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I. Introduction

Historically, female athletes only compete against other female athletes, males against males. Over the last few decades, this concept and definition of female and male in athletics has been a hotly-discussed topic. This is especially so at the highest level of international track and field, where the quest to eliminate cheaters who consume illicit performance enhancing drugs is a top priority. As technology has improved, there is a greater ability to determine what substances give an unfair competitive advantage and detect when those banned substances are present in an athlete. The understanding of human biology has also developed exceedingly. While this growth in understanding has been immensely beneficial to general human existence, these same development seem to be taking a toll on female athletes who are intersex or hyperandrogenic.

II. Historical & legal overview of the problem

Intersex is a broad term "used for a variety of conditions in which a person is born with a reproductive or sexual anatomy that doesn't seem to fit the typical definitions of female or

male."[1] There are various ways intersex can present itself. For example, "a person might be born appearing to be female on the outside, but having mostly male-typical anatomy on the inside."[2] In another instance, a "person may be born with mosaic genetics, so that some of her cells have XX chromosomes and some of them have XY."[3] Intersex characteristics are not always present at birth. Many times people do not discover they are intersex until puberty or upon discovering infertility.[4] Often people never discover it during life but it is discovered during an autopsy.[5]

Hyperandrogenism is a medical condition causing a person to produce high levels of hormones.[6] While there are various forms of hyperandrogenism, the International Association of Athletics Federations (IAAF) regulates the form of hyperandrogenism in intersex female athletes where they produce testosterone at much higher levels than the female average.[7] The IAAF has taken the position that hyperandrogenic female athletes should not be allowed to compete until they take action to suppress naturally occurring high levels of testosterone.[8]

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[1] *What is intersex?*, Intersex Society of North America, 2008.
[2] *Id.*
[3] *Id.*
[4] *Id.*
[5] *Id.*
[6] *Hyperandrogenism explained and what it means for athletics*, USA Today, Aug. 2, 2016.
[7] *Id.*
[8] Sean Ingle, *Sebastian Coe: IAAF right to seek court ruling over hyperandrogenism issue*, The Guardian, Aug. 12, 2017.

Testing for the sex of an athlete, has been around in track and field for decades. In fact, the use of anabolic doping agents was first recorded at the 1952 Olympic Games, with wide belief that the first use was German athletes at the 1936 Olympic Games.[9] First, it was a basic physical examination; later it was a chromosome test. In the 1980s, however, the IAAF considered testosterone levels when determining who was "woman enough" to participate in competitions after Spanish hurdler Maria Martinez-Patino was unfairly thrown off Spain's Olympic team based on a chromosome test.[10] In 2011, the IAAF began "a three-stage medical examination process if it suspected a female athlete had hyperandrogenism."[11] Between the 1980s and 2011, the IAAF handled the issue of intersex female athletes and hyperandrogenism on a case-by-base basis.[12] This remains. Because the IAAF believes testosterone to be the most significant trait enhancing athletic performance, the IAAF feels hyperandrogenic women have an unfair performance advantage over other female athletes. To the IAAF, this belief results in requiring these hyperandrogenic female athletes to actively lower their testosterone levels. The IAAF has taken this stance to ensure fair, level competition, understanding that in these circumstances, nobody is cheating and this is purely a biological issue.[13]

III. Overview of laws in place

Who is the IAAF

The IAAF is the governing body of world competition, making the rules and decisions regarding equipment and doping in international track and field competition.[14] The organization is a signatory of the World Anti-Doping Code, rules that have been adopted by the IAAF Council.[15] The Athletics Integrity Unit enforces these rules on international-level athletes and athletic personnel in regards to "education, testing, investigations, results management, hearings, sanctions, and appeals."[16] In implementing these rules, the Athletics Integrity Unit board appoints an Independent Anti-Doping Review Panel approves, monitors, and provides suggestions regarding the anti-doping program, advising the Athletics Integrity Unit on anti-doping.[17] The IAAF and the International Olympic Committee (IOC) have spent over half a century aggressively trying to determine who is a woman for the purposes of international competition.

[9] M.L. Healy et al., *Endocrine profiles in 693 elite athletes in the post competition setting*, 81 Clinical Endocrinology, 294, 298 (2014).
[10] *Hyperandrogenism explained and what it means for athletics*, USA Today, Aug. 2, 2016.
[11] *Id*.
[12] *Hyperandrogenism explained and what it means for athletics*, USA Today, Aug. 2, 2016.
[13] *Id.*
[14] International Association of Athletics Federations, *About the IAAF*, https://www.iaaf.org/about-iaaf.
[15] Sean Ingle, *Sebastian Coe: IAAF right to seek court ruling over hyperandrogenism issue*, The Guardian, Aug. 12, 2017.
[16] *Id.*
[17] *Id.*

What is "doping"

The definition of doping is multidimensional. It is the "presence of a prohibited substance or its metabolites or markers in an athlete's sample."[18] It is the "use or attempted use by an athlete of a prohibited substance or a prohibited method."[19] Doping is also "evading, refusing or failing to submit to sample collection", "tampering or attempted tampering with any part of doping control", "possession of a prohibited substance or a prohibited method", "trafficking or attempted trafficking in any prohibited substance or prohibited method", complicity, prohibited association, and the administration or attempted administration of a prohibited substance or method to any athlete in or out of competition.[20] Lastly, doping is "any combination of three missed tests and/or filing failures." [21] In other words, an athlete is "doping" if she is born with what is considered a "banned substance" such as a certain level of testosterone.

Banned Substances

The World Anti-Doping Agency (WADA) establishes the list of prohibited substances. A list is established every year and is valid from January 1 to December 31 of that year. Some substances are prohibited both in and out of competition while other substances are only banned in competition. There are also banned substances specific to sport. These banned "substances" include both substances and methods.

The following substances are banned in and out of competition: anabolic agents; peptide hormones, growth factors, and related substances and mimetics; beta-2 agonists; hormone and metabolic modulators; diuretics and masking agents; and non-approved substances.[22] The following are methods banned in and out of competition: manipulation of blood and blood components; chemical and physical manipulation; and gene doping.[23]

An example of an anabolic agent is an anabolic androgenic steroid. Testosterone is an endogenous anabolic androgenic steroid. Testosterone is a banned substance because of its numerous "potential" performance-enhancing effects. These include "boosting the oxygen-carrying capacity of the blood, building lean muscle mass and increasing mental drive and aggressiveness."[24]

[18] Anti-Doping Rule Violation 2.1.1.
[19] Anti-Doping Rule Violation 2.2.
[20] Anti-Doping Rule Violation 2.3, 2.5-2.10.
[21] Anti-Doping Rule Violation 2.4.
[22] World Anti-Doping Agency, *What is prohibited*, 2017, https://www.wada-ama.org/en/prohibited-list/prohibited-at-all-times.
[23] *Id.*
[24] Martha Kelner and James Rudd, *Caster Semenya could be forced to undertake hormone therapy for future Olympics*, The Guardian, July 3, 2017.

Some studies indicate female athletes might experience "improved visuospatial abilities."[25]

Permitted Substances & Treatments, Exceptions

With respect to testosterone, a female athlete is eligible to compete in the women's competitions if she has blood testosterone levels below 10 nmol/L, which is the lower limit of testosterone for men.[26] Anything above 10 nmol/L is considered an advantage that is subject to the anti-doping regulations, even if that testosterone level is naturally occurring.

Testing

Under the Anti-Doping Rules, testing and investigating shall only occur for anti-doping purposes.[27] Testing athletes provides evidence of compliance or non-compliance with the Anti-Doping regulations. When there are findings adverse to the Anti-Doping regulations, investigations will occur to gather intelligence and evidence to determine whether a violation actually occurred. Investigations are not limited to adverse findings. Any athlete, who has not retired, may be subject to testing. The Integrity Unit plus any anti-doping organization with testing authoritative powers, can require an athlete to provide a sample at anytime and anyplace.[28] This includes athletes serving a suspension or period of ineligibility.[29]

Testing for and diagnosis of hyperandrogenism in the elite international athletic world "considers only high testosterone and tissue sensitivity."[30] The IAAF and IOC use serum testosterone as the sole biological variable to regulate women's participants' eligibility.[31] Female athletes with testosterone levels about 10 nmol/L are required to either (1) undergo medical intervention to lower the levels or (2) risk being banned from women's events.[32] These testosterone levels and hyperandrogenism under the IAAF are determined through "systematic hormonal screening" to fulfill the "athlete biological passport [ABP]."[33] The ABP monitors "selected biological variables over time that indirectly reveal the effects of doping rather than attempting to detect the doping substance or method itself."[34]

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[25] *Id.*

[26] Peter Sonsken et al., *Medical and Ethical Concerns Regarding Women with Hyperandrogenism and Elite Sport*, The Journal of Clinical Endocrinology and Metabolism, 825 (Mar. 1, 2015).

[27] IAAF Anti-Doping Rules 5.1.

[28] IAAF Anti-Doping Rules 5.2.1.

[29] *Id.*

[30] Rebecca M. Jordan Young, Peter H. Sonsken, and Katrina Karkazis, *Sex, health, and athletes*, BMJ, at 1, Apr. 28, 2014.

[31] Peter Sonsken et al., *Medical and Ethical Concerns Regarding Women with Hyperandrogenism and Elite Sport*, The Journal of Clinical Endocrinology and Metabolism, 825, 825 (Mar. 1, 2015).

[32] *Id.*

[33] Rebecca M. Jordan Young at 2.

[34] World Anti-Doping Agency, *Athlete Biological Passport*, 2017, https://www.wada-ama.org/en/athlete-

Under the IAAF, full testing processes for testosterone begin with a clinical examination and endocrine assessment that determines whether or not there are grounds for classifying a female athlete as hyperandrogenic.[35] If such grounds are found, at least a full physical and gynecological examination incur, with endocrine assessments of blood and urine, medical history including family medical history, and psychological assessments. [36] This includes "measuring and palpating the clitoris, vagina and vulva, as well as evaluating breast size and pubic hair scored on an illustrated five-grade scale."[37]

Organizations like the IAAF "integrate the Athlete Biological Passport into the larger framework of robust anti-doping program in order to: [i]dentify and target athletes for specific analytical testing by intelligent and timely interpretation of Passport data; and [p]ursue possible anti-doping rule violations based on atypical passport [. . .] ."[38] In other words, while the ABP requires the IAAF to regulate doping, the IAAF chooses to implement the highly questionable, unideal regulations on natural testosterone.

Proof of doping

The IAAF, or other Anti-Doping organization with power, has the burden of establishing that an anti-doping violation has occurred.[39] The IAAF or other organization, has to establish "the commission of the alleged Anti-Doping Rule Violation to the comfortable satisfaction of the hearing panel, bearing in mind the seriousness of the allegation that is made."[40] This standard of proof is not to the level of beyond a reasonable doubt and is somewhere between preponderance of the evidence and clear and convincing evidence. Facts proving an anti-doping violation "may be established by any means", which includes the following: admissions; analytical methods; compliance with an official international standard; WADA-accredited and WADA-approved laboratories; those facts established by "a court or professional disciplinary tribunal of competent jurisdiction that is not the subject of a pending appeal"; and inferences drawn by a hearing panel in a hearing based on the accused's refusal or failure to respond to questions from an investigation or requests prior to a hearing.[41]

biological-passport.

[35] Jordan Young at 2.

[36] Rebecca M. Jordan Young, Peter H. Sonsken, and Katrina Karkazis, *Sex, health, and athletes*, BMJ, at 2, Apr. 28, 2014.

[37] Ruth Padawer, *The Humiliating Practice of Sex-Testing Female Athletes*, The New York Times, Jun. 28, 2016.

[38] World Anti-Doping Agency, *Athlete Biological Passport*, 2017, https://www.wada-ama.org/en/athlete-biological-passport.

[39] IAAF Anti-Doping Rules 3.1.

[40] *Id.*

[41] IAAF Anti-Doping Rules 3.2.

On rebuttal, the athlete, or whoever is alleged to have committed the violation, has to refute the established presumption or establish specific facts or circumstances by a preponderance of the evidence, or "a balance of probability."[42]

Managing Results & Hearing

Results management & investigation

Hearings and managing athlete testing results are governed by the procedural rules of the national federation or Anti-Doping organization that initiated or directed the athlete testing and sample collection.[43] However, the Integrity Unit, under the Anti-Doping Rules, has responsibility over results management for investigations conducted by the Integrity Unit; possible violations that arise where there has been testing conducted under the Anti-Doping Rules; violations that arise where no testing has occurred; a National Anti-Doping organization initiated the sample collection; and for a filing failure or missed test. The Integrity Unit also oversees adverse ABP findings.

After the results management or investigation process by the Integrity Unit, National Federation, or National Anti-Doping organization, if an Anti-Doping Rules violation is asserted, the athlete or the person who committed the violation will be notified of a violation and referred to a hearing.[44]

Hearing

The Disciplinary Tribunal is the IAAF established "court" with jurisdiction over Anti-Doping Rules violations asserted by the Integrity Unit, National Federation, or other National Anti-Doping organization.[45] The Disciplinary Tribunal has the following powers:

"to rule on its own jurisdiction; to appoint an independent expert to assist or advise it on specific issues [. . .]; to expedite or to adjourn, postpone or suspend its proceedings, upon such terms as it will determine, where fairness so requires; to extend or abbreviate any time limit specified in any rules or by the Disciplinary Tribunal itself; to order any party to make any property, document or other thing in its possession or under its control available for inspection; to allow one or more third parties to intervene or be joined in the proceedings, to make all appropriate procedural directions in relation to such intervention or joinder, and thereafter to make a single final decision or separate decisions in respect of all parties; to order that certain preliminary and/or potentially dispositive questions [. . .] be heard and determined in advance of any other issues in the matter; to award interim relief or other conservatory measures on a provisional basis and subject to final determination; to make any other procedural direction or take any other procedural

[42] *Id.*
[43] IAAF Anti-Doping Rules 7.1.
[44] IAAF Anti-Doping Rule 8.1.
[45] *Id.*

steps which the Disciplinary Tribunal considers to be appropriate in pursuit of the efficient and proportionate management of any proceeding or matter pending before it; and to impose costs orders."[46]

Hearings before the Disciplinary Tribunal begin with the head of the Integrity Unit sending the "Notice of Charge" (written notice) to both the athlete or person charged with the violation and the Disciplinary Tribunal chairperson.[47] This notice outlines the violations that have taken place, the Anti-Doping rule that has been breached, a summary of the facts that are the basis for the allegation, the applicable consequences, matters related to provision suspension, and the fact that the athlete is entitled to respond to the notice.[48]

The person charged with the violation may respond in a number of ways: admit to the charge and acquiesce to the consequences; admit to the charge but dispute or attempt to mitigate the consequences; or deny the violation and have the Disciplinary Tribunal decide, at the hearing, the charge, if it is upheld, and any consequences.[49]

Upon receiving the notice of charge, the chairperson appoints one or three members of the entire Disciplinary Tribunal to hear the case and decide the violations alleged in the notice. Appointees cannot be involved if they have any personal connection or interest to anyone involved; had any prior involvement with any matter or facts giving rise to the proceedings; is the same nationality as the party charged; or if impartiality or independence would be questioned as determined by the chairperson.[50]

Both the Integrity Unit and the charged person have the right to be present and heard at the hearing as well as be represented by legal counsel.[51] The charged person may also submit a writing for the Disciplinary Tribunal panel to consider in its deliberations.[52] The hearings are conducted confidentially.[53] After all submissions, the Disciplinary Tribunal panel deliberates whether a violation has occurred and what the consequence should be. The panel issues their decision, in writing, within 14 days of the conclusion of the hearing, and sends the decision to the parties, WADA, and whoever else has a right to appeal the decision. This written decision contains and explains the findings, whether a violation has occurred, the consequences, why the maximum consequence has not occurred, the

[46] IAAF Anti-Doping Rule 8.6.1.
[47] IAAF Anti-Doping Rule 8.6.1.
[48] IAAF Anti-Doping Rule 8.4.2.
[49] IAAF Anti-Doping Rule 8.4.3.
[50] IAAF Anti-Doping Rule 8.5.2.
[51] IAAF Anti-Doping Rule 8.8.2.
[52] IAAF Anti-Doping Rule 8.8.3.
[53] IAAF Anti-Doping Rule 8.8.1.

date the consequence begins, the reasons of all the aforementioned, and the rights surrounding appeal.[54]

Consequences

Anti-Doping violations have a number of consequences. Where there is an Anti-Doping violation found from an in-competition test, the athlete is automatically disqualified and forfeits medals, titles, awards, points, and prize and appearance money.[55] Results from other events the athlete has competed in may also be disqualified.[56] Consequences can vary greatly depending on whether it is the athlete's first offense and the degree of fault the offender has in the offense.

Where an athlete has committed an Anti-Doping violation, and it is the athlete's first Anti-Doping offense, the athlete shall be ineligible for four years where the violation either did not involve a specified substance or does involve a specified substance but the violation was unintentional.[57] The period of ineligibility is two years where the athlete, who failed to submit a sample, can show that the violation was unintentional. For a first offense, the two year period of ineligibility can be reduced to one year if the degree of fault is lower.[58] Where the athlete or person who committed the violation can prove that he or she was simply negligent or bears no fault at all, than the period of ineligibility is eliminated.[59]

The period of ineligibility may be eliminated, reduced, or suspended for reasons that are not fault-related. One reason is substantially assisting the Integrity Unit in discovering or establishing Anti-Doping Rule violations.[60] Another reason is where an athlete or other violator voluntarily admits to committing a violation before other evidence has been established.[61]

Where the violation is the athlete or offender's second offense, the period of ineligibility is one of the following, whatever is greater: "six months; one-half of the period of ineligibility imposed for the first anti-doping offense without taking into account any reduction [. . .]; or twice the period of ineligibility that would be applicable to the second Anti-Doping Rule violation if it were a first Anti-Doping Rule violation, without taking into account any reduction [. . .]."[62] Where a prior violation has occurred within ten years of the recent violation, that prior violation shall be taken into account to calculate the period of ineligibility.[63] When multiple

[54] IAAF Anti-Doping Rule 8.9.2.
[55] IAAF Anti-Doping Rule 9.1.
[56] IAAF Anti-Doping Rule 10.1.
[57] IAAF Anti-Doping Rule 10.2.1.
[58] IAAF Anti-Doping Rule 10.3.2.
[59] IAAF Anti-Doping Rule 10.4.
[60] IAAF Anti-Doping Rule 10.6.1.
[61] IAAF Anti-Doping Rule 10.6.2.
[62] IAAF Anti-Doping Rule 10.7.1.
[63] IAAF Anti-Doping Rule 10.7.5.

violations have taken place at once, the ineligibility periods for each offense shall run sequentially.[64]

Appealing

Athletes and others found to have committed an Anti-Doping Rules violation may appeal the decision. For international-level athletes or athlete support persons, or those involving international competitions, a decision can be appealed exclusively to the Court of Arbitration for Sport (CAS).[65] Disciplinary Tribunal decisions may also be appealed exclusively to CAS.[66] All other decisions "may be appealed to an independent and impartial body in accordance with rules established by the National Federation or National Anti-Doping Organisation."[67] WADA can appeal a decision that was not rendered in a timely manner.[68]

Appealing to CAS must occur within 30 days from receipt of the decision. Appeals must be filed with the CAS and IAAF on the same day[69]. Respondent has 30 days to file an answer with the CAS after receiving the appeal brief.[70] Taking on an appeal is up for the Anti-Doping Review Panel to decide. The CAS Code of Sports-related Arbitration applies. Cross appeals and subsequent appeals are permitted. Where the IAAF is involved, the CAS panel is bound by IAAF constitution, rules, and regulations.[71] The CAS' decision is final and binding on all parties and there is no right of appeal from the decision. [72]

Luckily, the court of arbitration for sport has temporarily suspended the IAAF's disciplinary practices in regard to restricting permitted levels of testosterone among female competitors. Nonetheless, the IAAF continues to this day to stand by and argue for these practices, giving this paper relevance.

IV. Argument & Analysis

The IAAF discriminates against female athletes with atypical sex development. One highly publicized example of this, that will be discussed further below, is the case of Dutee Chand. The IAAF uses advanced technology to inequitably punish female athletes born intersex. These uses are intrusive, violative, and often quite embarrassing to the female athletes, resulting in arbitrary conclusions and decisions. Rather, the IAAF should and can use modern-day technology to create and implement rules regarding testosterone doping in a more just way. They have all the right tools, boards, and actors in place to make the right

[64] IAAF Anti-Doping Rule 10.7.6.
[65] IAAF Anti-Doping Rule 13.2.2.
[66] IAAF Anti-Doping Rule 13.2.3.
[67] IAAF Anti-Doping Rule 13.2.3.
[68] IAAF Anti-Doping Rule 13.3.
[69] IAAF Anti-Doping Rule 13.7.1.
[70] *Id.*
[71] IAAF Anti-Doping Rule 13.9.4.
[72] IAAF Anti-Doping Rule 13.9.6.

decisions, they just fail to fully utilize all the resources available to their fullest capacity.

The IAAF and IOC concern for testosterone doping are understandable. Fairness is allegedly one of the most important principles to the IAAF and IOC, and testosterone is the "most widely abused performance-enhancing drug."[73] 64 of 116 female athletes serving doping bans as of December 2016 tested positive for androgens, or testosterone.[74] The advantages from heightened testosterone levels are, to the IAAF and their medical and science personnel, potentially quite significant. At times the IAAF has been successful and just in monitoring doping in female athletes.

For instance, the IAAF successfully found and penalized Russian sprinters who had engaged in doping. Russia had state-sanctioned androgenic doping, and Russian 800-meter 2012 London Olympic gold medalist Mariya Savinova was stripped of her medal.[75] She received a four-year ban and nullification of her July 2010 to August 2013 race results by the CAS for doping during that time period. Savinova's biological passport plus her videotaped admission of taking oxandrolone, an anabolic steroid, were the CAS' clear evidence of Savinova's doping.[76] In the video, Savinova described how her coach, her husband, and others had tested for and designed a sophisticated system for the oxandrolone to be in and out of her body in 20 days.[77] At least nineteen other Russian athletes have been stripped of their 2008 or 2012 Olympics medals.[78] As a result of this widespread, systemic doping, the entire Russian track and field team was barred from competing in the 2016 Olympic games in Rio.[79] Consequently, Russia was also barred from competing in the 2017 World Championships in London.[80] This crackdown on Russian female track doping is unrelated to naturally occurring high levels of testosterone, and the action taken against Russia - the bans - is an understandable punishment that furthers the interests of fairness.

While the IAAF may have the proper processes in place to make the best decisions regarding doping with people actively taking banned substances and methods, there are still many ways in which the IAAF is in the wrong. The IAAF's regulations of testosterone levels and hyperandrogenism in female athletes are

[73] Martha Kelner and James Rudd, *Caster Semenya could be forced to undertake hormone therapy for future Olympics*, The Guardian, July 3, 2017.
[74] Martha Kelner and James Rudd, *Caster Semenya could be forced to undertake hormone therapy for future Olympics*, The Guardian, July 3, 2017.
[75] Colleen Curry, *The face of Russia's doping scandal: Mariya Savinova*, The Guardian, Nov. 10, 2015.
[76] Marissa Payne, *Russian runner who admitted on video to doping is stripped of Olympic gold*, The Washington Post, Feb. 10, 2017.
[77] *Id.*
[78] Marissa Payne, *Russian runner who admitted on video to doping is stripped of Olympic gold*, The Washington Post, Feb. 10, 2017.
[79] *Id.*
[80] *Id.*

discriminatory, in opposition to the Olympic charter, unethical, and wholly without scientific backing.

Discriminatory

The IAAF regulations on testosterone and who is woman enough to participate are discriminatory against women and consequently discriminatory against particular athletes because of their success. Men are not regulated nearly as vigorously as women. These regulations on hyperandrogenism in women came to fruition as a response to the success of Caster Semenya and are executed upon suspicion that follows successful women track athletes such as Dutee Chand. Following a discussion of the differences in IAAF treatment of men, the stories of Semenya and Chand will be discussed further below.

Male athletes do not undergo even remotely similar invasive, dehumanizing testing procedures as female athletes. There are no regulations of naturally occurring advantages in male athletes. There never have been. In fact, these naturally occurring higher levels of testosterone in male athletes are praised. Furthermore, the regulation of the "presence of a prohibited substance or its metabolites or markers in an athlete's sample" such as naturally occurring high levels of testosterone is discriminatorily practiced. Male athletes are not kept under as watchful an eye as female athletes in regards to testosterone levels. Additionally, female athletes are penalized for success, with the IAAF harshly coming down on female athletes whose success is questioned as being the result of high testosterone. The same cannot be said for the treatment and penalization of male athletes for testosterone.

Caster Semenya

Caster Semenya is a South African middle distance runner and 2016 Olympic gold medalist. After the 2009 Berlin world championships, in which Semenya, took 1st in the 800m, the IAAF received criticism for not properly investigating her.[81] The public questioned Semenya's success as being a result of high levels of testosterone, and in response the IAAF subjected Semenya to "unwarranted and invasive scrutiny of the most intimate and private details" of Semenya's being. Semenya won the 2009 World Championships by a full two seconds. Afterward, people insultingly called her a man. She was punished for "being too fast and supposedly too masculine."[82] This was the catalyst for the current policies the IAAF enacted in 2011.

If the IAAF has their way, Semenya, and other female athletes in the future, could be forced to undertake hormone therapy for future Olympics and international

[81] International Association of Athletics Federations, *Semenya Rockets to the Top of the World*, Aug. 26, 2009, https://www.iaaf.org/competitions/iaaf-world-championships/news/semenyas-Rockets-to-the-top-of-the-world.
[82] Jere Longman, *Understanding the Controversy Over Caster Semenya*, The New York Times, Aug. 18, 2016.

competition.[83] Male athletes do not face such threats of force. Male athletes are not faced with invasive procedures and being thoroughly embarrassed the way Semenya and other female athletes are made to feel. This treatment of Semenya stemmed from negative, weak people upset with her success, something else that does not happen to male athletes.

Dutee Chand

Dutee Chand is a record-breaking Indian sprinter. Her story and battle against the IAAF, documented by *The New York Times*, started in June 2014, when Chand was called in by the director of the Athletics Federation of India - the Indian affiliate of the IAAF - to meet in Delhi.[84] Upon arriving in Delhi, Chand was sent to a clinic to meet with a doctor for the Athletics Federation of India, and instead of being given a standard urine or blood test, the doctor said he would perform an ultrasound. She was confused, but the doctor assured her it was routine.

In fact, the ultrasound test was prompted by Chand's stellar performance at the Asian Junior Athletics Championships (AJAC). In response to her surprising successful performance, people began to question her testosterone status. Chand's muscles were quite pronounced in comparison to other women, and she had a stride people believed too impressive for someone of her stature. A few days after the ultrasound, Chand received a letter in the mail requesting she do a gender verification test. Within days Chand was sent to a private hospital and had her blood drawn for her natural level of testosterone to be measured. Chand also received chromosome analysis, an MRI and another gynecological exam. The results of her tests indicated that her "male hormone" levels were above the "typical female range," which meant within the male range. Chand was banned from racing because the IAAF feared she would have a competitive advantage from the excess testosterone.

Chand appealed her ban to the CAS, arguing the IAAF's regulations discriminated against female athletes with "a particular natural physical characteristic."[85] Though the IAAF disputed Chand's arguments, the CAS found in favor of Chand, finding in particular that other factors contribute to elite athletic performance, not solely testosterone. This will be further explored in a later section. The CAS' findings required the IOC establish policy or guidelines for intersex at the 2016 Rio Olympics, and the IOC instead urged the IAAF to show the CAS evidence in support of the reinstatement of the IAAF rules on hyperandrogenism. Chand participated in the Rio Olympics, where she did not even qualify for the 100-meter semifinals.

[83] Martha Kelner and James Rudd, *Caster Semenya could be forced to undertake hormone therapy for future Olympics*, The Guardian, July 3, 2017.
[84] Ruth Padawer, *The Humiliating Practice of Sex-Testing Female Athletes*, The New York Times, Jun. 28, 2016.
[85] Ronald S. Katz and Robert W. Luckinbill, *Changing Sex/Gender Roles and Sport*, 28 Stan. L. & Pol'y Rev. 215, 237 (2017).

Chand's failure to advance to the 100-meter semifinals at the Rio Olympics is prime evidence the IAAF's understanding of the beneficial effects of naturally occurring high levels of testosterone is misguided and useless. The differences in Semenya's performance - gold - and Chand's performance - did not advance to the semifinals - alone showcase how unreliable testosterone levels can indicate performance advantages. The IAAF's failed actions resulted in them extending an invitation to Chand to the world championships, a seeming concession to their failed policy and actions. In spite of evidence of the IAAF's failed, useless regulations, the IAAF still argues for and pushes these regulations and their usefulness. The IAAF is still seeking a court ruling in favor of its policies and procedures.[86]

The regulations will, and do, unnecessarily and negatively affect women with intersex conditions that result in high testosterone levels instead of solely punishing the female athletes who are actually doping with testosterone. These IAAF regulations on testosterone and hyperandrogenism further discriminate against women by causing women to live in fear, to live with concerns that their male counterparts do not experience. Women have added stressors and pressures other than making sure they prepare their bodies for elite competition; they must worry about something entirely out of their control, something their body naturally produces. Semenya and Chand's experiences are prime examples of the discrimination women track athletes experience that men do not. The male track athletes do not have to take drugs to suppress their natural hormones, they do not have to have surgery that is not medically required, and they do not undergo the social backlash and exposure of their private lives. The IAAF discriminates against women, particularly intersex and hyperandrogenic women, and this discrimination is in direct opposition to the Olympic charter.

In opposition to the Olympic charter

The Olympic charter codifies the "fundamental principles of Olympism."[87] The charter also establishes the relationship between the international federations associated with the Olympics and the Olympics themselves. IAAF regulations are in opposition to Principle 6 of the Olympic charter. Principle 6 states "any form of discrimination affecting the Olympic Movement" is prohibited.[88]

At the minimum, there should be a fairness applicable to all women, if not all men, too. A woman who has been living as a woman her whole life, and who has not doped, should be able to compete as a woman. Additionally, women should not have to forfeit the opportunity to represent their country because of the way their body naturally functions, especially if the options are do not compete at all or undergo invasive, embarrassing hormone therapy and surgery.

[86] Sean Ingle, *Sebastian Coe: IAAF right to seek court ruling over hyperandrogenism issue*, The Guardian, Aug. 12, 2017.
[87] The Olympic Charter, 10, 11, Sept. 19, 2017.
[88] *Id.* at 16.

Lack scientific backing

The medical decisions in Olympic female athlete hyperandrogenism cases have absolutely no scientific backing.

IAAF health and science department researchers conducted a study and concluded that the heightened testosterone levels in elite female track athletes provided an impactful performance boost. 1,332 female athletes, competing in various track and field events at the 2011 and 2013 world championships, had their blood testosterone levels measured.[89] The results of the study indicated that those participants with the highest levels of testosterone demonstrated "significant advantages" or, in other words, ran faster than those participants with the lowest levels of testosterone. The head researcher found this to be "new evidence [of] the performance-enhancing effects of androgens in elite female athletes."[90] However, this understanding of how testosterone works in athletes has been rebutted by other reputable scientists and studies.

The assumption that the naturally occurring high levels of testosterone give an unfair advantage in competition is woefully misguided, as evidenced by Dutee Chand failing to make it past the first round at the 2017 World Athletic Championships. Success can be attributed to many other factors such as genes on the Y chromosome that control height and lean body mass.[91] Body composition is a key feature in elite sports.[92] In 2014, a study measuring the profile of hormones in a select group of elite athletes was published in *Clinical Endocrinology*.[93] Blood samples from 813 volunteer elite athletes from 15 different sport categories were obtained. A subset of 693 of the 813 had their endocrine profile measured. These samples were drawn within two hours post major national or international competition. The study obtained hormone profiles on 454 male and 239 female athletes. This was the first study to document hormone profiles in elite male and female athletes. The study's findings are significant to debunk IAAF and IOC beliefs about the "normal" testosterone levels in a woman.

The first finding to puncture a hole in the IAAF's ill-informed belief in testosterone levels indicating who is "woman" enough to perform is the impact of lean body mass (LBM) on performance. Difference in LBM sufficiently accounts for observed differences in strength and performance. The study found that women had an LBM of 85% that of men, a 10-kg difference in LBM in elite female athletes,

[89] Martha Kelner and James Rudd, *Caster Semenya could be forced to undertake hormone therapy for future Olympics*, The Guardian, July 3, 2017.
[90] *Id.*
[91] Sonsken et al. at 826.
[92] M.L. Healy et al., *Endocrine profiles in 693 elite athletes in the post competition setting*, 81 Clinical Endocrinology, 294, 298 (2014).
[93] *Id.* at 297.

and that LBM is the most likely explanation for differences in performance, not testosterone.[94]

The elite female athletes had high levels of testosterone, the upper limit of the normal male range, but the normal serum testosterone (LH) and follicle-stimulating hormone (FSH) in those women indicates women may have had other issues such as androgen insensitivity syndrome, polycystic ovary syndrome, or hyperandrogenism.[95] The high levels do not indicate a competitive advantage or intentional doping.

Additionally, the study found low serum testosterone values in the elite male athletes, another indicator that serum testosterone does not determine athletic performance.[96] These male athletes run faster than the female athletes, running some of the fastest times in history, but they have low testosterone levels at performance time, indicating how little role testosterone can have in performance. Athletes had different mean testosterone levels between genders, but there existed a complete overlap of the range of testosterone concentrations. This overlap indicates that limiting participation of female athletes based on "normal" serum testosterone levels is incorrect and in need of overhaul.

The study concluded there is "no clear separation between the testosterone levels of male and female elite athletes."[97] The findings of this study totally negate the IAAF and IOC belief that testosterone levels determine performance and competitive advantage and restriction of women without "normal" serum testosterone levels. Elite female athletes as a group generally have higher testosterone levels than the average woman.[98] Raised levels of testosterone in women can be caused by other occurrences and wholly unrelated to unfair doping, such as cysts or other ovarian syndromes.[99]

Anti-doping regulations are in place to punish people who are cheating, and satisfy that purpose in instances like the Russian doping scandal. However, the IAAF director has already admitted hyperandrogenism is not an issue of cheating because no one is cheating.[100] He acknowledged this is a biological issue. Perhaps he should seriously consider what the biological experts know.

Violating ethical standards

[94] M.L. Healy et al. at 298 (2014).
[95] M.L. Healy et al. at 296 (2014).
[96] M.L. Healy et al. at 302 (2014).
[97] M.L. Healy et al. 294 at 298 (2014).
[98] Rebecca M. Jordan Young, Peter H. Sonsken, and Katrina Karkazis, *Sex, health, and athletes*, BMJ, at 1, Apr. 28, 2014.
[99] *Id.*
[100] Sean Ingle, *Sebastian Coe: IAAF right to seek court ruling over hyperandrogenism issue*, The Guardian, Aug. 12, 2017.

The medical practices required by the IAAF standards violate the ethical standards of clinical practice.

A study in France that was carried out in a way that mirrored IAAF testing was found to violate ethical standards of clinical practice.[101] The Sonsken piece found that since those practices were the same as the IAAF testing practices and found unethical, than the IAAF practices are surely unethical.[102] The study found devastating effects on athletes due to the trauma from the testing and having their identity questioned.[103]

Other unethical practices the study explored the IAAF has also carried out. For example, the IAAF gender requirements and testing result in unnecessary surgeries and medical procedures, just as the France study did.[104] Other non-athlete women with similar biological characteristics do not require these same surgeries or procedures. This raises serious ethical concerns since the testing and practices are only needed for eligibility purposes, not health purposes. Practices in the study and suggested by the IAAF, like the removal of gonads and clitoral mutilation for the purposes of athletic eligibility, are unethical especially since hyperandrogenism does not cause morbidity or indicate disease, which actually warrant the removal of gonads and clitoral mutilation. [105] In fact, the IAAF regulations to lower testosterone levels directly conflict with the medical approach to hyperandrogenism.[106] The IAAF offers to pay for some procedures, not all, and does not provide for after care.[107] This is sure to have a negative impact on athletes from regions lacking the resources for necessary medical supervision and long-term follow up.[108] For the athletes who require lifelong hormone replacement, the upkeep might be entirely too expensive. The short term and long term medical implications of these unnecessary procedures are widespread. Such practices are unacceptable in the medical field outside the IAAF realm.

These policies, practices and effects trickle down and extend beyond elite, international level competitors. The IOC requires national Olympic committees "'actively investigate any perceived deviation in sex characteristics' before registering athletes."[109] India has already created a policy for discerning sex

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[101] Peter Sonsken et al., *Medical and Ethical Concerns Regarding Women with Hyperandrogenism and Elite Sport*, The Journal of Clinical Endocrinology and Metabolism, 825, 825 (Mar. 1, 2015).
[102] *Id.*
[103] *Id.*
[104] Sonsken et al. at 826,
[105] Jordan Young at 2.
[106] *Id.*
[107] Peter Sonsken et al., *Medical and Ethical Concerns Regarding Women with Hyperandrogenism and Elite Sport*, The Journal of Clinical Endocrinology and Metabolism, 825, 826 (Mar. 1, 2015).
[108] Peter Sonsken et al., *Medical and Ethical Concerns Regarding Women with Hyperandrogenism and Elite Sport*, The Journal of Clinical Endocrinology and Metabolism, 825, 826 (Mar. 1, 2015).
[109] Rebecca M. Jordan Young, Peter H. Sonsken, and Katrina Karkazis, *Sex, health, and athletes*, BMJ, at 1, Apr. 28, 2014.

characteristics that applies to women athletes at every level.[110] Four young female athletes, ages 18 to 21, have already undergone unnecessary gonadectomy procedures to comply with IOC requirements.[111] They were subject to more than the average procedures, undergoing "karyotyping and genetic analysis, abdominal-pelvic magnetic resonance imaging, and radiography to determine bone mineral density and composition."[112] In a traditional medical scenario, doctors, at least in the United States, would likely have their licenses revoked for such practices.

The IAAFs procedures are invasive, irreversible, and potentially widespread.[113] Due to the IOC mandate to investigate any perceived abnormal sex characteristics in athletes, young female athletes are subject to gonadectomy procedures and partial clitoridectomies to achieve the requisite womanhood.[114] Because of the testosterone limits allowed in women athletes, 14% of women athletes are subject to being investigated for "hyperandrogenism", and all the invasive, unethical procedures that come with it.[115]

V. Conclusion

Going forward, it appears the IAAF and IOC have only two options: adapt or cease to exist. People, sports fans and participants domestically and internationally, will find a way to overhaul the IAAF and their unethical, discriminatory practices. To avoid dying out, the IAAF first needs to make and apply rules equally to men and women, and these rules need to completely disregard the way someone was born. If the IAAF wants to keep these stringent rules, punishing female athletes with naturally occurring high levels of testosterone then the IAAF must do the same for male athletes. In the greatest interest of fairness, the regulations regarding the eligibility of hyperandrogenic women athletes, including the unnecessarily invasive medical intervention and "corrective" treatments, should be rescinded immediately. At the end of the day, if a woman has lived as a woman her whole life, the IAAF should, and frankly must, let her compete with the women. The counter to this argument is the question of how do transgender athletes fit in, but that is outside the scope of this paper.

In every other field, the law changes as the times change, as more people come to recognize what is right and what is clearly so very wrong. Slavery. Women's suffrage. Jim Crow. Gay rights. Just as those have changed, so the IAAF needs to change. And the IAAF needs to learn from history. Most of those historical changes occurred much later than they could and should have. People surely regretted being on the wrong side of history. The IAAF must do all it can to avoid having those regrets, too.

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[110] *Id.*
[111] Rebecca M. Jordan Young, Peter H. Sonsken, and Katrina Karkazis, *Sex, health, and athletes*, BMJ, at 2, Apr. 28, 2014.
[112] *Id.*
[113] *Id.*
[114] *Id.*
[115] *Id.*