## HED Matters Theme: Enhancement Drugs and Treatment

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## Editorial

#### Dear Reader,

Currently the evidence-base around how to treat people who experience physical and psychological issues with their non-prescribed anabolic steroids and other enhancement drug use is limited (e.g., which treatments are most effective, what medications and psychosocial interventions to use to support recovery from dependence). Indeed, there is very little published research evidence on which to base specific recommendations for the assessment and management of patients experiencing health issues resulting from their enhancement drug use. Adding to this is that most knowledge of the health harms of anabolic steroids and its treatment is based on low level evidence, such as expert opinion, case reports or small observational studies. There are also very few comprehensive management recommendations and/or clinical guidelines available for treating this drug-using group. This is problematic as people who use anabolic steroids and other enhancement drugs are a growing patient group for a range of health services across the globe.

Luckily, there is a growing group of researchers, particularly in Norway, the Netherlands and the United Kingdom, who are doing ground-breaking research on how to best treat people who use non-prescribed steroids. Some of this great work will be discussed in this issue. Specialised services for consumers and educational tools targeted at health professionals are also slowly increasing. So, we are hopeful that in the (near) future more (effective) treatment options will be available to consumers who experience health issues with their use.

This last issue of our miniseries focuses on treatment. We have three interesting contributions; starting off with a Q&A with Christine Wisløff and Marie Lindvik Jørstad from the Oslo University Hospital talking about the Steroid Project they are running. The purpose and main goal of the project is to improve treatment and make it more accessible for previous and current consumers of anabolic steroids in Norway. Next up is PhD student Julio Amaral who talks about his work on better understanding the health strategies consumers adopt to prevent and treat adverse effects from their use. Finally, we have a piece from PhD student Hans Christian Bordado Henriksen from the University of Oslo who talks about his work regarding the use of hormone therapy in the treatment of anabolic steroid dependence.

We hope you enjoy this last issue of our Miniseries. The first issue on Prevention and the second on Harm Reduction are available online.

Sincerely,

The HEDN Team



Dr Katinka van de Ven



Dr Kyle Mulrooney



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Dr Matthew Dunn



Dr Alexandra Hall

All contributions reflect the author's point of view. Inclusion does not confer endorsement by the HEDN Board.

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### Q&A with Project Manager Christine Wisløff and Marie Lindvik Jørstad, The Steroid Project, Oslo University Hospital, Norway

#### Could you tell me about The Steroid Project? What is the purpose of the project?

Our main goal is to make treatment better and more accessible for previous and current users of anabolic steroids with steroid-related health problems, or who are in need of help to quit their use. In Norway, these users have a right to publicly funded substance use disorder (SUD) treatment. It has been like that since 2013, when use and possession of anabolic steroids became illegal in Norway. The Steroid Project was established in 2014 at Oslo University Hospital as a national project to collect knowledge about this "new addiction" and treatment, and inform health professionals.

However, we soon found out that the users were not aware of their treatment rights and few sought treatment. Therefore, we aimed at informing users, their next of kin and the general population about health consequences related to anabolic steroid use and treatment options. Our daily work includes production of e-learning courses, informational material on online public health sites, and holding lectures and arranging seminars for clinicians nationwide.

We are also conducting clinically relevant research about anabolic steroids, and inform users, their next of kin, the general public, and health professionals about anabolic steroids and treatment through a social media campaign. In 2015, we established an information service to make it easier for users of anabolic steroids to get information about what kind of treatment is offered and possible treatment outcomes, as we registered that few sought treatment after 2013. The personal service is free and no referral is required. The service is open for users, next of kin and health professionals – they can call, send mail or have a personal meeting.

### How many people who use AAS contact your information service each year, and for what reasons do they want treatment?

In the first years, about 40 users contacted us each year, and we realized that we needed to make users aware of our service. Therefore, in 2018, we launched a social media campaign directed at the users, their next of kin and the general public. The campaign consists of various short videos presenting user experiences, research facts, and information about side effects and treatment that are spread as 'ads' in different social media platforms. Interested viewers can click on the ads and are redirected to the web page https://www.steroidelab.no/ where they can find all the videos, information about anabolic steroids, treatment and how to contact us.



The same year, more than 100 persons contacted us, and more than 200 in 2019 and 2020. Two thirds of the now more than 800 information seekers wanted treatment after the information session. Our experience is that a combination of physical and psychological side effects, or psychological side effects alone, are the main reasons for why they want to stop using anabolic steroids. However, these are only numbers displaying how many wanted treatment after contacting us. In addition, many seek treatment without contacting us. We do not have detailed information about how many users of anabolic steroids that have received anabolic steroid related treatment from their general practitioner or in SUD treatment or other treatment in Norway as anabolic steroid dependence is not a specific diagnose and can therefore not easily be summed up. However, our research has found that 30 % of patients in mainly inpatient drug treatment report lifetime AAS use, so a large proportion of patients with previous or current steroid use are already in treatment.

## How do you manage and treat AAS dependence? Are there any key principles or strategies that you follow?

Patients who seek outpatient substance use disorder treatment for anabolic steroid related health problems are either current users who struggle to quit, men who have recently quit but struggle with unbearable symptoms, or those who have quit some time ago but struggle with mental health problems. The withdrawal symptoms are related to low endogenous testosterone and involve depression with or without suicidal ideation, anxiety, fatigue, sleep disorder and sexual dysfunction. These symptoms are hard to endure, and many have a history of restarting use to relieve these symptoms and this is a central factor in developing steroid dependence among men.



Photo by the Marcel Strauß from Unsplash

During the withdrawal phase, several weekly supportive psychosocial sessions and regular monitoring of hormonal function is essential. The physician is responsible for physical examination and referral to relevant specialists as well as evaluating (together with the patient in question) whether prescription of antidepressants, sleep medication or treatment of erectile dysfunction is needed. The stabilization phase is important as many find it hard to lose the wellbeing effect and struggle mentally with reduced muscle volume. The treatment providers evaluate pre- and co-morbid mental health problems and provide relevant psychotherapy, psychoeducation and sometimes medication. Many patients need help with economy, work life, other substance use, social relations and aggressive behavior. Some need therapy over longer time whereas others only need frequent support during the withdrawal phase.

Our colleague, researcher and psychiatrist Ingrid Havnes, has received funding to examine health risks during steroid use, whether hormone therapy with Clomifen makes it easier to handle the withdrawal phase and to assess to what extent health risks are reduced after cessation. Due to Covid-19, this study has been postponed, as we need physical contact with the participants. This study will hopefully start during the fall 2021. It will take some time until we can present the results, but we hope that the results can be used to improve treatment for those who struggle to quit anabolic steroids. Our colleague, Hans Christian Bordado Henriksen, talks more about the study later in this issue.

#### Has the treatment programme been evaluated? If so, what did the evaluation show?

We have conducted a qualitative study among men who have been in outpatient treatment and have found that they appreciate knowledgeable staff, supportive frequent sessions during cessation and treatment of mental health problems. Also, it was a clear message that they desired a 'medical post cycle therapy' or legal tapering of testosterone. As no guidelines on endocrine therapy for the user group exists, some tapered nonprescribed testosterone during outpatient treatment. As this is illegal in Norway, they could get a criminal case when being in treatment for anabolic steroid dependence. This, and clinical experience with the patient group, is the main reason why the study on hormone therapy during cessation was initiated.

# There is a lot of interesting research going on in relation to your clinic and your clients (the Anabolic Steroid Research Group). What are the most important findings from these studies? And which results have surprised you the most?

Our advantage is that we collaborate with the different groups in the field. The Steroid Project is involved in the Anabolic Steroid Research Group, and we do also collaborate with different substance use disorder and somatic clinics in Norway as well as with many user representatives. That makes it easier for researchers to know what the clinicians and users need, and it makes it easier for The Steroid Project to spread research findings to clinicians, users and the general public.

The Anabolic Steroid Research Group has many important and exciting findings. Astrid Bjørnebekk's research findings showing that long term AAS use and dependence is related to changes in brain anatomy, cognition and behavior has received a lot of attention among researchers, users, clinicians and the general public. Also, the study among female users described how they entrusted a close social male to make decisions on their behalf on what anabolic steroids and amounts to use. They were often unprepared for the irreversible masculinizing effects that were difficult to process and could negatively influence self-esteem, social life and sexual function, both during and after use.

Lifetime anabolic steroid use is common among prisoners and may be an indicator of more severe substance use problems. It was also found that 8% of all prisoners had used anabolic steroids during the 6 months prior to imprisonment and nearly all ceased use in prison. The withdrawal symptoms may add to the mental health burden after incarceration and screening for previous and present steroid use at incarceration and increased staff awareness are needed to provide tailored treatment.

The most surprising finding was that more than 30 % of patients in SUD treatment in Norway had experience with anabolic steroids as well, but most of these patients experienced a lack of knowledge among clinicians on this topic. We have had many clinicians saying that patients using anabolic steroids do not exist in their clinics. However, when we informed a network of clinicians in SUD treatment in Norway about these findings, we experienced that many clinicians got more engaged in this topic. They started screening SUD patients about anabolic steroid use, and this made them "find" these patients more often.

#### Thanks a lot for taking the time to share your experiences!

Thank you so much for your interest in our project. We are very passionate about this topic, about the patient group and how treatment can be improved to meet the user's needs. It is inspiring to be part of the HED network, and we are looking forward to be able to gather physically in seminars again.



**Christine Wisloff** is a nurse with specialization in mental health and physical activity and addiction. She has over ten years of clinical experience from outpatient addiction treatment of patients, including men with steroid dependence and related health problems. She has been the leader of the Steroid Project since it was established in 2014. Her main work consists of project management, close collaboration with user representatives, holding lectures and arranging seminars for clinicians about anabolic steroid use, side effects and treatment. She is responsible for the information service, where she has guided and supervised more than 900 users, next of kin and health professionals.

**Marie Lindvik Jørstad** has a background in psychology, culture and communication, and she has been working in the Steroid Project since 2016. She is also a member of the AAS research group at Oslo University Hospital, and has been involved in steroid related research since 2014 with planning, data collection, analysis and dissemination of results. Her main work consists of developing written material, both scientific and aimed at health professionals, users and the general public, and producing e-learning tools for clinicians. She writes manuscripts and texts in close collaboration with user representatives for the campaign Steroidelab.



### ERC Spotlight: Let's talk about it

By Julio Amaral, PhD student, National Addictions Centre, King's College London.

"Ask her about the steroids, doctor". These words, spoken by the father of a patient during her admission in an Addiction Recovery Clinic, triggered my research on anabolic steroids. Prior to that, I had two passions in Medicine that seemed hard to conciliate: Psychiatry and Sports Medicine. Psychiatry came first, as I joined the Panic Disorder Laboratory at UFRJ's (Brazil) during my first year of Medical School. There I published my first systematic review, on the CO<sub>2</sub> test for panic disorder (Amaral et al., 2013).

#### Rio 2016: Olympic Games and addiction

By the end of Medical school, I was working as a voluntary Doctor in Rio 2016 Summer Olympic Games' playfield and also got acquainted with anti-doping procedures at the Brazilian Laboratory of Doping Control (BLDC) – linked to UFRJ's Chemistry Institute. My curiosity about the health of athletes and the limits of human performance finally 'kicked in'. However, working with elite athletes seemed too inaccessible at the time. I had the feeling that this 'human enhancement business' was not limited to Olympians, it was part of our everyday lives.

The missing piece came during a routine admission in the aforementioned Addiction Clinic. A woman in her 30s came looking for a long-term admission to deal with recurring misuse of alcohol and sedatives. When her father asked me to mention the anabolic steroids, we started talking about it and I was surprised to know that she was using it. She looked fit, but not excessively muscular - as I imagined 'steroid users' to be. She then explained that her problems with alcohol and benzodiazepines started as a coping mechanism to deal with the insomnia caused by her steroid cycles. She was also surprised: no other doctor had ever talked about the use of anabolic steroids with her. After that interview, I came to realise that at any given time, about 10% of the Clinic's patients had a history of past or current use of anabolic steroids - and no one has ever talked about it. These case reports were published during my Masters in Psychiatry (Amaral and Cruz, 2017), and marked the beginning of my research in this field.

"Ask her about the steroids, doctor". These words, spoken by the father of a patient during her admission in an Addiction Recovery Clinic, triggered my research on anabolic steroids

#### Bodybuilders and mental health

My Master's goal was to look for associations between urinary levels of androgens and psychiatric symptoms in people using anabolic steroids. A pilot case appeared (again) at the Addiction Clinic: A 24 year old man who attempted suicide after a cycle of anabolic steroids. This patient was treated with fluoxetine, which seemed to have prevented further episodes of anxiety, depression and suicide attempts even when he used anabolic steroids (Amaral et al., 2020). That report discussed serotonergic pathways involved in mood disorders experienced by some steroid users, and was supported by urinary analysis of endogenous and exogenous androgens. Urinary analysis was performed by the BLDC, in a first-time collaboration with the Institutes of Psychiatry and Endocrinology.

The next step was to investigate if a higher exposure to anabolic steroids would be associated with crescent incidence and severity of psychiatric symptoms – and if urinary androgens could be used to measure anabolic steroid-exposure, thereby bypassing the limitations of self-reported drug use. With the help of Rio de Janeiro's Bodybuilding Federation (IFBB-Rio), I managed to interview 107 bodybuilding athletes – 77 men and 30 women – who also provided blood and urine samples for analysis. The conclusion of this study was delayed by the COVID-19 pandemic and a disruption in the analysis, but preliminary findings suggested that the associations are not as clear as I expected. The majority of bodybuilders had none or very mild psychiatric symptoms, despite the regular use of huge doses of anabolic steroids – confirmed by soaring concentrations of urinary androgens. Many variables – such as genetics and selection bias – could be used to explain why those athletes did not experience the mood and substance use disorders I had seen among patients of the Addiction Clinic, but one of them drew my attention: Their health strategies.



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#### Health strategies and current studies

People using anabolic steroids frequently adopt strategies to prevent and treat adverse effects of those substances. These include medical consultations, blood examinations and the advice of more experienced users. Usually based on trial-and-error and with different degrees of success, these strategies allow some people to use steroids for decades with minimal adverse effects. Besides, people using anabolic steroids frequently complain of being stigmatised by doctors who are not knowledgeable about "gear". To understand these strategies and the environment of risk reduction, I started my PhD at King's College London's National Addiction Centre in October 2019. The study is funded by King's International Scholarship award.

This research is based on three studies. The first is a recently concluded meta-analysis of papers investigating the prevalence of anabolic steroid uses seeking support from physicians. It analyses papers published worldwide since the 1980's to observe changes in help-seeking behaviour among different subpopulations of steroid users such as gym goers, bodybuilders and adolescents. The meta-analysis also describes the kind of support sought by anabolic steroid users and other sources of steroid-related information.

The second study is a survey with anabolic steroid users living in the UK to understand their health strategies. Conducted between July and September 2021, it has so far recruited hundreds of anabolic steroids users across England, Wales, Scotland and Northern Ireland. Finally, a group of survey respondents will be invited to take part in qualitative interviews to discuss health strategies and the impact of the COVID-19 pandemic in their use of anabolic steroids and harm reduction.

It has been a journey of discoveries. As seen in the work of other members of HEDN, the study of human enhancement is a multidisciplinary field, involving relationships with self-image, performance, cultural and social influences, the medical system, personal choices and the very concept of health. I am proud to be a part of HEDN and its fantastic team of researchers. These are very challenging and exciting times, and we must be ready to listen to people in order to understand the role of human enhancement in our lives. Let's talk about it!



**Julio Amaral** is a Medical Doctor and a PhD student at King's College London. His research interests include psychiatry and addiction science, anabolic steroids, ethics of human enhancement and harm-reduction strategies. Funded by King's College London, his current research is investigating strategies adopted by people using anabolic steroids in the UK to treat and prevent adverse effects.



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### Hormone therapy as a possible revolution in treatment of anabolic androgenic steroid dependence

By Hans Christian Bordado Henriksen, MD, doctoral student, Division of Mental Health and Addiction, Oslo University Hospital and Institute of Clinical Medicine, University of Oslo, Norway

#### Guidelines - where art thou?

I drew attention to patients affected by the use of anabolic androgenic steroids (from now on referred to as AAS) quite early on in my career as a medical doctor. Working closely with men suffering from hypogonadism (i.e., low testosterone level) at Rigshospitalet in Copenhagen, Denmark, I also encountered many AAS-users. They sought treatment for side effects related to either current or previous AAS-use, often involving sexual dysfunction, infertility, breast enlargement, and severe fatigue. Depression, anxiety, excessive sweating and sleep disorder was also frequently reported. Common for them all: the symptoms were intolerable but treatment options were limited and only the most severe cases were prioritized. The treatment we offered usually revolved around the physicians' own previous clinical experience with AAS-users and the few publications that existed in the area. We ended up giving some long-term users life-long testosterone replacement therapy due to a chronically low self-production of testosterone. We treated some infertile users with injectable fertility drugs (gonadotropins) in hopes for better sperm count and quality. Some men with severe and persisting breast tissue growth underwent surgical removal. However, clear guidelines on how to approach this patient group from a medical point of view was lacking, and many men were rejected treatment because of this, even though they suffered severe AAS-related side effects.

#### Steroid induced testosterone insufficiency

AAS-use is associated with several health risks, involving among others cardiovascular, hematologic, endocrine, metabolic, neurologic, and mental disturbances (Pope et al., 2014). One of the most known side effects, and a central component of AAS dependence, is hypogonadism. It is a medical condition characterized by absent or low testosterone production, caused by a downregulation of the sex hormone system: the hypothalamic-pituitary-gonadal axis (Kaprara & Huhtaniemi, 2018). The overall mechanism of how hypogonadism develops in AASusing males and females is well understood. If you supply your body with high doses of synthetic testosterone or other androgens over a period of time, your brain (i.e., the pituitary gland and hypothalamus) starts to believe that you have sufficient amounts of testosterone, and will then stop self-production for an unknown period of time (Rahnema et al., 2014).



However, you will only suffer symptoms of hypogonadism after you cease AAS use, when your body can no longer rely on the outside supply of androgens and your testosterone levels drop to zero. The withdrawal phase that follows is characterized by fatigue, sexual dysfunction, and depression, which sometimes is severe and accompanied by increased suicidal risk (Lindqvist et al., 2014). For men, this hypogonadal phase can last from several months up to a year, or longer, and it might even be permanent for some. In AAS-using women, however, it has been suggested that the phase is shorter, although more knowledge is needed.

The lacking recognition of AAS users in the health care system is what motivated me to start my current PhDresearch in Norway.

#### **Cold turkey**

The lacking recognition of AAS users in the health care system is what motivated me to start my current PhD-research in Norway. What I witnessed during my work in Denmark was an increasing number of otherwise healthy young men, suffering tremendously from the mental and physical side effects of AAS use, and with nowhere to go. In the absence of proper guidelines, users are often encouraged to cease AAs use "cold turkey", and simply hope for the best. Consequently, as the symptoms linked to hypogonadism are difficult to cope with, users tend to restart use (Bonnecaze et al., 2020).

#### Available treatment today

AAS users in Norway have had the rights to substance use disorder (SUD) treatment since 2013. The SUD treatment program includes basic medical examinations, supportive psychotherapy, psychopharmacological treatment and frequent follow-ups through the difficult phase of AAS cessation. The purpose is to reduce or end AAS-use, as well as lower the risk of side effects associated with on-going use. However, as of today, there are no treatment guidelines describing the potential beneficial effects of receiving hormonal therapy during AAS withdrawal, although a Dutch group of endocrinologists has summarized ten years of clinical experience with this patient group and shared their views on treatment options (de Ronde & Smit, 2020).

#### Off-label use of hormone therapy – a pilot study

With the above in mind, let us take a closer look at our research project, led by Ingrid Havnes, MD, PhD and specialist in psychiatry and general medicine at Division of Mental Health and Addiction, Oslo University Hospital. Several medical departments at Oslo University Hospital in Norway will participate in this longitudinal intervention study, where we will explore health risks during current AAS use.

A sample of AAS-dependent men enrolled in outpatient SUD treatment will receive hormone therapy for 16 weeks and be monitored at several time points up to 12 months following cessation. We will compare the participants' withdrawal symptoms against a control group consisting of AAS-using males ending their cycles temporarily but without this medical intervention. The control study is currently ongoing and led by Dr. Astrid Bjørnebekk, head of research in The Anabolic Androgenic Steroid Research Group at Oslo University Hospital.



Image by Aaron Burden from Pixabay

#### An antiestrogen's effect on AAS dependence

A suggested model described by Rahnema and colleagues (2014) involving the antiestrogen clomiphene will be the framework for the hormone therapy proposed in our study. Clomiphene was approved for medical use in the 1960s and has mainly been used in the treatment of female infertility. However, it has shown promising effect in hypogonadal men (of other causes than AAS use) concerning both symptom relief and improved fertility rates (Wheeler et. al, 2019). In addition, it is a common substance used in non-prescribed post-cycle therapy to relieve withdrawal symptoms among AAS users (Rahnema et al., 2014). In the proposed model, clomiphene will be given for 16 consecutive weeks, with treatment starting some weeks after AAS-cessation when the testosterone level is within the upper normal range. During the first four weeks of intervention, topical testosterone replacement therapy is added to ensure normal testosterone levels and to avoid withdrawal symptoms while awaiting the effect from clomiphene. The hypothesis is that clomiphene will reset the sex hormone axis and induce normal testosterone production in the testicles. In cases where the endogenous testosterone production does not respond adequately to clomiphene, human chorionic gonadotropin (hCG) will be added to the treatment regimen.

#### Development of new treatment guidelines

Can clomiphene contribute to the stimulation of an AAS-user's own testosterone production and ultimately reduce the amount of withdrawal symptoms during cessation? What are the general health risks associated with AAS-use and will termination of use reverse them? These are the main questions that we aim to answer in our study. Our research goal is to increase knowledge about AAS-related risks and improve treatment for those who struggle to cease use. If the proposed treatment model proves to be safe and effective, there may not only be health benefits for the AAS users but also less emotional burden for their next of kin during and after the withdrawal period. Additionally, as half of AAS users that seek specialized health service are either on sick leave, social benefits or without any job (Havnes et al., 2019), it may also contribute to reduction of these costs to society. In the long-term, new treatment-options for AAS-dependence might benefit clinicians all around the world who come across an increasing number of distressed AAS users, often without having any well-defined treatment guidelines to follow.

Hans Christian Bordado Henriksen, MD, is a doctoral student at Oslo University Hospital (OUS) in Norway. He has previously provided treatment for men with hypogonadism including users of anabolic androgenic steroids within a Department of Endocrinology. He is now part of The Anabolic Androgenic Steroid Research Group at OUS as well as the National Steroid Project in Norway.



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### Doping A Sporting History April Henning and Paul Dimeo

Why is doping a perennial problem for sport?

Drawing on numerous case studies, *Doping: A Sporting History* charts the origins of today's anti-doping system to the founding of the modern Olympic Games. From interwar notions of sporting purity to the post-war stimulant crisis, what seemed an easily resolvable problem soon became an impossible challenge as pharmacology improved and Cold War politics allowed doping to flourish. The late twentieth century saw the creation of the World Anti-Doping Agency, but have these global measures led to unintended harms?

From the cyclist Tommy Simpson, who died in 1967 on Mont Ventoux with amphetamines in his jersey, to Team Russia's expulsion from the 2018 Winter Olympics, *Doping: A Sporting History* is a gripping, provocative account that ultimately proposes a new approach: one for the inclusion and protection of athletes.

April Henning is Lecturer in Sport Studies at the University of Stirling, and is co-author (with Jesper Andreasson) of *Performance Cultures and Doped Bodies: Challenging Categories, Gender Norms, and Policy Responses* (2021). Paul Dimeo is Associate Professor in Sport Studies at the University of Stirling. His books include A History of Drug Use in Sport, 1876–1976 and (with Verner Møller) The Anti-Doping Crisis in Sport.



A gripping, provocative history of doping in sport

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### **Upcoming Events and Conferences**



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Although 2021 was yet again a strange year for conferences due to the COVID-19 pandemic, conferences are increasingly being organised, particularly online.

#### **Conferences:**

- 28 Jun 1 Jul 2022: British Society of Criminology Conference: https://www.britsoccrim.org/conference/
- 9-12 Oct: Australasian Professional Society on Alcohol & other Drugs (APSAD) conference: https://www.apsad.org.au/apsad-conference
- 22 Nov: International Society for the Study of Drug Policy (ISSDP) One-Day Side-Event Conference to Lisbon Addictions: https://www.issdp.org/
- 23-25 Nov 2022: Lisbon Addictions, European Conference on Addictive Behaviours and Dependencies: https://www.lisbonaddictions.eu/lisbon-addictions-2022/
- Postponed until 2022: **International Network of Doping Research Conference** (Aarhus, Denmark): https://ph.au.dk/en/research/research-units/sport-and-body-culture/research-unit-for-sport-and-body-culture/international-network-of-doping-research/ Contact Dr April Henning for more information: april.henning@stir.ac.uk



We are going to start producing the Human Enhancement Drugs vodcast. The HED vodcasts will cover the latest develops in the field of human enhancement drugs. Have suggestions for topics or would like to be featured, feel free to contact us.

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### Achievements by HEDN members



The human enhancement drugs network represents a diverse group of productive scholars from different academic disciplines. Below you can find the most recent work published by the members of the network. Photo by Pexels from Pixabay.

Peer-reviewed journals

- **Carter, B.N.Z., Boardley, I.D., & van de Ven, K.** (2021). The Impact of the COVID-19 Pandemic on Male Strength Athletes who use Non-Prescribed Anabolic-Androgenic Steroids (open access). Frontiers in Psychiatry. DOI: https://www.frontiersin.org/articles/10.3389/fpsyt.2021.636706/full
- Gatterer, K., Streicher, B., Petróczi, A., Overbye, M., Schobersberger, W., Gumpenberger, M., ... Blank, C. (2021). The status quo before the International Standard for Education: Elite adolescent athletes' perceptions of anti-doping education. Performance Enhancement & Health. doi:https://doi.org/10.1016/j.peh.2021.100200
- Königstein, K., Gatterer, K., Weber, K., Schmidt-Trucksäss, A., Tercier, S., & **Blank, C.** (2021). Geographical heterogeneity of doping-related knowledge, beliefs and attitude among 533 Youth Olympics participants. J Sci Med Sport, 24(11), 1116–1122. doi:10.1016/j.jsams.2021.06.001
- Piatkowski, T., **Dunn, M.**, White, K., Hides, L. & Obst, P. Exploring the harms arising from polysubstance use among performance and image enhancing drug users among young Australian men. Performance Enhancement & Health. Doi: https://doi.org/10.1016/j.peh.2021.100197
- Shimko, K.M. et al (in press). Performance- and image-enhancing drug use in the community: use prevalence, user demographics and the potential role of wastewater-based epidemiology. Journal of Hazardous Materials. DOI: https://doi.org/10.1016/j.jhazmat.2021.126340
- Underwood, van de Ven, K., & Dunn, M. (in press). Testing the boundaries: Self-medicated testosterone replacement and why it is practised. International Journal of Drug Policy. DOI: https://doi.org/10.1016/j.drugp0.2020.103087
- Van de Ven, K., Boardley, I., & Chandler, M. (in press). Identifying best-practice amongst health professionals who work with people using image and performance enhancing drugs (IPEDs) through participatory action research. Qualitative Research in Sport, Exercise and Health. DOI: https://doi.org/10.1080/2159676X.2021.1898457
- Vinther, A.S. (in press). Harnessing the global expertise in drug use and drug prevention in physical activity settings: results from the Anabolic Steroid Prevention Survey. Drugs: Education, Prevention and Policy. DOI: https://doi.org/10.1080/09687637.2021.2010658
- Weber, K., **Patterson, L. B., & Blank, C.** (2022). An exploration of doping-related perceptions and knowledge of disabled elite athletes in the UK and Austria. Psychology of Sport and Exercise, 58. doi:10.1016/j.psychsport.2021.102061

### Want to become involved?

#### Membership

HEDN is an international group of multi-disciplinary researchers with an interest in human enhancement drugs from various universities. We seek to strengthen working relationships between academic sectors, governmental agencies, NGOs, users groups and others interested in human enhancement drugs, performance and image enhancing drugs, and doping substances.

You can find the entire Human Enhancement Drugs Network on our website, where you can apply for membership: <u>https://humanenhancementdrugs.com/members/become-a-hedn-member/</u>

#### Follow us on social media to stay up-to-date!

Follow us via social media to stay up-to-date about the latest developments in the field of human enhancement drugs.

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