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HSC Public Health Agency
Project supported by the PHA


Understanding the Use of Performance and Image-Enhancing Drugs



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Housekeeping


- Breaks
- Microphones
- Internet connections
- Confidentiality
- Questions/comments



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Housekeeping

- Breaks
- Toilets and exits
- Fire drills
- Mobile phones
- Confidentiality



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Course Objectives

By the end of today, you will be able to:

- Describe various performance and image-enhancing drugs (PIEDs)
- Describe the various populations who might engage in PIED use
- Explain the risks associated with PIED use
- Identify approaches to working with people using PIEDs
- Identify relevant sources of support



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1 Introduction

What are performance and image-enhancing drugs?

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QUIZ



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Performance- and image-enhancing drugs (PIEDs) are substances used to improve or change a person's physical appearance, and/or increase their strength and sporting prowess.

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European Monitoring Centre for Drugs and Drug Addiction

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What Are PIEDs?




- Muscle and strength-enhancing drugs
- Weight loss drugs and “cutting agents”
- Drugs to enhance skin appearance

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PIEDs: Common Terminology


- Anabolic androgenic steroids (AAS): gear, stack, roids, juice
- Patterns of AAS use: cycling, stacking, running
 - AAS are typically used for defined periods (e.g. 8 weeks) with breaks in between
 - Stacking: using multiple substances at once
- Using without breaks (e.g. periods of higher dosing followed by lower doses): blasting and cruising
- Gaining weight: bulking
- Losing weight: cutting



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What Are PIEDs: Anabolic Androgenic Steroids (AAS)


- Anabolic = muscle-building (through enhanced protein synthesis)
- Androgenic = masculinizing/supporting development of secondary male characteristics (e.g. deeper voice, body hair growth)
- All AAS are synthetic derivatives of testosterone (and related hormones dihydrotestosterone and nandrolone)




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What Are PIEDs: Anabolic Androgenic Steroids (AAS)

- Testosterone is the primary male sex hormone
 - Muscle-building
 - Primary and secondary male sex characteristics
 - Differences in natural testosterone production in males vs. females
 - Adult male: 2.5-11mg/day
 - Adult female: 0.25mg/day



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How Do Steroids **Work?**

National Geographic - "The Science of Steroids"; <https://www.youtube.com/watch?v=klQaWO0yo7s>

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What Are PIEDs: Anabolic Androgenic Steroids (AAS)

- When people talk about the effects of steroids, they'll refer to how:
 - Anabolic they are (desirable)
 - Androgenic they are (undesirable)
 - Oestrogenic they are, or how it aromatises (undesirable)
 - Aromatisation refers to the conversion of testosterone to oestrogen
 - Oestrogenic side effects include water retention, body fat gain, and gynecomastia



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Methenolone ["Primo"]

Fluoxymesterone ("Halo")


Oxandrolone (Anavar)

Oxymetholone (Anadrol)

Nandrolone ("Deca"; "NPP")

Methandrostenolone ("Dbol")

Commonly Used Anabolic Androgenic Steroids



Drostanolone Propionate ("Mast")

Trenbolone ("Tren")

Stanozolol ("Winnny")

Boldenone ("EQ")

Testosterone esters

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AAS: Testosterone Esters

<p>Overall Effects</p> <ul style="list-style-type: none"> E.g. acetate, propionate, enanthate, cypionate, phenylpropionate, decanoate Highly anabolic and androgenic, moderately oestrogenic Available separately or in blends (e.g. Sustanon – test prop + test p + test iso + test deca) Most "basic"/"all-purpose" compound 	<p>Who Uses It?</p> <ul style="list-style-type: none"> Most people using steroids will use test either alone or as a "base" for a cycle Tested athletes tend to use cautiously as detection time is 3 months 	<p>Common Dosages</p> <ul style="list-style-type: none"> Men: 50-150mg/week for TRT; approx. 500+mg/week for steroid cycle Women: 2-4 mg week for TRT; 10-20 mg/week for steroid cycle Typically used for 8-16 weeks
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AAS: Boldenone (Equipose/"EQ")


<p>Overall Effects</p> <ul style="list-style-type: none"> Highly anabolic, moderately androgenic, mildly oestrogenic Good for strength and muscle mass with minimal water bloat 	<p>Who Uses It?</p> <ul style="list-style-type: none"> People wanting to gain quality mass with minimal bloat People who are cutting and want to retain muscle mass Untested strength/performance athletes Less likely to be used by tested athletes due to long detection time (5 months) 	<p>Common Dosages</p> <ul style="list-style-type: none"> Men: 200-400mg/week for 8-12 weeks Women: 50-75mg/week for 6-8 weeks
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 **AAS: Methandrostenolone (Dianabol/ "D-Bol")**


Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Highly anabolic, moderately androgenic, moderately oestrogenic Oral steroid (tablet) 	<ul style="list-style-type: none"> People wanting to bulk (gain mass) and gain strength quickly Performance athletes – untested and tested (can be detected for up to 6 weeks) Not likely to be used by bodybuilders close to prep (too much water + fat gain) 	<ul style="list-style-type: none"> Men: 15-30mg/day Women: Not popular with women due to androgenic side effects; 2.5-5mg/day Used for 6-8 weeks

 **AAS: Fluoxymesterone (Halotestin/ "Halo")**


Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Moderately anabolic, highly androgenic, non-aromatizing Oral steroid (tablet) 	<ul style="list-style-type: none"> People wanting to gain strength without putting on much size (or are in a cutting phase) Performance athletes in weight-restricted sports (e.g. boxing, powerlifting, Olympic weightlifting); detection time = 2 months Bodybuilders towards the end of prep for conditioning and "hardness" 	<ul style="list-style-type: none"> Men: 10-40mg/day for 6-8 weeks Women: not recommended due to it being highly androgenic

 **AAS: Drostanolone Propionate (Masterone/"Mast")**


Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Moderately anabolic and androgenic; non-aromatizing Anti-oestrogenic 	<ul style="list-style-type: none"> People looking to cut weight/fat (e.g. bodybuilders towards the end of prep) Untested and tested athletes looking for a boost in strength, especially if they're trying to stay in a particular weight class (or moving down a class) Detection time = 3 weeks 	<ul style="list-style-type: none"> Men: 200-400mg/week for 6-12 weeks Women: 50mg/week for 4-6 weeks

 **AAS: Methenolone Acetate and Enanthate [Primobolan (Depot)/ "Primo"]**


Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Moderately anabolic; mildly androgenic; non-aromatizing Oral (tablet) = Primo Acetate; injectable = Primo Enanthate 	<ul style="list-style-type: none"> People in a cutting phase or who want to put on lean muscle Untested and tested athletes; detection time 4-5 weeks Popular with women due to low androgenicity 	<ul style="list-style-type: none"> Men: 75-150mg/day for 6-8 weeks Women: 25-75mg/day for 4-6 weeks

 **AAS: Stanozolol (Winstrol/Winny)**


Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Highly anabolic, mildly androgenic; non-aromatizing Oral (tablet) and water-based injectable forms 	<ul style="list-style-type: none"> People in a cutting phase Athletes in strength/speed sports (e.g. Athletics, Olympic Weightlifting) Tested athletes may be more likely to use oral formulation – detection time 3 weeks (9 weeks for injection) 	<ul style="list-style-type: none"> Men: 15–25mg/day (oral) per day or 50mg every other day (injectable) for 6–8 weeks Women: 5–10mg/day (oral) or 20mg every 4 days (injectable) for 4–6 weeks

 **AAS: Oxymetholone (Anadrol)**

Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Highly anabolic, moderately androgenic; highly oestrogenic “Considered by many to be the most powerful steroid commercially available” (Llewellyn, p. 190, 2017) 	<ul style="list-style-type: none"> People bulking who don’t mind water retention (i.e. non-physique athletes) Athletes where being “big and strong” is the primary goal (e.g. powerlifting, strongman) Detection time = up to 8 weeks 	<ul style="list-style-type: none"> Men: 25–150mg/day for 6–8 weeks Women: not recommended/typically used due to likelihood of virilization

 **AAS: Oxandrolone (Anavar/“Var”)**

Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Highly anabolic, mildly androgenic; non-aromatizing Oral (tablet) Considered to be particularly mild and well-tolerated (minimal side effects) 	<ul style="list-style-type: none"> Bodybuilders in a cutting phase People wanting to gain strength/lean mass without much size or water retention Untested and tested in speed/anaerobic performance sports (e.g. gymnastics, swimming); detection time = 3 weeks Highly favoured by women due to low androgenicity 	<ul style="list-style-type: none"> Men: 15–50mg/day for 6–8 weeks Women: 5–10 mg/day for 4–8 weeks

 **AAS: Nandrolone (“Deca”/“NPP”)**

Overall Effects	Who Uses It?	Common Dosages
<ul style="list-style-type: none"> Highly anabolic; mildly androgenic and oestrogenic Phenylpropionate: Durabolin, “NPP” Decanoate: Deca Durabolin Cypionate: Dynabol 	<ul style="list-style-type: none"> People in a bulking phase Favoured as a recovery-enhancing steroid Can be used during cutting phases to preserve muscle mass Very unlikely to be used by tested athletes – detection time up to 18 months 	<ul style="list-style-type: none"> Men: 200–600 mg/week for 8–12 weeks Women: 50mg/week for 4–6 weeks

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AAS: Trenbolone/"Tren"

Overall Effects

- Highly anabolic and androgenic; non-aromatizing but can have progestin side effects (similar to estrogen)
- Notorious for being very effective but having difficult side effects, particularly around emotions and cardiovascular endurance

Who Uses It?

- Anyone looking for greater definition and strength without much water retention or fat gain; useful for cutting, bulking, and strength
- Typically taken as part of a "stack"/rarely used on its own

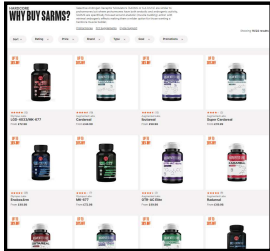
Common Dosages

- Men: 100-300mg per week (acetate); 200mg-800mg/week (enanthate); 6-8 weeks
- Women: not commonly used/recommended due to high risk of virilization

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Other Muscle and Strength Enhancing Drugs: SARMs

- Selective Androgen Receptor Modulators
- Non-AAS oral drugs (capsule and suspension) that are meant to mimic the anabolic effects of AAS
 - Non-aromatizing and have minimal androgenic effects
- Only came to market around 2015
- Some have had/are undergoing clinical trials, and some haven't
 - e.g. osteoporosis, muscular dystrophy



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Other Muscle and Strength Enhancing Drugs: SARMs

- Readily available in UK supplement shops (brick and mortar and online) despite lack of formal approval by any governmental health bodies
 - Lack of long-term studies – future risks unknown
 - For some SARMs, effects are largely anecdotal
- Popular with young people (ease of access) and women (lower risk of virilization)



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Other Muscle and Strength Enhancing Drugs: SARMs and SARM-Adjacent Drugs



Post from reddit.com/r/SARMs describing one of andarine's side effects

- SARMs with more clinical trial information
 - Ligandrol (LGD-4033)
 - Enbosarm (Ostarine, MK-2866)
- SARMs with less clinical trial information
 - Andarine (S4, GTX-007)
 - YK-11
 - RAD-140
- SARM-adjacent drugs
 - Cardarine (GW-501506)
 - Ibutamoren (MK-677)

Source: William Llewellyn's Anabolics, 11th Edition (2017)

Other Muscle and Strength Enhancing Drugs: **SARMs**

	Anabolic Effects	Hepatotoxicity	Lipid Changes	Suppression of Natural Testosterone Production	Other Notable Effects	Typical Usage
Andarine (S4)	Mild/moderate	Mild*	Mild/moderate	Moderate	Visual disturbances (common)	25-75mg/day for 4-8 weeks
Ligandrol (LGD-4033)	Moderate/strong	Mild*	Moderate/strong	Moderate/strong	Mild androgenic effect	2-10mg/day for 4-8 weeks
Enbosarm (Ostarine, MK-2866)	Mild/moderate	Mild*	Mild/moderate	Mild	Visual disturbances (rare)	10-30mg/day for 4-8 weeks

Source: William Llewellyn's Anabolics, 11th Edition (2017)


Other Muscle and Strength Enhancing Drugs: **SARMs**

	Anabolic Effects	Hepatotoxicity	Lipid Changes	Suppression of Natural Testosterone Production	Other Notable Effects	Typical Usage
RAD-140 (Vosilasarm)	Moderate	Low*	Mild/moderate	Moderate		5-30mg/day for 6-12 weeks
YK-11	Unknown	Unknown	Unknown	Unknown	The only steroidal SARM; has not yet been studied in humans	1-10mg/day for 4-8 weeks

Source: William Llewellyn's Anabolics, 11th Edition (2017)

Other Muscle and Strength Enhancing Drugs: **SARM-Adjacent Drugs**


- “SARM-adjacent” drugs are drugs (often peptides) that are not truly SARMs but are often sold alongside them/in the same category
- Cardarine (GW-501516)
 - Originally developed to treat metabolic and cardiovascular diseases
 - Abandoned after animal clinical trials showed rapid cancer development in multiple organs at a dosage of 3mg/kg bodyweight per day
 - Taken for endurance and fat loss
 - 10-20mg/day for 8-12 weeks



Source: William Llewellyn's Anabolics, 11th Edition (2017)

Other Muscle and Strength Enhancing Drugs: **SARM-Adjacent Drugs**

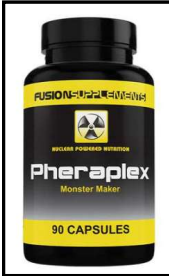
- Ibutamoren (MK-677)
 - Drug developed to increase the secretion of hormones such as Growth Hormone and ghrelin (hunger hormone); currently going through Phase II trials
 - Used recreationally for fat loss, muscle gain, and recovery
 - 10-25mg/day for 3-6+ months



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Other Muscle and Strength Enhancing Drugs: Prohormones

- Compounds converted (by enzymatic process) to anabolic hormones in the body
- Untested and unapproved drugs that are readily available from UK supplement shops
- Examples
 - 4-Androstenediol
 - Epistane
- Tend to have negative effects on the liver



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Other Muscle and Strength Enhancing Drugs: Peptides

Insulin (“slin”)

- Highly anabolic and powerful for lean tissue growth
- Typically used alongside AAS
- Very risky – can cause severe (and potentially fatal) hypoglycaemia
- 1IU/10kg bodyweight with meal +protein shake 30-60 mins after injection


Human Growth Hormone (hGH/Somatropin)

- Used for muscle growth, fat loss, and recovery; often used alongside AAS
- Provides other appearance-related benefits (e.g. skin, hair, anti-aging)
- Can cause diabetes, thickening of certain bones and appendages (e.g. feet and hands), and enlargement of internal organs
- 1-6 IU/day for 6-24 weeks

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Other Muscle and Strength Enhancing Drugs: Peptides

- Some experimental (i.e. limited human research available) peptides are used to stimulate the secretion of growth hormone and to hasten injury healing
 - “Healing compounds” (e.g. BPC-157, TB-500)
 - Some promising rodent-based research around their ability to promote healing of tendons and ligaments – but human research is lacking, including information around long-term risks or harms




Source: Guyer, Wragg, & Wilson (2019)

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Other Muscle and Strength Enhancing Drugs: Peptides

- Growth hormone secretagogues – often stacked (e.g. one GHRH + GHRP) and dosed multiple times per day
 - Growth-hormone releasing hormones (e.g. sermorelin)
 - Ghrelin (hunger hormone) and its agonists (e.g. ipamorelin)
 - Growth hormone-releasing peptides (e.g. GHRP-2)
- Limited research around outcomes that would be of interest to people using PIEDs (e.g. body composition) and safety



Sigalos & Pastuszak, 2016

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PIEDs: Weight Loss Drugs and Cutting Agents




- Weight loss drugs and “cutting agents” are drugs that are used to drop weight – ideally water weight and body fat
- Typically work by increasing metabolism and/or decreasing appetite
- Can carry serious risks – typically cardiac risks (e.g. heart attack, stroke) or gastric risks (e.g. nausea, vomiting)

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Source: Samenuk et al., 2002

PIEDs: Weight Loss Drugs and Cutting Agents

- “ECA Stack” (Ephedrine, Caffeine, Aspirin) or “EC Stack” (without aspirin)
 - Ephedrine (má huáng) can be found in some medicines* and Chinese herbal teas
 - Has been linked to adverse cardiac impacts, including heart attack, stroke, and sudden death in young people (under 40) without pre-existing heart conditions
 - Aspirin included to help prevent clotting
 - Typically 20-30mg ephedrine + 200mg caffeine + 81mg aspirin



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PIEDs: Weight Loss Drugs and Cutting Agents

<p>Clenbuterol (“Clen”)</p> <ul style="list-style-type: none"> Drug (often used in veterinary medicine) for asthma (bronchodilator) Increases metabolism by approx. 20% → fat loss Used for 8-12 weeks in dosages from 20 – 100mcg Can cause cardiac problems (including atrophy) 	<p>DNP (2,4-dinitrophenol)</p> <ul style="list-style-type: none"> A drug that was used medically for weight loss in the US in the 1930s, but was banned due to toxicity Also used to make explosives in the UK and US Increases energy expenditure by 30-40% → average weight loss of around 1kg/week Typically used in dosages of 150-300mg/day <ul style="list-style-type: none"> Can cause fatal hyperthermia
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PIEDs: Weight Loss Drugs and Cutting Agents

<p>T3 and T4 Thyroid Medications</p> <ul style="list-style-type: none"> Increases the action of the thyroid → increased metabolism Typically used alongside AAS or clenbuterol to decrease the risk of muscle loss Often used in 12.5-50 microgram dosages per day Misuse can cause hyperthyroidism, high blood pressure, cardiac arrhythmia, and death 	<p>Ozempic/Wegovy (Semaglutide); Mounjaro (Tirzepatide); Saxenda/Victoza (Liraglutide)</p> <ul style="list-style-type: none"> Injectable drugs (daily or 1x/week) used to treat Type 2 diabetes and obesity Work by mimicking GLP-1 hormone → increased insulin + slower digestion = decreased hunger Can cause unpleasant side effects (esp. gastric) Risk of weight rebound after stopping
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PIEDs: Melanotan II



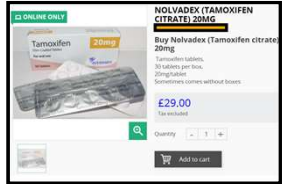
1 month of Melanotan II usage - reddit.com user

- Synthetic form of α -Melanocyte-stimulating-hormone that signals our melanocytes to produce more melanin \rightarrow darker skin/improved tanning
- Medicine that was originally investigated for photoprotection and sexual dysfunction but abandoned in the early 2000s
 - Limited information on long-term effects etc.
- Can lead to changes in freckles and moles \rightarrow increased risk of skin cancer, including melanoma

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Other Drugs Associated With PIED
Use: **Post-Cycle Therapy (PCT)**

- Drugs used to support natural testosterone production after an AAS cycle
 - Selective Oestrogen Receptor Modulators (SERMs): used to counteract high levels of oestrogen/encourage natural testosterone production; clinically used with breast cancer patients
 - Nolvadex/"Nolva" (Tamoxifen Citrate)
 - Clomid (Clomiphene Citrate)
 - Raloxifene
 - Torem (Toremifene Citrate)



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Other Drugs Associated With PIED
Use: **Post-Cycle Therapy (PCT)**



- Drugs used to support natural testosterone production after an AAS cycle
 - hCG (Human Chorionic Gonadotropin): synthetic form of a hormone produced in pregnancy \rightarrow LH \rightarrow increased test production
 - Aromatase Inhibitors (AI): decrease oestrogen in the body by blocking conversion of androgens to oestrogen
 - Aromasin (Exemestane)
 - Arimidex (Anastrozole)
 - Letrozole (Femara)


Photo: eroids.com user

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2 Who Uses PIEDs?

What is the prevalence of PIED usage, and what types of individuals might use PIEDs?

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Who uses performance- and image-enhancing drugs?

ASCERT Public Health Agency (2024); McVeigh et al. (2021)


Who Uses PIEDs?: Introduction

- Estimated 328,000–687,000 men aged 15–64 using AAS in the UK
 - “Not possible” to estimate number of people using full breadth of PIEDs
- PHA NI Needle and Syringe Exchange Services (2023/24)
 - 12,756 steroid packs dispensed, mostly from community pharmacy sites (93%); mostly to men with 35–39 year olds being most common
 - 3,046 unique clients accessed the service
 - Onward social supply is common
 - AAS are the most common substance recorded by NSES in 4/5 Trust areas

ASCERT Hildebrandt et al., 2012; Heimly Jensen & Johannessen 2015; Pope et al., 2012; Lood et al., 2012

Who Uses PIEDs?: Risk Factors


- Desire to improve health and wellbeing, including increased strength and muscle mass
 - Especially if wanting to do so more quickly/easily, or wanting to break through their “natural barrier”
- Body dissatisfaction
 - For young people: perception of being under- or overweight
- Association with other people who use PIEDs



ASCERT Lood et al., 2012; Hanley Santos & Coomber, 2016

Who Uses PIEDs?: Risk Factors

- People wanting to “project” strength and health for occupational (e.g. bouncers, armed forces) or other purposes
- Athlete-specific risk factors
 - Injury/setbacks, esp. close to important qualifying events or other competitions
 - Including non-sport related setbacks that may disrupt training
 - Not reaching goals within a desired time frame
 - Unfavourable comparisons to teammates and/or competitors



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I competed [in bodybuilding] on and off from 2014–2017. I always did well on regional stages but I had **no business** thinking about trying to compete at a national level...and to be honest, I was told if I wasn't willing to go down the **enhanced path**, there really was **no point** in trying to complete at the next level.

[...] In 2021, I made the decision to add PEDs. [...] Almost 10 years of what felt like **spinning my wheels**, even though I was checking all the boxes. I have **no regrets**.

“

Reddit.com user (female)

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[I started using AAS because] I needed to **get a bit of weight on**, because every time I went 'round to see my mother she would say, “God, haven't you lost weight? Are you back on [heroin] again?” I'm like, “No, I'm not on the bloody stuff!” And it was really **panicking** me. People were saying, “Oh, you're drawn in and that.” I'm like, “Crikey, I wish I could put weight on to **shut everyone up**.”

33 Year Old Ex-Heroin User (Male)

“

Hanley Santos & Coomber (2016), p. 3-4

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Expert



Wellbeing



Athlete



YOLO

Christiansen, Schmidt Vinther, & Liokaftos's (2016) Typology of (Male) Use of AAS

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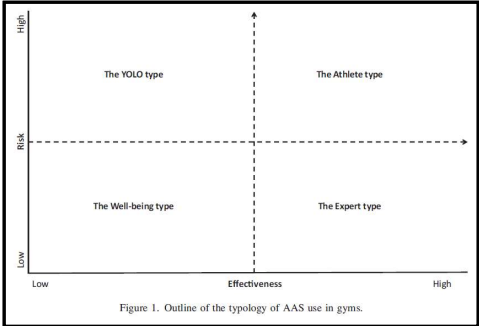


Figure 1. Outline of the typology of AAS use in gyms.


Christiansen, Schmidt Vinther, & Liokaftos's (2016) Typology of (Male) Use of AAS

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Christiansen, Schmidt Vinther, & Liokaftos (2016), p. 4

ASCERT Christiansen, Schmidt Vinther, & Liokaftos (2016)

Who Uses PIEDs?: The Expert



- May see themselves as an “applied science project”
 - Tend to be very strict about bloodwork and are keen to work in partnership with health professionals
 - Are acutely aware of risks associated with PIED use and are typically on top of research and self-monitoring (i.e. “controlled risk taking”)
 - Often seen as a source of expertise in PIED-using communities
 - High effectiveness, lower risk

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*I find the **medical science** behind it fascinating, and I can come up with many excuses for how I justified using [PIEDs], but I like the idea of putting **theory into practice** and [seeing] if you have learned enough by reading online [...] so I think it's nice that you can **learn** such things by yourself.*

27 Year Old Using PIEDs (“The Expert” Type)


“

Christiansen, Schmidt Vinther, & Liokaftos (2016), p. 3

ASCERT Christiansen, Schmidt Vinther, & Liokaftos (2016)

Who Uses PIEDs?: Wellbeing

- Primarily concerned with looking and feeling good
- May feel that they are “ailing” in some way (e.g. natural aging, injuries) and want to remedy that
- Tend to use substances at lower dosages than those who are using for sport/performance
- Testosterone replacement therapy (TRT) is popular with wellbeing types
- Low effectiveness, low risk



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*I think it helps you stay **young**, right? You feel a little **better** and you feel more **rested** in the morning. Your skin becomes more youthful to look at, and your **energy** level is generally higher. I see it as a supplement for wellbeing, so I'm not using [hGH] to gain size but mostly to improve my own **wellbeing**.*


36 Year Old Using AAS and hGH (“Wellbeing” Type)

“

Christiansen, Schmidt Vinther, & Liokaftos (2016), p. 5

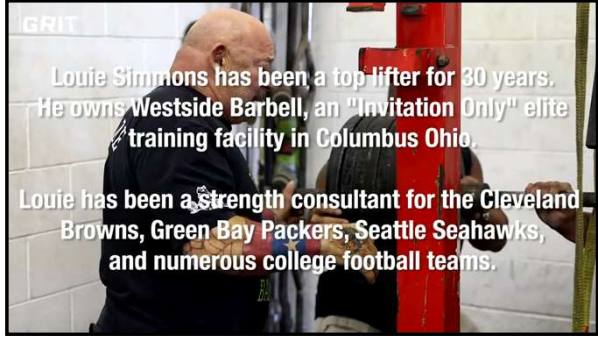
ASCERT Christiansen, Schmidt Vinther, & Liokaftos (2016)

Who Uses PIEDs?: The Athlete



- Use PIEDs for sport performance
 - Seen as an “inevitable but calculated risk”, particularly in high level sport
- Often engage with medical professionals/monitoring
 - May do so in order to avoid detection if using in tested sport
- May downplay PIED-related side effects and risks as they are used to the effects of difficult training, dieting, etc.
 - May find themselves going further than originally intended – motivated by results
- High effectiveness, high risk

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Louie Simmons has been a top lifter for 30 years. He owns Westside Barbell, an “Invitation Only” elite training facility in Columbus Ohio.

Louie has been a strength consultant for the Cleveland Browns, Green Bay Packers, Seattle Seahawks, and numerous college football teams.


Typology of (Male) Use of AAS: The **Athlete** Type

Vice Sports - <https://youtu.be/zqELlhoe9Nl8?si=OlsT4hmRlHDmsV>; Grit Media - https://youtu.be/joKupDEh_lc?si=jeqx9MOu2V9Wtz2

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Who Uses PIEDs?: “YOLO”

- More careless/haphazard in their use compared to other types
- May violate “conventional wisdom” around PIED use
 - E.g. waiting until 25 years old; reaching “natural limits” before use; sticking to shorter cycle timeframes
- Not likely to engage in health monitoring or PCT
- May see steroids as a “quick fix”, rather than part of a strict diet and training regime
- Low effectiveness, high risk



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[I used steroids for the first time] when I was 21. I simply ate 12 pills of Dianabol every single day for I don't know how long. It was just fucking insane, and I didn't get any advice at all. No one did anything to help me. I just thought it would be interesting to try out the same things as Arnold Schwarzenegger and as a huge friend of mine who trained and was using [AAS].

39 Year Old Former AAS User (“YOLO” Type)


“

Christiansen, Schmidt Vinther, & Liokaftos (2016), p. 6

ASCERT McVeigh et al., 2015; Chandler & McVeigh, 2013

Who Uses PIEDs?: What About Women?

- Tend to use AAS much less frequently than men
 - 8-16% of AAS users in the UK and Ireland are thought to be female
 - Tend to favour "milder" compounds like oxandrolone (Anavar) and stanozolol (Winstrol), and oral administration over injection
 - More concentrated amongst athletes; less common amongst "lifestyle" users
- May be more likely to use other PIEDs like fat burners and Melanotan II



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*It's pretty easy to [underestimate your tan] – while I've sometimes looked a bit silly **overdoing it**, I can laugh about it, it's not that serious. [...] I'm naturally pretty pale too, which you could probably figure out with me being Nordic and all, but I don't get burned easily and I **tan pretty fast**. I just love the extra **oomph** tan level I can get with Melanotan II, and I also love its other effects like **appetite suppression**.*

“

Reddit.com user (female)


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3 Risks Associated With PIED Usage

What might be the risks associated with the use of steroids and other PIEDs?

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Risks Associated With AAS: **Physical Health**




- Abnormal biomarkers (e.g. heart, liver) → increased risk of disease
 - Increased red blood cell count
 - Decreased HDL and increased LDL (lipids)
 - Increased oestrogen/oestradiol
 - Elevated liver biomarkers (e.g. ALT)
- Heart disease
 - Left ventricular hypertrophy
 - Heart attack
 - Sudden cardiac death

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Risks Associated With AAS: Physical Health

- Insomnia
- Reduced immunity
- Hypoglycaemia (if misusing insulin)
- Increased risk of tendon injury




- Premature closure of growth plates (children/young people)
- Natural testosterone production shutdown
 - Infertility

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Risks Associated With AAS: Physical Appearance

- Acne
- Hair loss*
- Water retention/bloating
- Development of breast tissue in men (gynecomastia)



22 Year Old Before and After Gynecomastia Surgery (Dr Mordcai Blau)

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Risks Associated With PIEDs: **Women** and AAS

MegSquats; https://youtu.be/zaj6eYbT3j4?si=Z2d_m2YRs99DL8n

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Risks Associated With AAS: Mental Health

- Clinically guided testosterone treatment has been associated with a reduction in depression symptoms in men
- AAS use associated with aggression and psychological distress – but no causal relationship has been established
 - Highly variable amongst users – “amplifies what’s already there”
 - Some case reports have been published with people experiencing severe, uncharacteristic negative mental health effects (including violence)
- Subjective user reports suggest variation between compounds in regards to mental health

Chegeni et al., 2021; Walther, Briedenstein, & Miller, 2019

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Why does [trenbolone] give you such a **short temper**? I haven't gotten into a fight since high school and I have a huge tolerance for bullshit, but when running tren I become incredibly **mean** and **aggressive** in my head. I want to **kill** people in traffic and punch people who stare at me or unexpectedly touch me, while normally this does not bother me at all. [...]

I'm not using tren as an excuse to act like an asshole since it all stays in my head, but I find it **scary** how tren makes me think at times and how **paranoid** it makes me in relationships.

“

Reddit.com user (male)

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[Answering the question “How have you managed your emotional/psychological negative side effects from using anabolics?”]

I kinda just put everything on the back burner, but I do feel more **irritable** and **angry** on Anavar. When I am just on [Primobolan] and [testosterone propionate], I didn't really feel the feeling of just being on [Anavar] with the side effects. I don't like Anavar but I do like how it helps me in the gym. No relationships I've been in were affected by it. But I guess everyone is different!

“

Reddit.com user (female)

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Risks Associated With AAS: Addiction and Dependence

DSM-IV-TR Criteria for Dependence	Frequency of Use	%
Tolerance	88	20.7
Withdrawal	190	44.6
Substance taken in larger amounts than intended	119	27.9
Desire yet unable to cut down or control use	51	12.0
Much time spent on substance-related activity	122	28.6
Other activities replaced by substance use	76	17.8
Continued use despite knowledge of problems	106	24.9
≥ 3 of the above	144	33.8

*Adapted from Kasayama et al.¹⁸
¹⁸Results averaged over 5 previously analyzed studies.
 Abbreviations: DSM-IV-TR, Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision.

- Continuous or chronic use of AAS despite prominent adverse effects
- Estimated 25-40% of people using AAS demonstrate dependence
- Withdrawal symptoms can include
 - Decreased sex drive
 - Dissatisfaction with body image and desire for more AAS
 - Fatigue
 - Lack of appetite

Brouer (2009, p. 132)

Magnolini et al., 2022; Brouer et al., 1990

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One little comment...like, “you've lost a bit of weight” – **my head will go** and I'll go home and feel like I wanna have a [shot of AAS]. I'm **knackered** from it. I started dieting and that as well now, and if I eat chocolate and things like that, it will **blow my head**.

“

“Lewis” in Harris, Dunn, and Abryn, 2016

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When you're not on cycle, you just want to be on cycle. You're like, "I just want to be back on cycle. I hate being normal, I hate being natty. I just want to be back there again." Then, when you get back there, and you feel the blood coursing through your veins, and the weight starts going up on the bar – you just feel invincible.

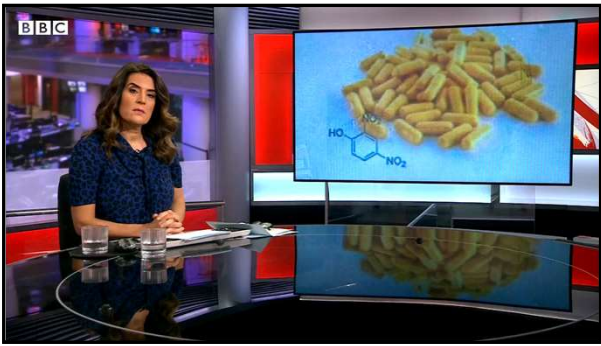
Elite Female Powerlifter

“

Dunn et al., 2023, p. 577

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BBC



Risks Associated With PIED Usage: Toxicity


BBC News; https://youtu.be/Bca_vWc5HeA?si=cGK9WRB3UeMGIOAH

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Hope et al. (2013); Bates, & McVeigh (2016)

Risks Associated With PIED Usage: Disease Transmission

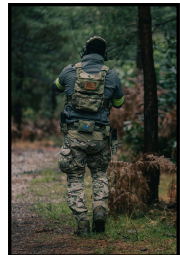
- Sharing injection equipment carries the risk of transmitting bloodborne viruses
 - Estimated 1-12% of PIED users in the UK share needles and multiple-dose vials
 - Similar rate of HIV in men injecting PIEDs (1.5%) as men injecting opioids or stimulants
- Evidence that men who use PIEDs are highly sexually active with low rates of condom use



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Risks Associated With PIED Usage: Bans from Sport and Professions

- The use of many PIEDs is banned (and tested for) by many sports and organisations, including
 - Any World Anti-Doping Agency signatories
 - Federations that fall under the Olympics and Paralympics (e.g. FIFA, World Rugby)
 - Other non-Olympic sport federations (e.g. International Powerlifting Federation)
 - UK military
 - Some workplaces, often involving public safety



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Risks Associated With AAS: The Law



- AAS are technically Class C drugs
 - Maximum penalty for manufacture, supply/intent to supply and import/export via post/courier: 14 years in prison + unlimited fine
 - Supply includes giving them to friends, even if no money is exchanged!
 - Legal for personal possession, including import on **your person**
- Other PIEDs (e.g. Melanotan II) may be unlicensed or licensed medicines, and may have penalties for supply/selling

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Risks Associated With PIED Usage: **Underground Labs**

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[Vendor's] reship of gear is trash. Put me in the **hospital** for a nice 3 night stay. They ended taking 5 ounces of pus out of my left glute. I injected last Thursday (typical protocol - sterile syringe, alcohol swab) and started noticing a huge welt on my side by Monday. By Monday night I had a horrible **fever** and **achiness** everywhere. Started to take [paracetamol] and ibuprofen every 4 hours and it wasn't working. Went to the ER on Thursday night and they said if I waited any longer, the **infection** would've went into my blood, getting me really sick.

[...] This is the first it landed me on the hospital, but not the first time his gear's gotten me **sick**. Dude's a fraud. Stay far away. Wouldn't wish this on my worst enemy.


“

Eroids.com user

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Risks Associated With AAS: Black Market

- Multiple studies have found illicitly sourced AAS to frequently be counterfeit and substandard; on average:
 - 36% are counterfeit
 - May have a different drug than what is listed on the label
 - May have drugs that aren't listed on the label
 - May not have any active ingredients
 - 37% are substandard
 - Contains the correct active ingredient but is over- or under-dosed



Magnolini et al., 2022

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4

Approaches to Working With People Using PIEDs

How might you best approach harm reduction work with people using PIEDs?

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Approaches for PIED Use: **Introduction**




- People using PIEDs do not see themselves as “stereotypical drug users”
 - Tend to (on average) lead healthier lifestyles (exercise, diet)
 - More likely to be employed
 - May be less likely to engage with needle exchange services if they have to mix with “traditional” service users
- Less likely to be interested in abstinence – more likely to want to continue and optimise use

Bates, Jones, & McVeigh (2016)

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Approaches for PIED Use: **Introduction**



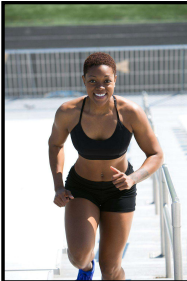
- People looking to work with those using PIEDs need to understand
 - These drugs work (i.e. produce the desired results), often in a way that is faster/easier/more convenient, or in a way that is not possible without PIEDs
 - “Breaking past natural limits”
 - Users often experience other desirable effects when taking PIEDs
 - Sexual arousal with Melanotan II
 - Mood improvement with testosterone

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Vinther (2023)

Prevention Approaches for PIED Use

- Limited research around PIED prevention
 - Largely revolves around sport anti-doping efforts and universal prevention (e.g. in schools)
- Preventive approaches need to
 - Make the case for drug-free training
 - Address the desire for improved strength, muscularity/appearance



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If you are not a bodybuilder, or attempting to be one, you don't need to enhance. [...] That's what I always tell people when they're considering it. "Do you want this to be your life? Because once you start, it will likely become that and could greatly shorten your life." There's consequences to the game and the average gym goer who wants to add a couple of pounds of muscle doesn't need the risk.

“

Reddit.com user

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Education also comes with providing alternative ways in which you can achieve what you want. [...] So it's not enough to tell young people, in particular teenagers, to not use steroids just because it's bad and then leave them in a vacuum, because they still have the need. They still want to look better. They still want to look more muscular.

So, the way it works is: "Don't take steroids, but I'm helping you to achieve your goal in maybe a more healthy way. I help you with your diet. I help you with your training regimen. I help you to achieve your goal because I recognize that the goal is important to you."

“

Vinther (2023), p. 92

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STERIODS - Uncovering the Real Cost




Elena M Brewer, MPH
Training Officer, ASCERT

Steroid Use Prevention: What Would You Say?

ASCERT; <https://youtu.be/gbESWY0LqWY?si=m8zr4--yXCogurhbh>


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Harm Reduction for People Using PIEDs

In groups, look at the case scenario provided to you and consider how you might work with the person described.


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 **Harm Reduction for People Using PIEDs**



- Awareness around risks associated with chosen substances, especially where there is common misinformation/lack of information
 - Melanotan II and mole changes/potential cancer risk
 - Infertility risk with AAS
 - Addiction risk


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 **Harm Reduction for People Using PIEDs**



- Diet and exercise optimisation
 - “Making the case for drug-free training”
 - Can lead to decreased usage – “dialling in” → needing fewer drugs to get the results they want
- Encouraging (or providing access to) “bloods”
- Sexual health information/services
- Information on other drugs


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 **Harm Reduction for People Using PIEDs**





- Awareness around the risks associated with injection and related behaviours (e.g. bloodletting)
 - Not sharing any equipment, including multi-use vials
 - BBVs (e.g. HIV, Hep C)
 - Post-injection pain and how to address it
 - Identifying injection-related infections
- Safer injection practices – intramuscular and subcutaneous
 - Needles that are used for IM vs IV use

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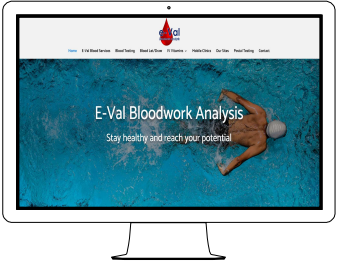
 **Signposting**

What support is available?

  **E-Val Blood Analysis**

Blood testing services for people using PIEDs operating out of Elite Health and Fitness, Lisburn

evalbloodanalysis.com



  **NIDACTS**

Northern Ireland Drug and Alcohol Coordination Teams

drugsandalcoholni.info





  **Family Support NI**

familysupportni.gov.uk

A directory of various support services (e.g. mental health, finances) and registered childcare services in NI



  **Thanks!**

Any questions?

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