer emergent compounds is still to be determined.

Misuse of Drugs Act (1971) and Medicines Legislation:

The key overlapping legislation in the above diagram is the **Misuse of Drugs Act 1971** and the **Human Medicines Regulations (2012)** which largely replaced the Medicines Act.

Compounds in the blue box are licensed for medical use. Some are only available on prescription (POMs), others can be purchased from a pharmacy without a prescription (Pharmacy Medicines or OTCs) and a small number can be purchased from any retail outlet.

Drugs covered by the **Misuse of Drugs Act 1971** (MDA) are in the magenta box. Drugs covered by the legislation are called Controlled Drugs (CDs). They are the ones usually referred to as Class A, B or C drugs. But in this diagram they are listed instead by Schedules. The Classes define the penalties for different drugs. The Schedules relate to the rules as to who can possess and supply them.

Schedule 1 drugs have no medical use; possession and supply will generally be illegal. While some people using PIDs will also use Schedule 1 controlled drugs, there aren't any Schedule 1 substances that, in their own right, could be considered Performance or Image drugs.

Schedule 2,3 and 4i are Controlled Drugs with legitimate medical uses – hence the overlap here between the magenta and the blue boxes. They are CDs but also prescribed as medicines (POMs). Drugs such as Methadone fit in to this group.

Legally they can only be supplied by someone authorised (e.g. GP, Pharmacist) and, importantly, a valid prescription is required for legal permission. Possession without a prescription is a criminal offence.

There aren't that many commonly used PIDs in these categories. Some PID users will use amphetamines, or methylphenidate (Ritalin) as weight-loss agents or for their stimulant effects.

GHB has historically been used in the context of muscle development but use declined once the drug was made a CD. There is recreational use of cocaine, and some use of benzos, especially where AAS can interfere with sleep.

Schedule 4ii drugs are treated differently. The law still restricts supply to authorised bodies such as GPs or Pharmacists. The key difference is that unlike Schedule 4i drugs, personal possession is not an offence even where there is no valid prescription. Although supply may well have taken place illegally, possession isn't illegal and this means that people can use AAS without themselves offending. The main drugs in Sch. 4ii are drugs associated with sports and image including Testosterone and its derivatives, many other AAS, some ancillary compounds such as HCG, Clenbuterol, Growth Hormone and a few other compounds.

Schedule 5 drugs are used as medicines, and although they have potential for misuse they can be bought in pharmacies without prescription. This includes some compounds containing pseudoephedrine which may be popular as a stimulant for weight loss.

POM not CDs: There are a large number of compounds other than Anabolic Androgenic Steroids, and most of these are not covered by the Misuse of Drugs Act. Many are legitimate medicines and are covered by Medicines regulations. Examples include anti-oestrogens such as Tamoxifen, most or the aromatase inhibitors, diuretic and EPO.

Pharmacy Medicines and General Sales: A small number of medicines available in pharmacies without prescription or on the General Sales list are used in the context of performance and image drugs. This includes medicines containing caffeine, theophylline, aspirin and pseudoephedrine.

"Borderline Products" are compounds which sit on the cusp between medical and non-medical use. The Borderline Products Team examine how such products are packaged, marketed and sold, and the contents of them. If claims for (for example) their health or medical utility are made, then they are more likely to be classed as a medicine and then have to comply with the **Human Medicines Regulations.** If it is determined that they are not being sold

for their purported medicinal benefits, then they can sidestep being classed as a medicine.

So for example the sale of 5-HTP in health food shops as a "food supplement" does not fall foul the Medicines regulations. No claims are made about it being used to treat depression.

Psychoactive Substances Act: In order to deal with the massive increase in emerging Novel Psychoactive Compounds (NPS) the Psychoactive Substances Act came in to force in May 2016.

It creates offences in relation to production, supply, importation or exportation of hitherto unregulated compounds (unless exempt). Possession is not an offence except in custodial settings.

While the legislation will prohibit the supply of some PIDs, it may not be applicable to the majority of body-building related substances.

It will all come down to interpretation of "psychoactive" and it will be for a court to determine this in relation to specific compounds. The legislation will certainly prohibit the supply of so-called "smart drugs" such as siblings of Modafinil which is clearly psychoactive. Likewise, the GABA-analogue Phenibut will also be covered by the PSA.

It is less likely that pro-hormones, Selective Androgen Receptor Modulators and peptides will be considered 'psychoactive.' As such it seems likely that a large number of compounds being developed for physical enhancement will fall outside the scope of the PSA.

Changes to the law on Anabolic Androgenic Steroids:

As Anabolic Androgenic Steroids are in Schedule 4ii of the Misuse of Drugs Regulations, possession without prescription is not an offence.
In 2010, the Advisory Council on the Misuse of Drugs (ACMD) produced a report on AAS which made a number of recommendations to Government.[5]

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[5] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/119132/anabolic-steroids.pdf

Key changes adopted by Government as a result were:

1) requiring a person to be in “personal possession” at the time of importation.

   The aim of this change was to clamp down on the purchase of AAS from overseas websites. Products sent in the post from overseas could now be confiscated without further investigation. It would remain legal for people to travel abroad and purchased products, bringing enough for personal use back in luggage.

2) Remove the requirement for drugs to be in a “medicinal product” from the legislation. This was a curious change. The ACMD said that the term was ill-defined and caused confusion. It had previously meant that licensed pharmacy product was legal, but product made by Underground Labs and counterfeit products probably weren’t.

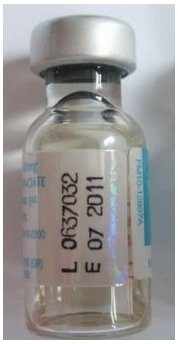
A possible consequence of these changes has been to increase the in-country market for non-pharmacy products while at the same time making it harder and illegal to import pharmacy products from on-line agents abroad.

7 Manufacture, Supply, Sources and Quality

The sale of Performance Enhancing drugs is illegal in many countries and so the market for anabolic steroids is rife with counterfeit drugs and fake products.

Pharmacy Products (Pharma): Anabolic Androgenic steroids were initially developed for medical use and manufactured under license. Over time, these licenses have been sold on to other companies. These products are **Pharmacy Products** manufactured under license. They should be of known quality and strength, made to exacting pharmaceutical standards. They are increasingly hard to source as legitimate medical use has dwindled.

Veterinary Products: in some countries, use of AAS in animal husbandry has been more widespread and so AAS reaching the sports market may be diverted veterinary stock.



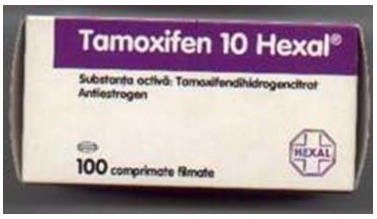
Fake Pharmacy Products: Counterfeiters produce copies of Pharma products, duplicating packaging and labelling. The quality of packaging and content is highly variable. Products could be non-sterile, over or under-dosed, contain a different product or nothing pharmacologically active at all.

Underground Labs (UG): Underground labs manufacture AAS and other compounds without licence. This could include previously-licensed compounds and newer compounds that were never licensed, different blends and doses. Quality can vary from product that is equal to lab-grade product, to low quality products. In order to prevent counterfeiting some products will have security measures in packaging to deter fakers.

Fake UG Products: As a UG lab gains a good reputation, fakers will try and copy their product. As with fake pharmacy products, quality is highly variable.

Home-made: Overseas labs offer raw AAS powder on a wholesale basis, and this has led to an increase in small-scale production of products in the UK. Using steroid powder, oil, benzyl alcohol and vials sourced on-line, these operations produce small batches

which tend to sell across a limited geographic area. Risks include the wrong steroid being sourced, under- or -over dosing and non-sterile production.



Diverted/fake medicines: Lots of products are legitimate prescription medicines and are sold on-line. Some of this stock is legitimate, some ripped off from hospital and pharmacy stocks and some of it will be fake/counterfeit products.

Fakes and Scams:

Any search of the internet will throw up hundreds of on-line outfits purporting to sell anabolic steroids and other PIDs. However, a high proportion of these are "scammers," who will defraud credit-cards, sell details on to other bodies, supply inert products or supply counterfeits. Such operations are known as "scammers."

Most of the on-line suppliers found by a simple Google search cannot and do not sell genuine PIDs. To do so would, in most countries, be illegal and so operations would be rapidly shut down and prosecuted. Generally, a trusted is required who has access to genuine products.

Having sourced drugs, there is still a risk that the products are counterfeit, and a range of strategies can help identify fake products. However, as many of the fakes are of a high standard, it can be nearly impossible to differentiate the products.

The Welsh drug testing website WEDINOS tests and publishes tests results of samples sent in by the public. When it started up, it included AAS test results but it was swamped by samples sent in by vendors using the site to "prove" their product was legit. They had to withdraw the service for AAS and since then there's no easy route to get a product tested.

All the major body-building websites and discussion boards maintain lists of fakes and scammers, and anyone trying to identify products should consult these for further information.

Some board moderators will also offer to look at pictures or descriptions and advise if products are known fakes. A good UK starting point for such a service MuscleTalk – listed in the "contacts" section.

They offer the following advice on source checking (from: http://www.muscletalk.co.uk/source-checking.asp)

- Have a good basic background knowledge on what you are wanting to buy
- Do not rush placing your order, take your time if you appear gullible you will be scammed. Ask loads of questions in your e-mails assess their reply times and their response.
- Research to find out who the company/person is; what they have to offer and the different types of steroids. Are they based in Europe or USA? It makes a big difference to customs.
- Check all the scammer lists. These can be found on numerous sites
- Email a Moderator for their advice on possible suppliers you have found.
- Ask for references, these could be fixed so check them out too!
- Check their pricing - if it looks really low, be suspicious. Do they include delivery in their prices? It may look a bargain until you add up the cost of posting.
- Most suppliers will not send samples
- If you think they could be legit order only a small amount. Build mutual trust, as it's a two-way thing with a genuine supplier. If they are legit never post their details on a message board unless they give their consent.
- Do not send large amounts of money until you are 100% sure. Even then double check.
- Just remember - if you are scammed you have no comeback and the supplier could be in a different country. You've lost your hard-earned money and delayed your cycle.
- If you are in doubt, do not order!!
- If you sign up for a board and post something like: "Hi, I am new and looking for a source..." you are going to receive emails from scammers - beware!
- Any source that is legit does not need to solicit business

Additional steps for avoiding scams:

- The packaging on fakes usually looks a lot like the original, but look at the expiration date and the batch number. If they look like they were all printed in the same process as the label, they are probably fakes.
- Be sure that the expiration date on the box matches the one on the product as well. Real pharmaceuticals are packaged in large quantities and the batch number and the expiration date are imprinted later in a different process.

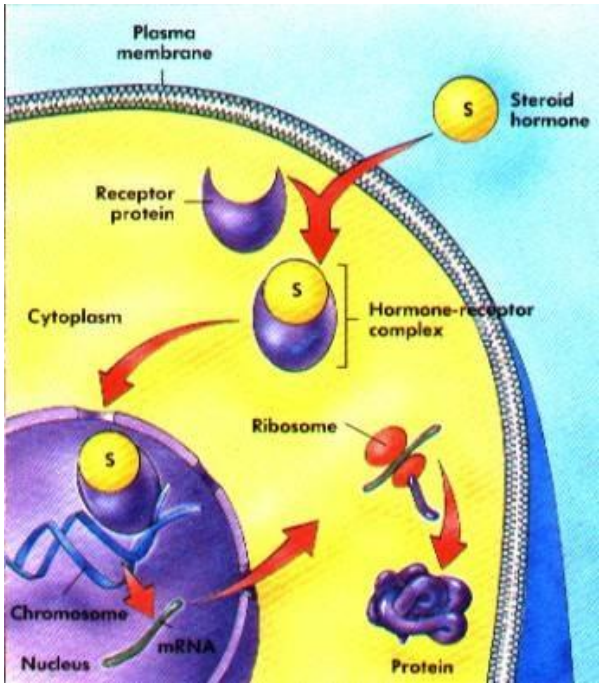
- Look for low quality labels; You should not be able to easily peel the label off the ampoule or the bottle. Most steroids made by legitimate companies use labels with rounded corners so pay attention to that as well. Also be sure to check that it is on straight and that it doesn't overlap itself, this is a sign of low quality.
- If you are checking a glass ampoule, be sure that if you have a few, they are filled consistently, and of the same colour. If it doesn't have a label, be sure that its imprint is straight and level and cannot be smeared easily.
- Be especially aware of multi-injection vials, these are easily obtained by counterfeiters and are not easily available as a legitimate drug.
- A final visual inspection of any products can identify bad fakes. If the caps of vials are loose, or rubber seals are perished then the substances should be discarded.

Workplace implications and practice issues:

- Stress that as with any other non-regulated substance there is a significant chance of getting fake/contaminated product
- Explore risks of this with customer: infection, under- or -over-dosing, unexpected side effects (e.g. unexpectedly using a product that does aromatise)
- Discuss ways of reducing risks of being sold fake substances
- Getting information from people who use which can be cascaded to workers and other users.
- Sharing information with partner agencies if dangerous contaminated AAS are available on local market

8 How Steroids Work

Method of Action:



A steroid such as testosterone enters the blood stream. Much of it binds to plasma. The small amount that doesn't bind is "free" or "bio-available" testosterone and able to reach and act on receptor sites.

The steroid reaches a target area, such as a muscle. It passes through the cell wall and binds to a **Receptor Protein.**

The combined hormone and receptor is called a **Hormone Receptor Complex.** This is able to pass in to the cell nucleus and change processes of the cell. This can include in changes in protein synthesis, resulting in increased growth.

Different hormones will have different effects at different sites. So within muscles, steroid hormones may increase size of muscles. Within hair cells, it may increase hair production. Other effects elsewhere could include changes to mood, alteration of bone growth or other local effects.

About Testosterone:

Testosterone is a hormone produced by men in the testes and in both men and (at a lower level) women in the adrenal cortex. Women also produce lower levels in the ovaries and the placenta. This testosterone produced inside the body is **endogenous testosterone.**

Production of endogenous testosterone

Testosterone production in men is controlled and regulated by a system called the **Hypothalamic-Pituitary-Testicular Axis.** Understanding this system is essential for understanding and advising on key processes related to AAS.

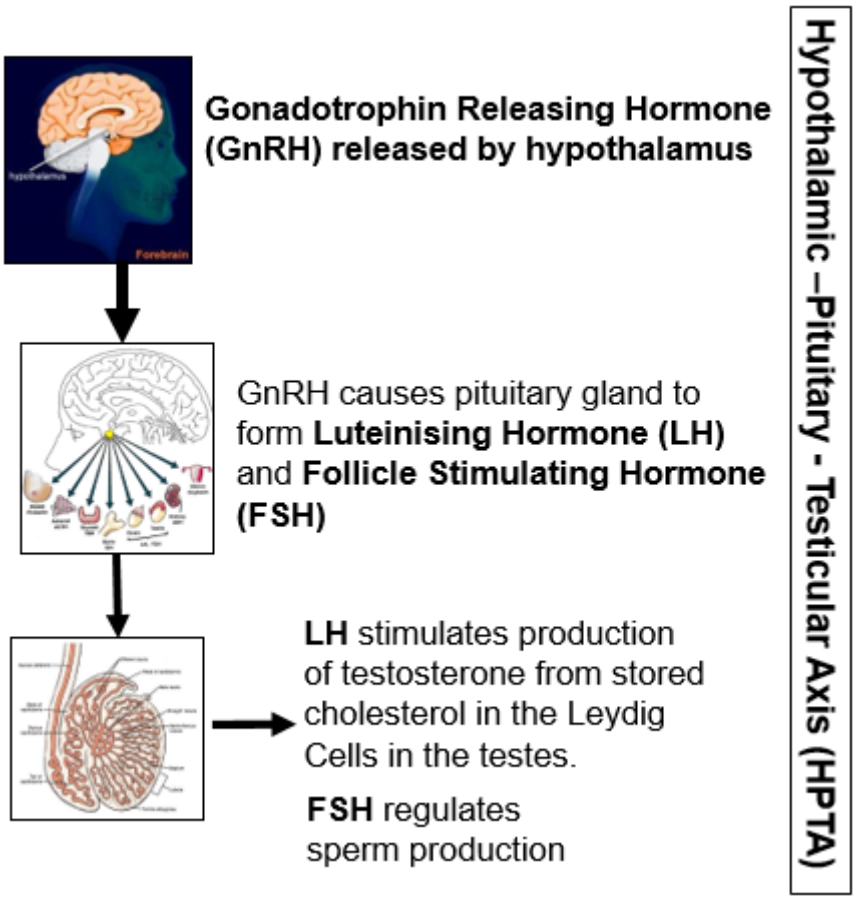


Figure 3 the HPTA

The HPTA: Gonadotrophin-Releasing Hormone (GnRH) is released in the hypothalamus. It triggers the release of Luteinising Hormone (LH) and Follicle-Stimulating Hormone (FSH) in the pituitary gland. FSH stimulates the production of sperm in the testes; LH triggers the synthesis of testosterone.

Factors influencing testosterone synthesis: Lots of factors influence production of testosterone. This includes:
Age: testosterone production increases dramatically during puberty, then drops off over a number of years.
Ethnicity: levels of free testosterone vary amongst different ethnic groups;
Drug use: drug use, including alcohol use, can reduce levels of testosterone
Diet and obesity: poor diet and obesity impacts on testosterone levels
Injury or illness: organic illness or injury affecting the hypothalamus, pituitary gland or testes will impact on testosterone levels;
Mental health: depression, anxiety and sleep disorders can all have a negative impact.

Testosterone "boosters:" There are a number of products on the market reputed to increase the production of testosterone. These include herbal

products (e.g. Horny Goat Weed, Tribulus Terrestris, Fenugreek extract) and a range of chemicals. There is not a robust evidence base supporting these supplements but there is a thriving market for them nonetheless.

Workplace implications and practice issues:

- When working with young people contemplating AAS use, stress that they are producing large amounts of "natural" testosterone at this age. It is the "best" time to train naturally; use of AAS at this stage will suppress production of this natural testosterone
- Explore to what extent lifestyle or other factors could have a negative influence on testosterone levels. It may be that natural levels of testosterone could be increased through lifestyle changes rather than electing to use AAS.

Testosterone Profile:

Testosterone is **anabolic** and **androgenic.** It affects both growth and development but also male secondary sexual characteristics such as hair growth, patterns of fat-deposit and sexual drive.

Low levels of testosterone can result in **catabolism** or muscle wasting.
High levels of testosterone in men can result in:

- Increase in lean muscle
- Increased territoriality, irritability and aggression
- Increased sex drive and libido, sperm production
- Reduction in body fat
- Feelings of strength and endurance

As testosterone is responsible for many male secondary sexual characteristics, it can have a number of serious side effects on women who have excessively high levels of testosterone. This can result in the development of male characteristics; this process is called **virilisation** and can result in symptoms including:

- Deepening of voice,
- Development of increased facial and body hair,
- Enlargement of clitoris
- Restructuring of bones, especially face and chin
- Sterility

Natural Synthesis of Testosterone:

Testosterone is produced from the synthesis of cholesterol in a number of stages.

Cholesterol is converted in to pregnenolone. This compound is used as a building block for a number of other compounds in its own right.

Pregnenolone is converted in to testosterone in a number of steps. Testosterone is in turn converted in to DHT by the enzyme 5a-reductase.

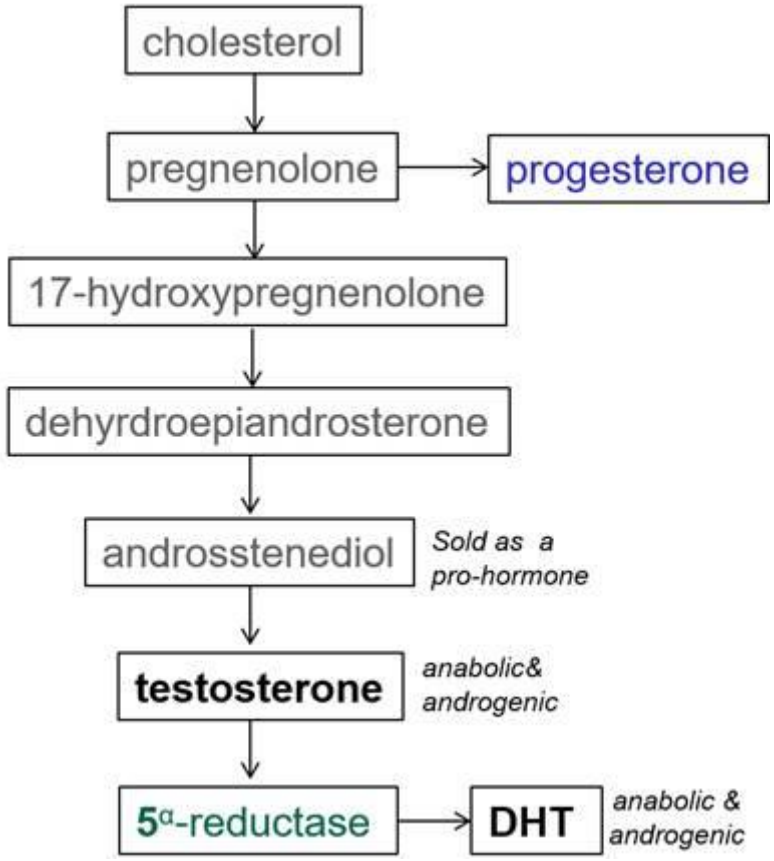


Figure 4: testosterone production

Exogenous Testosterone:

Testosterone was first isolated in animals in 1935. It has been used medically, in animal husbandry and for sports performance in humans ever since. Testosterone introduced from outside the organism (rather than produced in the organism) can be called **exogenous testosterone.**

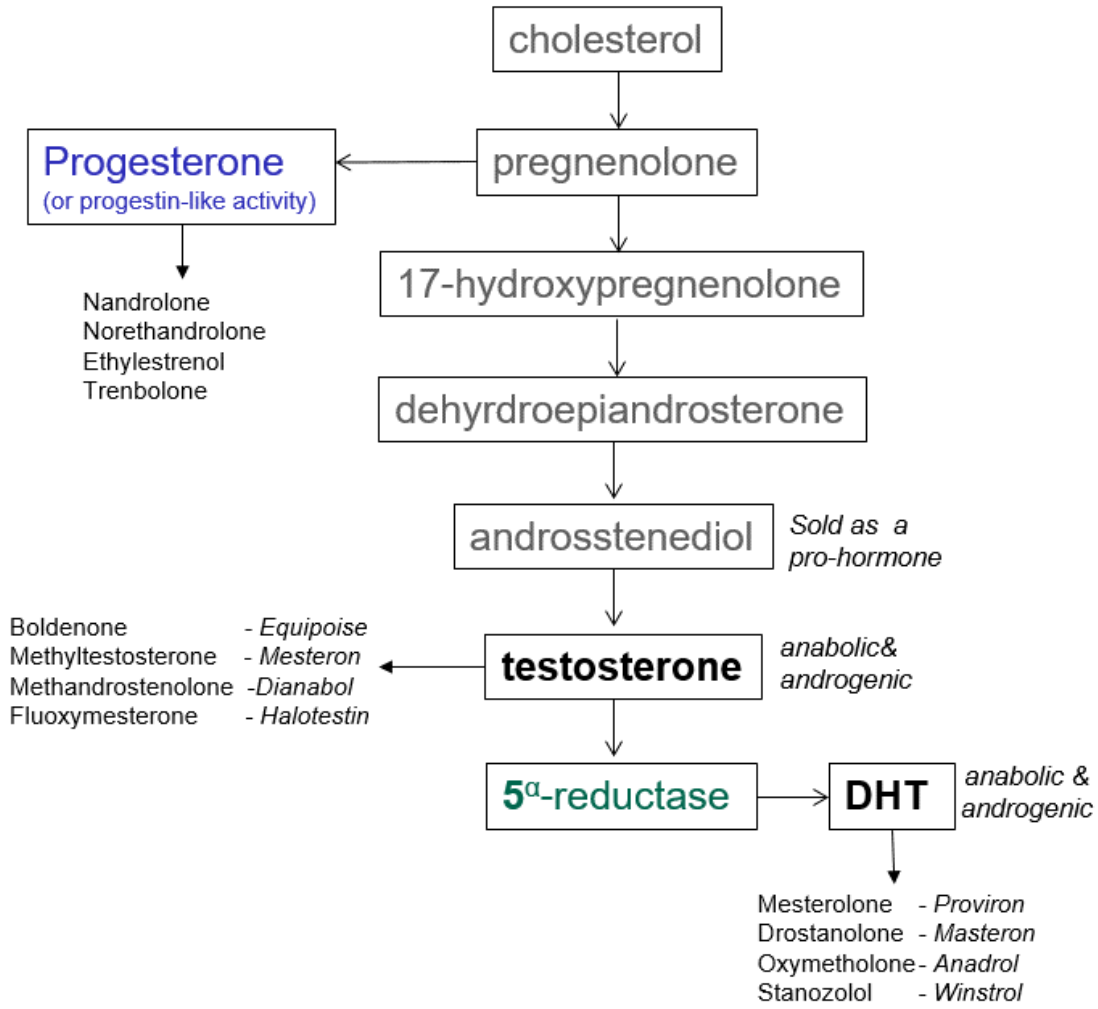
A key medical use was for people who lacked or had low levels of endogenous testosterone. It has also been used to treat low growth levels, anaemia, erectile dysfunction, and other problems associated with low

testosterone levels. Typically, these interventions have been applied to men whose levels of testosterone were naturally low or had declined exceptionally fast with age.

Exogenous Testosterone outside of medical settings: The anabolising effect of testosterone makes it an obvious choice as a Performance Drug. It can promote rapid physical change to muscle shape and size and can mentally increase the drive needed to train hard and frequently. It therefore became the lynchpin of body-building drugs. A large number of other drugs are derived from the testosterone molecule.

Other Key AAS building blocks

Figure 5 Core families of AAS



In addition to the testosterone-derived anabolic steroids, a number of other compounds are derived from Progesterone and DHT.

Progesterone: The main function of progesterone in women is to prepare the uterus to receive a fertilised egg and to maintain the uterus during pregnancy.

Importantly some steroids which are used for their anabolising effects are related to progesterone rather than testosterone. The most significant of these is **Trenbolone**. This substance has widely been used in body-building as it is promotes hard muscle growth. However, as it can have serious unwanted side-effects on male users including reduced libido, inhibition of erections and the development of secondary sexual characteristics (see Aromatisation, Chapter 8).

DHT: a metabolite of testosterone, Dihydrotestosterone (DHT) is in itself the building block for a number of other drugs, some of which are illustrated in Figure 4. DHT is associated with a number of problems, including acceleration of male-pattern balding.

9 Oestrogen and Aromatisation

About Oestrogen:

Testosterone is frequently referred to as a "male hormone" but is present, albeit at lower levels, in women too. Likewise, oestrogen (estrogen, estradiol) is often referred to as a "female hormone" but is also present in men. At low levels it is an important component of the male hormonal system. Indeed, it may be that too little oestrogen can inhibit muscular development and bone health in men, even where testosterone levels are high.

Aromatisation: Formation of Oestrogen

Oestrogen is converted from testosterone by the ***enzyme*** **aromatase.** Aromatase is secreted in lots of places, including bones and adipose fat.

Aromatase converts testosterone and testosterone-related compounds to oestrogen.

Drugs derived from DHT are not converted to oestrogen by aromatase. Likewise, drugs derived from progesterone do not convert to aromatase but can cause problems in their own right.

Some compounds are more rapidly converted to oestrogen than others. Some users are more sensitive to the effects of oestrogen and will experience unwanted effects more rapidly.

Action of Oestrogen:

Oestrogen at higher levels in men has significant effects.
Weight Gain: elevated levels of oestrogen in men are associated with increased fat deposits, especially adipose fat. This in turn can increase levels of aromatase, leading to greater oestrogen production.

Water retention/bloating: elevated oestrogen can cause increased water retention. People using AAS who get very rapid weight gains may think that they are gaining muscle mass but a proportion of this rapid weight gain is likely to be retained water.

Gynecomastia: Oestrogen binds to receptor sites in breast tissue, leading increased development of breast tissue. This breast development, gynecomastia, ("*gyno," "bitch tits")* can self-resolve in minor cases but in

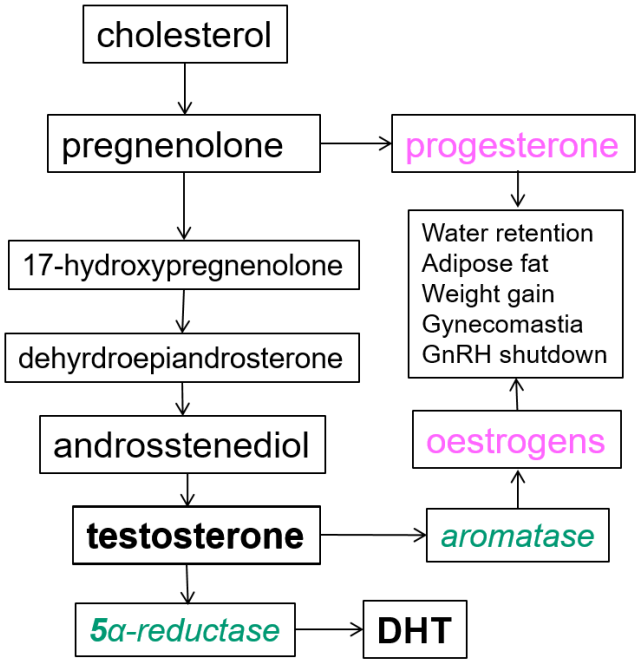
serious cases can be permanent, requiring surgical correction. (see further information in **Complications**.)

Reduction in Testosterone Production:
Increases in oestrogen are believed to trigger a reduction in the release of GnRH in the hypothalamus. This inhibits the HPTA, reducing and stopping production of testosterone. This "shut-down" can have short and long-term consequences. It is discussed separately in the next chapter.

Interventions to address gynecomastia

For people determined to use AAS, thought needs to be given as to the management of oestrogen-induced gynecomastia and the management of shut-down. As the two issues are linked, there is crossover between the interventions. We'll consider gynecomastia first.

Avoid compounds that aromatise: As this diagram shows, testosterone is converted by aromatase in to oestrogens. DHT, on the other hand, is not converted by aromatase and so drugs that are derived from DHT do not carry the same risks of aromatisation. Some drugs aromatise more slowly than others, and so people could choose to reduce risk by their drug selection.



Progestin-type drugs are also not converted by aromatase. However, they can exert their own feminising effects including gynecomastia so are not risk free.

Figure 6 Pathways for drug-induced gynecomastia

Use lower doses for shorter periods of time: Experience will help people gauge how sensitive to oestrogen formation they are, and some people will find that by using lower doses of drugs for shorter periods, they do not experience significant issues.

Use of anti-oestrogens and SERMS: Selective estrogen receptor modulators (SERMS) are drugs that are widely used in the treatment of breast cancer and

other illnesses where oestrogen is a factor. They are often called "oestrogen antagonists," but are not pure agonists, which would work at all oestrogen receptors. Instead SERMS have a blocking action at specific receptors, enabling them to work with better selectivity at (for example) receptors in breast tissue.

The use of SERMS by male AAS is widespread, to prevent gynecomastia and help reverse "shut-down" of the HPTA. As oestrogen acting on the hypothalamus is a key cause of this shut-down, use of a SERM can block oestrogen's action here, restarting the HPTA.

Drugs in this family include: **tamoxifen, clomiphene** (used primarily in post-cycle treatment).

Use of Aromatase Inhibitors: Aromatase inhibitors (AIs) were also developed to treat cancers where oestrogen is a factor. AIs bind to aromatase, preventing the enzyme from producing oestrogen.

These drugs have been relatively expensive but are becoming more widespread amongst AAS users.

Drugs in this family include: **Letrozole, Anastrozole, Exemestane. Mesterolone (Proviron)** also has some use as an aromatase inhibitor, and is also used its androgenic effects in body building.

Why not just prevent all oestrogen formation? Given the problems associated with oestrogen in male AAS users, it would seem that heavy use of AIs or SERMs would remove the problem altogether. However, there is good evidence that just as too much oestrogen is a problem, so too is too little. Low levels of oestrogen seem to inhibit muscular growth and development. The aim of anyone using SERMs or AIs is to keep oestrogen levels low enough, but not too low.

Progestin-induced gynecomastia: Some drugs don't get converted to Oestrogen but instead exert a progestin-type effect. In male users this is very similar to the effects of oestrogen, including water-retention, adipose fat, reduced libido and gynecomastia.

The popular and widely-available AAS nandrolone (Deca Durabolin) is an example of a drug with a progestin-type effect. Preventing progestin-

induced symptoms is linked to oestrogen-related problems, but requires different solutions.

Drugs in this family include: **trenbolone, nandrolone [?]**

Stop oestrogen formation: There is a widely-held view that oestrogen needs to be present for progestins to work. Some will therefore use AIs to prevent the formation of oestrogen that would "activate" progestins. The use of a drug that aromatises (e.g. testosterone) with a progestin-family drug (e.g. trenbolone) without use of an AI is a high risk situation.

The drug nandrolone (Deca Durabolin) is slightly trickier as while it has a progestin-like effect it also aromatises, albeit very slowly. As such it can provide the oestrogen required to trigger a progestin-type effect. This isn't a problem for everyone, but may be for those who are using for longer periods of time or are very sensitive to gynecomastia.

Use of compounds with an anti-progestin action: Stanozolol (Winstrol) has an anti-progestin effect and so the use of this alongside compounds that cause progestin-induced gynecomastia is another potential response.

Drugs include: **Stanozolol (Winstrol)**

Impact of Prolactin? There is a school of thought (not entirely supported by the evidence) that progestin-type drugs can elevate levels of the hormone prolactin. Prolactin is responsible for milk-production and also has a negative impact on libido in male users. Heavy use of these drugs by some men is associated not just with gynecomastia but also lactation and significant loss of libido and erectile function.

Although there is not conclusive evidence that this is related to prolactin, some AAS users have started to introduce prolactin-blockers in to their drug regimes.

Drugs in this family include: **bromocriptine, cabergoline**

Figure 7 Points for preventing gynecomastia

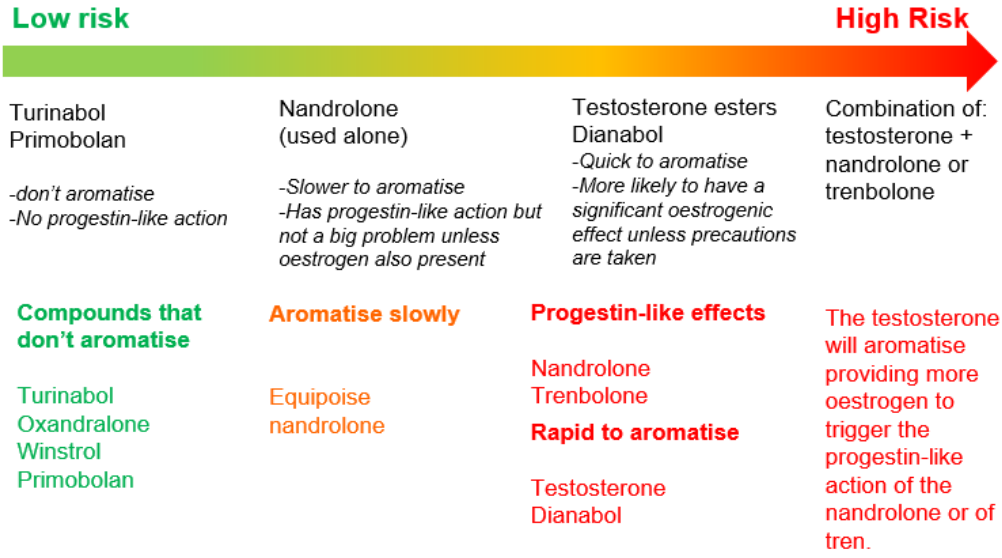
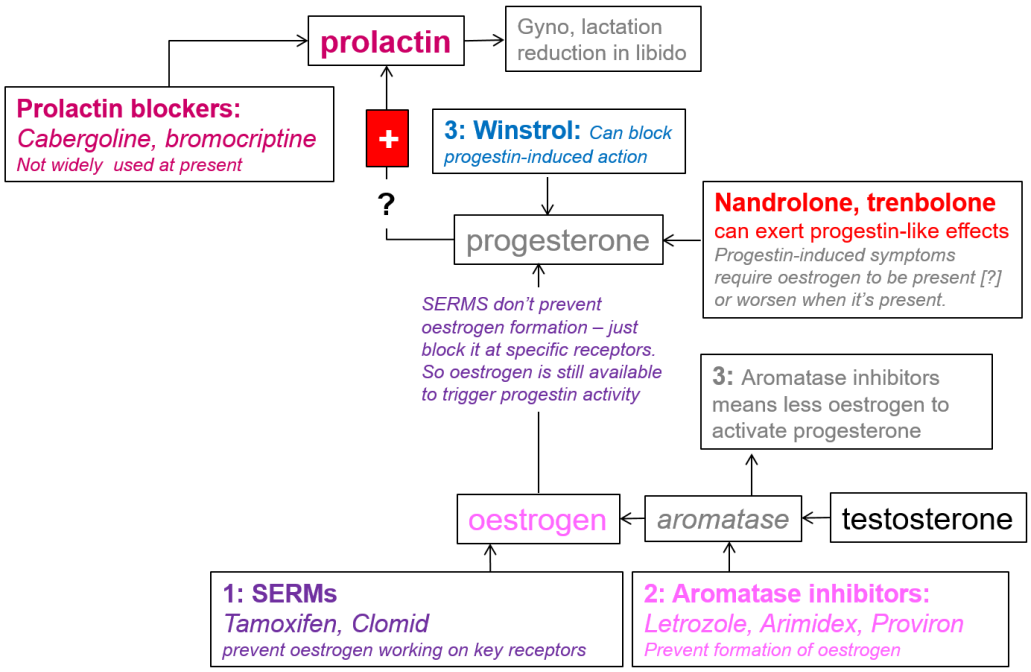


Figure 8 examples of relative Gynecomastia Risk



Workplace implications and practice issues:

- Ensure workers are familiar with key issues relating to oestrogen formation
- Develop screening/guided conversations to explore client understanding of and responses to problems linked to oestrogen
- Assess if compounds being used (a) aromatise or (b) exert progestin-type activity
- Assess if measures are in place to manage oestrogen/other causes of gyno
- Assist in education & understanding of causes of gynecomastia & related issues
- Explore solutions including substance selection and the role of SERMs and AIs.
- Screen for negative symptoms caused by oestrogen or progestin-type activity.

10 Shut down and Post Cycle Treatment

The previous chapter looked at the impact of oestrogen, especially in relation to gynecomastia. In addition to these problems, oestrogen also has an impact on production of testosterone.

Elevated oestrogen levels are detected by the hypothalamus; this has a negative impact on the Hypothalamic-Pituitary-Testicular Axis (HPTA). Levels of GnRH go down leading to a drop in LH and FSH. This in turn leads to a drop in testosterone and sperm production.

At first, endogenous testosterone levels decline, and then drop lower still. The Leydig cells that produce testosterone are not replaced, and there may be a drop in testicular mass. The longer the process goes on, the greater the risk that recovery may be very slow, or full recovery may not happen. This reduction in testosterone production is often referred to as "shut-down."

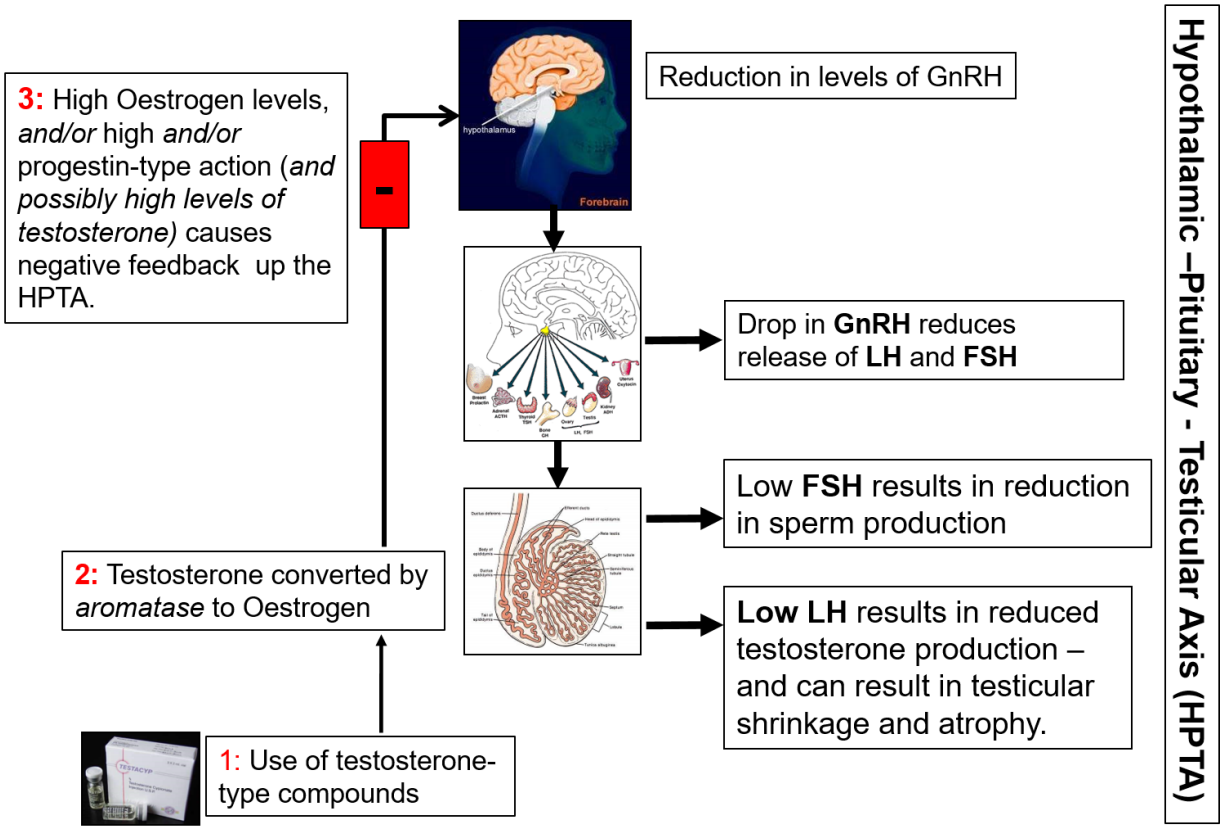


Figure 9: Oestrogen-induced shut-down

Impact of shut-down:

The drop in production of **endogenous testosterone** is important for several reasons:

Dependency on exogenous testosterone: if endogenous production of testosterone reduces (or stops) the user is increasingly dependent and then wholly reliant on testosterone-type compounds from outside to maintain hormone levels.

This is analogous to the use of heroin: with extended use, heroin users produce less endorphins of their own. Eventually endorphin production may stop leaving the user dependent on opiates from outside to replace these endorphins.

Crash when use stops: when use of AAS use stops, especially suddenly, levels of exogenous testosterone will start to drop. Hopefully, natural production of testosterone will restart but this could be a slow process, taking weeks or longer, especially after long cycles of AAS use.

In the interim, there is no testosterone coming from outside and not enough being produced inside.

The person is liable to drop from a very high level of testosterone to very low levels. These exceptionally low levels could cause:

- Catabolism – rapid loss of mass and muscle
- Depression
- Loss of energy/fatigue
- Low libido/poor erectile function

This crash is unpleasant and makes it harder for the person to retain any gains made during the cycle. This failure to make gains may be misattributed to under-dosing or too short a cycle. The risk then is the person resumes use at higher doses or uses for longer. Successfully ending a cycle is as important as what happened drugs and training wise during the cycle.

Reduction in testicular mass: with shorter cycles, the shut-down of the HPTS is primarily a chemical process. With longer periods of shut-down, the process is also a physical one where the cells in the testes are not replaced, leading to shrinkage and atrophy. Where this has been significant, recovery will take much longer and the person may not make a full recovery.

impotence/fertility issues: drops in testosterone, increase in oestrogen, reduction in Follicle Stimulating Hormone (FSH) and possible impact on prolactin can have a significant impact on libido, erectile function and sperm production. Low levels of FSH can reduce sperm production. Users may report reduced sex drive and poor quality or absence of erections.

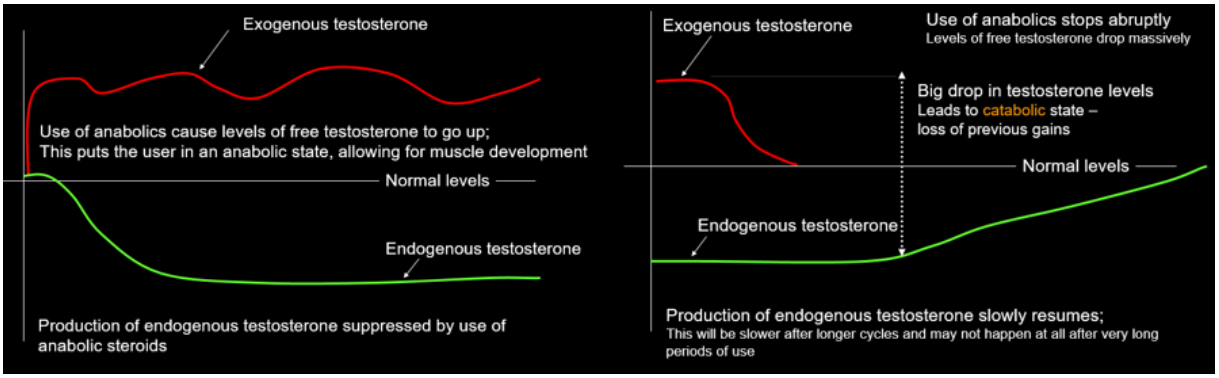


Figure 10 Suppression of endogenous testosterone and crash

It may well be that when use of AAS stops, testosterone levels return to normal within a matter of weeks. However, even this relatively short timeframe could result in significant loss of on-cycle gains. In order to retain gains, how the cycle ends is as important as what happened during the cycle.

Interventions to address shut-down:

Additional drugs may be used in order to help reduce the impact of shut-down and bring endogenous testosterone levels back to "normal." This process forms what is usually referred to as **Post-cycle treatment** (PCT) but may also take place during a cycle.

There are numerous proposed models of PCT, few of which have been properly evaluated. A protocol developed by Dr Michael Scally is one of the better evaluated ones and is described by William Llewellyn, author of the Anabolics series of reference books as "*perhaps the most trusted and clinically supported post-cycle therapy program presently available*."[6]
Most protocols will use this is something similar to help restore testosterone levels.
Measure of base-line testosterone: In an ideal world, people using AAS would be able to get their testosterone levels measured before they started a cycle. They would then be able to use this to gauge when PCT had restored levels

[6] http://anabolic.org/post-cycle-therapy-pct/

of testosterone to pre-cycle levels. Without such a measure there is an element of guesswork, or using an "off the shelf" programme which may be too long or too short for individual needs.

Human Chorionic Gonadotrophin (HCG): HCG is used in the Scally protocol and others. HCG mimics the effect of Luteinising Hormone and so helps to trigger the Leydig Cells in the testes back in to action. It is used in the protocol to help restore testicular mass back to normal more rapidly.

As HCG can reduce sensitivity to LH, stimulate aromatase activity and reinforce shutdown of the HPTA, use is generally not for long periods of time and may be combined with other substances to offset its side effects.

HCG may also be used during longer cycles to help maintain testicular mass, but this is not so commonly reported.

HCG is supplied as a dry white powder in ampoules. It is dissolved in water and injected subcutaneously.

Clomiphene citrate (Clomid): Clomid is a selective estrogen receptor modulator (SERM). Unlike tamoxifen, it has greater selectively for oestrogen receptors in the hypothalamus. By inhibiting the activity of oestrogen here, the oestrogen-induced shut down ends, leading to a resumption or GnRH release, restarting the HPTA.

Tamoxifen: also used in the Scally protocol to reduce the effects of oestrogen already in circulation and produced as a result of any oestrogenic activity stemming from use of HCG.

PCT is timed to start before levels of exogenous steroid drop below the 'normal' point, allowing enough time for the PCT to start working.

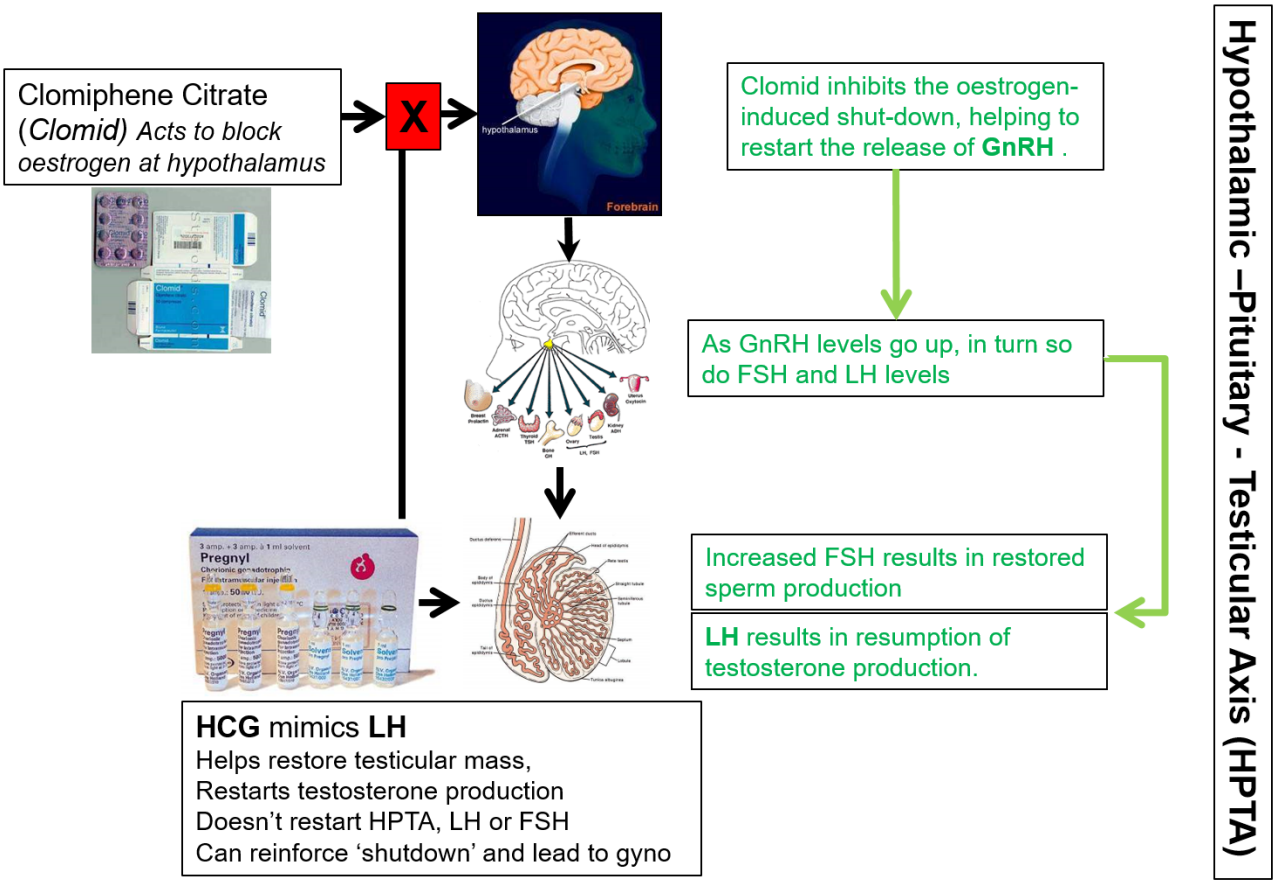


Figure 11 PCT: Clomid and HCG

"Blasting and Cruising" or "Bridging"

Rather than stopping use of AAS and completing PCT, some users continue use for extended periods of time. This typically involves higher doses of AAS to gain bulk and then dropping to a lower dose more akin to "normal" levels of testosterone as a resting or bridging phase before another period of higher-dose use.

The risk with such an approach is that the hormonal and physical aspects of being shut-down will be more pronounced and the prospects of a full recovery, even with PCT are diminished.

The fear of stopping for someone who has been "blasting and cruising" for months or even years must be very real, and at present we lack proper treatment pathways for individuals now highly dependent on AAS.

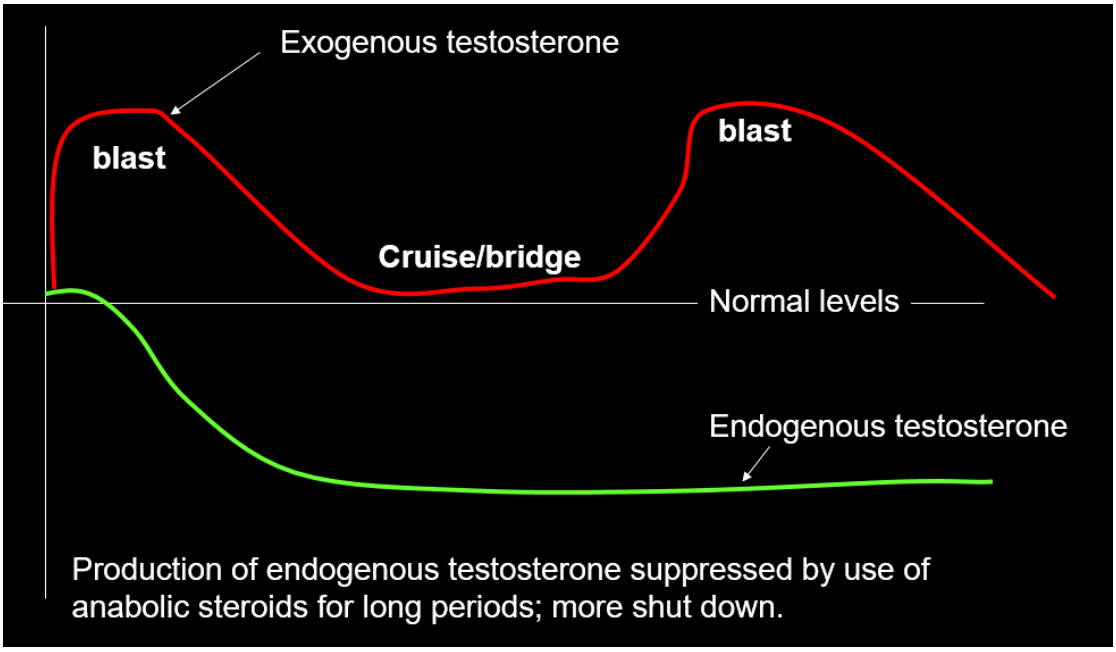


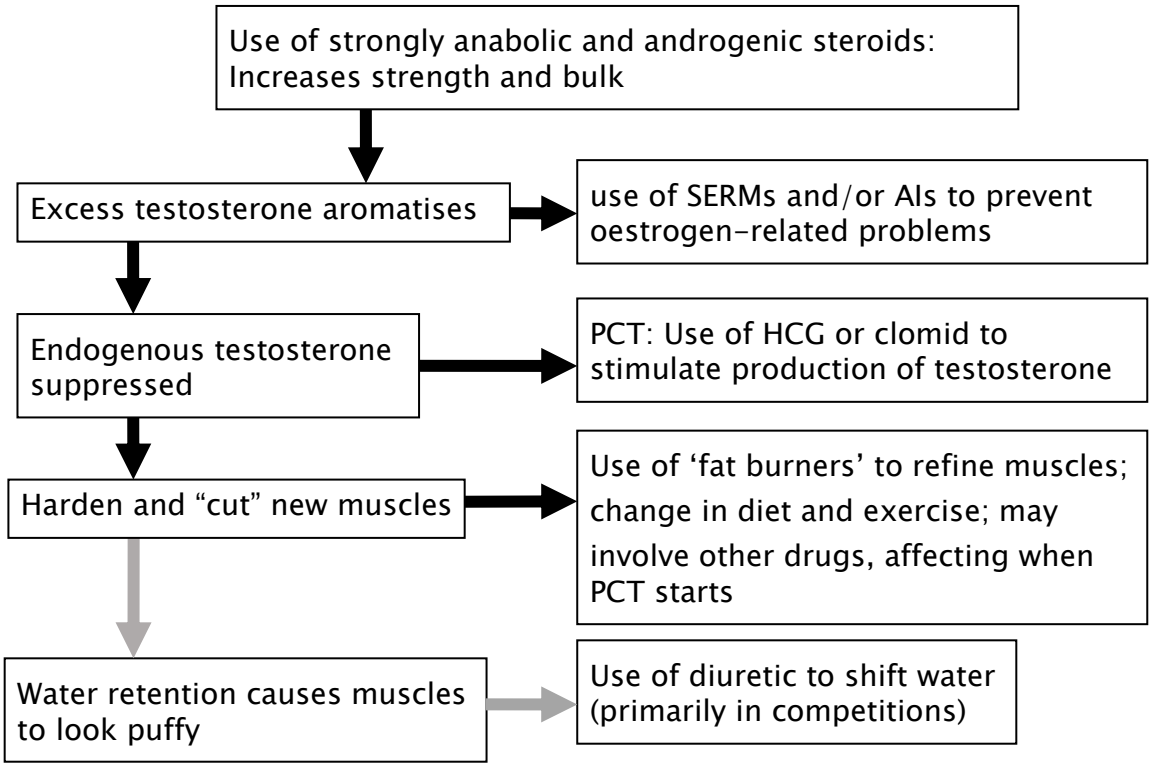
Figure 12: Blasting and Cruising

Workplace implications and practice issues:

- Ensure workers are familiar with key issues relating to shut-down, its causes and effects
- Develop screening/guided conversations to explore client understanding of and responses to shut-down
- Assist in education and understanding of causes of shutdown
- Assess if measures are being taken to manage the end of the cycle
- Discussion as to which compounds are to be used
- Consider referral to Scally protocol if appropriate
- Information about sub-cutaneous injection if using HCG
- Consider scope for testosterone testing in project to support appropriate PCT
- Psychosocial interventions to support people during crash post cycle
- Targeted interventions for those involved in or contemplating "bridging" rather than PCT.

11 Cycles

So far we have looked at some foundation aspects of AAS use; the use of AAS to create bulk and strength, and then the resultant problems of aromatisation and suppression of endogenous testosterone. This forms the backbone of a steroid **cycle** and the required **post cycle treatment.**



Anabolic Androgenic Steroids and some other PIDs are taken over a sustained period of time. This is a **cycle.**

A cycle needs to be long enough for the body to enter an anabolic state and for diet and training to facilitate muscle growth and development. Few people will end up using for less than six weeks.

The longer a cycle goes on, the greater the impact is likely to be on the body's own testosterone production, blood pressure, liver health, fitness and cholesterol levels.

In addition, steroid receptors may become desensitized or reduce in number and not be replenished fast enough and so steroid use may become less effective over a longer cycle. Cycles of sixteen to twenty weeks are becoming more common but are considered on the long side.

One compound may be run through the whole cycle, or different compounds may be introduced at different stages.

A stack is a combination of two or more drugs taking at the same time in the cycle, in the belief that they will have an additive, synergistic effect.

There is a belief that as some steroid receptors become exhausted, switching to steroids that work at other receptors can ensure that steroid use remains effective.

Steroid literature is replete with examples of cycles of different levels and complexities.

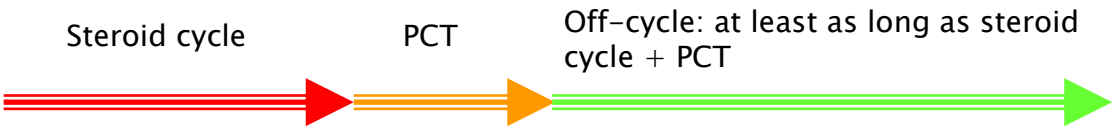
Key features could include:

- frontloading: taking short acting or oral compounds at the start to rapidly increase blood testosterone levels
- brief oral use: oral steroids used early on and discontinued to prevent too much liver damage
- introduction of longer acting drugs: to ensure these start to work when the earlier drugs have been cleared from the body
- switching compounds: when other receptors are becoming exhausted and depleted
- possible tapering: to reduce crash, though this is disputed

At the end of the process, there will typically be a period of **Post cycle treatment (PCT)** aimed at restoring the body back to its "natural state."

Ideally this should in turn be followed by a period completely "off cycle" where no PIDs are used. There is no hard and fast rule about how long this needs to be.

Longer periods without use of AAS is to be encouraged. A commonly proposed formula for the minimum time off everything is time spent on cycle + time spent on PCT.



Given the range of range of different PIDs that are available, and the differing effects each can have, different consumption programmes have been

designed for men and women, beginners and more experienced users, level of risk and desired outcomes.

Types of cycle:

Numerous body-building and steroid websites provide illustrative cycles. These should not be taken as applicable to each individual. They would need to be tailored for each individual's build and metabolism.

Women cycles: intended for women with less risk of virilisation

Cutting cycles/stacks: The use of a drug or combination of drugs to reduce body fat around muscles leading to muscles looking more "cut" or "ripped." The cut or ripped look is important for those competing or displaying.

This is an example of a cycle, based on a bulking cycle from a website. It has been reformatted here to make it easier to understand. It is purely illustrative and is not intended as an endorsement of compounds used, duration, structure or doses.

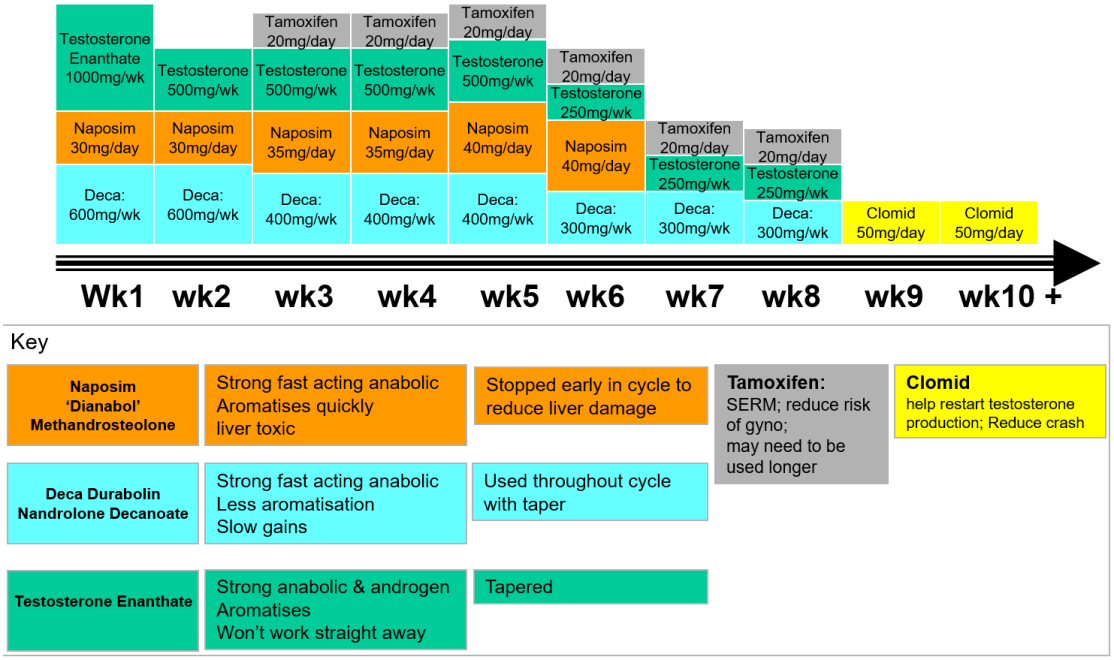


Figure 13 illustrative cycle

Testosterone Enanthate, Dianabol and Deca Durabolin are used at the start.

The **Testosterone Enanthate**, a powerful anabolic and androgenic, won't start working straight away, until the **ester** has been broken down.

The **Deca Durabolin** won't provide fast gains either. But it is a safer, less problematic compound and so provides a backbone through the whole cycle, tapered towards the end.

Naposim (Dianabol, Methandrostenolone) is strongly anabolic and moderately androgenic. It is used orally, and provides rapid bulking gains at the start of the cycle. However, it is liver toxic, causes significant water retention and aromatises easily. Its use is reduced and ends mid cycle.

As both the Naposim and the Testosterone aromatise readily, anti-oestrogens are introduced early in the cycle to reduce the risk of gynecomastia. Its use may need to continue longer at the end of the cycle.

Finally, **Clomid** (clomiphene citrate) is used to help restore endogenous testosterone production. However, it may need to be introduced earlier, and used for longer to reduce a crash.

Workplace implications and practice issues:

- organisations should develop policy on advice and information that will be provided relating to cycles and stacks
- few organisations will advise on specific cycles
- familiarity with common combinations and the core or a cycle structure will be useful
- workers should highlight the risks of longer cycles, and the importance of time off cycle
- psychosocial interventions may help those finding it tempting to extend cycles or start a new cycle sooner than indicated

12: Route of Administration: Oral v Injectable

[injecting AAS and other compounds is discussed in Chapter 16]

A number of steroid preparations are for oral use; others are intended for injection. While with heroin and other drugs there is typically a clear admonition against injecting the case is not so clear cut with anabolic androgenic steroids.

The key advantage of not injecting is it removed risks of injecting-related complications:

- The injectable steroids may not be sterile
- Risk of nerve or vein damage
- Infections due to unhygienic injecting technique
- Risk of BBVs
- build-up of scar tissue at injecting sites

While these risks would be avoided through the use of oral preparations, this is not wholly safe.

Oral steroids would be broken down easily during their passage through the liver and wouldn't allow an effective dose to reach the blood stream. In order to overcome this first-pass metabolism of steroids, they are chemically altered to survive passage through the liver. This process is **called C-17 Alpha Alkylation** (C17-AA.)

C17-alpha alkylation:

The addition of an extra molecular structure to the steroid means that the liver cannot it down easily. As a result, the drug is viable orally. The downside is that the compound is much more liver toxic so will have a far worse impact on liver health in long term use.

Oral steroids still won't last as long in the body, requiring more doses taken more frequently.

On balance there are pros and cons with both oral and injected preparations. Some commentators argue that the liver-damage stemming from oral use is so significant that injecting is the less risky option. This may be true where users have access to high quality pharmaceutical products. But with the current proliferation of grey market product, injectables carry significant risk too.

C17-AA Injectables: to further complicate matters, a small number of injectables (notably Winstrol) are also c17-AA and so can be liver toxic too.

Some users will typically use a combination of oral and injected preparations although there are still a very large number of exclusively oral users and some who will only use injectables.

Transdermal: Medical forms of testosterone are available in patch and gel forms for transdermal administration. An increasing number of higher strength gels are starting to reach the non-medical market, and while still not widely used are gaining popularity.

As transdermal preparations avoid first-pass metabolism through the liver, these preparations do not need to be C17-Alpha Alkylated, and so don't have the liver-toxic properties of oral steroids.

Workplace implications and practice issues:

- There should be no assumption that all users inject, nor that simply moving to oral preparations are inherently "safer."
- Unlike other drugs it's not automatically a harm-reduction intervention to advocate oral products over injectable
- Where oral products (or C17-AA injectables) are being used explore measures to safeguard liver health:
    - Use of liver "detoxifiers
    - Monitoring of liver health
    - Avoiding co-use of other liver toxic compounds
    - Regular breaks from use
    - Avoidance if other hepatic illnesses/damage are present

13 Esters, Duration of Effect and Half-life

In order for AAS to work, levels of the steroids in the blood need to be elevated and remain elevated for a sustained period of time. This puts the user in an anabolic state, allowing muscle growth to take place.

Peaks and troughs in steroid levels would be undesirable, as they would put the person in and out of an anabolic state, making it difficult to make and retain gains.

In order to maintain high levels of steroids, the route of administration and the **half-life** of the drugs is critically important.

Half-life of a drug is strictly how long it will take the peak level of the drug to drop by half. It is generally used as a measure of how long the drug works for. Half-life will vary from compound to compound and individual to individual, as everyone will have different rates of absorption and metabolism.

Exogenous testosterone would, if used in a "natural" state have a relatively short half-life and would be rapidly broken down and so would need to be taken frequently to maintain an effect. For some people that may require use at least once a day and maybe more frequently.

By tinkering with the molecular structure of a steroid, it is possible to extend the duration of effect.

Intramuscular 'depot' injections:

Most AAS are supplied as an oily suspension intended for deep muscular injection. The oil based steroid is then absorbed slowly from the muscle in to the blood stream (in the same way a psychiatric "depot" would work) which comes on gradually rather than all at once.

A small number of steroids are water-based rather than oil-based suspensions. They are still injected into a muscle.

It is imperative that oil based steroids are never injected in to a vein. This could cause an **oil embolism** where the oil would travel in to and block a lung. Even water-based steroids should not be used IV as the risk is the

suspension will end up in the lungs rather than in muscle where it is wanted.

Esterification:

The other way of changing the effective half-life of a steroid is through a process of **esterification.** This means adding an **ester** to the steroid.

An ester is a chain of molecules with a high attraction to oil. The presence of the chain of molecules slows the steroid from being released from the oil and entering the bloodstream until the ester has been broken down. The longer the chain, the slower the release of the steroid.

As the steroid doesn't get released until the ester is broken down, esterified steroids don't start to work immediately. It could be several days until the steroid starts to reach receptors. Some cycles plan for this by including faster acting oral steroids at the start before the injectables "kick in."

Some combinations of esterified steroids are sold in pre-blended preparations (e.g. Sustanon, Tri-Test.) The esters break down at different rates, releasing steroids in to the blood-stream at intervals. This allows for less frequent dosing and more consistent levels of steroid.

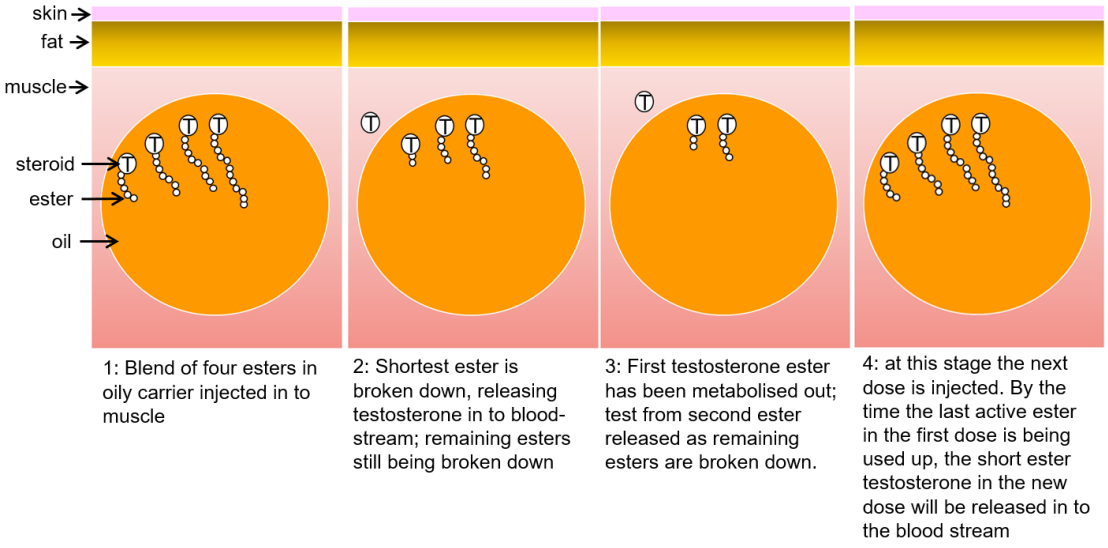


Figure 14 Release of four-ester steroid blend

The ester chains also have a weight; the longer the chain and the greater the weight, the more of a given compound will be ester as opposed to active drug. So for example a compound such as **testosterone enanthate** might come in a 250mg preparation of which 180mg would be testosterone and 70mg would be the ester.

Some esters will cause significant irritation at injecting sites, to the extent that some people are unable to tolerate some esters. This tends to be associated with shorter esters.

The table below looks at key esters, and the extent to which they prolong periods of effect:

Ester	Acid	Extends duration	Notes
Propionate	Propionic Acid	Slows release over several days; propionate compounds usually injected two or three times weekly	e.g in Test. Propionate “Prop” Also used as the shortest ester in Sustanon
Acetate	Acetic Acid	A couple of days	Used on oral primobolan tablets, Finaplix and some forms of testosterone
Isocaproate	Isocaproic Acid	Around one week	Used in testosterone products Sustanon and Omnadren
Phenylpropionate	Propionic Acid Phenyl Ester	Slightly longer than propionate; administration at least twice weekly	One of the medium esters used in Sustanon
Caproate	Hexanoic Acid	Around one week	
Enanthate	Heptanoic acid,	Approx. 10-14 days, though users will still typically use twice weekly	e.g. in Testosterone Enanthate Primobolan Depot
Cypionate	Cyclopentylpropionic Acid	10-14 days	E.g. in Testosterone Cypionate “Cyp”
Decanoate	Decanoic Acid Capric Acid	As long as one month, but with drops after two weeks. Usually used in a weekly schedule	Long acting ester Used with nandrolone (as in Deca-durabolin) and in Sustanon
Undecylenate	Undecylenic Acid	2-3 weeks Usually used in weekly schedules	Occurs in Equipoise
Undecanoate	Undecanoic Acid,	2-3 weeks	e.g. used in Dynabolan and Andriol
Laurate	Dodecanoic Acid Laurostearic Acid	3 weeks to 1 month	e.g. used in Laurabolin
Based on “A beginner’s guide to Testosterone Esters” Iron Magazine: 2001			

14 Factors influencing AAS selection

There are a wide range of different AAS on the market, and numerous brands and products. Choosing which products to use is based on a number of factors.

Oral or injectable: as discussed, some users will prefer not to use oral compounds and others may elect not to inject at all.

Duration of effect: this may influence choices based on value, ease of administration and perceived advantages.

Anabolic v Androgenic effect

Rather than thinking of an AAS being anabolic or androgenic it's better to think of them having a ratio of effect which could be balanced between anabolic/androgenic effect or skewed to one side or the other (usually strongly anabolic with a weaker androgenic action.)
Drugs can then be relatively weak or relatively strong, a reflection of their potency.

Testosterone is used as a bench-mark for comparing effects, and is given an anabolic to androgenic ratio and potency of 100:100.

Strongly Anabolic and androgenic compounds will significantly increase bulk and gaining muscle mass quickly. The androgenic aspect will contribute to strength but increases the likely side effects. Some strongly androgenic compounds can have a greater impact on mood, skin, sexual function and health issues such as prostate and testicular function.

Strongly anabolic/weakly androgenic compounds won't offer such spectacular gains, but the reduced androgenic activity reduces the risks. An example of a strongly anabolic/weakly androgenic compound is nandrolone, with a profile of 125:37.

Stronger drugs will give more dramatic results and more rapid gains. This will always make them with popular. In theory, given their potency, this should mean that they can be used at lower doses for shorter periods which would be a good thing.
In practice some people will want to use the strongest compounds and at high doses and for long cycles. Use of stronger compounds and especially at high doses for long periods will bring with them greater risk of side-effects.

Results sought: product selection may be influenced by the results sought. People who are looking for large amounts of bulk will go for stronger anabolic androgenic compounds. People looking to gain lean hard muscle rather than bulk, or refine existing muscle will choose specific compounds.

Availability and cost: While people may be interested in exotic or renowned products, practical issues such as affordability and availability will probably be decisive. AAS users need reliable and consistent supply so a reliable affordable source is likely to be preferred over hard-to-source, more expensive compounds.

Reliability: as with other illicit drugs markets there are numerous fakes and scams on sale. Products that are known to be reliable, with good track records and a known pedigree are likely to appeal. The issue of Fakes and Scams is discussed in more detail in Chapter xxx)

Peer Opinion: Significant store is placed on the wisdom of other users, including immediate peers and those on forums and discussion groups. Products held to be good, strong and reliable by peers are likely to be more popular.

Risk v reward: some people will be more risk adverse and trade off spectacular results for a higher level of safety. Others will want to maximise gains even if this entails higher risk.

Personal experience: Previous users will influence choice; users may have found that they get on better with certain compounds, achieve better results or like/dislike the effects of substance A more than substance B.

15 Other Substances Used

Alongside the anabolic steroids, anti-oestrogen compounds and PCT mentioned so far, a collection of other substances may also be used in the context of Performance Enhancing Drugs.

Growth Hormone and related Compounds

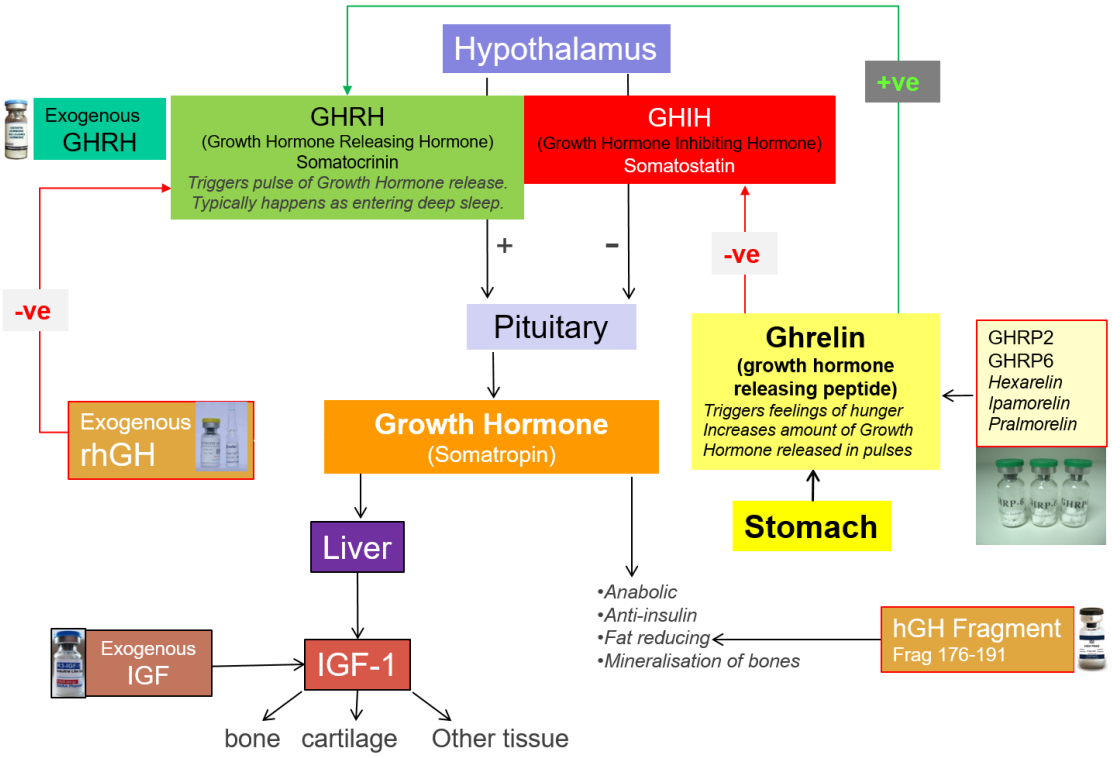


Figure 15 Growth Hormone & related compounds

Growth hormone is a peptide hormone produced in the pituitary gland. Originally extracted from human or animal corpses, it is now produced synthetically and properly called recombinant human Growth Hormone (rhGH).

Historically it has been hard to source and expensive and while it is now easier to obtain it still remains a relatively expensive compound.

At low doses, growth hormone is used as a performance/image drug to help reduce body fat. At higher doses it has a greater anabolic effect, leading to increased lean muscle. It also helps increase bone density.

It is supplied as a freeze-dried white powder to which sterile water is added, forming a solution that is injected subcutaneously. It is a very long-chain

molecule, difficult to produce and fragile. It is not clear how much of the rhGH sold on the UK market is genuine or of sufficient quality.

GHRH: As with other drugs, a negative feedback loop is observed, where use of rhGH causes a reduction in natural GH release, by suppressing release of Growth Hormone Releasing Hormone (GHRH) in the hypothalamus.

Synthetic GHRH is now supplied, and it is claimed that it will cause increased release of Growth Hormone without the negative feedback caused by using rhGH.

GHRP: An increasingly fancied substance are Ghrelin-mimicking drugs. Ghrelin (Growth Hormone Releasing Peptide, GHRP) is released in the gastric tract. GHRP is triggered in part by eating cycles. In turn it causes release of GHRH, which in turn triggers release of Growth Hormone.

GHRP is an increasingly popular compound, sold under a range of names. It is not thought that use of GHRH causes the same negative feedback on natural GH release that use of rhGH would cause, but there is a lack of robust research at this time.

GH Frag 176-191: GH Fragment is the part of the molecular chain responsible for GH fat-reducing effects. So Fragment lacks the same anabolic effects but claims to offer weight loss. It is supplied as a dried powder to be dissolved and injected subcutaneously.

IGF-1: Release of Insulin-like Growth Factor 1 is triggered by Growth Hormone. IGF-1 has an anabolic effect but also works on bone growth, cartilage and tendons. IGF-1 release could be triggered by use of rhGH or related compounds. A synthetic alternative rhIGH-1 (mecasermin) is also marketed and has some popularity as a PID. It is injected subcutaneously. There are a number of risks with use including hypoglycaemia.

Weight Loss Agents

A number of products are used to reduce body-fat levels. Growth Hormone and related compounds are used for this purpose, as discussed in the preceding section.

Other compounds include more 'traditional' stimulants, thyroid agents and some other compounds.

Stimulants: Classic stimulants such as amphetamine could be used for reduction in body fat. They increase metabolic rate, reduce appetite and may increase cortisol release which contributes to fat burning. However, it is not commonly reported in the context of PIDs. Other stimulant drugs such as **Clenbuterol, Ephedrine, Phentermine and Yohimbine** are used as weight loss tools though.

Prior to the introduction of the Psychoactive Substances Act, analogues of Phentermine such as 3-FPM also cropped up as weight-loss agents.

Caffeine, either in drinks or in products such as Pro-Plus is also frequently used as a weight loss agent. The combination of Ephedrine, Caffeine and Aspirin (ECA) is a widely used weight loss combination.

Workplace implications and practice issues:

- Stimulants used for weight loss can increase blood-pressure. Discuss with customers about indicators of high blood pressure. Ideally screening for blood pressure and heart problems should be available
- Aspirin can cause gastric damage especially if people are fasting to achieve low levels of body fat

Thyroid agents:

Thyroid agents are used in the treatment of thyroid diseases and are now used in the context of PIDs as weight loss agents. Figure 16 looks at the main Thyroid pathways and shows the two main compounds used, T3, a synthetic version of the naturally expressed thyroid agent and levo-thyroxine, a synthetic analogue of T4. T4 is converted in to T3, a process that is increased by hGH.

Use of thyroid agents can cause a significant increase in fat-reduction, alongside high body temperature, sweating, jitters, insomnia and headaches.

Use of external thyroid agents causes negative feedback up the Hypothalamic-Pituitary-Thyroid axis, reducing natural release of T4 and T3. When use of external use stops suddenly, lack of thyroid activity can cause a sudden bounce back in weight. Long term use can cause thyroid problems.

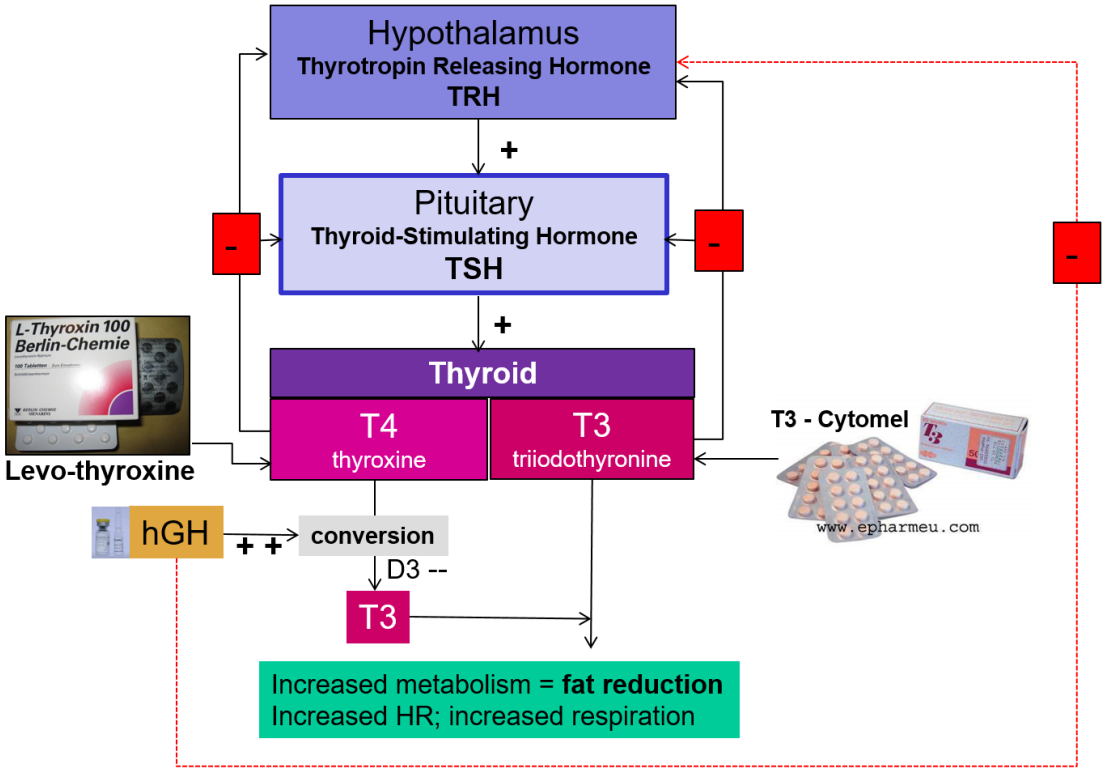


Figure 16 Thyroid pathways

A product called T5 is sold on-line, passing itself off as a thyroid agent. It is usually an ECA style mix of stimulants.

DNP: 2-4 dinitrophenol is used as a pesticide and industrial dye. When consumed it interferes with cell mitochondrial function making cells process energy less efficiently. Energy is wasted as heat, so the body burns more fuel (fat) to replace the lost energy. The increased heat causes increased body temperature and if this gets too high can be dangerous. There have been a number of fatalities linked to DNP. Despite the risks, it is still used as a weight loss agent.

Insulin

Although frowned on as being very high risk, use of insulin can have an anabolic effect and increase storage of protein and glucose in muscle.

Insulin is usually injected subcutaneously, and taken alongside a high-carb drink with additional carbs on hand in case of dangerous drops in blood sugar levels.

Risks of insulin use include a dangerous, possibly life-threatening drop in blood-sugar levels (hypoglycaemia) and possibly affect natural production of insulin, increasing risk of diabetes.

Diuretics

The oestrogenic activity of some anabolic androgenic steroids causes water retention (bloating, the bloat). This makes muscles look bigger and increases weight, but muscles may be overly smooth and weak. Some water retention is useful as it can help retain fluid levels in joints, and can help reduce damage. However, this isn't the aesthetic sought by competitive body builders who seek a 'dry' look.

Losing water weight can also help in competitions so a person can get in to a lower weight category at weigh ins.

Diuretics are the key tool used to shift water fast. This may include the use of a drug which is specifically a diuretic or another compound (e.g. alcohol, caffeine) which also has diuretic properties.

Key diuretics include **Aldactone** and **Furosemide** (Lasix). Use of strong diuretics can lead to severe dehydration, imbalance in key electrolytes, kidney damage and other problems.

Painkillers and anti-inflammatories:

Use of analgesics and anti-inflammatories to reduce pain in joints and muscles may allow people to train harder or train through injury. However, it increases the risk of injury or damage to muscles and ligaments.

At one time the opiate pain-killer nalbuphine hydrochloride (Nubain) was quite widespread amongst body builders, leading to some people to develop opiate dependencies/

AAS use can cause gastric upset and liver problems so care should be taken when using liver-toxic analgesics such as paracetamol or those that could cause gastric problems such as aspirin or ibuprofen.

Melanotan:

Melanotan 1 (Afamelanotide) and Melanotan ii were developed to help treat low pigmentation in skin. Although not currently licensed as medicines they started to be sold in unlicensed markets. Melanotan ii is considered more effective and associated with less side effects.

Melanotan increases the number of melanin-releasing melanocytes, meaning that people can tan faster and darker than they would normally.

Some retailers and users also claim increased libido in both men and women, and suppressed appetite.

Melanotan is also less positively associated with nausea, flushing, increased freckle formation and mole growth. There is concern that it may contribute to the development of melanomas.

Melanotan is supplied as a dry powder to which bacteriostatic water is added. A single vial of powder makes up multiple doses. Unless bacteriostatic water and good hygiene is practised, the vial of solution could represent a source of infection.
It is injected subcutaneously in an initial higher dose "loading phase" and then in a lower dose "maintenance phase."

Dosing: 1/day for tanning 1-2/week maintaining

Typical female dose: Loading phase: (simple): 0.5mg/day daily for 2-6 weeks

Amount Required: One ampoule = 20 doses = 20 days supply

Equipment requirements: 1 syringe/needle for filling vial
7 syringes per week for course = 42 needles for 6 weeks

GHB:

Gamma-Hydroxy Butyrate (GHB) is a full GABA agonist, and works as a powerful sedating drug. It is not immediately obvious why such a drug should have any place as a Performance or Image Drug. However, it became popular as there was a belief that, as the drug induced slow-wave sleep, it would increase release of Growth Hormone.

At this time GHB was still legal and it was promoted by some body builders. Unfortunately, it caused physical dependency and overdoses amongst some users, including those promoting it.

It was made a Controlled Drugs and has generally fallen from favour. Those who still liked it but were unwilling to break the law turned to **GBL**, the pro-drug of GHB until this was made a controlled drug.

As GBL is only partially controlled and remains legal to supply for industrial uses, it is still easily available.

Other GABAnergics like **Phenibut** were also used by some; this drug is now covered by the Psychoactive Substances Act.

SARMS

Selective Androgen Receptor Modulators (SARMs) are relatively new to market and, as with all new things there is immense buzz and hype around them.

A google search of the term SARMs throws up in excess of 2 million results, and a look at Google Trends shows a sharp increase in interest internationally and in the UK.

Figure 17 Google Trends (UK) for SARMs

SARMs are intended to be more selective than classic Anabolic Androgenic Steroids like testosterone. The aim is to target receptors in specific locations such as on muscles, bones etc. The hope for PID users is that these will enable muscle development without the same impact on the HPTA, prostate or other points where non-selective AAS work.

In much the same way NPS took the recreational drugs field by storm, so SARMs could represent a big change in performance drugs. At present most are still very new, and are emerging from research settings in to gym use. They are widely offered on-line and numerous unverifiable claims being made for their efficacy.
Manufactured in bulk, including in Chinese labs (like NPS) SARMs are cropping up labelled as "food supplements" and in "pre-training workouts." Doses and exact contents may not always be clear.
They are not currently covered by the MDA and are unlikely to fall under the PSA as they are not likely to be psychoactive if targeting only muscle tissue.

Examples include **Ostarine** (MK-2866), **Enobosarm, Testolone, S-40503**

Long term risks are as yet not known.

Miscellaneous ancillaries:

Accutane (Isotretinoin): some people experience very bad acne through use of AAS and have used Accutane to reduce their symptoms. Accutane is a licensed medicine but has significant physical and mental health risks associated with it including elevated suicide risk. In medical settings its use would be closely monitored.

Milk Thistle: After all those liver-toxic drugs Milk Thistle is used to help detoxify the liver. It's probably the safest of the compounds mentioned so far.

Creatine: As muscles are exercised, the chemical Adenosine Triphosphate (ATP) is depleted meaning that energy can no longer be released to fuel muscle activity. Creatine represents a ready source of replacement ATP. This rapid replacement means training can take place for longer with faster recovery, contributing to more muscle development.

Viagra: because, given the hammering that the HPTA has probably taken after all this, something is needed to restore action down below…

Workplace implications and practice issues:

- Advice, assessment and HR should not be limited to AAS.
- As with other types of drug use, PID use can cover a wide range of drugs; workers should ensure that they have access to resources and information on these, and that they are up-to-date
- As with NPS, when new drugs emerge on to the market, little is known about the risks and effects. It is important, as with NPS, to stress the unknowns relating to these compounds.
- Where high risk compounds are being used such as Insulin, GHB or DNP, targeted advice and HR interventions could be required.

16 Injecting Performance and Image Drugs

Intramuscular Injection (IM, Muscling)

AAS are usually injected into muscles. When drugs are injected into the muscle, they are absorbed into the blood stream via the muscle's blood system, and then return via the venous system to the heart, lungs and on to the rest of the body.

If oil-based AAS were injected intravenously, oil would travel in to the lungs, where it could cause a blockage (embolism). This would be dangerous and potentially fatal.

Some PIDs are injected subcutaneously and are discussed separately.

The majority of people using AAS think that they work systemically (across the whole body) rather than locally, at the point of injection. They therefore inject in to muscles on the basis that these are the safest sites to use.

A minority are convinced that (some) AAS have a local effect and so will do "spot" or "site" injections to help improve specific muscle groups. This could include muscles that would never normally be used for IM injections.

Without clinical evidence, arguments about the effectiveness of site injections continues but it is something that should be discouraged due to the additional risks.

A few substances, notably Formebolone, can cause muscles to swell up at the injection site and so could contribute to the belief that it is causing muscle development at the site.

Health risks

AAS may have been prepared in clandestine labs, and may be non-sterile, contaminated or of variable strength. This can result in infections and other complications.

Where powders (such as HCG) are being prepared and injected, risks may arise from the drug itself, or the water used to reformulate it.

Some products such as veterinary implant pellets are not intended for injection and doing so brings with in increased risk of infection.

Unhygienic technique can lead to infection. Sharing of ampoules, vials or needles brings with it risk of blood-borne viruses like HIV.

Injection could cause damage to tissues, nerves or blood vessels.

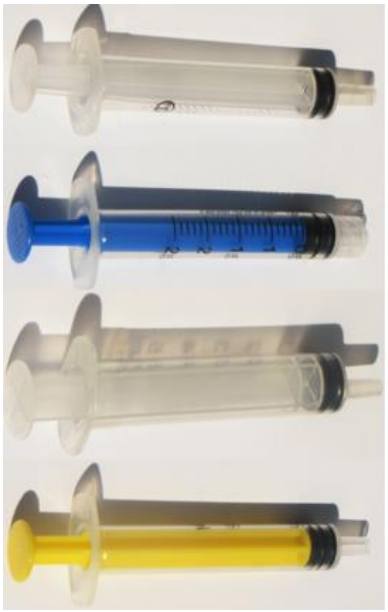
Repeated injection of steroids in to the muscle can lead to scarring of the area, and sites will need to be rotated to reduce this risk.

Equipment

Injection of AAS into a muscle requires the following:

- **Syringe Barrel**
- **Drawing-Up Needle**
- **Needle(s) for injection**
  Soap and water
- **Swabs**
- **Sharps box**

Barrels:



2ml Barrel: most widely used

2ml Luer Lock:
less likely for needle to detach during injection

2ml Nevershare
Coloured barrel to reduce accidental sharing

5ml Barrel
For larger doses/stacks
Would need to be split between two sites.

For AAS a 2ml barrel will normally be sufficient though people using larger doses or stacking compounds may require a 5ml barrel. As quantities exceeding 2ml are too great for a single injecting site, doses will need to be split between two sites.

This advice is generally accepted but some still inject larger quantities, as much as 4ml per site in the glutes.

To reduce risk of needle detaching during injection, some injectors prefer Luer-lock syringes, which hold the needle in place rather than the more common Luer slip syringes.

While the key message should be a fresh syringe for each injection, use of coloured barrels is advocated to reduce risk of accidental sharing.

Needles:

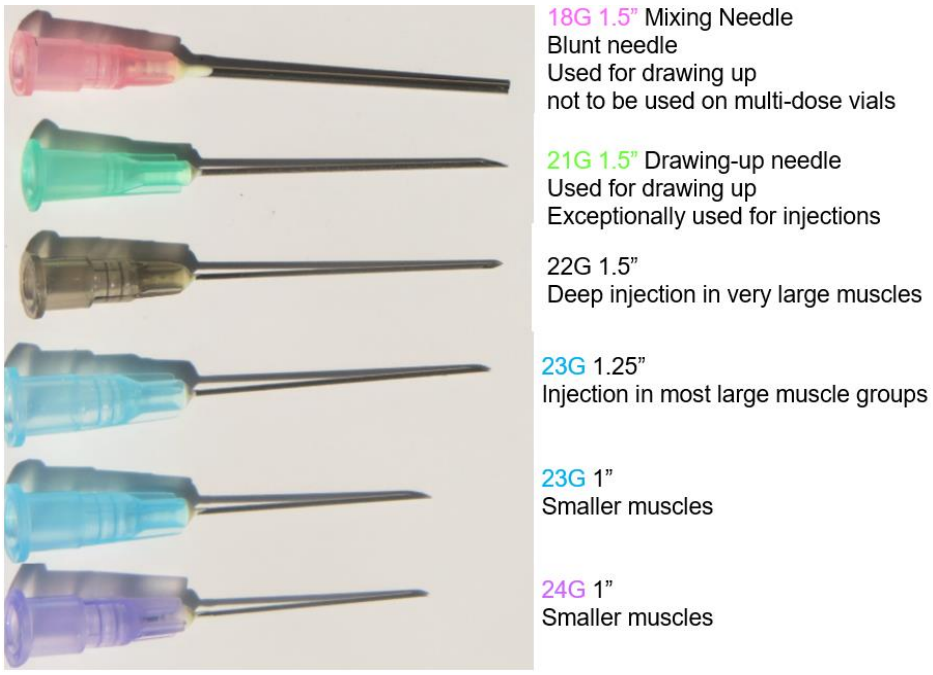


Figure 18 Needle Sizes for IM injection

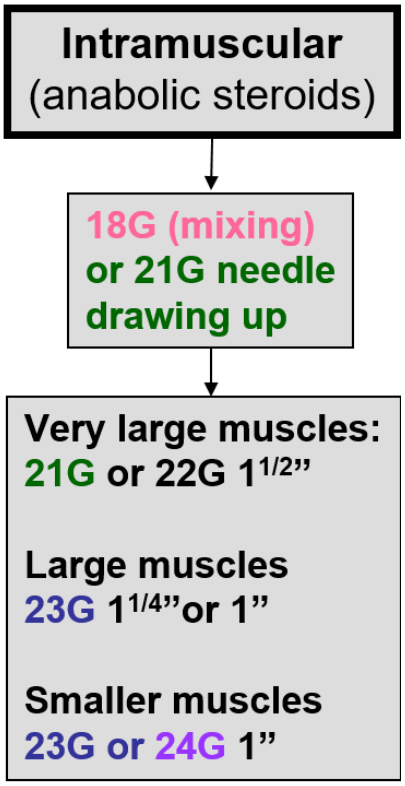
Drawing-up needle: A large-bore needle makes it easier to draw up thick oily solutions. As the needle will be blunted piercing rubber stoppers or scraping the bottom of ampoules, it is not used for the injection.

Most people use a 21G (green) 1.5" needle for drawing up. Some agencies have promoted blunt "mixing needles" for drawing up, to help reinforce that this needle is not to be used for injection.
The downside of blunt needles is that they leave a larger, ragged hole in stoppers and in the case of multi-dose vials, leaves them open to contamination. On this basis 21G needles are preferable for drawing up.

Needles for Injection: Intramuscular injections require a longer, thicker needle than intravenous injection. A longer needle is required to reach an adequate depth into the muscle. There is a risk that thin needles could snap off in the muscle and so a thicker needle will be required.

Fluid leaves a fine needle under higher pressure than a larger-bore needle, causing more pain and damage at the injection site, another reason not to use finer needles.

Depending on build, depth of fat, size of muscles, and the site selected, a 23G (blue) 1" or 1 1/4" needle is usually suitable.



If a longer needle is needed (e.g. very large muscles or higher level) and the person needs something more than a 1¼" needle, they will need to use a 1½" needle. The best option would be a 22G (black) needle. It would cause less damage than the larger 21G green needle.

In theory there is no need for any steroid user to be injecting with 21G (green) needles. 23G or 22G needles cover the length range from 1" to 1½"" and this is more than adequate.

Unfortunately, too few needle exchanges stock a 22G needle so some steroid injectors will have to use these overly-large needles 21G needles.

For injections in to smaller muscles, shorter needles will be needed. This will depend on the site being used but 1" 23G (blue) needles are the most widely used. 24G (lilac) needles are suitable but less commonly distributed.

If larger quantities are to be injected, doses will need to be split and injected at different sites. A fresh needle should be used each time to reduce damage.

Soap and water: required for cleaning hands and the injecting site prior to injecting

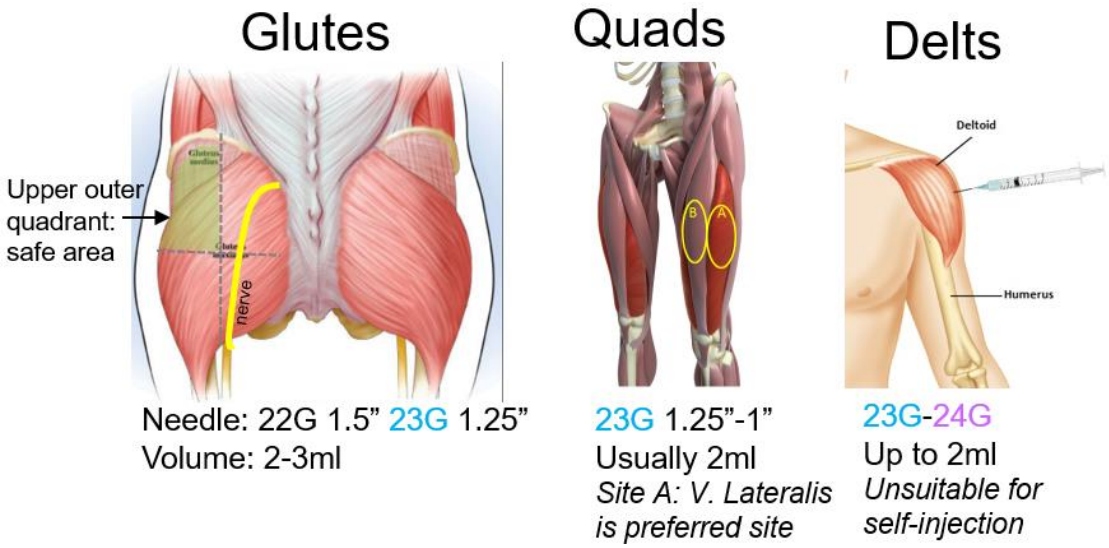
Swabs remain essential for PID users. They should not be needed to clean the injecting site as they are not required where the person is "socially clean."

Washing site and hands with soap and water is more than good enough. Swabs should be used if a person can't wash prior to injecting. But their primary use is to wipe the top of ampoules prior to injecting. This is especially important with multi-dose vials as pathogens from the stopper could be transferred in to the vial, leading to infection.

Sharps box: for safe disposal of equipment.

Sites

Three main sites are used for IM injections: the buttocks (Gluteus Maximus), thigh muscle (Quadriceps), and top part of the arm (Deltoids.)



Glutes: the preferred site is the upper, outer quadrant, well away from the path of the sciatic nerve. It can be difficult for people to see and reach the site themselves and so may get injected by another. This

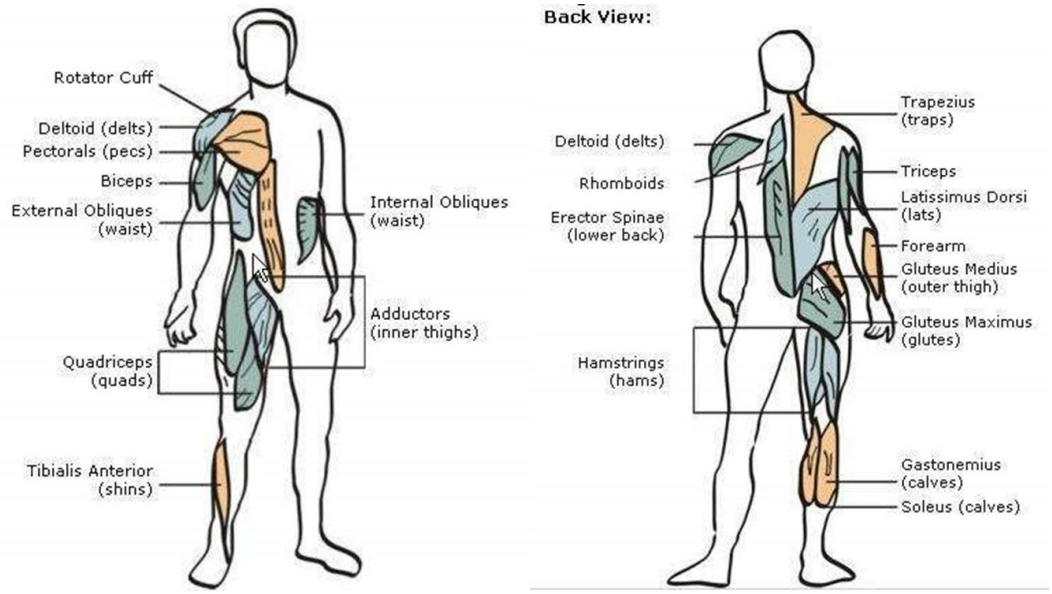
Quads: The thigh is the most accessible for someone injecting themselves. The outer part of the thigh muscle, Vastus Lateralis is the preferred site.

Delts: inaccessible for most people to inject themselves; would rely on someone else to do the injection.

Spot Injections:

Other sites are used for spot-site injections. Some body-builders disagree that such injections bring about lasting growth. They agree that the muscle may temporarily swell, but that this will go down later. Others are adamant that muscle gains can be achieved through spot-site injections.

The risks of site injecting are greater as the muscle groups involved are smaller and they tend to be closer to nerves and blood vessels. Many will require the user to be injected by another as they will be inaccessible otherwise.



Sites that may be used include:
•Trapezius: tricky area as there are numerous blood vessels and nerves in the area. Will need someone else to administer.
•Biceps: inspect area carefully for veins; smaller needles and smaller volumes
•Triceps: lots of nerves and veins; careful inspection of these areas
•Chest: highly dangerous; short needle going in at a shallow angle, rather than in at 90 degrees. Injection of oil or other material into the chest could be fatal.
•Forearms: very small muscles and lots of veins; small needles and aspirate to ensure not in a vein.
Calves: large vein and nerves run behind muscle

Regardless which site is used, it will take time to heal, and so recently used sites should not be reused until they are fully healed. Rotating sites will reduce scarring at injecting sites.

Process – IM Injection

- Only drugs prepared for IM injection should be injected into muscles. Any powders or solid contaminants will remain in the muscle and may cause infection.
- The maximum amount of fluid should be no more than 3mls in larger muscles, 2ml or less in smaller ones. [Large body builders routinely exceed this.] Larger amounts should be split and injected separately into different sites.
- Always use sterile equipment. Don't reuse drawing up needles.
- Choose the site (remembering to rotates sites and avoiding bruised or damaged areas).
- Wash hands with soap and water before opening equipment.
- Wash the injecting site with soap and water.
- If using oil-based anabolic steroids, gently warm to body temperature; this will help the oil become more fluid and easier to draw up and inject. The solution should not be overheated; warm, not hot.
- Place all equipment on a clean surface.
- Swab the rubber stopper of a vial; this is especially important when using multi-dose vials.
- Some illicitly produced ampoules will be made of poor standard glass, or not be scored; people will use amp-cracker to protect fingers when opening ampoules. Watch for glass fragments entering the ampoule.
- Draw up the drugs with a sterile drawing-up needle. When filling from vials add the stage below;
    - Vials: draw air into the syringe an equivalent volume to the amount to be injected. Push the needle through the stopper and "inject" the air in to the vial. Now draw up the fluid; the increased pressure in the vial will help it enter the syringe.]
- Remove the drawing up needle and place it in a sharps box.
- Attach a sterile needle of the correct gauge and length for the chosen site.
- Stay relaxed; tensing the muscle will only make entry difficult causing increased pain and damage.
- Loosely hold the muscle, but not squeezing it hard; just enough grip to make it an easier target.
- Hold the syringe like a dart and steady the injecting hand on the thigh. The needle should pierce the muscle at 90 degrees with a smooth rolling motion from the wrist. Do not push the needle in too slowly as this will only cause more pain and tissue damage.

- Do not push the needle in right to the hub as this will add trauma to the site and may increase the chance of the needle snapping.
- Pull back slightly (aspirate) on the plunger to make sure that the needle is not in a blood vessel, if it is a small plume of blood will appear. If this happens withdraw the needle and place pressure on the site. Discard the preparation and begin again. At the very least change the needle. [this step shouldn't be required if people are injecting in to the three main sites. Indeed, current nurse training no longer includes aspiration before IM injections. However, as AAS users may be injecting in to non-typical sites, aspiration remains important. Further, as "bro-wisdom" all advocates aspiration, there's little benefit in trying to discourage this.
- If no blood appears (there will be a small bubble of clear fluid) then the needle is in the muscle.
- Inject slowly and steadily as this will reduce tissue trauma.
- Withdraw the needle slowly.
- Do not use swabs post injection as they will harden the skin and slow healing
- Gently massage the area to help oil disperse between muscle fibres
- Dispose of the equipment in a sharps bin.

Z-Tracking:

This injecting technique involves gently pulling skin while undertaking the injection, and releasing it afterwards so that the pulled skin effectively seals the injection hole afterwards. The idea is to reduce any leakage of oil from the site.

Rather than exploring Z-tracking, it is probably safer to examine why oil leaks form the injecting site. Likely reasons include:

- Using a needle which is too short
- Injecting too much oil
- Injecting too fast.

Subcutaneous injections (subcut, SC, Skin-popping)

SC injections involve injecting a small volume of fluid so it sits in the fatty tissue below the skin. It is absorbed slowly in to the blood stream. Only small volumes can be injected this way.

A number of compounds are injected SC including: **Insulin, Growth Hormone** (rhGH) and related peptides (**GHRH, GHRP, GH Frag), HCG, Melanotan, IGF**. There are a small number of advocates of SC AAS injection but generally it's impractical (getting oil through a fine needle), can cause complications, and most people are unconvinced that it offers any significant benefits.

Some preparations (like insulin) will come pre-dissolved. Others may be supplied as dry powder and come with or without water.

Where the ampoule contains a single dose of drug, Water for Injection is added to the powder and the ampoule agitated gently to form a suspension.

If the ampoule is to make up multiple doses (such as GH or Melanotan) it is preferable to use **bacteriostatic water** which contains a small amount of alcohol to prevent bacterial growth. Unfortunately, needle exchanges are prohibited by law from distributing bacteriostatic water.

RhGH is very fragile and needs to be handled with care. This includes:

- Storing in fridge both in dry state and when reconstituted
- Adding water carefully down the side of an ampoule, not directly on to the powder
- Rolling ampoule gently rather than shaking to mix the suspension
- Fill multiple syringes at the same time, and store, capped, in a sealed box in fridge. If a shared house where children are present, consider buying a small "drinks" fridge for such storage.

Equipment

Figure 19 SC Needles

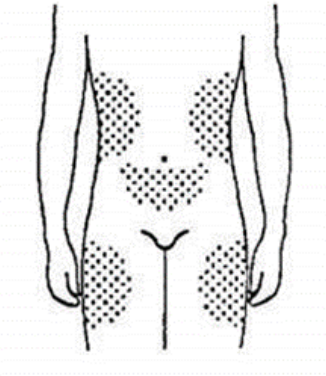
Subcutaneous injections require small quantities of fluid be injected using fine needles. No more than 0.5mL of solution should be injected into a site, so a 0.5mL or 1mL barrel will be adequate.

A short fine needle (27G, 29G or 30G) should be used. This could be a fixed needle (such as an Insulin-style syringe), a separate barrel with Luer slip needle, or a Nevershare-style syringe. If two-piece equipment is used, needles with a low dead-space could be supplied to minimise waste.

The 1ml Nevershare with a 30G needle is probably ideal for SC injection, given the fine needle, low void-space and colour coding to reduce risk of sharing.

Sites

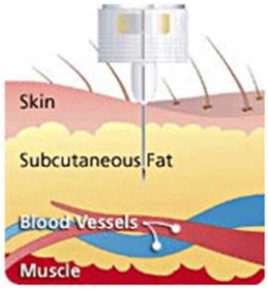
The indicated sites are the preferred ones for subcutaneous injections. The area over the abdomen is the easiest to use.



Sites where the skin is already bruised, discoloured or blemished should be avoided.
Sites will take time to heal, and so should be rested to allow for healing.

Growth Hormone causes local fat break-down at injecting sites so rotation of sites is especially important to ensure that this isn't concentrated in one area.

Process



- Clean hands and injecting site with soap and water
- Use sterile equipment.
- A small amount of abdominal tissue is gently held between thumb and finger to raise it away from the muscle.
- For people of normal build, the needle can go in at 90°; for exceptionally lean people (can't pinch 2cm of tissue at site) it may need to go in at a shallower angle. The needle should enter the fatty layer below the skin.
- The contents should be injected slowly into the site. Up to 0.5ml can be injected.

Equipment Distribution

Not everyone who injects PIDs attends Needle Exchanges (Nx); a significant number source equipment on-line, attracted by greater anonymity, convenience, or a desire not to use "drug" services. There is also a great deal of secondary distribution where one person collects large quantities of equipment for peers.

In order to encourage attendance at services, some agencies distribute equipment in batches, encouraging people to attend again mid-cycle for a check-up, returns and more equipment. Such an approach, though well-intentioned, is contrary to best-practice guidance and distribution should be linked to client need.

Workplace implications and practice issues:

- Agencies need to ensure that suitable stock for PID users is available, including fine needles for SC injection, swabs, drawing up needles and range of needles for IM injection
- Where pre-packaged equipment is supplied, "sports packs" containing equipment suitable for IM and SC injections should be available
- Nx assessment documents needs to be PID-specific, to ensure questions relevant to PIDs are included
- Staff need to be confident of preparation and process for PIDs including IM and SC technique
- Discussion should take place with all users to assess and improve technique
- Quantities of equipment should reflect user requirements for cycle and not be rationed
- Agency should ensure policy is in place around secondary distribution, possibly encouraging peer distributors to engage with the service as volunteers and peer outreach advocates

17 Injecting-related complications:

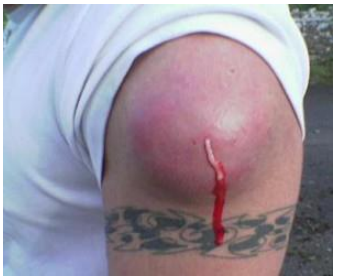
Abscess:

The injection of non-sterile compounds or poor injecting practice can result in infections at the injecting site. This can result in abscess formation.

Prevention:

- Source high quality products and check for fakes
- Examine products for evidence of tampering or contaminants in solution
- Discard if seals or stoppers are damaged or degraded
- Wash hands and injecting site with soap and water
- Swab vials before drawing up
- Use sterile equipment for each injection – including drawing up needles.
- Ensure injection goes in to deep muscle

Presentation: IM injections may mean any infection is in deep muscle and may not be visible on the surface. Indicators could include soreness in the muscle, with a feeling of a hot, solid lump in the muscle. There may be redness in the area and some evidence of swelling.



If it is close the surface, there may be more obvious swelling, which will be red and inflamed. White pus may be visible, and there could be discharge.

If a deep abscess is releasing toxins in to the bloodstream, there may be indicators of systemic infection (septicaemia) including raised body temperature, headache, nausea and generally feeling unwell.

Abscesses will (rarely) heal themselves but more frequently will need to be lanced and drained, and treated with antibiotics. If left untreated, surgery will be needed to excise the infected tissue leaving major scarring. Encouraging prompt treatment can reduce the need for surgery.

Evidence of septicaemia requires a rapid referral to hospital.

BBV transmission:

Injecting PID users are at risk of contracting or spreading BBVs through unsafe injecting practice and unprotected sex. Education should be provided about:

- Risks of sharing needles and syringes
- Cross contamination from swabs, blood spills etc.
- Risks associated with sharing ampoules or multi-dose vials
- Safer sex
- Safe disposal of equipment

As with other at-risk populations, offers of vaccine, and testing for BBVs should be encouraged.

Scarring:

Repeat injections over a sustained period of time can lead to scar tissue forming. This risk can be reduced by:

- avoiding the use of excessively large needles
- rotating sites
- allowing sites to heal
- not swabbing after injecting
- using a fresh needle for each injection.

Broken needle:

A needle can snap during injecting and this can cause dangerous complications. This is a rare occurrence but is more likely if people use unsuitable needles. To avoid this risk, people should:

- use a suitably robust needle
- go in at 90 degrees and try to avoid bending the needle at an oblique angle or tensing the muscle
- avoid going in up to the hub (though this point is debated).

If a needle does snap, the person should endeavour to keep still and remove the protruding end of the needle with a pair of pliers or fingers as appropriate. It will be easier for a third party to do this. If the needle cannot be retrieved, medical help will be essential. Mark the area where the needle went in with a pen, and get to A+E.

Post-Injection Pain (PIP):

Discomfort post-injection is common and should go away. It could be caused by short-chain esters, crystals from highly-dosed compounds coming out of solution, reactions to oil or alcohol in the mixture, mechanical irritation from the needle, injecting too fast, or a reaction to the specific drug being injected.

By experience the person should know if this PIP is normal for them, using this product. If the discomfort doesn't go away, or is worse than normal then it could be more than just PIP and medical advice should be sought.

Bad Reaction:

Fake or non-sterile products can trigger an adverse reaction, which includes nausea, shakes, tremors and headaches. These symptoms will develop shortly after injecting. They should be taken as a warning sign that the drugs may be contaminated.

If symptoms persist, medical assistance should be sought.

18 Key Health Problems related to PID Use:

The use of AAS and other PIDs can are associated with a range of health problems. Some of these are more common than others. Through carefully planned use, sensible precautions and research, many of the risks can be reduced or prevented entirely.

The evidence base for some of the health problems associated with AAS use is not as strong as sometimes claimed. The ACMD report on AAS concluded "*Some of these harmful physical effects are commonly self-reported, e.g. acne, endocrine effects, gynaecomastia in males – but others are rarer and therefore the causal link to anabolic steroid use is equivocal."*

The underlying reasons for some of these problems have been discussed in preceding sections. In this chapter, key physical and mental health complications are briefly explored, along with symptoms, prevention strategies and responses. This list should not be used as a definitive guide to diagnosis, but as an aid to identifying some of the more common problems:

Aching Muscles: May be indicator of excessive training. It is important that such aches are taken as a warning sign and not masked through the use of pain-killers to facilitate further training.

Acne: Both men and women may experience acne during the use of steroids. Skin is likely to become more oily as sebaceous glands become over active. The back and face are especially prone to acne. The use of over the counter acne treatments may help reduce these symptoms, along with washing with soap and water. Use of POMs such as Accutane is more risky and is associated with physical and mental health problems.

Acromegaly: overgrowth of bones on forehead, hands and feet, especially related to use of Human Growth Hormone.

Aggression: Use of steroids, especially highly androgenic ones, can cause increased aggression and difficulty in controlling temper. This "roid rage" can cause intrapersonal problems, violent behaviour and, at its most extreme, serious offending behaviour. It is a hotly contested subject, where a chicken-and-egg argument highlights the difficulty of establishing if steroids cause more aggression or people prone to aggression are more likely to use steroids.

Either way, awareness of this issue is important. The problem can be addressed by reducing or avoiding the use of androgenic compounds. Coping strategies such as anger management can help reduce violent incidents. The use of relaxation aids such as herbal remedies, breathing exercises and meditation can assist people affected by elevated aggression.

Balding: Some steroids can speed up the process of hair loss in male-pattern balding. This hair-loss is typically non-reversible. It is associated with DHT-derived drugs and the metabolisation of testosterone into DHT.

Cholesterol Levels: Steroids increase the level of LDL and decrease the level of HDL. LDL (low density lipoproteins) is thought of as "bad cholesterol." HDL (high density lipoproteins) is "good cholesterol" and helps get rid of the bad cholesterol.

LDL is associated with clogged arteries and so lower levels of HDL and higher levels of LDL directly correlate to heart attacks.

Steroid users should have their levels of cholesterol regularly checked to reduce risk of high blood pressure and heart disease.

Clitoral enlargement (Women): **Clitoral hypertrophy** is a symptom of ***virilisation*** in women using androgenic steroids. It is permanent and non-reversible. Some women find this an asset, but others find it disfiguring and uncomfortable.

To avoid this, the use of strongly androgenic compounds is discouraged and if they are used, at lower doses for shorter periods.

Damage to joints and ligaments: The use of powerfully anabolic drugs can cause a substantial increase in muscle size and weight – but not necessarily in muscle strength. These weighty muscles can strain ligaments and bones, and cause tears or damage to muscles, ligaments, joints and bones.
When levels of fluid retention drop, joint discomfort may worsen.

As with muscle damage, recognising the need to train properly and recover if injured is important.

Depression: Depression can have numerous sources including the drop of testosterone levels at the end of a cycle. The crash from a "hyped up" state to

a resting state can leave the user low and depressed. Similarly, observing the rapid loss of bulk and strength at the end of the cycle can cause low mood.

While some of these symptoms may abate as testosterone levels return to normal, depression may have other underlying reasons which may need to be explored through counselling.

Diabetes: increased risk for people using Insulin, or Growth Hormone, IGF as part of a range of PIDs.

Facial and body hair (women): The excess production of facial and body hair (hirsutism) is a sign of virilisation in women using high doses of androgenic steroids. Generally, these symptoms will reverse when steroid use is discontinued.

Fatigue: The dietary strains and training requirements of body building put a substantial impact on the body alone and can cause exhaustion.

However, the use of PEDs can cause tiredness and feelings of fatigue. A general feeling of being "unwell" could have numerous causes including:

- The "crash" following the end of a cycle when levels of natural testosterone may be low
- Low blood sugar levels
- Impaired liver function
- Bad reaction to one or more drugs
- Impaired sleep due to steroid or stimulant use
- Excessive training
- "crash" following excessive use of caffeine and ephedrine used to reduce body fat

Gynecomastia (aka "gyno," "Bitch Tits")

This condition is a sign of elevated oestrogen in men. It causes growth or development of one or both breasts. The nipple can become sore and enlarged and there is a development in breast size.

Warning signs can include puffiness and soreness around the nipple, a lump or solid feeling in the breast tissue.

Gynecomastia can occur where steroid use is not taking place; however, it is a key risk of steroids which aromatise, or exert a progestin-type effect.

The risks can be reduced by avoiding use of steroids that aromatise, using at lower doses for shorter periods and the use of oestrogen blockers or aromatisation inhibitors.

Some of the growth may spontaneously reverse when oestrogen levels drop; however, for others, gynecomastia can be a permanent symptom, which requires surgery to remove the presence of the over-developed breast tissue.

Interventions:

- Ensure that users understand causes of gyno and prevention & management strategies;
- Encourage users to undertake regular self-examinations to detect early signs of gynecomastia
- Where significant gynecomastia is an issue support referral to GP for full range of support and testing

Headaches: It is hard to be certain what causes headaches but they are a common side effect; they may indicate an increase in toxic compounds in the body which are being inadequately metabolised and excreted. They may also reflect altered hormone levels, high blood pressure, dehydration or muscular strains.
While the use of headache remedies is an obvious answer, it may mean that important causative factors are not identified.

Heart problems: over development of heart tissue, training, high blood pressure and cholesterol levels and imbalanced diets increase the risk of heart problems.

Interventions: Some services are introducing heart monitors to pick up early indicators of cardiac abnormalities.
Other activities that increase risk of heart problems such as use of stimulants (either recreationally or for weight loss) increase risk of cardiac problems. Evidence of any cardiac problems should trigger a referral to health care services.

High Blood Pressure: The use of steroids can elevate blood pressure to potentially dangerous levels. This can cause headaches, circulatory problems, impaired vision, nosebleeds and potentially increase the risk of strokes and heart problems.

Steroid users should ensure that they can have their blood-pressure taken regularly so that elevated blood pressure can be detected earlier.

Use of compounds (such as stimulants) that further elevate blood pressure should be avoided.

Impaired Immune System: There is some evidence that use of AAS can have a negative impact on the immune system; this can be exacerbated by high intensity training which can cause a drop in immune system activity.

Impotence: Male users may experience erectile problems during or after a period of steroid use. Some users will offset this through the use of Viagra, but for others there may be longer term problems with sexual dysfunction.

Erectile problems could be linked to poor libido and low testosterone levels, or could be mechanical, in terms of blood flow to the penis. When hormonal shut-down occurs (low testosterone) or there are raised levels of prolactin, loss of sex drive and erectile function is not uncommon. The correct use of PCT should help hormone-related loss of libido and erectile problems.

Kidney Problems: The combination of high drug loads, high-protein diets with additional creatine intake, altered fluid and sodium levels and increased blood pressure can cause complications to kidney function. This can include swelling of the kidneys, impaired kidney function and, in extreme cases, damage or failure of the kidneys.

A careful watch of fluid intake and retention, care in the use of diuretics and checks in the event of pain around the kidneys should help avoid permanent damage to the kidneys.

Liver damage: Steroids, especially oral ones which have been C17-alpha-alkylated, are very liver toxic and will put a substantial strain on the liver.

Heavy use of steroids can cause liver damage, impaired liver function, jaundice, hepatitis and ultimately cancers of the liver and liver failure, though this is much more rare.

Much liver damage will be asymptomatic and would only show up with LFTs. Symptoms could include itchy skin, discoloured urine, ache in the lower back, fatigue, and nausea. If the liver is severely inflamed jaundice (yellowness of the skin and the whites of the eye) may be observed.

Interventions: The best approach has to be avoiding putting such a strain on the liver: using lower doses, for shorter periods of time with breaks to allow liver health to recover.

People who have a history of impaired liver function should avoid the use of liver-toxic compounds. The use of other liver toxic substances alongside C-17 AA steroids (e.g. alcohol) should be avoided.

Informed users will have regular tests of liver function to assess the impact of steroid use on liver health.

Many steroid users take high levels of Milk Thistle Seed Extract which helps to improve liver function.

Prostate Gland: The use of AASs can lead to the male prostate gland to become enlarged. This can be painful, cause difficulty in urinating and some sources suggest a link with prostate cancer.
Encouraging regular steroid users to get prostate checks is important, and urinary difficulties should be referred for further investigation.

Skin cancer: may be a risk for people using high doses of tanning agents; weak evidence of this at present.

Sterility: Both men and women can have impaired fertility as a result of steroid use. Male sperm production and fertility can be impaired, and ovulation and menstruation in women may become irregular or cease.

For women, avoidance of strongly androgenic compounds, and using at lower doses for shorter periods may reduce the risk. For men, shorter, lower dose cycles with proper PCT should reduce the chances of permanent changes to fertility.

Stomach pains: Oral steroids can sometime bring about stomach aches in some users, the most common being Anapolon, Primobolan, Winstrol, and Dianabol. The symptoms can be anything from a slight discomfort to nausea, diarrhoea, and vomiting. Sometimes this can be avoided by taking the steroids at mealtime.
However, the symptoms could also be a marker for gastric problems such as stomach ulcers. In such situations the use of drugs such as aspirin, ephedrine and caffeine could exacerbate such symptoms.

Testicular Shrinkage; Penile Shrinkage (Men): The ongoing use of testosterone-based compounds can result in testicular shrinkage in men and, in severe case, atrophy of the testicles. The penis can also become smaller.

These symptoms may be permanent and irreversible. The use of drugs like Human Chorionic Gonadotrophin and Clomid will be used to stimulate and increase production of endogenous testosterone at the end of the cycle.

Water and Salt Retention: As many steroids can increase water retention and the retention of sodium. In turn this can cause muscles to appear bigger but also cause puffiness of skin. The retention of water can lead to hyponatraemia, cause electrolyte imbalances and can be dangerous.

The use of diuretics, although a ready way of shifting this excess water can in turn cause substantial problems including severe dehydration, loss of electrolytes and increased strain on the kidneys.

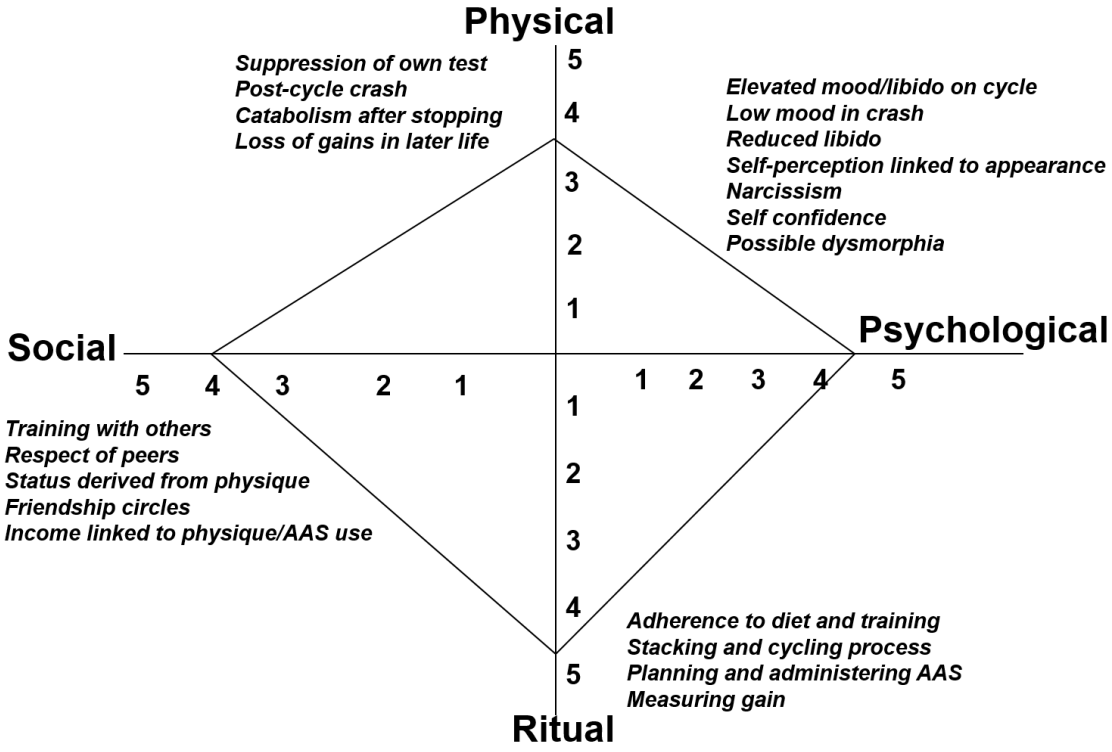
19 Dependency

The ACMD report says of dependency "*there is not enough evidence to connect chronic anabolic steroid use with substance dependence*." It goes on to say that there is evidence that the positive effects of use on cycle and unpleasant ones off cycle are powerful reinforcers of behaviour.

Despite the reservations of the ACMD, drugs-agency workers do see AAS users who have all the characteristics of dependent use:

- Use is escalating, in terms of doses, duration and frequency of cycles
- There is reduction in control and person breaks their own "rules"
- There is evidence of harm
- There is evidence of psychological or physical distress on stopping, and use continues or other substances are taken to relieve this

Dependency could exist across several domains:



Physical: during early stages of AAS use, users may rapidly gain bulk and mass. These rapid gains may make it tempting to carry on for longer.

When a cycle ends, some of these gains will be lost. Sudden loss of gains, can encourage users not to stop or to restart use.

Even growth maintained post each cycle can be transitory and hard to maintain. Where a (over)developed body builder ceases to use steroids, there may be rapid catabolism or breaking down of muscles. Users will see hard-gained muscles melting away, reinforcing the need to continue use.

Unless training is continued, a person can rapidly lose form and people can end up looking physically big but flabby.

These factors can make it difficult to discontinue use.

Psychological: Use of steroids can offer a powerful psychological effect of feeling stronger, more confident, able to train harder, increased sex-drive and increased energy.

Conversely, when use discontinues there is likely to be a "crash" which can include reduced libido, tiredness, low mood and reduced confidence. This again will encourage repeated use.

Where there are psychological drivers for use such as self-esteem or dysmorphia, these would need to be addressed so that a person felt more able to move away from use.

Social: Body-building circles provide a very strong reinforcing social circle. With the growth of body building websites, these and gyms provide a supportive, welcoming community which is dedicated to physical development. The positive regard of these people can become important and be a difficult environment to leave.

Outside of gym settings, if a person gains social recognition, status and respect from their physical appearance, this validates and reinforces use.

Ritual: The use of PEDs is part of a wider behaviour including meticulous diet and exercise planning. It requires development of carefully planned schedules, sourcing drugs, administering drugs and then measuring gains and success. There is a very tangible outcome – increased size, or increased strength. The ritualistic aspects are powerful reinforcers of behaviour.

Same yet different:

There are clear similarities in terms of how AAS use can lead to dependency. Use can suppress natural body processes, and cause observable physical and psychological symptoms on stopping. Social and psychological factors can drive use, and like other drugs AAS use represents a "quick fix."

One key difference is the belief systems underlying use. Some AAS users believe that they are taking the imperfect body and improving it through the use of chemicals. Very few people addicted to heroin or crack would view their own drug use as an "improvement."

On stopping, heroin and crack users therefore expect to see gains in physical health and appearance. They will probably look "better" once they stop. For someone using AAS the situation is reversed. The belief is that they look better with an enhanced physique. Leaving this mindset behind is a huge hurdle to overcome.

Workplace implications and practice issues:

- Dependency on AAS is real: agencies need to acknowledge it
- Where agencies only see people pre-cycle, there is less opportunity to look at mood post-cycle, support people through their crash and explore dependency
- Developing strategies to attract people both on- and off-cycle is essential
- Counselling and therapeutic interventions will need to explore the strong psychological and social drivers for use;
- It is likely that 1:1 interventions will be more useful than mixed group settings.

20 Women and PID use

The use of hormones that are based around testosterone and others with a strong androgenic effects can have serious and permanent side-effects on women. The drugs can have a **virilising** effect which causes **masculinisation.**

These effects, can include:

- Deepening of voice, thickening of vocal chords
- Interruption of the menstrual cycle
- Development of increased facial and body hair,
- Coarsening of skin
- Reduction in breast tissue
- Enlargement of clitoris (clitoral hypertrophy)
- Restructuring of bones, especially face and chin
- Fertility problems

As there is less aesthetic demand for overly large muscles amongst women, and given the significant risks, the use of AAS by women is far lower than by men.

Women who do use AAS may try to reduce these risks by:

- Avoidance of substances with a powerfully androgenic effect;
- Lower doses than men
- Shorter cycles
- Use of alternative substances such as Growth Hormone (GH)

Women who use AAS may under-utilise drugs services and rely on partners/peers to get equipment. Creating accessible services to the small number of women using AAS is important so that the potential health problems that they face can be discussed.

Some people gender assigned female at birth may use AAS are seeking the masculinising effects as the use of hormones may form part of a process of gender transition.

The use of other PIDs, including weight loss agents, tanning products and diuretics is more widespread amongst women and use of these compounds is of course not restricted to performance and sports settings.

21 Young People and PIDs:

Steroid use can have a serious and lasting effect on adult men and women. The effects on young people can be even more serious.
Steroid use amongst young women in the UK is not reported as a significant issue in the UK, though this situation could change. As with adult women, the use of dietary and other image drugs is more widespread.
PID use amongst young men, including AAS is reported and is an area of growing concern.
The use of steroids amongst young men who have not finished growing and maturing can affect physical and sexual maturation

Problems for juvenile steroid users can include:

- Premature sealing of epiphyses, preventing long bone development
- Stunted growth
- Interruption of puberty, incomplete pubescent development, failure for full genital development to be attained ;Fertility problems
- Development of male characteristics in girls
- Development of female characteristics in boys
- Increased liver problems
- Worse acne
- Emotional difficulties

Attitudes of and to young steroid users:

While the steroid-using community agree on very little, they do agree that the use of AAS by people who have not completed puberty is too dangerous to countenance.

The better-regulated body-building forums actively discourage use of steroids amongst young people. They stress the risks of early use, the importance of diet and training and the need to build and maximise these gains before considering steroid use.

However, there is absolutely nothing to suggest that younger users cannot access drugs and information from people who do not share these scruples. The quality of both the drugs and the information may be of dubious quality. For many young men who want to use steroids, it is perceived to be a very fast short-cut to a desirable body. In reality, without the discipline, diet, training, money and knowledge, it is likely to be dangerous and damaging.

It is useful to divide young people using (or thinking about steroids) in to two

	Population 1	Population 2
Characteristics	• Under 21; • Attending gym; • Interested in sports/exercise/body building • Some diet and training knowledge • Patchy steroid knowledge	• Under 21; • Not using gym • Limited interest in training and nutrition • Use of other substances present; • Very limited steroid knowledge; • Primarily interested in looking bigger for cosmetic reasons
Key issues	• Steroid use at this stage is premature; • Naturally high testosterone levels mean use of exogenous testosterone not needed and wasteful; • Full natural gains not yet been achieved; • May not have knowledge and discipline to use steroids effectively and more safely	• Steroid use likely to be partly or wholly ineffective due to poor diet and lack of exercise; • Health risks increased due to poor knowledge of risks, risk reduction strategies, and polydrug use; • Little benefit in promoting 'natural training' as this is not a key interest. • May be polydrug use
Key Messages	• Now is too early; • Should not start until at least after 21 when full pubescent development and growth has been completed; • You are producing lots of natural testosterone at the moment: using AAS at this time shuts this down. • Train naturally to perfect diet, sleep and exercise. • When this has been perfected for at least three years and gains in weight and strength have started to plateau, this is the earliest even to think about using PIDs. • Ensure that you do as much research as possible and ensure you know what to use and how to use it as safely as possible.	• Steroid use has a high level of risk if used unsafely; • Cosmetically, instead of big muscles you run the risk of impotence, acne, greasy skin, bloat and breast tissue. Without diet and training muscle gains will look big, but will be physically weak and can't be retained. • Polydrug use is more dangerous • Eating better, moderate exercise and grooming will probably achieve the results you want better than a bodged attempt to use steroids. • Introduce harm reduction only if the person is utterly determined to use anyway

groups, for whom different specific messages need to be developed.

Workplace implications and practice issues:

- Specific resources and care pathways should be developed for younger AAS users
- These resources and care pathways should be appropriate to the two populations described
- For young people from population 1, referral to trainers who can advise on nutrition and training will be able to assist people with gains naturally
- Young people contemplating steroid use may need additional help to understand some of the complex information about aromatisation and shut down

22 Services for Steroid Users:

Service user take-up of services, especially needle exchange, has increased substantially in the past few years. However, there are some measures that services can undertake to ensure ease of access and delivery of appropriate services:

Publicity: services will need to be publicised through non-typical routes. This could include:

- Gyms and sports clubs
- Bulletin boards on websites
- Health food shops and sports shops
- Magazines
- Local contests
- Word of mouth

Access times: PID users may well be in work and so may find lunchtime or evening services easier to access.

Relationships with other users: PID users do not view themselves in the same light as other drug users and many express a preference not to share services with them. Several respondents to a KFx questionnaire expressed a preference for services which were exclusively for PED users. Anecdotally, some services have reported that other needle exchange clients feel intimidated by PED users and so would prefer not to have them using the services at the same time.

Whilst in resource terms, few areas have the resources to establish wholly separate services, a distinct service with tailored resources, opening times, assessment tools and publicity material may well be appropriate.

Equipment Needs: Injecting PED users will need a range of equipment and this is best met through provision of Pick-and-mix, not pre-packed provision. This will typically include:

- needles than syringes for drawing up & split-site injections
- More large bore needles for large muscle groups
- More swabs, for cleaning vials and multi-site injections
- Larger sharps bins for larger barrel and needle discards
- No need for filters and stericups
- Advice about IM and SC technique

•

Environment and Staff Training:

Part of the reason for a lack of engagement by PID users and staff is mutual misunderstandings on both sides. Workers assume that steroid users know lots about their subject and only want needles. While this may often be the case there is a growing population of steroid users who are less knowledgeable about what they are taking and the risks.

PID users tend to assume that drugs workers know nothing about AAS and so don't see any point in engaging with workers. They may not see a need for a service and don't come seeking help around cessation.

In order to overcome this, workers clearly need to be better trained. But they also need to revise the assumption that steroid users know what they are doing; many don't.

But lastly, workers need to ensure they focus what they are good at – needle exchange, harm reduction, explaining risk, and exploring alternatives. They should not need to explore the issue of combinations of drugs for specific effects. Policy will need to be developed to help map the boundaries for agencies – the nature and level of information that should be provided without promoting use of non-medical compounds.

The environment in to which SID users come is also important. Most needle exchange and drugs services reflect their primary client group – heroin and crack users. So the literature, posters, and resources on display are aimed at this client group. The risk is that, to a steroid user, this environment reinforces the idea that this is not a service for them. It may be useful to redesign a service, especially if it is going to run as a dedicated session for steroid users.

Assessment: Most agency assessment tools (both for treatment and Needle Exchange) are generic or opiate-specific and have little of relevance to steroid users. Specific assessment tools should be developed to ensure relevance to PID users.

For example needle exchange assessment tools will focus on IV injection, will look at sharing such as spoons and filters and will not be applicable to people injecting steroids intramuscularly.

See Appendix for an example of an assessment tool

Additional services: PID users are reluctant to seek help from GPs as they wish to ensure that the use of PIDs does not appear on medical notes. This is because steroid use is not wholly legal and can jeopardise health and sporting insurance.

However, there are a number of interventions that could be offered to PID users to reduce health including:

- Advice about BBVs, testing and vaccinations
- Wound care for abscesses and site infections
- Blood pressure and cholesterol checks
- Liver function testing
- Profiling of hormone levels
- Access to support and counselling as required.

These services are useful for several reasons:

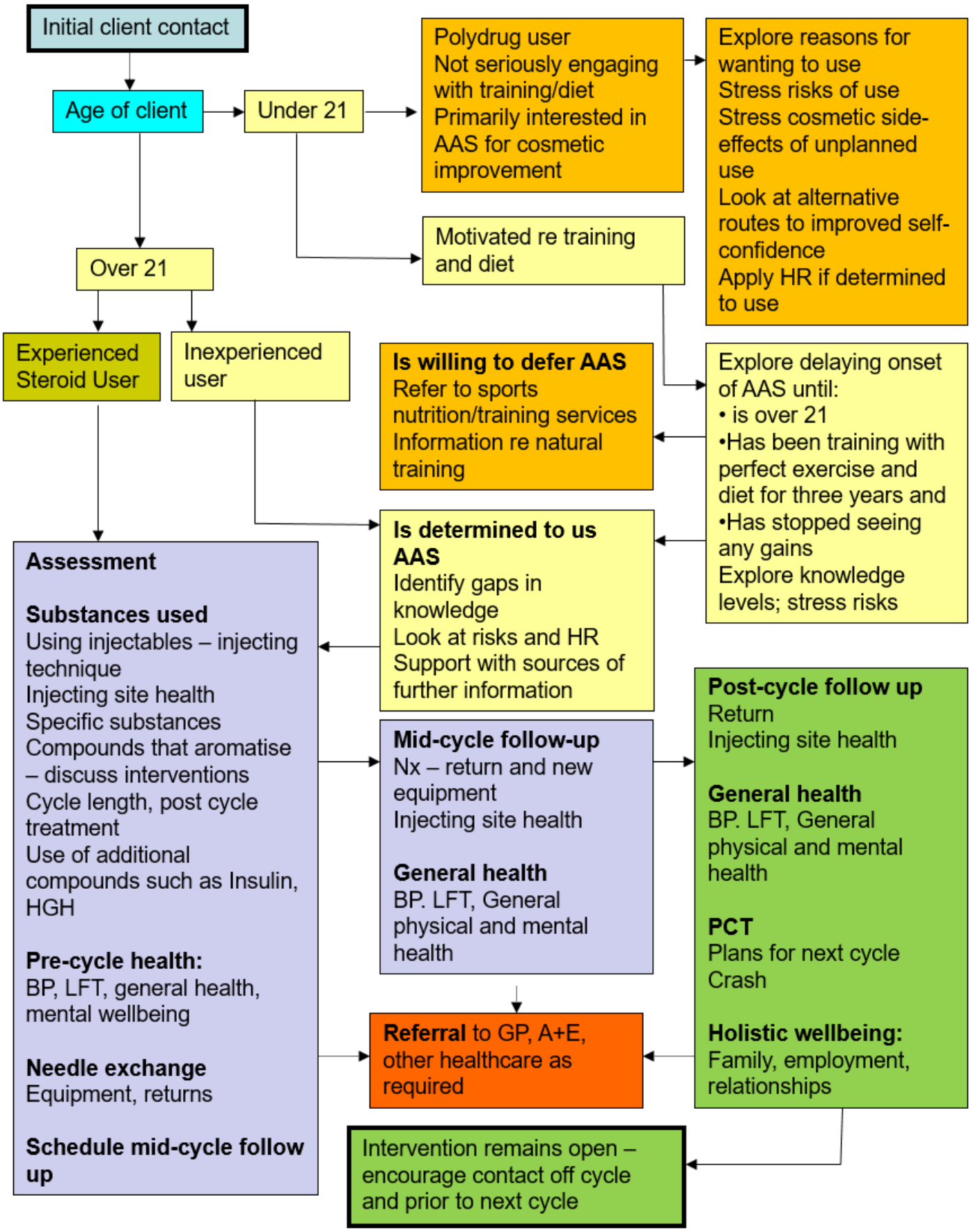
- It represents an incentive to use a drugs service as opposed to sourcing equipment on line
- It allows people to identify when problems are emerging early and adjust behaviour accordingly
- Hormone testing can ensure that people don't use ancillary compounds used for PCT at higher doses or longer than required;
- Provision of such services represents a good way to get people in to services not just pre-cycle but also in the critical post-cycle window where there is a better chance of reflection and discussion.

Care planning:

As with other drug users, a clear pathway of care for steroid users should be in place, which ensures that they are able to access the widest range of services at appropriate stages of their use and cycle.

An illustrative care plan is shown over.

PIDs Illustrative Care Plan



23 Look up Charts for AAS & other PIDs

The look-up tables later in the pack look at all the major products used, and key information about each product.

The tables are to provide key information on commonly used PIDs. The information has been gleaned from multiple sources but isn't comprehensive or exhaustive! Further research by workers and end users will be essential and sources of further information are included at the end of the pack

Names, Terms and Abbreviations:

Work with PIDS entails numerous abbreviations, acronyms, initials and slang. Some of these are covered in the glossary at the start of this pack.

Compounds have a **full chemical name** which describes its molecular structure. It is a bit of a mouthful and no-one refers to it by this name.

Instead people use a **short chemical name** which is usually a contraction of the full chemical name. This is not a brand-name. Instead it is an accepted name which is used internationally for the same compound.

Manufacturers who produce and distribute different products originally gave these products **Brand Names**. These were once specific to a company but, as the drugs are widely counterfeited, lots of producers use the same Brand Names. In some cases, the Brand Name is more widely known and used than the short chemical name. Some brand names are now obsolete as the companies that manufactured them ceased production.

Some manufacturers will sell non-steroidal products with "sound-alike" names to give the impression that it is an AAS when it may just be a blend of dietary supplements.

Some very new compounds, such as SARMS are so new that they only have lab research numbers.

Finally, users may use short hand slang for products they use.

Examples of PID Nomenclature

AAS Names:

Full chemical name:
17a-methyl-17b-hydroxy-1,4-androstadien-3-one 1-dehydro- 17a-methyltestosterone
Short chemical name: methandrostenolone
KEY BRANDS: DIANABOL
Slang: *d-bol*

Sometimes the short chemical name can be an indicator of the composition of the product. The specific ester in a product may be included in the short chemical name, but this is not always the case!

Full chemical name:
17β-Hydroxyestra-4-en-3-one
Short chemical name: nandrolone
KEY BRANDS: Deca Durabolin [contains decanoate ester]
Slang: Deca

SARM

Long chemical name:
{4-[({4-methyl-2-[4-(trifluoromethyl)phenyl]-1,3-thiazol-5-yl} methyl)sulfanyl]-2-methylphenoxy}acetic acid

Lab reference number: GW 501-516
Short Chemical name: N/A
"Official" Brand Name: Cardarine
Unofficial Market name: Endurobol

Soundalikes:

Units and Measures:			
cc	cubic centimetre		
ml	millilitre	1/1000 of a litre	
mg	milligram	1/1000 of a gram	thousandth
mcg (µg)	microgram	1/1,000,000 of a gram	millionth
IU	International Unit		

An international unit (IU) is an international accepted amount of a substance. This type of measure is used for the fat-soluble vitamins (such as vitamins A, D and E) and certain hormones, enzymes, and biologicals (such as vaccines).

The definition of an international unit (IU) is generally arbitrary, technical, and eminently forgettable. For example, an IU of vitamin E is the specific biological activity of 0.671 milligrams of d-alpha-tocopherol. Nonetheless, most IUs are quite handy and helpful in use as a means of standardizing measures. A single IU of rhGH (growth hormone) is around 330 µg.

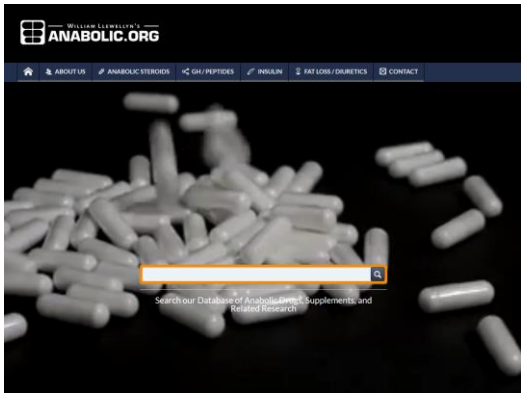
All international units are officially defined by the International Conference for Unification of Formulae.

Dosing schedules:		
m.e.d.	multi every day	dosing more than once a day
e.d.	every day	dosing once per day
e.o.d	every other day	dosing every second day

Routes:		
IM	intramuscular	injection in to a muscle
SC	subcutaneous	injection below skin and above muscle
IV	intravenous	injection in to vein

Drug Look-Up Tables:

As the number of brands has proliferated it is far better to use an on-line search engine and a reliable web-reference site when encountering brands or names.



The database at Anabolics.org is perfect for this task. The short index in this pack is intended to help the reader navigate by the most frequently used names but is by no means comprehensive.

ACP-105	**SARMs**
Agovirin	**Testosterone Suspension (ester)**
Anabol	**Methandrostenolone**
Anabolin	**Nandrolone Decanoate**
Anadrol	**Oxymetholone**
Anapolon	**Oxymetholone**
Anasteron	**Oxymetholone**
Anastrozole	**p116**
Anavar	**Oxandrolone**
Androgel	**Testosterone Gel**
Aromason	**Exmestane**
Arimidex	**Anastrozole**
Avodart	**Reductase Inhibitors**
BMS-564929	**SARMs**
Boldebal	**Boldenone undecyclenate**
Boldenone	**p107**
Caffeine	**p116**
Chlorodehydromethyl-testosterone	**Turinabol**
Choragon	**Human Chorionic Gonadotrophin**
Clen	**Clenbuterol**
Clenbuterol	**p116**
Clomid	**Clomiphene**
Clomiphene	**p117**
Creatine	**P117**
Cyp	**Testosterone Cypionate**
Cypionate	**Testosterone Cypionate**
Cytomel	**Liothyronine**
D-bol	**Methandrostenolone**
Deca	**Nandrolone decanoate**
Deca-Durabolin	**Nandrolone decanoate**
Danabol	**Methandrostenolone**
Dianabol	**Methandrostenolone**
Do Dos	**Ephedrine**
Dutaseride	**Reductase Inhibitors**
Dynabolon	**Nandrolone Decanoate**
Drol	**Anadrol**
Drostanolone	**p107**
Enan	**Testosterone Enanthate**
Enant	**Testosterone Enanthate**
Ephedrine Hydrochloride	**p117**
Eq	**Boldenone undecyclenate**
Equipoise	**Boldenone undecyclenate**
Esiclene	**Formebolone**
Exmestane	**p118**
extraboline	**Nandrolone**
Femara	**Letrozole**
Finasteride	**Reductase Inhibitors**
Fluoxymesterone	**p108**
Formebolone	**p108**
Fortesta	**Testosterone Gel**
Frag	**Growth Hormone Fragment**

Gamma Hydroxy Butyrate	**p118**
GHB	**Gamma Hydroxy Butyrate**
Ghrelin	**Growth Hormone Releasing Peptide**
Genotropin	**Growth Hormone**
Gonadotrophan	**Human Chorionic Gonadotrophin**
Growth Hormone	**p119**
Growth Hormone Fragment	**p120**
Growth Hormone Releasing Hormone	**p119**
Growth Hormone Releasing Peptide	**p120**
Halotestin	**Fluoxymesterone**
HCG	**Human Chorionic Gonadotrophin**
Hexarelin	**Growth Hormone Releasing Peptide**
Human Chorionic Gonadotrophin	**p120**
Humatrope	**Growth Hormone**
Ipamorelin	**Growth Hormone Releasing Peptide**
Insulin	**p121**
Insulin Growth Factor	**p122**
IGF1	**Insulin Growth Factor**
Laurabolin	**Nandrolone Laurate**
Letro	**Letrozole**
Letrozole	**p122**
Levo-thyroxine	**p125**
LGD-121071	**SARMs**
LGD-2226	**SARMs**
LGD-4033	**SARMs**
Linomel	Liothyronine
Liothyronine	**p123**
mast	**Drostanolone Propionate**
Masteron	**Drostanolone Propionate**
Melanotan	**p123**
Mesterolone	**p108**
Methandrostenolone	**p109**
Methenolone Acetate	**p10**
Methenolone enanthate	**p109**
MK2866	**SARMs**
Nalbuphine Hydrochloride	**p123**
Nandrolone	**p109**
Nandrolone Decanoate	**p109**
Nandrolone Undecanoate	**p109**
Nandrolone Laurate	**p109**
Nap	**Methandrostenolone**
Naposim	**Methandrostenolone**
Nolva	**Tamoxifen**
Nolvadex	**Tamoxifen**
Nubain	**Nalbuphine Hydrochloride**

Ostarine	**SARMs**
Oxandrolone	**p110**
Oxymetholone	**p110**
Oxymeth	**Oxymetholone**
Pregnyl	**Human Chorionic Gonadotrophin**
Proscar	**Reductase Inhibitors**
Prov	**Mesterolone**
Proviron	**Mesterolone**
Primo	**Methenolone**
Primobolan Depot	**Methenolone enanthate**
Primobolan Oral	**Methenolone**
Primoteston Depot	**Testosterone Enanthate**
Prop	**Testosterone Propionate**
RAD-140	**SARMs**
Reductase Inhbitors	**p115**
R3 IGF1	**Insulin Growth Factor**
S4	**SARMs**
S-40503	**SARMs**
SARMs	**p114**
Sermorelin	**Growth Hormone Releasing Hormone**
Serostim	**Growth Hormone**
Somatocrinin	**Growth Hormone Releasing Hormone**
Somatoliberin	**Growth Hormone Releasing Hormone**
Somatomedin C	**Insulin Growth Factor**
Somatropin	**Growth Hormone**
Spiractone	**Spironolactone**
Spiropent	**Clenbuterol**
Spironolactone	**p124**
Stanazolol	**p111**
Stromba	**Stanazolol**
Strombaject	**Stanazolol**
Sust	**Sustanon**
Sustanon	**p113**
Synthol	**p124**

T3	**liothyronine**
T4	**Thyroxine**
Tamox	**Tamoxifen**
Tamoxifen	**p124**
T-bol	**Turinabol**
Testa C	**Testosterone Cypionate**
Testadiate-Depo	**Testosterone Cypionate**
Testex Leo prolongatum	**Testosterone Cypionate**
Testogel	**Testosterone Gel**
Testosterone Aqueous	**Tesosterone Suspension**
Testosterone Cypionate	**p111**
Testosterone Depot	**Testosterone Enanthate**
Testosterone Enanthate	**p112**
Testosterone Gel	**p113**
Testosterone Propionate	**p112**
Testosterone Suspension	**p112**
Testoviron Depot	**Testosterone Enanthate**
Tetraiodothyronine	**Thyroxine**
Thyroxine	**p125**
Tprop	**Testosterone Propionate**
Tren	**Trenbolone Acetate**
Trenbolone	**p114**
Trenbolone Acetate	**p114**
Turanabol	**Turinabol**
Turinabol	**p107**
Var	**Oxandralone**
Winny	**Stanazolol**
Yohimbine	**p125**
Winstrol	**Stanazolol**

Chemical Name:	Boldenone Undecyclenate				
Brand Names: Equipoise, Boldebal			**Slang names:** *Eq, Bol*		
Description:	AAS; testosterone derivative; veterinary preparation				
Route:	IM	**C17-AA**	No	**Anabolic/Androgenic**	100/50
Oestrogen/Progestin	Aromatises slowly; no known progestin-like activity				
Typical Dose	200-400mg per week, possibly split in two or three day doses				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Long acting ester
- Reasonably available and popular
- Low risk of liver damage, low levels of aromatisation
- Relatively slow acting and so used in longer cycles or alongside faster acting steroids.
- Widely available in S. America

Chemical Name:	Chlorodehydromethyltestosterone				
Brand Names: Turinabol, Turanabol			**Slang names:** *T-bol*		
Description:	Anabolic Steroid; dianabol derivative				
Route:	Oral	**C17-AA**	yes	**Anabolic/Androgenic**	?
Oestrogen/Progestin	No oestrogenic activity; does not aromatise				
Typical Dose	15-40mg/day, for 6-8 weeks				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Any increasingly popular oral steroid. Actually quite an old one, but now increasingly available via UG labs.
- Moderately powerful effect, not dissimilar to d-bol, but less water retention

Chemical Name:	Drostanolone Propionate				
Brand Names: Masteron			**Slang names:** *Mast*		
Description:	AAS; Derived from DHT; moderately powerful anabolic: produces lean muscle mass				
Route:	IM	**C17-AA**	No	**Anabolic/Androgenic**	62-130/25-40
Oestrogen/Progestin	Doesn't aromatise; may reduce aromatisation partially; no noted progestin activity				
Typical Dose	200-400mg per week in three doses				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Only sourced through underground labs

Chemical Name:	Fluoxymesterone				
Brand Names: Halotestin			**Slang names:**		
Description:	AAS; Testosterone derivative; strongly androgenic: produces lean muscle mass				
Route:	oral	**C17-AA**	yes	**Anabolic/Androgenic**	1,900/850
Oestrogen/Progestin	Does not aromatise; no progestin activity noted				
Typical Dose	10-40mg/daily for short cycles to avoid liver damage				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Powerfully androgenic – good strength drug, but less useful for bulk
- Risks of androgenic side effects – aggression, acne, hair loss
- Not widely available

Chemical Name:	Formebolone				
Brand Names: Esiclene			**Slang names:**		
Description:	AAS; inflammatory. Primarily used to make muscles briefly larger than for muscle development.				
Route:	IM	**C17-AA**	yes	**Anabolic/Androgenic**	n/a
Oestrogen/Progestin	No/no				
Typical Dose	1-2ml per muscle group for 2-5 days				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Causes muscle to swell up with lymph fluid
- Muscle looks at feels bigger and harder
- Is used in specific muscles to make them more pronounced
- Contains lidocaine to reduce pain at injection sites
- Muscles will “deflate” after administration
- Injected into smaller muscles so smaller needles needed

Chemical Name:	Mesterolone				
Brand Names: Proviron			**Slang names:** *Prov*		
Description:	Steroid: Androgenic; not anabolic. DHT derivative. Used to offset aromatisation caused by other drugs				
Route:	Oral	**C17-AA**	No	**Anabolic/Androgenic**	100-150/30-40
Oestrogen/Progestin	Inhibits aromatase so anti-oestrogenic; no noted progestin activity				
Typical Dose	25-50mg/day taken in AM and PM dose				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Androgenic steroid; not anabolic; although profile shows it to be as anabolic as testosterone, the drug is metabolised in to non-anabolic metabolites.
- Can help elevate levels of free testosterone by binding to Sex Hormone Binding Globulin, preventing testosterone from doing so.
- Blocks aromatisation; less powerfully so than Arimidex
- Also increases hardness of muscles
- Widely available

Chemical Name:	**Methandrostenolone**				
Brand Names: Dianabol, Anabol, Naposim			**Slang names:** *D-Bol, nap*		
Description:	AAS; testosterone derivative; primarily supplied as an oral medication				
Route:	Oral	**C17-AA**	yes	**Anabolic/Androgenic**	90-210/40-60
Oestrogen/Progestin	Aromatises rapidly				
Typical Dose	15-30 mg/day taken in AM and PM dose (3-5 hr half-life)				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Powerful anabolic with androgenic properties
- Increases bulk and strength but also causes water retention
- Aromatises so generally will be used with oestrogen blockers
- Can speed up balding in men, aggravates acne
- Can cause aggressive behaviour at high doses
- Not advised for women due to powerful virilising effects
- Highly popular in tablet form; readily available
- Often used at the start of cycles to provide early rapid gains
- Use discontinued after first few weeks to reduce strain on liver

Chemical Name:	**Methenolone Enanthate** **Methenolone Acetate**				
Brand Names: Primobolan Depot			**Slang names:** *Primo*		
Description:	AAS; DHT Derivative				
Route:	IM	**C17-AA**	No	**Anabolic/Androgenic**	88/44-57
Oestrogen/Progestin	Doesn't aromatise; no noted progestin activity				
Typical Dose	75-150mg/week often taken in combination for stronger effect				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Good basic steroid with anabolic effect;
- Weaker than Deca-durabolin
- Comparatively low risk: low liver toxicity and low risk of elevating blood pressure
- Used by women in smaller doses: virilisation can occur
- Widely available and very popular especially in Europe

Chemical Name:	**Nandrolone Decanoate**				
Brand Names: Deca-Durabolin, extraboline			**Slang names:** *Deca*		
Description:	AAS; derived from nor-testosterone				
Route:	IM	**C17-AA**	No	**Anabolic/Androgenic**	125/37
Oestrogen/Progestin	Very low level of aromatisation; some progestin-like activity				
Typical Dose	200-600mg/week often taken in combination for stronger effect				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- A relatively 'mild' steroid – gives gain in bulk and some strength gains
- Does aromatise to an extent especially at higher doses. The oestrogen also increases the progestin-like activity. Use of AIs can reduce both issues.
- likely to experience symptoms of virilisation.
- Relatively expensive and widely faked

Other Esters	**Nandrolone Laurate: Laurabolin** longer acting

Chemical Name:	Oxandrolone				
Brand Names: Anavar			**Slang names:** *Var*		
Description:	AAS; DHT Derivative				
Route:	Oral	**C17-AA**	Yes	**Anabolic/Androgenic**	322-630/24
Oestrogen/Progestin	Doesn't aromatise; no noted progestin activity				
Typical Dose	15-25mg/day for 6-8 weeks				
Legal status (UK)	Class C: Schedule 4ii				
Notes • highly anabolic, and enjoys a relatively low risk profile given its relative potency. • Less significant for bulking, more significant for lean hard quality muscle gain • Low androgenic effect so popular with women and more sensitive users • Less impact on endogenous testosterone production • Relatively expensive • Can cause nausea and gastrointestinal pain					

Chemical Name:	Oxymetholone				
Brand Names: anadrol, anapolon			**Slang names:** *drol*		
Description:	AAS; DHT Derivative. Very powerful bulking agent				
Route:	Oral	**C17-AA**	Yes	**Anabolic/Androgenic**	320/45
Oestrogen/Progestin	Very significant oestrogenic activity in its own right; doesn't aromatise and use of aromatase inhibitors of no help; had been believed was due to progestin-like activity but not supported by evidence. Use of anti-oestrogens likely.				
Typical Dose	25-150mg/day for 6-8 weeks				
Legal status (UK)	Class C: Schedule 4ii				
Notes	• Very powerful oral steroid which offers big gains in bulk and strength very quickly. • Causes very high levels of water retention • Widely used and popular; • Size gains rapidly reverse if use is discontinued suddenly • Used at start of cycle to increase bulk, before switching to other compounds for lasting gains • Not recommended for use by women				

Chemical Name:	**Stanozolol**				
Brand Names: Winstrol, Stromba			**Slang names:** *Winny*		
Description:	AAS; DHT Derivative. Very powerful bulking agent				
Route:	Oral/IM	**C17-AA**	Yes	**Anabolic/Androgenic**	320/30
Oestrogen/Progestin	No; acts as progesterone-blocker and so can block the actions of other substances that can cause feminisation through the action of progesterone				
Typical Dose	50mg Every other day (by injection) or 15-25mg/day oral				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Widely used and popular
- Does not aromatise and partially blocks progesterone-induced gynecomastia and other symptoms
- Liver toxic, but less so than some other 17AA compounds
- Comes in aqueous solution that needs to be shaken prior to injection
- Also comes in tablet form
- Helps develop strength and hardness of muscles and can also so is used to harden and cut in muscles.
- Also used by women, but with increases risk of side effects, but at lower doses and for shorter periods.
- The crystal-size of different brands of Stanozolol affect which equipment will be needed, and the half-life of the drug. Larger crystals will be absorbed more slowly, so won't need to be injected so often. However, a larger (22G) needle will probably be needed. Finer powders will pass through a finer (e.g. 23-24G) needle but will need to be used more frequently.

Chemical Name:	**Testosterone Cypionate**				
Brand Names: Testex Leo Prolongatum,			**Slang names:** *Cyp*		
Description:	AAS; testosterone ester				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	200-600mg/week				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- A "benchmark" testosterone ester
- Powerfully anabolic and androgenic
- Won't start working so quickly so likely to be used in conjunction with shorter-acting AAS
- Significant bulking and strength gains
- oily skin, acne, accelerated male pattern balding
- Causes water retention: muscles may look puffy but joints may be less painful
- Can cause symptoms of feminisation very rapidly, especially in sensitive individuals
- High impact on endogenous testosterone production – many will use another treatment to stimulate testosterone production
- Big crash – and loss of growth – when use is discontinued suddenly
- Increased risk of aggression,
- Not recommended for women as has powerfully virilising effects

Chemical Name:	Testosterone Enanthate				
Brand Names: testosterone prolongatum, testoviron depot,			**Slang names:** *Enan*		
Description:	AAS; testosterone ester				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	200-600mg/week in one or two doses				
Legal status (UK)	Class C: Schedule 4ii				
Notes	• As for T. Cypionate				

Chemical Name:	Testosterone Propionate				
Brand Names: Testex Leo, Testoviron			**Slang names:** *Test Prop, Prop*		
Description:	AAS; testosterone ester				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	50-100mg every day or every other day (Men) weekly doses of 200-400mg per week				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- As for T. Cypionate
- Shorter ester; starts working faster
- Will need to be injected more frequently
- Some people find it more painful to inject

Chemical Name:	Testosterone Suspension				
Brand Names: Agovirin, Aquatest			**Slang names:** *Test Susp*		
Description:	Anabolic Steroid; testosterone in water				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	100-200mg every 2-3 days				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Non esterified; starts working within hours
- Short duration of effect; needs to be administered more frequently
- Other risks as for Testosterone
- Not widely available

Common Name:	**Sustanon**				
Chemical Name: Testosterone propionate 30mg, Testosterone phenylpropionate 60 mg, Testosterone isocaproate 60 mg, Testosterone decanoate 100 mg				**Slang names:** *Sust*	
Description:	Anabolic Steroid; blend of four different testosterone esters				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	250-1000mg/week most are happy on 250-500mg				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Blend of testosterone esters gives a long period of effect
- Widely available and highly popular
- Shorter acting esters start working first, and then longer acting esters start working afterwards
- Anabolic and androgenic – provides bulk and strength
- Side effects similar to other testosterone compounds: oily skin, acne, sexual excitement, increased balding
- Reduces endogenous testosterone production

Name:	**Other Testosterone blends**				
Brands: e.g. Tri-test, Test 400, Testobolin					
Description:	Various ester blends				
Route:	IM	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	Will vary according to blend				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Lots of multi-dose blends on the market
- Often produced by UG labs
- Dosing frequency will vary according to blend

Name:	**Testosterone Gel**				
Brands: e.g. Androgel, Testim, Testogel, Fortesta					
Description:	Testosterone in gel preparation				
Route:	transdermal	**C17-AA**	no	**Anabolic/Androgenic**	100/100
Oestrogen/Progestin	Yes, readily aromatised; use of SERMs or AIs likely				
Typical Dose	Depends on blend used; medical products are low dose for hormone replacement. For muscular development, doses of 20g may be required, as only a small amount of testosterone will enter bloodstream				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Intended for medical use to remove need for injections
- Low dosed gels intended as hormone replacement therapy
- Not widely used as a PID; some prison reports.
- Can cause local irritation and acne at administration site
- Can be transferred to partners via skin-to-skin contact – so female partners need to take care to avoid exposure

Chemical Name:	Trenbolone Acetate				
Brand Names: Trenbolone, Finaplix, finajet, trenbol			**Slang names:** *Tren*		
Description:	AAS, primarily veterinary use; nandrolone derivative				
Route:	Oral, Transdermal Snorted, (IM)	**C17-AA**	no	**Anabolic/Androgenic**	500/500
Oestrogen/Progestin	Not aromatised; marked progestin activity				
Typical Dose	100-300mg per week in 2-3 doses				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Used to develop lean hard muscle
- Hard to source as an injectable; More widely available are veterinary pellets for implanting in to cattle.
- In order to make the implants in to a usable form they may be crushed and snorted, made in to a solution and applied to the skin using additional chemicals or made in to a solution and injected. The latter method brings with it a very high risk of infections due to the difficulty of creating a sterile, particle free solution from the implants.

Chemical Name:	Trenbolone esters				
Examples: Trenbolone Enanthate Trenbolone Hexahydrobenzylcarbonate (Parabolan)				**Slang names:** *Tren, Powerbone*	
Description:	AAS, nandrolone derivative				
Route:	(IM)	**C17-AA**	no	**Anabolic/Androgenic**	500/500
Oestrogen/Progestin	Not aromatised; marked progestin activity				
Typical Dose	150-300mg per week				
Legal status (UK)	Class C: Schedule 4ii				

Notes

- Used to develop lean hard muscle
- Parabolan now very scarce and much of what is on sale is fake

Family Name	Selective Androgen Receptor Agonists (SARMs)				
Examples: S4 (Andarine), MK2866 (Ostarine), BMS-564929, LGD-121071, LGD-2226, S-40503, RAD140, ACP-105, LGD-4033					
Description:	Novel drugs which reputedly will have a very targeted anabolic or androgenic effect. Intended to target specific group of androgen receptors and thus avoid triggering side-effects on other sites.				
Route:	oral	**C17-AA**	?	**Anabolic/Androgenic**	?
Oestrogen/Progestin	Little information about potential side-effects; there is evidence that they cause gynecomastia,				
Typical Dose	Varies according to product				
Legal status (UK)	Not currently regulated				

Notes

- Very new to market
- As with NPS lots of people flogging lots of unknown products making lots of spurious claims
- Small number of genuine products on market
- Evidence that use reduces levels of endogenous testosterone and reduces LH and FSH so some impact on HPTA
- Little known about long term risks and effects

Reductase Inhibitors

Examples: **dutaseride (Avodart) finasteride (Proscar)**
The enzyme **Reductase** converts testosterone and close derivatives in to the more androgenic compound dihydrotestsosterone (DHT). In addition to sought-after androgenic properties, DHT also contributes to development of oily skin, acne, male pattern balding and prostate problems. Reductase inhibitors reduce conversion of Testosterone to DHT. This effectively skews the balance of Testosterone, making it relatively less androgenic. Finasteride has greater selectivity, reducing the impact on male pattern balding but less impact on prostate or skin. **Risks:** impotence, reduced libido, difficulty ejaculating, allergic reactions, birth defects; should not be used by either partner without contraception

Chemical Name:	Anastrozole
Brand Names: Arimidex	
Slang names:	
Description:	Aromatase Inhibitor
Route:	Oral
Typical Dose	500-1000mcg/day (0.5-1mg)
Legal status (UK)	POM

Notes

- Powerful aromatase inhibitor
- Stops the enzyme aromatase working so prevents excessive levels of testosterone being metabolised into oestrogen; this means that the risks of feminisation are reduced in male users
- Used alongside steroids that aromatise
- Causes lower levels of HDL (good) cholesterol when used with testosterone, which increases risk of circulatory and heart problems
- For this reason, some people would favour an oestrogen blocker like tamoxifen
- Expensive
- Common side effects are: shortness of breath, dizziness, diarrhoea, vomiting, headache, hat flashes, weakness, cough, dry mouth, skin rash, sweating, abdominal pain and bone pain.

Caffeine
Used as part of a stack (Ephedrine, Aspirin, Caffeine) to increase metabolic activity and burn fat. Usually taken in the form of Pro-Plus. Powdered caffeine available from on-line suppliers. Excessive use can cause headaches, tremors, insomnia and may cause or irritate stomach ulcers. It can also cause cardiac arrhythmias; risk is elevated when used alongside stimulants, or where there are pre-existing cardiac problems.

Chemical Name:	Clenbuterol
Brand Names: Spiropent	
Slang names:	*Clen*
Description:	Bronchiodilator and stimulant; used to aid fat loss
Route:	Oral
Typical Dose	Starting at 20-40 mcg/day with some people going up to 120mcg or more
Legal status (UK)	CD: Class C. Sch. 4ii

Notes

- Widely used in athletic and body building circles
- β adrenergic receptor; one of the adrenal receptors but less impact on heart rate and much more impact on lung capacity and vasodilation in muscles and the liver.
- Increases respiratory capacity
- Stimulates fat burning – used to create a lean and muscled look
- Will start to break down muscles when used in excess
- Some belief (though little evidence) that it has anabolic properties
- Side effects can include elevated blood pressure, insomnia, rapid heart rate, panic

Chemical Name:	Clomiphene citrate
Brand Names: Clomid	
Slang names:	
Description:	Synthetic anti-oestrogen; clinically used in fertility treatment; Used by male bodybuilders as a partial anti-oestrogen and as post-cycle treatment
Route:	Oral
Typical Dose	50-100mg/day for up to 30 days at the end of a cycle
Legal status (UK)	POM

Notes

- Very widely used – important for male users as a tool for normalising sperm and testosterone production
- Not anabolic – is a weak oestrogen
- Binds to a blocks oestrogen receptors so stops aromatised hormones reaching receptors: reduced symptoms of aromatisation in men – reduced chances of gynecomastia and water retentions
- Stimulates production of endogenous testosterone in men
- Used at end of cycle to stimulate suppressed testosterone in men
- Side-effects can include hot flushes and visual distortion

Creatine
Naturally occurring compound found in foods which is essential in the body for energy transportation and muscle development. Creatine is essential for cells to form and use Adenosine Triphosphate (ATP). During exercise ATP becomes rapidly depleted, and without ATP, cells cannot use energy effectively. Creatine is required to replenish it, and would normally be assimilated from food. To meet the need to replace creatine faster, many athletes will use creatine as a food supplement. It is widely considered to be an essential aspect of diet for body builders. However much of the creatine taken is surplus to requirements and excreted. High doses are associated with kidney problems.

Common Name:	Ephedrine
Chemical Name:	Ephedrine Hydrochloride
Brand Names:	
In the UK, ephedrine is usually obtained through the use of Do-Do Chesteze cough treatments, Ma Huang and illicitly imported Ephedra; A wide range of medicines contain ephedrine.	
Slang names:	*Ephedrine, E, Eph*
Description:	Stimulant
Route:	Oral
Typical Dose	25mg three times per day
Legal status (UK)	POM

Notes

- Used to speed up metabolism and burn fat
- Typically used as part of a fat burning stack alongside caffeine and aspirin (ECA Stack)
- Powerful appetite suppressant
- Can cause insomnia, stomach irritation, tremors, palpitations

Chemical Name:	Exemestane

Brand Names: Aromasin	
Slang names:	
Description:	Third generation Aromatase inhibitor; binds, irreversibly to aromatase and prevents it working
Route:	Oral
Typical Dose	12-25mg/day
Legal status (UK)	POM

Notes

- Powerful new aromatase inhibitor
- Less widely available and less popular than other compounds like letrozole
- Side effects including weakness, pain, nausea. Possible increased risk of osteoporosis

Common Name:	**GHB**
Chemical Name:	Gamma Hydroxy Butyrate
Slang names:	GBH
Description:	GABA-agonist: sedating, relaxant
Route:	Oral
Half-life	4-8 hours
Typical Dose	Depends on build and strength of GHB
Legal status (UK)	Class C Schedule 4i

Notes

- GHB was used in body building circles before it became popular in recreational drug settings
- It is used to promote sleep and to stimulate natural production of Growth Hormone
- When it was widely available, body builders would typically take a teaspoon of GHB in a pint of water before bed.
- Now illegal to possess and supply in the UK
- Increased risk of overdose
- Impure
- Addictive – withdrawal symptoms similar to benzos
- In its place **GBL** – the pro-drug of GHB has become more widespread. It is still legally supplied for legitimate industrial used
- The nootropic **Phenibut**, a GABA agonist, was legal and also used as a depressant but supply is now prohibited under the Psychoactive Substances Act (2016).

Common Name:	**Growth Hormone**
Chemical Name:	**Recombinant Human Growth Hormone, rhGH**
Brand Names: Somatropin, Humatrope, Serostim	
Slang names:	*Growth, GH*
Description:	A synthetic version of natural Human Growth Hormones; anabolic effect, and stimulates the production of growth promoting agents in the liver; used at ;pw doses for weight loss, and higher doses for muscle, bone joint strength.
Route:	Subcutaneous; less commonly Intramuscular
Half-life	Less than 1 hour
Typical Dose	2-4IU per day injected SC at three or four separate sites Lower doses used for weight loss; higher doses for growth 6-22 week cycle
Legal status (UK)	Class C, sch4.ii

Notes

- Probably talked about more than it is used
- Synthetic compound, increasingly widely available
- Lots of counterfeit products on market
- Fragile molecular chain
- Has direct and indirect anabolic effects
- Directly has an anabolic effect on muscle and bone, causing thickening and strengthening of bone and muscle, tendons and ligaments
- Causes organs to grow too
- Indirectly causes levels of Insulin-like growth factor (IGF-1) to go up which also has an anabolic effect
- Risks include development of diabetes, acromegaly (overgrowth of cranial bones, hands and feet)
- Young users may end up with stunted growth
- Thyroid problems, heart problems also reported

Common Name:	**Growth Hormone Releasing Hormone, GHRH**
Chemical Name:	Somatorelin (endogenous), Somatoliberin, Somatocrinin
Brand Names: Sermorelin	
Slang names:	
Description:	
Route:	SC
Typical Dose	200-500 mcg, often in split doses, one AM and one pre-sleep. which is given before sleep
Legal status (UK)	POM

Notes

- GHRH is responsible for triggering ‘pulses’ of GH release from the pituitary gland.
- Rather than taking GH, some people prefer GHRH as it doesn’t appear to suppress GH production.
- Expensive and hard to source.

Common Name:	Growth Hormone Releasing Peptide: GHRP
Chemical Name:	GHRP-2 (Ghrelin) GHRP-6
Brand Names: Hexarelin, Ipamorelin (GHRP-2)	
Description:	Peptide stimulates growth hormone release (the amount released with each pulse)
Route:	SC
Typical Dose	50-300 mcg at a time. In 2-3x doses per day
Legal status (UK)	POM [?]

Notes

- Increases overall levels of GH
- Can also stimulate appetite – good for people bulking, not so much for people cutting
- Sometimes combined with other compounds such as GHRH

Common Name:	Growth Hormone Fragment
Chemical Name:	GH Fragment 176-191
Slang names:	*Frag*
Description:	Section of GH molecular chain believed to help with fat burning. Not used for bulking, solely for weight loss
Route:	SC
Typical Dose	250-500mcg when fasting, pre training
Legal status (UK)	POM [?]

Notes

- Used when fasting

Common Name:	HCG
Chemical Name:	Human Chorionic Gonadotrophin
Brand Names: Pregnyl	
Slang names:	
Description:	Hormone produced in the placenta of pregnant women;
Route:	SC
Half-life	Can stimulate testosterone production for as long as five days
Aromatises	Elevates testosterone levels; as this may aromatise, can cause/exacerbate gynecomastia and other symptoms
Typical Dose	2000-3000IU every 2-3 days
Legal status (UK)	Class C, Sch4ii

Notes

- Mimics effects of Luteinising Hormone; used in fertility treatment for women
- In men, the use of HCG stimulates the production of testosterone and so, where this has been reduced to the use of other steroids, HCG use at the end of a cycle and help bring endogenous testosterone “back on line.”
- Also used during cycles to reduce testicular atrophy
- This can help reduce testicular shrinkage, decrease impotence and improve libido;
- For other users, HCG helps to provide a smooth transition from the “on cycle” to “off cycle” state avoiding a crash in between where muscle gains may be lost.
- Excess testosterone produced through the use of HCG will aromatise causing symptoms such as water retention and gynecomastia so HCG will often be used alongside an anti-oestrogen compound.
- Excessive use will desensitise the Leydig Cells in the testes to Luteinising Hormone and so with prolonged use will reduce, not increase testosterone production
- Supplied as a freeze-dried white powder with a separate solution of liquid; the two are mixed and injected;
- Can cause more frequent erections, increased libido and acne in male users.

Common Name:	Insulin
Chemical Name:	Insulin
Brand Names: Humulin R is the preferred brand for this purpose as it is fast acting and has a short half-life. Other brands bring a greater risk of hypoglycaemia due to longer periods of action.	
Description:	Pancreatic hormone which regulates blood-sugar levels
Route:	SC injection
Half-life	Four hours, but depends on brand
Typical Dose	1 IU per 10-20lbs lean weight
Legal status (UK)	POM

Notes

As a medicine, typically prescribed to people with diabetes. In the context of PEDs, is used in two main contexts.

Insulin is used towards the end of, or after training. A high-carbohydrate drink is consumed within 15 minutes. The insulin is thought to increase the amount of glycogen transported in to the muscle.

Insulin is injected subcutaneously and so users will need Iml insulin syringes for this purpose and may need guidance around SC technique.

Some users will inject Insulin IM into triceps but this brings with it faster absorption and increased risk of hypoglycaemia.

Misuse of Insulin can bring with it a range of serious complications. Blood sugar levels can drop dangerously low when Insulin is taken and this can cause drowsiness or coma. Ensuring that high carb drinks are used and the user is vigilance for signs of hypoglycaemia is essential.

Symptoms of mild to moderate hypoglycaemia include: hunger, drowsiness, blurred vision, depressive mood, dizziness, sweating, palpitation, tremor, restlessness, tingling in the hands, feet, lips, or tongue, light-headedness, inability to concentrate, headache, sleep disturbances, anxiety, slurred speech, irritability, abnormal behaviour, unsteady movement, and personality changes.

If any of these warning signs should occur, the user should immediately consume a food or drink containing sugar such as a sugary snack bar or carbohydrate drink. This will treat a mild to moderate hypoglycaemia and prevent a severe state of hypoglycaemia.

Severe hypoglycaemia is a serious condition that may require medical attention. Symptoms include disorientation, seizure, unconsciousness, and death.

Concern has grown that improper use of Insulin in healthy adults can trigger the development of diabetes-type symptoms, which may be permanent and irreversible.

The use of Insulin appears to be on the increase in the UK.

Common Name:	IGF
Chemical Name:	Insulin-like Growth Factor
Brand Names: Somatomedin C	
Slang names:	IGF 1, R3 IGF1
Description:	An analogue of the liver-produced substance Insulin Growth Factor which is produced by elevated insulin levels (See Insulin, above)
Route:	SC
Half-life	Around half an hour; a similar product Long R3 IGF 1 has added molecular chains which slow down the breakdown, giving a half-life of up to 12 hours.
Typical Dose	20mcg/day but doses do go to 120+mcg/day
Legal status (UK)	POM (not listed in BNF)

Notes

- Is meant to come as a white powder in sealed vials which is dissolved for injection;
- Some sites offer a premixed liquid preparation; bulletin boards argue if these are real or fakes. Most argue they are fakes.
- Not widely available and highly expensive;
- IGF is naturally produced in the liver and IGF1 and related compounds are synthetic analogues.
- Causes increased burning of fat
- Can lead to growth in number of muscle cells, leading to growth and increased strength
- For risks see notes on Insulin, below.

Chemical Name:	Letrozole
Brand Names: Femara	
Slang names:	*Letro*
Description:	New generation of aromatase inhibitors which stops aromatase working and permanently binds to aromatase enzyme causing it to stop working
Route:	Oral
Half-life	2 days
Typical Dose	.25-.5mg/day
Legal status (UK)	POM

Notes

- Increasingly widely used
- Widely available on illicit market
- The most effective aromatase inhibitor currently available

Chemical Name:	Liothyronine Sodium
Brand Names: Cytomel, T3	
Slang names:	T3
Description:	Synthetic Thyroid Hormone; mimics natural thyroid agent T3 (triiodothyronine)
Route:	Oral
Typical Dose	25-75mcg/day for men; women up to 50mcg. Usually used for maximum of six weeks, tapered at end.
Legal status (UK)	POM

Notes

- Used medically to treat thyroid insufficiency
- When used outside of medical settings, duplicates effects of the thyroid hormone LT-3 in the body
- Increases metabolism and burns fat very effectively
- Excess use can cause irreversible damage to thyroid gland, resulting in a need for long-term medical help
- side effects: heart palpitation, trembling, irregular heartbeat, agitation, shortness of breath, excretion of sugar through the urine, excessive perspiration, diarrhoea, weight loss, panic
- Increased risk when used with stimulants

Common Name:	Melanotan
Chemical Name:	
Brand Names: Melanotan, Epitan, Melanotan ii	
Description:	Tanning agents
Route:	SC
Typical Dose	Doses vary according to existing skin tone, body weight Loading Phase: 250-500mcg daily: 2-4 week course Maintenance: lower doses to retain tan
Legal status (UK)	Not licensed; would fall foul of Medicines Regulations

Notes

- Used to increase amount of melanin produced by increasing number of melanocytes
- Tanning agent, combined with exposure to sunlight or tanning bed, increases level of tan
- Tan will not be permanent
- Supplied as powder; needs to be mixed with bacteriostatic water to inhibit bacteria growth when stored
- Dilution is important to ensure mixture does not cause excessive tanning
- Risks not yet known – may increase mole development and increase risk of skin cancer

Chemical Name:	Nalbuphine Hydrochloride
Brand Names: Nubain	
Description:	Opiate analgesic
Route:	SC, IM or IV injection
Half-life	5 hours
Aromatises	NA
Typical Dose	20-30mg
Legal status (UK)	POM

Notes

- Used as a pain killer to reduce pain during or after training; Allows for harder and longer training
- As an opiate can lead to dependency and withdrawal symptoms
- Very rarely used now

Chemical Name:	Spironolactone
Brand Names: Aldactone	
Description:	Diuretic
Route:	Oral
Typical Dose	75-150mg/day
Legal status (UK)	POM

Notes

- Used to help reduce water retention and show increase muscle hardness and definition
- Milder than other diuretics such as Lasix
- Can cause headaches, cramping and dehydration
- Excessive dehydration can be dangerous and cause kidney problems and electrolyte imbalance

Synthol

Synthol is a mixture of fatty acids, alcohol and lidocaine. It is a “site enhancement oil” rather than an anabolic agent. It is injected in to the muscles causing them to become distended. It is not intended to be drawn in to the blood stream. Injecting in to a vein could be fatal.

Synthol may or not be widely used. As it is widely considered to be “cheating” as the muscles have not been expanded through training, most people do not admit to Synthol use.

Synthol can create very large muscle size but this will diminish over time – over months or possibly years.

As the mixtures sits in the muscle for a long time, it brings with it significant risk of infection. It can also cause necrosis by inhibiting blood flow through the muscles.

Chemical Name:	Tamoxifen Citrate
Brand Names: Tamoxifen, Nolvadex	
Slang names:	*Nolva,Tamox*
Description:	SERM, hormone which blocks oestrogen receptors, oestrogen antagonist
Route:	Oral
Aromatises?	Blocks receptor sites preventing symptoms of aromatisation
Typical Dose	10-30mg
Legal status (UK)	POM

Notes

- Used with compounds that aromatise to block the oestrogen receptor sites
- Preferred to Arimidex as doesn’t affect HDL (good cholesterol) as much
- Also elevates LH and FSH so aids Post cycle recovery
- Does not prevent aromatisation, just competes with oestrogen at receptor sites
- Side effects can include nausea, vomiting, hot flushes, numbness, and blurred vision can occur.

Chemical Name:	Thyroxine, tetraiodothyronine
Brand Names: Levo-thyroxine, T4, Synthroid	
Slang names:	**T4**
Description:	T4 is the pro-hormone for T3; it is naturally metabolised in to T3.
Route:	Oral
Typical Dose	25-75mcg/day for men; women up to 50mcg. Usually used for maximum of six weeks, tapered at end.
Legal status (UK)	POM

Notes

- Used medically to treat thyroid insufficiency
- T4 is converted to T3 with the action of Deiodinase 2 (D2)
- With excess use of T4, levels of D2 drop and levels of D3 (which inhibits T4-T3 conversion) drops. So heavy or prolonged use of T4 gives diminishing returns.
- At lower dose causes increase in T3 levels with same results and risks as using T3

Yohimbine
Plant bark extract mainly used as an aphrodisiac. Now used by some PID users either as a topical ointment reputed to increase fat burning, or as capsules to increase metabolism and burn fat. Theoretically should be covered by the Medicines Act or the Psychoactive Substances Act, but is still widely sold.

24 Where to get Further Information

This resource pack used multiple sources to check and verify content. The main internet sites used to develop the contents are listed below along with other useful sites and sources of information. Inclusion in this list should not be taken as endorsement of the sites or their content:

Websites:

http://www.ipedinfo.co.uk/
Public-health Wales website; lots of good information and the only statutory PID information site in UK

https://humanenhancementdrugs.com/
network of professionals, academics and interested others: lots of resources and information regarding compounds used for human "enhancement."

http://anabolic.org/
William Llewellyn's Anabolic.org – author of the Anabolics handbooks makes all material available on-line free of charge in this amazing website. Essential with good search facility

http://www.muscletalk.co.uk/
Excellent UK-based website. Good discussion boards and very helpful moderators who have contributed to the development of this resource. Would suggest this site as a first port of call.

http://www.steroidabuse.org/
NIDA website on Steroids.

http://www.ukad.org.uk/
UK anti-doping website. Includes lists and information on all prohibited substances including steroids. Useful and comprehensive resource.

Leaflets/booklets:

Steroids: John Campbell & Andrew Preston: Exchange Supplies: 50pp
Excellent spiral-bound booklet with illustrations. Ideal for conversations between workers and people using PIDs.

Practitioners Guide to Steroids: Exchange Supplies -Poster

Injecting Anabolic Steroids: Linnell Communications [previously Lifeline] Available from Exchange Supplies: A6 Double sided flyer.
One side with general risk, other with injecting information

Anabolic Steroids – Hardcore Information 36pp: Booklet Linnell Communications [previously Lifeline] Print edition 2016; available from Exchange Supplies
Information on key products, injecting, risks and harm reduction

Anabolic Steroids – Hardcore Information: Lifeline: John Baines: Not Dated
Generally good information leaflet; not keen on the injecting section; some significant errors; good drugs information section

Anabolic Steroids: A guide for users and professionals:

Muscle Boundaries: A users guide to steroids and other performance and image enhancing drugs: HIT: Magazine-style booklet: published 2010
Originally written and designed for Australian users, and adapted by HIT for the UK. Styled to look like a leading body-building magazine. Glossy. Lots of pictures of men with big muscles. Not sure if this is a good thing. Patchy information – really mixed in terms of what is covered and what is not; so for example HCG is mentioned, Clomid isn't. And lots of terms are introduced but never explained

Muscle Boundaries: Safer Injecting: HIT 2014
Smaller booklet to accompany the magazine style resource.

Anabolic Steroids: HIT: Postcard; basic information Date: 2010

Books

William Llewellyn's Anabolics: 10th Edition: Molecular Nutrition LLC: 2011
The most comprehensive book on the subject, and regularly updated. Tries to approach the subject from a neutral and evidence-based approach but the book is clearly for people who are interested in using steroids. Nonetheless an indispensable resource. Same information now on the anabolics.org website.

Human Enhancement Drugs: the emerging challenges to Public Health:
Northwest Public Health Observatory: Liverpool JMU: 2012
Great summary and review of key issues and substances in human enhancement

KFx
Learning of Substance

Needle Exchange Assessment Tool
Performance and Image Drugs

Name:

Date of assessment:

Type of contact: initial ☐ follow up ☐

Is: Planning cycle ☐ About to start cycle ☐
Started cycle ☐ End of cycle ☐

Age: U18 18-21 22-25 26-35 36-45 45+ Gender: Male ☐ Female ☐
Ethnic group: Trans ☐

Anabolic androgenic steroids injected? Yes ☐ No ☐
Specify substances in current cycle

Is injecting other substances: yes ☐ no ☐

Insulin ☐ HCG ☐ Tanning agents ☐ HGH ☐

Other ☐ (Specify)……..

Intramuscular technique discussed :
Yes ☐ no ☐ Has had previous input ☐ Not applicable ☐

Subcutaneous technique discussed:
Yes ☐ no ☐ Has had previous input ☐ Not applicable ☐

Additional injecting risks:

Sharing of any of the following:
Barrels ☐ Needles used for drawing up ☐ Needles used for injecting ☐
Vials or ampoules ☐ Sterile/bacteriostatic water ☐

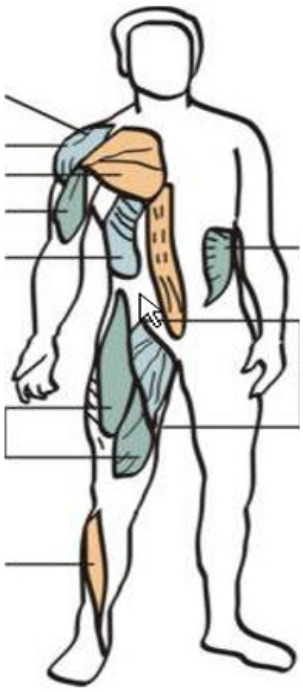
Injected by another/injects others: yes ☐ No ☐
Discussion of legal and health risks

Hepatitis vaccination:
Offered: ☐ Outcome: Action

Disposal advice: ☐ Action:

Interested in full SIDs care plan assessment
Yes: now ☐ Later: ☐ Date set No: ☐
Already care-planned: ☐

Intramuscular sites used:



Site Health:

Action:

Equipment requirements:

(encourage client to return mid-cycle to return equipment, check sites and for fresh equipment)

Barrels	Quantity
One-piece 0.5ml	
One-piece 1ml	
1ml barrels	
2ml barrels	
5ml barrels	

Pins		Quantity			
18G (mixing)					
21G	1.5"				
22G	1.5"		1 1/4"		
23G	1¼"		1"		¾"	
24G	1"				
25G	1"		5/8"		
26G	¾"				
27G	1"		¾"		
30G	1/2"				

Swabs	
Sharps box	
Water	
Condoms	

Other notes/action points

Worker initial