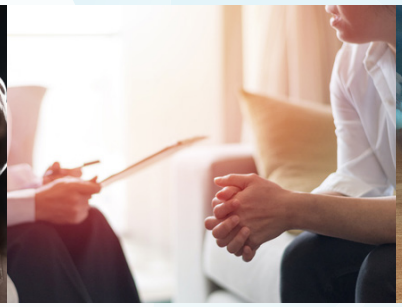
GP guide to harm minimisation for patients using non-prescribed anabolic-androgenic steroids (AAS) and other performance and image enhancing drugs (PIEDs)



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GP Guide to harm minimisation for patients using non-prescribed anabolic-androgenic steroids (AAS) and other performance and image enhancing drugs (PIEDs)

To see the web version of this Guide, visit https://www.snhn.net/steroid-harm-minimisation

The purpose of this Guide is to provide GPs and other health professionals with up-to-date, evidence-informed guidance on how to manage and minimise harm for people who are contemplating, currently using or wanting to stop non-prescribed anabolic-androgenic steroids (AAS) and other performance and image enhancing drugs (PIEDs).

The Guide is based on the best available evidence and draws upon an extensive literature review and the experience and knowledge of health professionals, researchers, and people who use non-prescribed AAS and other PIEDs.

The harm minimisation approach taken in this Guide is in line with the National Drug Strategy (https://www.health.gov.au/resources/collections/national-drug-strategy). It acknowledges the inherent risks of drug use and the range of supports needed to progressively reduce drug-related harm to the user, the community, and families. This approach does not condone the use of illicit drugs.

Acknowledgment

This resource was developed by Dr Katinka van de Ven, Dr Beng Eu, Dr Eva Jackson, Dr Esther Han, Dr Nicole Gouda, Ms Pat Simmonds and Mr Craig Parsons. We would also like to thank all the health professionals and other experts who have been consulted throughout this process.

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Contents

Background ... 3

- What are PIEDs? ... 4
- Common terminologies used by people who use non-prescribed AAS ... 4
- Prevalence of AAS use in Australia ... 5
- Why do people use AAS and other PIEDs? ... 5
- At what age do people start using AAS? ... 5
- What are the routes of administration? ... 5
- Other types of PIEDs and illicit substances used in addition to AAS ... 6
- Common adverse effects of AAS use ... 7

Assessment ... 8

- Consider common reasons for presentation ... 9
- Consider whether the patient may be using non-prescribed AAS or other PIEDs ... 9
- Consider recommended interviewing techniques to ask about AAS and other enhancement drug use ... 9
- History-taking ... 10
- Consider assessing for specific potential adverse effect from PIED use ... 11
- Check for features of dependence ... 11
- Check for withdrawal symptoms following cessation of non-prescribed AAS use ... 12
- Perform a physical examination and mental health assessment ... 12
- Arrange investigations (consider whether a patient is currently using and their type of use) ... 12
- Use motivational interviewing techniques to assess patient's motivation and willingness to change ... 13

Red Flags ... 14

Management tips ... 15

- Patient considering using non-prescribed AAS ... 15
- Patient already using non-prescribed AAS or other PIEDs ... 16
- Patient willing to cease their non-prescribed AAS and other PIED use ... 17
- Patients who are professional/elite athletes ... 17

Referral sources ... 18

Information for health professionals and patients ... 22

Online education: webinars ... 23

Related HealthPathways ... 26

Background

About the non-prescribed use of AAS and other PIEDs

What are PIEDs?

Performance and image enhancing drugs (PIEDs) [1] are drugs used to enhance the appearance of a person and/or to improve their physical capabilities such as strength or endurance.

- The term represents a wide range of substances (see the*other types of PIEDs* section), but the oldest and largest group are non-prescribed anabolic-androgenic steroids (AAS), which have been used since the at least the late 1940s [2].
- The term PIEDs is generally used as people who use non-prescribed AAS commonly use other enhancement substances.
- There are **numerous types of AAS** (e.g. testosterone, boldenone, nandrolone and stanozolol) with different strengths and actions on the body. Exchange Supplies offers an informative poster of the most common AAS and other PIEDs used, including common dosages. The PDF is freely accessible HERE (https://www.exchangesupplies.org/pdf/P097A.pdf).

PIEDs fall under the broader category of **human enhancement drugs (https://humanenhancementdrugs.com/education-and-training/hed-information-pamphlet/) (HEDs)**[3]**.** HEDs may be divided into six categories:

- Muscle drugs (e.g. anabolic-androgenic steroids);
- Weight-loss drugs (e.g. 2,4-Dinitrophenol)
- Hair and skin enhancing drugs (e.g. Melanotan II);
- Sexual enhancers (e.g. sildenafil);
- Cognitive enhancers (e.g. methylphenidate); and
- Mood and behaviour enhancers (e.g. beta blockers).

Muscle enhancers, weight-loss drugs and image enhancing drugs are the three categories commonly referred to as PIEDs, or better known in elite sport as ‘doping substances’.

PIEDs are generally considered a subset of HEDs, as these substances are strongly associated with sport and fitness and tend to include substances that improve sporting performance and/or physical appearance as opposed to for example enhancing cognition.

Common terminologies used by people who use non-prescribed AAS

On and off cycles:

- AAS are mostly used in cycles with a duration between 6 and 18 weeks, termed an 'on cycle'. This is usually followed by a similar period of AAS-free training termed the 'off cycle'.
- The rationale behind this strategy is to gain muscle mass and strength during an on cycle, allowing the body to recover between on cycles. There is limited empirical evidence to support the effectiveness of this approach.

Blast and cruise:

- 'Blast and cruise' is the continuous use of AAS involving a higher dose – the blast – for a set period, followed by a lower dose – the cruise – for a set period.
- This rotation can continue for an extended period (up to several years) and due to the lack of any off-cycle this approach may potentially increase health risks[4] associated with testicular shutdown.

Stacking:

- People who use non-prescribed AAS typically "stack" the drugs, meaning that they are taking 2 or more types of AAS and mix oral and/or injectable types.
- The belief is that different types of AAS interact to work synergistically in addition to complementing the varied half-lives and duration of action of specific AAS. There is no empirical evidence to support the effectiveness of stacking.

Post-cycle therapy (PCT):

- A primary concern of AAS use is its potential to suppress natural testosterone production. In response, some consumers will use other pharmaceutical substances during or after cessation of use of AAS (i.e. off/post cycle) to help restart natural testosterone production (e.g. Tamoxifen and Anastrozole to prevent gynaecomastia).
- There is limited empirical evidence to support the effectiveness of current PCT approaches (https://humanenhancementdrugs.com/wp-content/uploads/Visual-4-A4.pdf) .

Spot injecting:

- The injecting of AAS into smaller muscles. Some people who use non-prescribed AAS will inject it into smaller muscles (typically pectorals, biceps, triceps or calf muscles) as they believe that it makes that particular muscle grow bigger.
- This practice should be discouraged. It is important to explain to a patient that AAS do not cause localised muscle growth and that spot injections can increase the risk of complications.

Prevalence of AAS use in Australia

Population studies indicate that the prevalence of non-medical use of AAS in Australia is relatively low, but is steadily increasing (0.3% in 2001, 0.6% in 2016[5]) There are other indicators that AAS use is rapidly growing: e.g.

- The *Australian Needle Syringe Program survey National Data Report* (https://kirby.unsw.edu.au/report-type/australian-nsp-survey-national-data-report) shows a significant increase in PIEDs as 'last drug injected' in NSW over the period 1995-2019; from 1% to 10%.
- The 2017 *Australian Secondary Students' Alcohol and Drug Survey* (ASSAD) (https://www.health.gov.au/resources/collections/australian-secondary-school-students-alcohol-and-drug-assad-survey-2017) report shows that 2% of secondary school students report using AAS or other enhancement drugs in their lifetime, with 1% reporting use in the past month.

— Why do people use AAS and other PIEDs?

Motivations for using non-prescribed AAS and PIEDs vary but the most common reported reason is for *aesthetic purposes* (changing their body image or for cosmetic purposes)[6].

Other reported motivations are:

- For recreational and competitive bodybuilding.
- To enhance sport performance.
- To enhance occupational performance (e.g. security staff who uses AAS to become stronger).
- Hormone replacement therapy.
- Retaining youthfulness.
- For anti-aging purposes.
- To aid injury pain/anxiety/increase confidence.

— At what age do people start using AAS?

- Between the ages of 20 and 24 years old – use can start as early as 14 years of age (rare).
- Older men (40 and over) who start using non-prescribed AAS for anti-aging purposes[7].

— What are the routes of administration?

AAS can be injected or taken orally (although they are also available in gels, patches and depot injections), depending on the product and it is common to see people using a mixture of both injectable and oral products[8].

Both routes of administration carry risks, either via the injecting process (e.g. infection), or liver dysfunction caused by using oral products.

Injectable AAS are injected intra-muscularly (although there are reports of subcutaneous injections), typically into the gluteus (i.e. buttocks), outer thigh or shoulder.

- Some other PIED, such as human chorionic gonadotrophin and human growth hormone (HGH), are used subcutaneous.

Patient Resources:

- This video (https://www.ipedinfo.co.uk/iped-film-video/) demonstrates the safest techniques for reducing AAS injecting related harm,
- This poster (https://www.exchangesupplies.org/pdf/P113A.pdf) and pamphlet (https://www.exchangesupplies.org/pdf/A47A.pdf) from Exchange Supplies contains information on safe injecting practices.

Other types of PIEDs and illicit substances used in addition to AAS

People who use non-prescribed AAS often use other types of PIEDs and illicit substances to (1) achieve augmented effects, (2) to minimise adverse effects of AAS use, and (3) for recreational purposes[9]. Some commonly used substances are (list not exhaustive) [10]:

Drug	Trade/ other names	Purported reasons for use (by patients) [11]
Tamoxifen	Nolvadex ®	Tamoxifen (oral) is used as an oestrogen blocker. This is used to prevent gynaecomastia (growth of glandular breast tissue in males)
Anastrozole	Arimidex ®	Anastrozole (oral) is used as an oestrogen blocker. This is used to prevent gynaecomastia
Human chorionic gonadotrophin (HCG)	Pregnyl®	HCG (injected) is used to minimise depressive symptoms upon AAS cessation/withdrawal, to improve testosteroneLproduction, to prevent weight-loss, to stop testicular atrophy, and to increase strength.
Clomiphene citrate	Clomid	Clomid (oral) is taken to 'kick start' the endogenous production of testosterone during an 'off cycle', as testosterone production is often shutdown due to high-levels of exogenous AAS.
Human growth hormone (HGH)	Somatropin ®	HGH (injected) is used for its anabolic effects and strength, to burn fat, and for weight loss.
Ephedrine		Ephedrine (oral) is used to increase energy and boost training, and to enhance weight loss
Clenbuterol	Spiropent ®	Clenbuterol (oral), a β2 agonist, is used for its anabolic effects, burning fat properties, removing of skin fluid, and forLweight-loss purposes.
Diuretics	Furosemide Spironolactone	Diuretics (oral and injectable) are used for a variety of reasons, including to treat water retention caused by certain types of AAS; to enhance muscular definition; and, in competitive sport, to mask doping drugs and to drop in weight category.
2,4-DNP	2,4-dinitrophenol	2,4-DNP (oral) is used for fat burning purposes and to reduce weight (DNP is highly toxic even in small doses). DNP isLnot licenced for human consumption.
Melanotan II		Melanotan II (injected) is mainly used as a tanning agent but also used for enhancement of sexual arousal.
Insulin		Insulin (injected) is used for its anabolic effects and strength, to burn fat, and for weight loss purposes.
Selective androgen receptor modulator (SARMs)	Examples: Ostarine (MK-2866) Ligandrol (LGD-4033) Testolone (RAD-140) Andarine (GTx-007, S-4)	SARMs mimic the muscle building effects of AAS (by binding to androgen receptors), with supposedly less side effects than AAS. There is however no empirical evidence to support this claim. The use of SARMS is rare compared to AAS.
Gamma hydroxybutyrate (GHB)		Recreational drug (oral and injectable); used to enhance sleep.

Alcohol		Legal drug (oral); used for better sleep and relaxation.
Stimulants	Common ones: Cocaine Amphetamine	Recreational drug (snorted, insufflation, and injectable); also used to boost training, alertness and psychological wellbeing.
Cannabis	Marijuana Weed	Recreational drug (smoked/oral); also used for relaxation and to manage pain.

See also Exchange Supplies' Guide to steroids + other drugs used to enhance performance and image (https://www.exchangesupplies.org/pdf/P099_2.pdf) which amongst others give an overview of the different types of PIEDs used (incl. peptides).

— Common adverse effects of AAS use

Although the majority of adverse effects may be mild or may go unnoticed by the person using these substances[12], all people who use AAS experience some form of adverse effect (e.g., high cholesterol) and some of these may be long-term (even after stopping).

Note: The adverse effects in bold are well recognised in the literature and probably of serious concern.

Cardiovascular

- **Dyslipidaemia – atherosclerotic disease**
- **Cardiomyopathy**
- Cardiac conduction abnormalities
- Coagulation abnormalities
- Polycythaemia (i.e. Erythrocytosis)
- Hypertension

Hepatic:

- Inflammatory and cholesteric effects
- Peliosis hepatis (rare)
- Neoplasm (rare)

Kidney:

- Renal failure secondary to rhabdomyolysis
- Focal segmental glomerulosclerosis
- Neoplasms (rare)

Neuroendocrine (males):

- **HPT suppression – hypogonadism from AAS withdrawal**
- Decreased spermatogenesis
- Infertility
- Gynaecomastia
- Prostatic hypertrophy
- Virilising effects
- Libido and other sexual function changes

Neuroendocrine (females):

- Amenorrhea
- Changes in the reproductive system
- Development of a more masculine physique; breast tissue atrophy, deepening of voice, coarse skin, and hirsutism (excessive hair growth)

Brain and cognition abnormalities

- Changes in brain volume and cortical thickness
- Reduced cognitive functioning (incl. speed of processing, working memory, problem solving and memory function)
- Neuronal apoptosis – cognitive deficits

Infectious (due to the methods of administration)

- Soft tissue & muscular abscesses
- HIV/Hepatitis risk

Musculoskeletal

- Tendon rupture
- Premature epiphyseal closure (in adolescents, rare)

Dermatologic

- Acne (in some cases severe)
- Striae
- Premature balding

Neuropsychiatric

- **Mood disorders – mania, hypomania and depression**
- Aggression
- Insomnia
- **AAS dependence**

Assessment

Practice point

Explain Confidentiality

A common reason that patients do not disclose their use is because they are worried that the information will be passed on to a third party (e.g. police). It is therefore key to assure the patient of doctor-patient confidentiality.

- Patients can be assured that information regarding the use of AAS and other PIEDs will be kept confidential unless that use is putting the patient's or someone else's life or health in immediate danger.
- Although possession and use of non-prescribed AAS is a criminal offence there is no obligation to report this if a GP becomes aware of it. It is only mandatory to report serious offences (i.e. those that carry a sentence of 5 years or more (e.g. murder, rape, drug trafficking)).
- Insurers can request information in medical records to
    - Gather/confirm information prior to providing insurance.
    - Assess a claim.
    - Ascertain any relevant non-disclosure of information on the part of the patient when purchasing insurance which may make a claim invalid.

1. Consider common reasons for presentation

Consider common reasons for presentation – a patient may present:

- Requesting to be monitored and tested because they have stopped their non-prescribed AAS use (they may or may not be aware of adverse effects from their use).
- Requesting for their testosterone levels to be tested because the patient suspects that their levels are low and wants to discuss the option of hormone replacement therapy, especially in older men.
- Requesting information and advice when already using or when contemplating the use of AAS for non-prescribed reasons, particularly around minimising harms.
- With adverse effects from their non-prescribed AAS use, including related to their injecting practices (e.g. abscess).
- With signs or symptoms of AAS withdrawal (e.g. decreased or absent libido, fatigue and low energy), often related to hypogonadism.
- Presenting with symptoms such as gynaecomastia or severe acne – possibly requesting specific treatments (e.g. tamoxifen or Isotretinoin).

2. Consider whether the patient may be using non-prescribed AAS or other PIEDs

Consider whether the patient may be using non-prescribed AAS or other PIEDs when the patient is:

- A muscular, toned man – particularly if he presents with infertility, loss of libido, erectile dysfunction, low mood, severe acne, or gynaecomastia.
- A muscular, toned woman – particularly if she presents with abnormal menstruation, deepening of voice, clitoral enlargement, or increase growth of body hair (hirsutism).
- Someone whose blood tests show high haemoglobin or other relevant abnormal results, such as high testosterone levels, liver and kidney abnormalities.

Note that not all patients will have evident features of PIED use, for example, older men who will use non-prescribed AAS for anti-aging purposes as opposed to obtaining a muscular physique. It is therefore important to include AAS in general history taking when updating the patient's alcohol and other drug history in the general adult population.

3. Consider recommended interviewing techniques to ask about AAS and other enhancement drug use

How to ask about AAS and other enhancement drug use?

- Avoid asking patients directly if they are using non-prescribed AAS or other PIEDs, as there is the risk that patient will be offended. *Instead ask about this as part of regular assessment/history taking.*

Useful questions:

- As part of a comprehensive assessment a GP could ask:
  - *Do you use or take anything to help with your workouts or muscle gain?; or*
  - *Can you tell me about supplements you are using, including any use of pills, powders or injectables?*
- When asking, a GP could note:
  - *I am asking this because am interested to see if we need to be checking for any other related health issues.*

4. History-taking

History – ask about:

- **Current and past use of non-prescribed PIEDs:**
  - Age of initiation
  - Route of administration
  - Reason for commencement and specific goals;
    - It is important to examine why patients are using and what their relationship is with the substance. There may be underlying issues such as anxiety, depression or lack of body confidence.
  - How long has the patient been using AAS and other PIEDs, what regimen(s) have they used in the past and the duration of the cycles?
  - Current use including duration of cycle and amount.
  - What adverse effects or withdrawal symptoms has the patient experienced during or after a previous cycle of AAS? Particularly check for signs and symptoms that may indicate AAS-induced hypogonadism (see withdrawal section)

- **Relevant personal medical history including co-morbidities, and alcohol and other drug use (see background section)**
  - Comorbidities – check for pre-existing conditions as well as conditions potentially caused by AAS use (list not exhaustive)
    - Cardiovascular disease including high blood pressure or high cholesterol;
    - Reduced kidney function or liver disease (particularly when patients are using oral AAS);
    - Sexual dysfunction: e.g. heightened or reduced libido
    - Psychiatric:
      - Depression or anxiety (particularly when patient stops using AAS)
      - Body dysmorphic (particularly muscle dysmorphia) and eating disorders may also be present (not common). See body dysmorphic disorder checklist below.
      - Psychosis (rare but may occur with prolonged use)
    - Sleeping disturbances (may be caused by disturbances on hypothalamic-pituitary-adrenal axis) – consider using the Sleep Disorders Questionnaire (https://actt.albertadoctors.org/CPGs/Lists/CPGDocumentList/Sleep-Disorders-Questionnaire.pdf) to screen for a sleep disorder
  - Current medications; and
  - Current dietary supplement use.
  - Alcohol and other substance use – people who use AAS may also use other illicit substances like cocaine, cannabis and amphetamines to further enhance training and for relaxation. The use of alcohol and other substances also increases the risk of behaviour and mood disturbances as well as end-organ damage (e.g., heart, liver).
  - In case of suspicion of a body dysmorphic disorder – checklist
    - A person may have a body dysmorphic disorder if they:
      - Have been very concerned about some aspect of their physical appearance;
      - Worry or think a lot about how they look;
      - Believe that they have a physical abnormality or defect that makes them ugly;
      - Frequently look in the mirror, body check or skin pick or avoid mirrors;
      - Engage in excessive grooming and frequent cosmetic procedures, with little to no increased satisfaction;
      - Wear excessive make-up or clothing to conceal perceived flaws;
      - Feel extremely insecure and self-conscious;
      - Avoid social situations and refuse to appear in photographs;
      - Belief that other people take special notice of their appearance in a negative way; and
      - Negatively compare their appearance to others.
    - The RACGP website (https://www.racgp.org.au/afp/2015/november/body-dysmorphic-disorder-in-men/#20) provides useful information on body dysmorphic disorders, including screening questions from dysmorphic concern questionnaire that GPs could use in their assessment:
      - Have you been very concerned about some aspect of your physical appearance?
      - Have you considered yourself misformed or misshapen in some way (e.g., nose, hair, skin, sexual organs, overall body build)?
      - Have you considered your body to be malfunctional in some way (e.g., excessive body odour, flatulence, sweating)?
      - Have you consulted or felt you needed to consult a plastic surgeon, dermatologist or physician about these concerns?
      - Have you been told by others or your doctor that you are normal in spite of you strongly believing that something is wrong with your appearance or bodily functioning?
      - Have you spent a lot of time worrying about a defect in your appearance or bodily functioning?
      - Have you spent a lot of time covering up defects in your appearance or bodily functioning?

- **Family/social history**
  - Family history:
    - Medical history (particularly premature heart disease and prostate cancer[13]);
    - Psychiatric history (particularly check for depression, anxiety and major psychiatric conditions).
  - Social history: e.g. profession, occupation, spare-time activities, relationship status, and checking if the patient wants a family.

— 5. Consider assessing for specific potential adverse effects from PIED use

Although the majority of adverse effects may be mild or may go unnoticed by the person using these substances[14], all people who use AAS experience some form of adverse effect and some of these may be long-term (even after stopping).

Note: The adverse effects in bold are well recognised in the literature and probably of serious concern.

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- Coagulation abnormalities
- Polycythaemia
- Hypertension

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- Inflammatory and cholesteric effects
- Peliosis hepatis (rare)
- Neoplasm (rare)

Kidney:

- Renal failure secondary to rhabdomyolysis
- Focal segmental glomerulosclerosis
- Neoplasms (rare)

Neuroendocrine (males):

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- gynaecomastia
- Prostatic hypertrophy
- Virilising effects
- Libido and other sexual function changes

Neuroendocrine (females):

- Amenorrhea
- Changes in the reproductive system
- Development of a more masculine physique; breast tissue atrophy,Ldeepening of voice, coarse skin, and hirsutism (excessive hair growth)

Infectious

- Soft tissue & muscular abscesses
- HIV/Hepatitis risk

Musculoskeletal

- Tendon rupture
- Premature epiphyseal closure (in adolescents, rare)

Dermatologic

- Acne (in some cases severe)
- Striae
- Premature balding

Neuropsychiatric

- **Mood disorders – mania, hypomania and depression**
- Aggression
- **AAS dependence**
- Neuronal apoptosis – cognitive deficits

— 6. Check for features of dependence

Check for features of dependence. Consider using the *Diagnostic Criteria for Anabolic-Androgenic Steroid Dependence* to assess for dependence.
Dependence is defined as the problematic pattern of non-prescribed AAS use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

- Tolerance, as defined by either of the following:
  - A need for markedly increased amounts of the substance to achieve intoxication or desired effect.
  - Markedly diminished effect with continued use of the same amount of the substance.
- Withdrawal, as manifested by either of the following:
  - A characteristic withdrawal syndrome, characterized for AAS by two or more of the following features: depressed mood, prominent fatigue, insomnia or hypersomnia, decreased appetite, and loss of libido.
  - AAS are used to relieve or avoid withdrawal symptoms.
- Using larger amounts or over a longer period than intended.
- There is a persistent desire or unsuccessful efforts to cut down or control substance use.
- A great deal of time is spent obtaining the substance, using the substance, or recovering from its effects.
- Important social, occupational, or recreational activities are given up or reduced.
- Continued use despite persistent or recurrent physical or psychological problem caused or exacerbated by use.

7. Check for withdrawal symptoms following cessation of non-prescribed AAS use

Check for withdrawal symptoms following cessation of non-prescribed AAS use.

Withdrawal symptoms

- Withdrawal is characterised by psychiatric and neuroendocrine symptoms, with the patient ultimately re-initiating non-prescribed AAS to alleviate or avoid their onset.
- Withdrawal symptoms typically appear upon discontinuation of AAS use due to AAS-induced hypogonadism (deficiency in testosterone), especially if they have used AAS for prolonged periods[15].
    - In some patients these symptoms can also be a result of underlying mental health disorders, such as depression, dependence and/or a body dysmorphic disorder.
- Although hypogonadism may gradually resolve after AAS use is discontinued, in some cases patients will exhibit hypothalamic–pituitary–testicular (HPT) suppression that persists for many months after AAS are discontinued and in some there is the risk that it becomes permanent.
- Common symptoms are:
    - Depressed mood
    - Prominent fatigue
    - Insomnia or hypersomnia
    - Decreased appetite
    - Loss of libido

8. Perform a physical examination and mental health assessment

Physical examination

Conduct a targeted examination based on any signs and symptoms:

- General appearance.
- Height, weight and BMI.
- Chest (gynaecomastia).
- Heart (blood pressure, pulse, signs of heart failure, cardiac murmurs).
- Abdomen/rectal examination (hepatic enlargement, prostatic hypertrophy).
- Urogenital examination (testicular atrophy) and measuring of testes.
- Skin/hair (acne, premature baldness, striae/stretch marks).
- Musculoskeletal (musculoskeletal injuries).

Mental health assessment

Check for:

- Depressed mood or other symptoms of depression.
- Symptoms of anxiety.
- Behavioural changes including aggression.

9. Arrange investigations (consider whether a patient is currently using and their type of use)

- In case a patient is still on an AAS cycle, it is worth checking their hormone levels 6 weeks after they have stopped their cycle.
- In case a patient has halted their use and hormone levels have not returned to normal, check again in 3 and 6 months.
- In case of 'blast and cruise' usage, use should be discourage but if patient is not willing to halt their use do base-line testing and test again 3 and 6 months to monitor adverse effects.

Please note that most people who use AAS will have abnormal results – this however does not mean that there is any (permanent) damage.
Consider investigations on a case by case basis taking into account presenting signs and symptoms, and risk factors (e.g. co-morbidities, use of injectables):

Test	Laboratory abnormalities	Notes
Hormones, incl. a) Testosterone (serum), SHBG (serum), LH (serum), FSH (serum), b) IGF-1 (serum), c) TSH, free T4; PSA (plasma) (men over age 45)	↓ luteinizing hormone (LH) and follicle stimulating hormone (FSH), ↑ testosterone and estradiol (with use of testosterone esters), ↓ testosterone (in individuals using other AAS but not testosterone).	Most useful when someone has stopped using, ideally for at least 3 months, to see how the patient is recovering. Hormone testing is less useful when someone is using as results are likely to be abnormal because of the effect of the AAS
Cholesterol profile (HDL, LDL, Triglycerides)	Non-prescribed AAS use may result in ↑ levels of low-density lipoprotein cholesterol (LDL-C) and ↓ levels of high-density lipoprotein cholesterol (HDL-C). Possible ↑ in total cholesterol. ↑ triglyceride levels.	Upon cessation of AAS use there will be gradual reduction in LDL-C, and ↑ in HDL-C.
Haemoglobin (Hb) and haematocrit	↑ Hb and erythrocyte volume fraction (EVF) levels	This can ↑ risk of thrombus formation.
Urea and electrolytes, and Cystatin-C	↑ creatinine levels	Elevated creatinine levels may indicate kidney injury or reflect ↑ muscle mass as well as rapid breakdown of excess muscle tissue. It can also be a result of over-consuming protein-based supplements. Cystatin C should be considered if the patient has abnormal renal function on initial testing. Not Medicare funded - costs around $50-60.
Liver function tests	↑ creatine kinase (CK), ↑ ALT, AST, alkaline phosphatase, lactate dehydrogenase (LDH), gamma-glutamyl transferase (GGT) and total bilirubin	Hepatic abnormalities may occur, especially with the use of oral forms of AAS. Note that ↑ ALT, AST, and LDH may also be muscular in origin as a result of extensive weightlifting and may not indicate liver disease.
Semen analysis Contact your laboratory for instructions on collecting the optimal semen sample.	↓ sperm count and motility, and abnormal morphology.	Non-prescribed AAS use inherently results in suppression of spermatogenesis. Normalisation of sperm count lags behind normalisation of plasma testosterone concentrations. Therefore, a wait-and-see approach is justified as a first step, that is, semen analysis should not be done within the rst 6 months after stopping AAS. If the sperm count is severely compromised 6 months after last use and the patient denies AAS use in the last months, check gonadotrophin and testosterone levels.
Thyroid function tests	↓ serum levels of total thyroxine (T4). ↑ resin uptake of triiodothyronine (T3) and T4.	Non-prescribed AAS use may result in ↓ levels of thyroxine-binding globulin causing ↓ total serum T4 levels and increased resin uptake of T3 and T4. Not routinely indicated but should be considered if signs or symptoms of thyroid dysfunction, if testes are smaller or if sudden weight changes.
Electrocardiogram (ECG) and/or Echocardiogram	Left ventricular hypertrophy (LVH)	AAS can cause left ventricular hypertrophy.
Sexually transmissible infection/ blood borne virus (STI/BBV) testing	Hepatitis B, Hepatitis C, and HIV. Patients who inject AAS, and particularly if they engage in risky injecting practices or risky sexual behaviours, should be tested for Hepatitis B, Hepatitis C, and HIV.	Consider if high risk behaviour (e.g. regular sexual activity with multiple partners, friend injecting patient) or to follow up vaccination status for Hep-B.

– 10. Use motivational interviewing techniques to assess patient's motivation and willingness to change

Use motivational interviewing techniques (http://www.racgp.org.au/afp/2012/september/motivational-interviewing-techniques/) to assess patient's motivation and willingness to change. Discuss with the patient if they intend to withdraw or continue using.

Red flags

- Use by a young person (<21) – high risk of irreversible complications even with short-term use.
- Comorbidities (e.g., cardiovascular disease, hypertension, hypercholesterolemia, polycythaemia).
- Post-use hypoandrogenism (deficiency in testosterone) which may be persistent.
- Elevated prostate-specific antigen (PSA).
- Liver and kidney abnormalities.
- Features of anabolic-androgenic steroid (AAS) dependence.
- Severe mood disruption (e.g., depression, (hypo)mania, aggression).
- Risky injecting practises or risky sexual behaviours.
- Concurrent alcohol and other drug (AOD) use disorder.
- Patients with a history of bipolar mood disorder or personality disorders.

Management tips

Patient considering using non-prescribed AAS

- **For patients < 21 years of age:**
  - AAS use by young people should be strongly discouraged because of the high risk of irreversible complications including:
    - Stunting of growth
    - Early physical maturation
    - Joint and bone pain
  - Discuss adverse effects that are most likely to have an immediate impact on the young person's appearance or performance,
  - such as severe acne.LExplain that testosterone levels are at their highest during adolescence and early adulthood. A young person therefore should have enough naturalLtestosterone to reach a muscular physique.
  - Discuss alternative ways to improve performance – nutrition or utilizing a certified strength and conditioning coach.

- **For all patients:**
- Educate on potential adverse effects (see page 7 - Common adverse effects of AAS use) of continual use, including infertility, erythrocytosis and dyslipidaemia. Informing a patient about risks may prevent them from starting to use AAS.
- Educate on the risks associated with illicitly produced AAS (e.g. the product may not be sterile or may not contain listed substance, and the amount of AAS mayLbe higher or lower than stated).
- Remind patient that non-prescribed AAS are illegal to possess and use in NSW and that it is illegal to inject others with AAS.
- Provide general advice:
  - Discuss realistic goals of training
  - Discuss training frequency and diet. If these are suboptimal, patients should be encouraged to consult a certified trainer or sports nutritionist beforeLconsidering (further) use of non-prescribed AAS.
- Explore patient's reasoning around use and assess for distorted self-image or muscle dysmorphia (MD).
  - MD is a condition that is characterized by body image disturbances, a drive for muscularity and excessive exercising. In some cases this will lead patient toLstart using AAS.
  - The *Muscle Dysmorphia Disorder Inventory* (https://shareok.org/bitstream/handle/11244/15190/Williams_okstate_0664M_13195.pdf?sequence=1#:~:text=The%20Muscle%20Dysmorphia%20Disorder%20Inventory%20(MDDI)%20is%20a%2013%20question,et%20al.%2C%202004).) (MDDI) may possibly be used to screen for MD.
- Offer regular follow up and medical support in achieving the patient's goals

— Patient already using non-prescribed AAS or other PIEDs

- **For patients < 21 years of age**
  - AAS use by young people should be strongly discouraged because of the high risk of irreversible complications including:
    - Stunting of growth (although rare)
    - Early hormonal and emotional maturation
    - Joint and bone pain
  - Discuss adverse effects that are most likely to have an immediate impact on the young person's appearance or performance, such as severe acne.
  - Explain that testosterone levels are at their highest during adolescence and early adulthood. A young person therefore should have enough natural testosterone to reach a muscular physique.
- Discuss alternative ways to improve performance – nutrition or utilizing a certified strength and conditioning coach.
- Consider referral to suitable support program such as Sydney Drug Education & Counselling Centre (SDECC) (https://sdecc.org.au/).

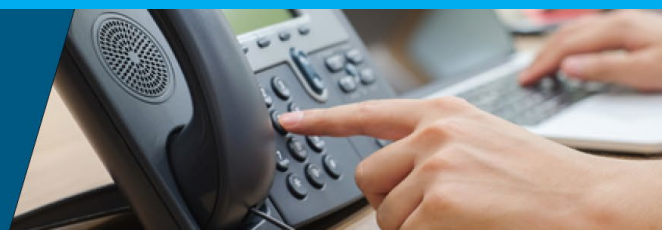
- **For all patients**
- Ask the patient if they have ever reflected on the possible health consequences of their use, now and in the future and educate on specific risks of adverse effects (https://www.snhn.net/steroid-harm-minimisation/background/#1605228935084-1f50c186-7110).
  - PIED-using patients often do not tend to consider long-term impacts of AAS use. It is therefore important to discuss aspects such as reduced fertility (which may take 1 to 2 years to normalize after discontinuation), erythrocytosis, and dyslipidaemia (and the impact this has on the heart).
  - Make sure to discuss this in an honest, non-judgemental, non-stigmatising (https://www.nada.org.au/resources/language-matters/), and non-exaggerating way.
- Warn against mixing AAS with other illicit substances, particularly;
  - Using stimulants (e.g. cocaine) while using AAS as it can increase feelings of aggression, make it more likely for a person to get out of control, may increase the risk of heart disease, and may cause disturbed sleep patterns which may hinder muscle growth.
  - Drinking alcohol and using oral AAS – as this can increase the risk of liver toxicity.
- Other advice that can be provided:
  - Discuss training frequency, getting adequate rest, and diet. If these are suboptimal, patients should be encouraged to consult a certified trainer or sports nutritionist before considering further use of non-prescribed AAS.
  - If patient is not willing to stop using – recommend reducing amounts or frequency of use.
  - Always use sterile injecting equipment and know how to inject; not only important to reduce risk of BBVs but also other injection-related harms (e.g. abscesses). Consider referral to a needle and syringe program (https://www.rushnsp.org.au/) for equipment, advice on safer injection practices and information on blood-borne virus (BBV) and other injection related risks (e.g. skin infections).
  - The quality and safety of black market AAS is unreliable. Seek help immediately if you experience adverse effects.
- Arrange regular follow up and regular investigations (during and after an AAS cycle) to monitor for emerging adverse effects from AAS use.
- Address specific medical issues (list not exhaustive)[16]:
  - Do not prescribe testosterone unless there is a medical indication.
  - Treat dyslipidaemia according to relevant guidelines.
  - Consider PDE5s for erectile dysfunction.
  - Discuss PrEP and safe sex in case of men who have sex with men (MSM)
  - Gynaecomastia:
    - Consider prescribing Tamoxifen – off-label use and not covered under the Pharmaceutical Benefits Scheme.
    - If pharmacological treatment is ineffective, refer to plastic or breast surgeon
  - Liver dysfunction, kidney injury, or established cardiovascular disease:
    - Encourage immediate discontinuation of non-prescribed AAS use.
    - Treat as per relevant guidelines and refer to the relevant specialty (e.g., hepatology, renal medicine, and cardiology).
  - Mental health problems:
    - Encourage cessation of AAS use.
    - If patient meets criteria for a body dysmorphic disorder refer to appropriate mental health specialist such as the Butterfly Foundation (https://butterfly.org.au/).

— Patient willing to cease their non-prescribed AAS and other PIED use

- Be positive, non-judgemental, non-stigmatising (https://www.nada.org.au/resources/language-matters/), and support the patient's capacity to change their non-prescribed AAS use.
- Provide information about potential withdrawal symptoms (see assessment section).
    - Make the patient aware that they will need to be able to endure a period of weeks or several months with symptoms of testosterone deficiency (see withdrawal section for common symptoms).
- Patients should be made aware that successful stopping is only possible if the patient can accept a loss in muscle mass and strength.
- Continued encouragement and monitoring of psychiatric and physiological complications are recommended to ensure underlying issues are addressed and to reduce the likelihood that the patient will return to using non-prescribed AAS.
- Address specific medical issues (list not exhaustive)[17]:
    - Hypogonadism:
        - Refer to the relevant specialty for treatment (e.g., endocrinology, fertility clinic) – A short treatment (<1 year) with clomiphene or Human Chorionic Gonadotropin (HCG) may be useful for men with suppressed gonadotropins and spermatogenesis resulting from AAS use.
        - If testosterone levels remain unequivocally low and other causes of hypogonadism have been excluded, testosterone substitution (https://www.mja.com.au/journal/2016/205/5/endocrine-society-australia-position-statement-male-hypogonadism-part-2) may be considered in the patient who has no desire to have children. It is recommended to do this in consultation with an endocrinologist.
    - Gynaecomastia:
        - Consider prescribing Tamoxifen – off-label use and not covered under the Pharmaceutical Benefits Scheme.
        - If pharmacological treatment is ineffective, refer to plastic or breast surgeon
    - Liver dysfunction, kidney injury, or established cardiovascular disease:
        - Encourage immediate discontinuation of non-prescribed AAS use.
        - Treat as per relevant guidelines and refer to the relevant specialty (e.g., hepatology, renal medicine, and cardiology).
    - Mental health problems:
        - Encourage cessation of AAS use
        - Offer referral to mental health professional as appropriate under a **GP Mental Health Treatment Plan (https://sydneynorth.communityhealthpathways.org/200563.htm)**
- Plan follow-up appointments in 2-4 weeks (depending on the issues at hand) to ensure support is in place once the patient has fully stopped using.
- If indicated, discuss referral options (see referral section).

— Patients who are professional/elite athletes

- GPs and other health professionals who treat professional athletes need to have a basic understanding of the anti-doping rules.
- Any GP that prescribes a prohibited substance, even inadvertently, can be subject to an anti-doping rule violation (ADRV).
- Therapeutic Use Exemptions (TUEs) are required for medical indications and treatment. For the elite athlete who has been sanctioned for the unapproved use of AAS or other doping substance, the management is generally straightforward – the athlete must discontinue using the banned substance.
- Sport Integrity Australia offers a course for medical practitioners that covers; (1) the role of athlete support personnel in anti-doping, (2) The World Anti-Doping Code, (3) Anti-Doping Rule Violations, (4) Penalties, (5) How your actions can result in an athlete being sanctioned, (6) Common Treatments for athletes, (7) Medications and Supplements, including Therapeutic Use Exemptions (TUEs). The *Medical Practitioner & Athlete Support Personnel Course* can be freely accessed HERE (https://elearning.sportintegrity.gov.au/course/index.php?categoryid=12).



Referral sources

PIEDs advice for GPs

Northern Sydney Local Health District (NSLHD) Drug and Alcohol Service

Contact the addiction specialists for advice during business hours 8:30am – 5:00pm Monday to Friday. Ph 1300 889 788

- Option 1 – outpatient services
- Option 2 – inpatient services
- Option 3 – opioid treatment program
- ***Option 4 – advice for medical professionals and all other enquiries***

After hours and on weekends the calls will go through to the Drug and Alcohol Specialist Advisory Service (DASAS).

Drug and Alcohol Specialist Advisory Service (DASAS)

A free phone advice service for health professionals on the clinical diagnosis and management of patients with alcohol and other drug related problems. For advice, contact the service via (02) 9361-8006.
For more information visit the website (https://www.svhs.org.au/our-services/list-of-services/alcohol-drug-service/drug-alcohol-specialist-advisory-service).

Dr Beng Eu, PIEDs/AAS Guide Expert Panel Member

Dr. Beng Eu is available to provide advice to GPs regarding patients using AAS.

He is a GP and co-director of Prahran Market Clinic, Melbourne and has provided health advice to people using AAS for the last 25 years.

His work in general practice has a focus on LGBT health, sexual health, sports medicine and HIV medicine.
Beng receives referrals through the steroid education program 'Your Community Health' in Victoria, has been involved in AAS education for GPs, and is involved in research in this eld. He appeared in the 2018 SBS Insight program` 'Sizing Up Steroids' (https://www.sbs.com.au/ondemand/video/1243915331563/insight-s2018-ep18-sizing-up-steroids).

Contact details: beng@prahranmarketclinic.com

Patient advice on safer injecting

Needle and Syringe Program – Responsive User Service in Health (RUSH) – North Shore – St Leonards

Royal North Shore Hospital (RNSH) Community Health Centre
2C Herbert Street, St Leonards 2065 NSW. Phone (02) 9462-9040

Provides clean injecting equipment, advice on safer injecting, disposal for used sharps, and information and referrals for counselling, medical care, legal, and other social services.

Hours: Monday, Tuesday, Wednesday and Friday 9:00 am to 5:00 pm (days and time subject to change, call prior to check opening times).

Needle and Syringe Program Website (https://www.rushnsp.org.au/)

Needle and Syringe Program – Responsive User Service in Health (RUSH) – North Shore – Brookvale

Brookvale Community Health Centre, 612-624 Pittwater Road, Brookvale 2100 NSW.
Phone (02) 9388 5110

Provides clean injecting equipment, advice on safer injecting, disposal for used sharps, and information and referrals for counselling, medical care, legal, and other social services.

Hours: Monday, Tuesday, Wednesday and Friday, 9:00 am to 5:00 pm
Needle and Syringe Program Website (https://www.rushnsp.org.au/)

Sydney North HealthPathways

HealthPathways is designed and written for GP use during a consultation and is accessible by all healthcare clinicians in the SNHN region.

Website: https://sydneynorth.communityhealthpathways.org/

Username: healthpathways Password: gateway

For more information, contact **healthpathways@snhn.org.au**

For out-of-area clinicians, contact your Primary Health Network (PHN) for access to your local HealthPathways site. Visit the website here (https://www1.health.gov.au/internet/main/publishing.nsf/Content/PHN-Contacts) for contact details for all PHNs in Australia.

Alcohol and other drugs – adults

Drug and Alcohol Treatment Referral – SNHN HealthPathways https://sydneynorth.communityhealthpathways.org/42814.htm

Drug and Alcohol Support – SNHN HealthPathways https://sydneynorth.communityhealthpathways.org/140774.htm

Dr Esther Han – PIEDs/AAS Guide Expert Panel Member:

- **GP, Drug & Alcohol Staff Specialist,Clinical Lecturer in the Discipline of Addiction Medicine, the Northern Clinical School, the Faculty of Medicine and Health, The University of Sydney.**
- Dr Esther Han has provided health advice to people using PIEDs both in GP and specialist settings. She is a big believer in motivational interviewing and harm minimisation and incorporates both of these elements into her practice.
- **Dee Why Medical Centre**, Shop A, 1-5 Dee Why Pde, Dee Why NSW 2099. Ph (02) 9981 3111.
- **NSLHD Drug and Alcohol Service** Level 1, Royal North Shore Community Health Centre, 2C Herbert St, St Leonards, NSW 2065. Ph (02) 9462 9199. See website here (https://www.nslhd.health.nsw.gov.au/Services/Directory/Pages/DrugAlcoholLNS.aspx).

Alcohol and other drugs – youth

SDECC – Sydney Drug Education & Counselling Centre https://sdecc.org.au/

DAYSS – Drug & Alcohol Youth Support Service https://www.catholiccaredbb.org.au/wp-content/uploads/DAYSS-Drug-Alcohol-Youth-Services.pdf

Eating disorders

Eating Disorders Specialised Review – SNHN HealthPathways

https://sydneynorth.communityhealthpathways.org/23304.htm

Hormone specialists

Non-urgent Endocrinology Review – SNHN HealthPathways

https://sydneynorth.communityhealthpathways.org/102077.htm

Mental health services – adults

Mental Health Services – SNHN HealthPathways

https://sydneynorth.communityhealthpathways.org/62063.htm

Mental health services – youth

Child and Youth Mental Health Counselling – SNHN HealthPathways https://sydneynorth.communityhealthpathways.org/168836.htm

CYMHS – Child and Youth Mental Health Service https://www.nslhd.health.nsw.gov.au/CYFH/TS/Pages/CYMHS.aspx

Psychiatry support line for GPs

Free specialist mental health advice for general practitioners, to support mental health management in primary care. Provided by ProCare Mental Health Services, and available Monday to Friday, 9.00 am to 5.00 pm.

To contact, phone 1800-16-17-18.

For more information visit the website. (https://www.gpsupport.org.au/)

Sexual health services

Sexual Health Review – SNHN HealthPathways

https://sydneynorth.communityhealthpathways.org/108275.htm

Dr Eva Jackson – PIEDs/AAS Guide Expert Panel Member

Sexual Health Physician, Head of Department, Sexual Health, Nepean Hospital, NBMLHD.

Private Practice: Doctor Eva (Penrith) and The Male Clinic (Macquarie University Hospital).

Eva is a generalist Sexual Health Physician with experience in HIV, BBVs, STIs, male and female sexual dysfunction, genital dermatology, transgender medicine and harm minimisation. In her work with Needle & Syringe Programs she gained extensive experience seeing men who use AAS and continues to consider and lobby for research for the best harm minimization approach and withdrawal treatment for this growing problem in Australia.

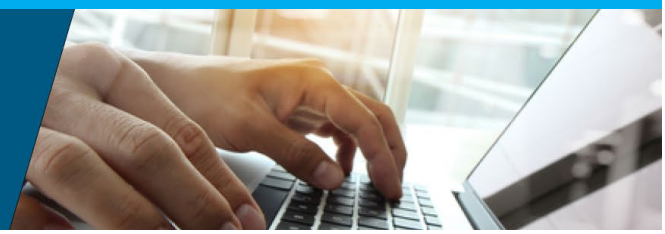
Macquarie University Hospital 2 Technology Place, Macquarie University 2109, Ph 1300 002 111

Private Practice eva@doctoreva.com.au 1 Hope St, Penrith 2750, Ph 0448 373 829

Nepean Hospital eva.jackson@health.nsw.gov.au Ph (02) 4734 2507

Suicide prevention support services

COVID-19 note – The Northern Sydney region has experienced a number of youth suicide attempts and deaths over the past months – see the NSLHD Suicide Prevention Services Guide (https://sydneynorthhealthnetwork.org.au/wp-content/uploads/2019/10/Mental-Health-Services-brochure_-October19.pdf).



Information for health professionals and patient

For health professionals:

- Endocrine Society of Australia (ESA) (2013) has published a Position Statement: Use and Misuse of Androgens (http://www.endocrinesociety.org.au/position-statement-androgens.asp) which gives an overview of androgen deficiency and when hormone replacement therapy is justified.
- The *Diagnostic Criteria for Anabolic-Androgenic Steroid Dependence* (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2696068/) to assess for dependence.
- Exchange Supplies'*Pocket guide to Steroids* (https://www.exchangesupplies.org/pdf/P097A.pdf) is a resource for patients to take home.
- Human Enhancement Drugs Information Pamphlet (https://humanenhancementdrugs.com/wp-content/uploads/Poster-HED-02-03-2020-Engels.pdf) gives an overview of the different types of enhancement drugs used.
- Sports Integrity Australia (https://www.sportintegrity.gov.au/) provides information to medical professionals who treat professional athletes.
- Exchange Supplies' Guide to steroids + other drugs used to enhance performance and image (https://www.exchangesupplies.org/pdf/P099_2.pdf) gives easy access to factual information on building muscle through diet and training, the drugs that are used to assist, how they work, how they are taken, the risks and dangers and what we know about reducing the risks.
- Exchange Supplies' pamphlet on side effects and risks, and injecting practices (https://www.exchangesupplies.org/pdf/A47A.pdf) and poster on injecting (https://www.exchangesupplies.org/pdf/P113A.pdf).
- IPEDInfo has developed a video on injecting practices and reducing injecting related harms (https://www.ipedinfo.co.uk/iped-film-video/) which is freely available for patients.
- The Network of Alcohol and other Drugs Agencies' (NADA)*Language Matters* (https://www.nada.org.au/resources/language-matters/) resource provides health professionals with best-practice guidelines on how to use language to empower clients and reinforce a person-centred approach.
- The National Drug Strategy 2017-2026 (https://www.health.gov.au/sites/default/files/national-drug-strategy-2017-2026_1.pdf) is a national framework for building safe, healthy and resilient Australian communities through preventing and minimising alcohol, tobacco and other drug related health, social and economic harms among individuals, families and communities.

For patients:

- Exchange Supplies'*Pocket guide to Steroids* (https://www.exchangesupplies.org/pdf/P097A.pdf) is a resource for patients to take home.
- Exchange Supplies' resource on side effects and risks, and injecting practices (https://www.exchangesupplies.org/pdf/A47A.pdf).
- Exchange Supplies' Guide to steroids + other drugs used to enhance performance and image (https://www.exchangesupplies.org/pdf/P099_2.pdf) gives easy access to factual information on building muscleLthrough diet and training, the drugs that are used to assist, how they work, how they are taken, the risks and dangers and what we know about reducing the risks.
- IPEDInfo has developed a video on injecting practices and reducing injecting related harms (https://www.ipedinfo.co.uk/iped-film-video/) which is freely available for patients.

Online education: webinars

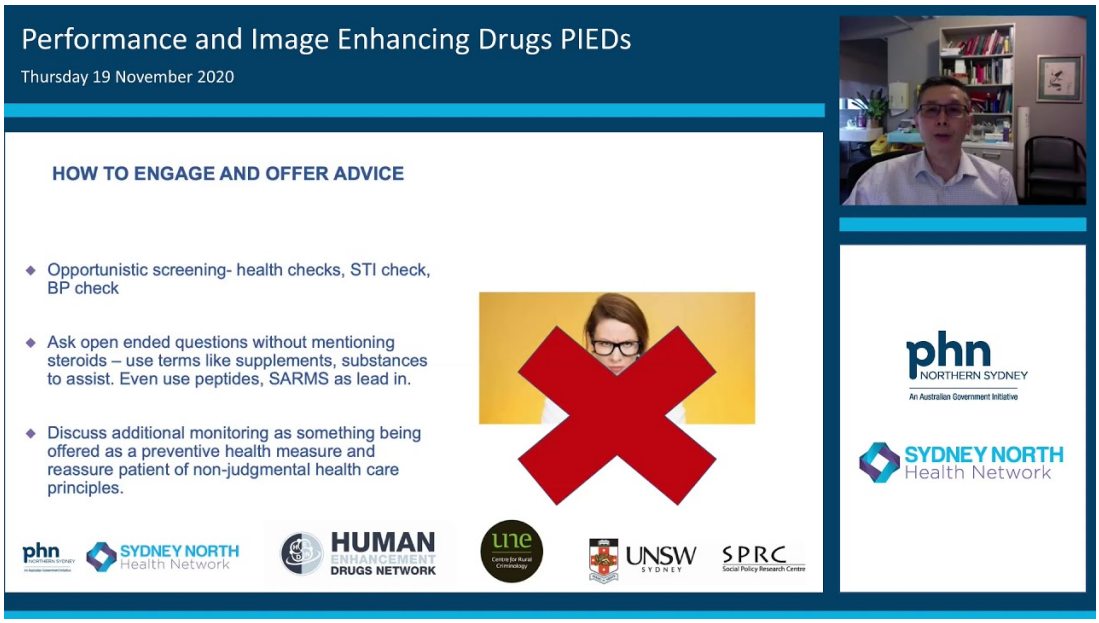
Introduction to Performance and Image Enhancing Drugs (PIEDs) (11mins)

Prevalence, what, why and how

Presenter: Dr Katinka van de Ven

(https://youtu.be/4UZ26I2pYOc)

View slides here (https://www.snhn.net/wp-content/uploads/2020/12/PIEDs-Webinar-Introduction-to-PIEDs.pdf)



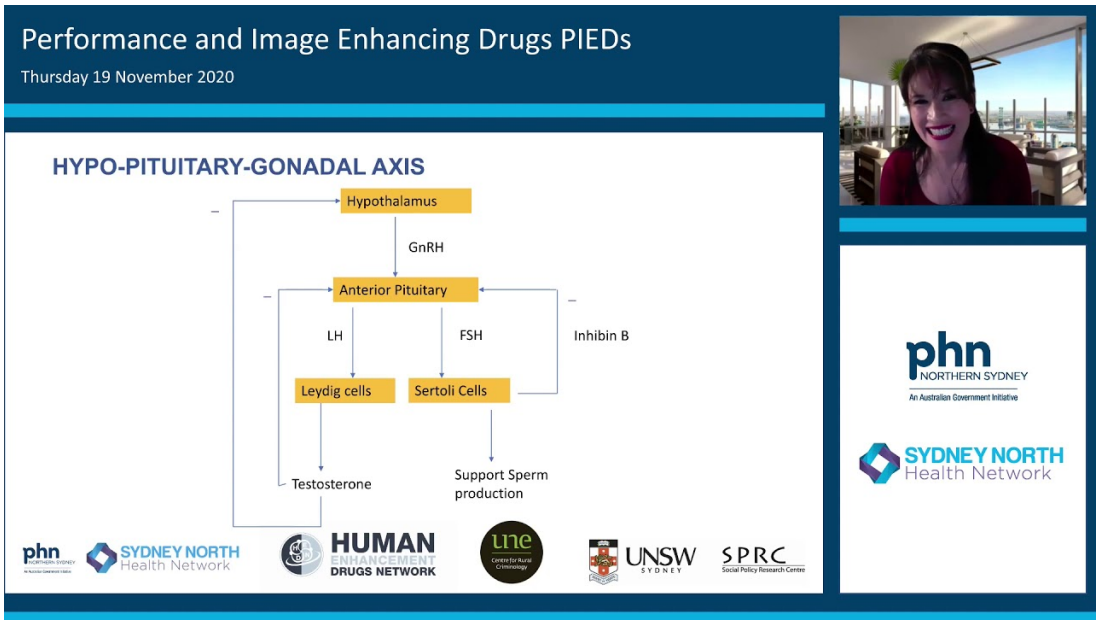
How to identify non-prescribed Anabolic-Androgenic Steroid (AAS) use (16mins)

Red flags, screening and assessment

Presenter: Dr Beng Eu

(https://youtu.be/ysIOMNXNaVQ)

View slides here (https://www.snhn.net/wp-content/uploads/2020/12/PIEDs-Webinar-Introduction-to-PIEDs.pdf)



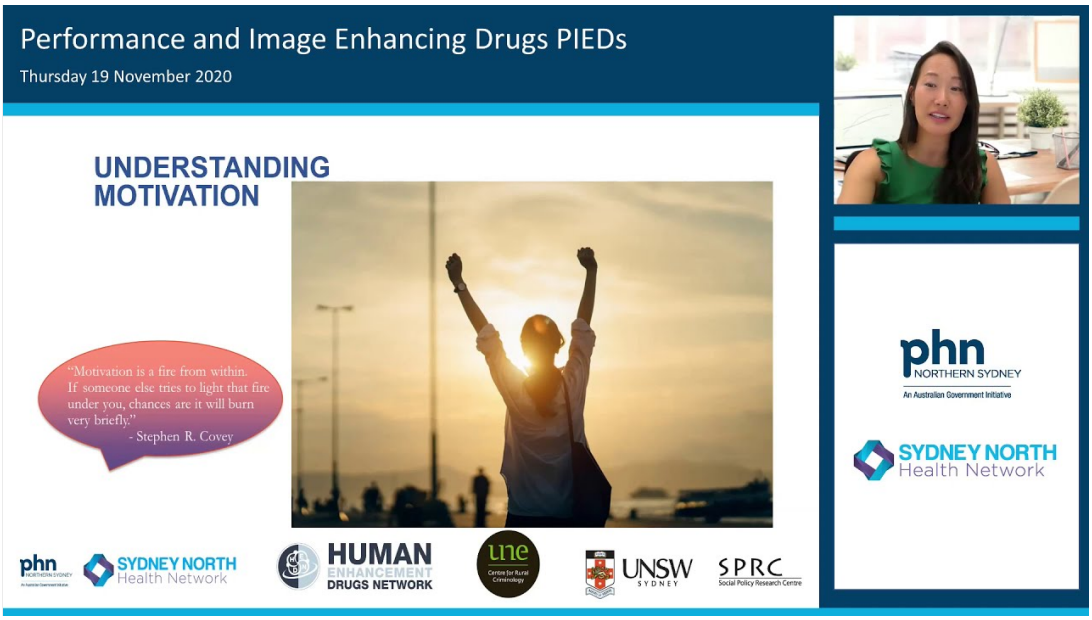
How to manage non-prescribed Anabolic-Androgenic Steroid (AAS) use (21mins)

Adverse effects and managing withdrawal

Presenter: Dr Eva Jackson

(https://youtu.be/ePtwwLB-UQY)

View slides here (https://www.snhn.net/wp-content/uploads/2020/12/PIEDs-Webinar-Adverse-Effects-and-Managing-Withdrawal.pdf)



PIEDs: managing a patient who is not yet ready to stop (15mins)

Engaging the pre-contemplative patient and minimising harms

Presenter: Dr Esther Han

(https://youtu.be/vESFBonsENY)

View slides here (https://www.snhn.net/wp-content/uploads/2020/12/PIEDs-Webinar-Pt-who-does-not-want-to-stop.pdf)

Related HealthPathways

List of HealthPathways related to PIEDs

Addiction and Drug Misuse

- Alcohol (https://sydneynorth.communityhealthpathways.org/16539.htm)
- Benzodiazepines (https://sydneynorth.communityhealthpathways.org/110568.htm)
- Cannabis (https://sydneynorth.communityhealthpathways.org/89864.htm)
- Codeine – Chronic Use and Deprescribing (https://sydneynorth.communityhealthpathways.org/454605.htm)
- Drug Seekers (https://sydneynorth.communityhealthpathways.org/45568.htm)
- Methamphetamine (Ice) (https://sydneynorth.communityhealthpathways.org/192335.htm)
- Opioids (https://sydneynorth.communityhealthpathways.org/108588.htm)
- Opioid Treatment Program (OTP) (https://sydneynorth.communityhealthpathways.org/35484.htm)
- Problem Gambling (https://sydneynorth.communityhealthpathways.org/87644.htm)

Addiction and Drug Misuse Requests

- Drug and Alcohol Treatment (https://sydneynorth.communityhealthpathways.org/42814.htm)
- Drug and Alcohol Support (https://sydneynorth.communityhealthpathways.org/140774.htm)
- Drug and Alcohol Advice (https://sydneynorth.communityhealthpathways.org/362153.htm)
- Problem Gambling Counselling (https://sydneynorth.communityhealthpathways.org/101134.htm)

Mental Health

- Anxiety in Adults (https://sydneynorth.communityhealthpathways.org/50595.htm)
- Depression in Adults (https://sydneynorth.communityhealthpathways.org/48351.htm)
- GP Mental Health Treatment Plan (https://sydneynorth.communityhealthpathways.org/200563.htm)

Sexual Health Requests

- Sexual Health Review (https://sydneynorth.communityhealthpathways.org/108275.htm)
- HIV Support (https://sydneynorth.communityhealthpathways.org/107366.htm)

Eating Disorders

- Eating Disorders (https://sydneynorth.communityhealthpathways.org/47956.htm)
- Eating Disorders Specialised Review (https://sydneynorth.communityhealthpathways.org/23304.htm)

HealthPathways is designed and written for GP use during a consultation and is accessible by all healthcare clinicians in the SNHN region.

Username: healthpathways Password: gateway

For more information, contact **healthpathways@snhn.org.au**

For out-of-area clinicians, contact your Primary Health Network (PHN) for access to your local HealthPathways site. Visit the website here (https://www1.health.gov.au/internet/main/publishing.nsf/Content/PHN-Contacts) for contact details for all PHNs in Australia.

Contributors

Centre for Rural Criminology

HUMAN ENHANCEMENT DRUGS NETWORK

UNSW SYDNEY

SPRC Social Policy Research Centre

phn NORTHERN SYDNEY
An Australian Government Initiative

SYDNEY NORTH Health Network

Footnotes

[1] In the UK the term IPEDs (image and performance enhancing drugs) is preferred as most people use these substances for image enhancement and not performance enhancement.

[2] Sagoe, D., Molde, H., Andreassen, C.S., Torsheim, T., & Pallesen, S. (2014). The global epidemiology of anabolic-androgenic steroid use: a meta-analysis and meta-regression analysis. Annals of Epidemiology, 24 (5), 383-398.

[3] Evans-Brown, M.J., McVeigh, J., Perkins, C., & Bellis, M.A. (2012). Human enhancement drugs. The emerging challenges to public health. Liverpool: Liverpool John Moores University; Van de Ven, K., Mulrooney, K.J.D., & McVeigh, J. (2019). Human Enhancement Drugs. UK: Routledge. ISBN: 978-1-13-855279-1

[4] Rowe, R., Berger, I., & Copeland, J. (2017). "No pain, no gainz"? Performance and image-enhancing drugs, health effects and information seeking. Drugs: Education, Prevention and Policy, 24(5), 400-408.

[5] AIHW. (2017). National Drug Strategy Household Survey 2016. Retrieved from Canberra, Australia: https://www.aihw.gov.au/reports/illicit-use-of-drugs/2016-ndshs-detailed/contents/table-of-contents

[6] Santos, G. H., & Coomber, R. (2017). The risk environment of anabolic–androgenic steroid users in the UK: Examining motivations, practices and accounts of use. International Journal of Drug Policy, 40, 35-43; Begley, E., McVeigh, J., & Hope, V. (2017). Image and Performance Enhancing Drugs: 2016 National Survey Results. UK: IPEDInfo.

[7] Begley, E., McVeigh, J., & Hope, V. (2017). Image and Performance Enhancing Drugs: 2016 National Survey Results. UK: IPEDInfo, UK.

[8] Van de Ven, K., Zahnow, R. McVeigh, J., & Winstock, A. (2020). The modes of administration of anabolic-androgenic steroid (AAS) users: are non-injecting users an overlooked population in health services? Drugs: Education, Prevention and Policy, 27 (2), 131-135.

[9] Zahnow, R., McVeigh, J., Bates, G., & Winstock, A. R. (2020). Motives and Correlates of Anabolic-Androgenic Steroid Use with Stimulant Polypharmacy. Contemporary Drug Problems, 47(2), 118-135. doi:10.1177/0091450920919456

[10] Sagoe et al (2015). Polypharmacy among anabolic-androgenic steroid users: a descriptive metasynthesis. Substance Abuse Treatment, Prevention, and Policy, 10(1), 12.

[11] These are reasons reported by people who use non-prescribed PIEDs for using these substances. However, in some cases there is no to little empirical evidence that these substances act in this way when used.

[12] De Ronde, W., & Smit, D.L. (2020). Anabolic androgenic steroid abuse in young males. Endocrine connections, 9(4), 102-11; Pope, H.G., Jr., Wood, R.I., Rogol, A., Nyberg, F., Bowers, L., & Bhasin, S. (2014). Adverse health consequences of performance-enhancing drugs: an Endocrine Society scientific statement. Endocrine Reviews, 35(3), 341-375; Kanayama, G., Brower, K.J., Wood, R.I., Hudson, J.I., & Pope Jr, H.G. (2009). Anabolic–androgenic steroid dependence: an emerging disorder. Addiction, 104(12), 1966-1978; Bjørnebekk, A. et al (2019). Cognitive performance and structural brain correlates in long-term anabolic-androgenic steroid exposed and non-exposed weightlifters. Neuropsychology, 33(4), 547-559.

[13] There is little evidence that AAS increases the risk of prostate cancer, but testosterone may stimulate prostate cancer growth.

[14] De Ronde, W., & Smit, D.L. (2020). Anabolic androgenic steroid abuse in young males. Endocrine connections, 9(4), 102-11; Pope, H.G., Jr., Wood, R.I., Rogol, A., Nyberg, F., Bowers, L., & Bhasin, S. (2014). Adverse health consequences of performance-enhancing drugs: an Endocrine Society scientific statement. Endocrine Reviews, 35(3), 341-375; Kanayama, G., Brower, K.J., Wood, R.I., Hudson, J.I., & Pope Jr, H.G. (2009). Anabolic–androgenic steroid dependence: an emerging disorder. Addiction, 104(12), 1966-1978.

[15] De Souza G. L., & Hallak J. (2011). Anabolic steroids and male infertility: a comprehensive review. BJU International, 108, 1860–5.

[16] See Bates et al (2019). Treatments for people who use anabolic androgenic steroids: a scoping review. Harm Reduction Journal, 16, 75 for more information on treatment for people who use non-prescribed AAS.

[17] See Bates et al (2019). Treatments for people who use anabolic androgenic steroids: a scoping review. Harm Reduction Journal, 16, 75 for more information on treatment for people who use non-prescribed AAS.