Dangerous New Identity: Is Change Needed in Determining Transgender Participation in Athletics Through New Gender Identity?

By: John J. Leppler
J.D. Candidate 2014, University of Baltimore School of Law

Abstract

This Article will address the “unfair advantage” the male-to-female athletes have over their females in sports that require a high degree of strength and power. Mixed Martial Artist Fallon Fox is a an ideal example for this issue because a high contact sport high intensity and “hyper-masculine” like Mixed Martial Arts is a good demonstration to illustrate the unfair advantage newly identified females have over their opponents after being a male, physically and legally in society for an extensive period of time.

Part II of this article will summarize the policies governing transgender athlete participation in Sport. Further, this section will note some of the tests that sports governing bodies use in determining whether a transgender athlete should be identified in athletics as her newly legal gender.

Part III will discuss the difference in cross-sectional musculature, hormone composition, and DNA relevant to both males and females, and discuss why even hormonal therapy and other forms of surgery that will aid in a “gender change” will still leave a natal male with a far superior athletic advantage over a male; especially done after a certain age. This article will conclude by contending a modification in the current guidelines for depicting whether a transgender should be allowed to participate.
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I. Introduction

Title VII of the Civil Rights Act of 1964 (“Title VII”) prohibits discrimination based on race, color, religion, sex, or national origin. Federal courts have been called upon to decide whether the Act’s prohibition against sex discrimination forbids discrimination based on transgender identity. The “transgender identity” can be considered the psychological gender identity that an individual has it does not conform to society’s expectations for one’s assigned sex at birth. These cases call into question the default assumption about sex, such as the notion that six is a simple matter of biological difference.

But what happens when a transgender identity person engages in athletics. Educations have long recognized the physical, psychological, social, and educational benefits that sports provide to individuals at the professional or college level. Sports governing bodies and educational institutions enacted policies to alleviate the segregation between men and women participating in athletics. However, transgender athletes were left aside. Most professional

1 Associate Professor, Western New England College School of Law. Thanks to Debbie Brake, Ann Gillard, Kris Newhall, Giovanna Shay, and Erin Welch for helpful feedback on earlier drafts.
3 Id.
sports governing bodies and governing bodies at colleges still have not incorporated transgender athlete into the existing athletic structure.\textsuperscript{5} Many athletes and officials of the governing bodies believe that transgender athletes have an unfair advantage when they compete in sports consistent with their gender identity.

Congress and other profession governing bodies had created policies to govern participation by transgender athletes. The International Olympic Committee (IOC) was the first sport organization to promulgate a policy designed to allow participation by transgender athletes in a manner consistent with their newly assigned sex.\textsuperscript{6} Before this point, most sports organizations required athletes to compete with members of their natal sex, but this policy implemented by the IOC was a catalyst for Congress to get involved in the United States.\textsuperscript{7} But what happens when Science meets legal equity. The male-to-female transformation in athletics may present problems. Guidelines have been set by different governing bodies in determining whether a natal male turned legal female athlete should participate against women in sports.

Recently in March 2013, a Female, Fallon Fox competed against a female in and Mixed Martial Arts (“MMA”) fight.\textsuperscript{8} Males competing in MMA are an accepted standard. Females have gained widespread acceptance in MMA. What happens when an openly transgender fighter, who is a newly identified female wants to compete at the professional levels against female? Fallon Fox fought and knocked out her opponent in a professional Ultimate Fighting Championship

\textsuperscript{5} Varda Burnstyn, The Rites of Men: Manhood, Politics and the Culture of Sport 45 (1999).
\textsuperscript{7} Buzuvis supra note 2 (Part I).
Bout in less than one minute. The 37-year-old was born a male, but underwent gender reassignment therapy and hormonal treatment beginning into 2006 to become a female. Governing bodies, most notably the IOC and the National Collegiate Athletic Association (“NCAA”) now allow transgender athletes to compete in athletic competition against their newly identity gender if they have undergone hormonally therapy for at least 2 years prior to competition and has undergone gender reassignment surgery; comprised of but not limited to androgen suppression, estrogen blood transfusion, genitalia modification, and other surgeries that would ultimately lower testosterone and raise estrogen in the body, the hormones that separate the physical attributes of the male and female sex.

This Article will address the “unfair advantage” the male-to-female athletes have over their females in sports that require a high degree of strength and power. Mixed Martial Artist Fallon Fox is an ideal example for this issue because a high contact sport high intensity and “hyper-masculine” like Mixed Martial Arts is a good demonstration to illustrate the unfair advantage newly identified females have over their opponents after being a male, physically and legally in society for an extensive period of time. Constitutional and political principles play an important role of letting transgender personnel identify with the gender they want to be accepted as in society. But sport and medical science invite empirical data to show the unfair competitive advantage natal male-to-female persons have in athletics that require a high degree of strength and explosive power output. Fox’s dominance in MMA sparked scientific research too truly to understand the lopsided competition, and should be taken seriously. The dominance could spread

9 Id.
10 Id.
11 Van Der Luit-Drummond supra note 6.
quickly to Olympic sports such as track and field (sprinting events, hurdles, pole vaulting, shot put, javelin) weightlifting, bobsled, and speed skating just to name a few.

Part II of this article will summarize the policies governing transgender athlete participation in Sport. Further, this section will note some of the tests that sports governing bodies use in determining whether a transgender athlete should be identified in athletics as her newly legal gender. Part III will discuss the difference in cross-sectional musculature, hormone composition, and DNA relevant to both males and females, and discuss why even hormonal therapy and other forms of surgery that will aid in a “gender change” will still leave a natal male with a far superior athletic advantage over a male; especially done after a certain age. This article will conclude by contending a modification in the current guidelines for depicting whether a transgender should be allowed to participate. Constitutional principles allowing a person to identify as their desired sex whether assigned or not is a bedrock principle but athletic competition inherently unfair and in contact sports can even severely injure persons due to the unfair advantage, “freedom of gender identity” must take a back seat to hard science.

II. Background

A. Transgender Individuals

The Term “Transgender” is a term used in society to describe individuals whose gender identity does not match the gender identity commonly experienced by those of the individuals’ natal sex. Transgender is distinct from interest, a category that include as number of natal

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physical conditions that produce atypical combinations of chromosomes, hormones, genital and other physical features.\textsuperscript{13}

The category of transgender includes those who are transsexual—identifying as the sex other than their natal sex. It also includes those who do not identify entirely with either sex (an identity that some call gender queer), or some who identify with some gender nonconforming expression or behavior but not as a member of other sex.\textsuperscript{14} The factors that cause an individual to have a transgender orientation are not fully understood. Studies suggest the origins of transgender sexuality are neurobiological, involving the brain’s exposure to atypical hormone levels during fetal development.\textsuperscript{15} Psychologists may apply a diagnosis of Gender Identity Disorder (GID) to those with “strong and persistent cross-gender identification” that is accompanied by “significant distress or impairment in social, occupational, or other important areas of functioning.”\textsuperscript{16}

Some transgender change their physical appearance with their gender identity by transforming their bodies through hormone treatments or a combination of hormone treatments or a combination of hormone treatments and surgical procedures—though not all transgender

\textsuperscript{14} In re Helig, 816 A.2d 68, 76-77 (Md. 2003) (citing, e.g., William Reiner, To Be Male or Female--That is the Question, 151 Archives Pediatric & Adolescent Med. 224 (1997); Milton Diamond & H. Keith Sigmundson, Sex Reassignment at Birth, 151 Archives of Pediatric & Adolescent Med. 298 (1997)).
\textsuperscript{15} Am. Psychiatric Ass'n, Diagnostic and Statistical Manual of Mental Disorders 532-38 (4th ed. 1994) [hereinafter DSM-IV].
individuals have access to these treatments. Some transgender individuals stay as they are and develop naturally while other conducts certain procedures that will develop consonance between their psychological. Desired gender and their physical appearance, biological sex, and DNA construction.

Besides hormone treatments, surgical options are available. Because hormone treatments change an individual’s appearance significantly, because surgery is expensive and rarely if ever covered by medical insurance, there are several transgender persons who choose not to seek such surgeries. Despite the common term of “sex assignment surgery,” people may choose from several different types of surgeries in order to obtain the desired result. For male-to-female transgender, the individual may choose genital surgeries to remove the penis or testes (appendectomy and orchiectomy) and surgeries to create female entail (angioplasty, clitoroplasty, and labiaplasty.) Male-to-female transgender may also undergo surgeries to change secondary sex characteristics; a common surgery done is breast augmentation.

Children like adults may have GID, as they learn of their gender and gender identity at their young ages. It is possible for children as young as three-years-old to manifest evidence of what later might be understood as a transgender identity. Studies have shown that the most common times for transgender individuals to realize they are transgender is in the child years;

17 Buzuvis supra note 2.
19 Williams v. Sch. Dist. of Bethlehem, 998 F.2d 168, 169, 180 (3d Cir. 1993) (denying summary judgment to male student seeking to try out for the girls' field hockey team, on the grounds that male students' opportunities have not previously been limited)
21 Alice M. Underwood supra note 18.
22 Buzuvis supra note 2.
depicted as prepubescent and adolescence. If the person is severable distressed by their being the opposite sex of what the person desires to be recognized, as by society, medical practitioners will commonly diagnose these children with GID. There is however no uniform age at which gender identity becomes fixed. Transgender individuals may experience different gender identities throughout development before an identity emerges. Whether transgender children should undergo sex assignment surgery is complicated. Constitutional principles in American jurisprudence state that individuals may decide for themselves what gender identity they emulate. Sometimes, medical providers may prescribe hormone treatment that would delay puberty, testosterone or estrogen suppression or acceleration compounds, or surgical procedures that reassign sex if the transgender individual so looks like, physically and anatomically as the desired gender of their choice.

B. Transgender Athletes

The transgender population has been steadily increasing. Although discrimination is till prevalent to deter individuals from openly acknowledging or presenting their gender that is astray from what society considers “the norm,” increased awareness, social and medical support,

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24 Id.
26 Id.
29 Id.
and legal protections have allowed more transgender individuals to identify themselves as such in a publicly.\(^{30}\)

**C. Policies Governing Participation of Transgender Athletes**

Sports Organizations have only recently begun, beginning with the IOC enacting a policy in 2004, to formalize policies addressing the inclusion of transgender athlete’s participation, specifically in sex-segregated sports.\(^{31}\)

1. **IOC 2004 Policy**

   IOC became the first sports organization to design a policy to allow participation by transgender athletes that was consistent with their newly assigned sex recognized under the law.\(^{32}\) Prior to 2004, most organizations required athletes to compete with members of their natal sex.\(^{33}\) As recently as 2009, with the speculation of whether females competing in the Olympics did not take any PEDs or were in fact natal females, the IOC forced female athlete participants to undergo compulsory chromosome testing in order to ensure that those individuals were in fact prenatal females.\(^{34}\)

   In 2003, The IOC actively endorsed its policy allowing transgender athletes to compete in their newly assigned sex once they underwent sex reassignment surgery that was specifically

\(^{30}\) Erin E. Buzuvis, Transgender Student-Athletes and Sex-Segregated Sport: Developing Policies of Inclusion for Intercollegiate and Interscholastic Athletics, 21 Seton Hall J. Sports & Ent. L. 1, 59 (2011)

\(^{31}\) Joe Leigh Simpson et al., Gender Verification at the Olympics, 284 JAMA 1568, 1568 (2000).

\(^{32}\) Van Der Luit-Drummond supra note 6.

\(^{33}\) Transsexuals in Sport – Fairness and Freedom, Regulation and Law by John Coggon, Natasha Hammond and Søren Holm, Routledge Publishing (1 April 2008)

\(^{34}\) Transsexual athletes treated unfairly by Donna Rose, CNN (20 October 2010) para 1.
limited to removal of the external genitalia and the gonads.\textsuperscript{35} Additionally, the IOC had a condition attached to their endorsement: unless the sex reassignment surgery occurred prior to the puberty, the athlete must also undergo hormone therapy to minimize “gender-related advantages,” observe a two-year waiting period following the surgery, and obtain government recognition of their newly-assigned gender.\textsuperscript{36} This policy became known as the Stockholm Consensus.\textsuperscript{37} This policy was adopted by the IOC, which resulted from the IOC Medical Commission’s meeting in Stockholm, Sweden. The Stockholm Consensus has three main requirements for transgender athletes to be recognized in their acquired gender and is widely used by most international sports governing bodies:

i. The athlete must have had gender reassignment surgery

ii. The athlete must have legal recognition of their assigned gender by the appropriate official authorities.

iii. The athlete must have had at least two years of hormone therapy.\textsuperscript{38}

These recommendations are now binding on any transgender athlete that wants to participate in a sport governed by the IOC and have also been adopted by other sports governing bodies. For example the Stockholm Consensus heavily influenced In England, the Football Association’s Policy on Transgender participation.\textsuperscript{39} It is fair to say the Football Association used IOC’s policy as a template. In England, male-to-female transgender athletes who underwent

\textsuperscript{35} Id.

\textsuperscript{36} Van Der Luit-Drummond \textit{supra} note 6.

\textsuperscript{37} The committee was comprised of the following experts Prof. Arne Ljungqvist (SWE), Prof. Odile Cohen-Haguenauer (FRA), Prof. Myron Genel (USA), Prof. Joe Leigh Simpson (USA), Prof. Martin Ritzen (SWE), Prof. Marc Fellous (FRA), and Dr Patrick Schamasch (FRA).

\textsuperscript{38} Id. See also Van Der Luit-Drummond \textit{supra} note 6.

\textsuperscript{39} The Football Association (FA) Policy on Transgender and Transsexual People in Football.
sex reassignment surgery before puberty are automatically regarded as their acquired gender under the Football Association’s Rules.\textsuperscript{40}

2. \textit{NCAA’s Determination when Addressing the Issue of Transgender Persons’ Athletic Participation}

The NCAA currently has no formal policy governing participation by transgender athletes in competition under its Bylaws. The NCAA took a different approach, and offers a “non-binding” position statement to its member institutions (Higher Level Education institutions can voluntarily become a member of the NCAA, and they can just as easily relinquish their membership.)\textsuperscript{41} The NCAA bases an athlete’s sex on his or her state classification; identifications on the athlete’s driver’s license, tax statements, voter’s registration, and other government-regulated documents.\textsuperscript{42} If an athlete who has a male state classification participates on a women’s team, the team is classified as a “mixed team” that is ineligible for the women’s championship in that specific interscholastic sport.\textsuperscript{43} Since the NCAA uses classification in a state’s documents to determine the gender of a specific student-athlete, this has produced inconsistencies across the country as trying to comply with the NCAA. Specifically, driver license modifications in different states had a several step process to ensure that the student-athlete’s modification of state document was not for fraudulent purposes but rather specifically for NCAA eligibility.

\textsuperscript{40}Id. A detailed discussion of the medical and legal issues surrounding intersexual individuals can be found in Chau and Herring (2002).
\textsuperscript{41}Colo. High Sch. Activities Ass’n, Constitution of the Colorado High School Activities Association art. 3, \url{http://www.chsaa.org/about/pdf/Handbook_2010.pdf}.
\textsuperscript{42}Unlike the MHRC, the CIAC and WIAA are nongovernmental organizations whose policies are private law that is binding on member institutions who have agreed to follow the organizations’ bylaws as a condition for membership.
D. Legal Principles that Affect the Formation of Transgender Athlete Participation Policies

As noted in Section I, legal principles in the United States depict the extent that allows sports governing bodies to limit transgender individuals’ access to compete in sex-segregated sports under their newly assigned gender American Law provides Constitutional provisions, sex discrimination statutes, and gender-identity discrimination statutes that sports governing bodies must abide by in creating policies for transgender participation.44

1. Legal Principles in the United States Constitution

The U.S. Constitution’s Equal Protection Clause of the Fourteenth Amendment forces the court to use intermediate scrutiny rather than rational basis scrutiny when it comes to states or governing bodies determining classifications based on sex.45 Under intermediate scrutiny, state classifications that discriminate between citizens based on their sex will only be upheld if the discriminatory regulations serve a substantial import purpose and are narrowly tailored to that purpose.46 In contrast if a state only had to meet a “rational basis scrutiny” test which is commonly granted to states by the courts in regulation of its own citizens, the state

44 Id. § 4552 (listing protected categories); 94-384 C.M.R. 4.02(B) (defining the scope of equal education opportunity regulations to include “any public school or educational program, any public post-secondary institution.


46 Virginia, 518 U.S. at 524 (“To succeed, the defender of the challenged action must show “at least that the classification serves important governmental objectives and that the discriminatory means employed are substantially related to the achievement of those objectives.” (citing Miss. Univ. for Women, 458 U.S. at 724)). Erin E. Buzuvis, Transgender Student-Athletes and Sex-Segregated Sport: Developing Policies of Inclusion for Intercollegiate and Interscholastic Athletics, 21 Seton Hall J. Sports & Ent. L. 1, 59 (2011)
classifications would only have to serve a “legitimate interest,” and the classifications were a reasonable way for the state to advance that interest.  

Although the heightened scrutiny is applied to striking down policies for discriminating against men and women, it is unclear that the “intermediate scrutiny” will apply to cases involving alleged discrimination against transgender athletes. To date, courts have not applied “intermediate scrutiny” in cases involving discrimination based on gender identity. It is difficult to distinguish discrimination of transgender individuals from other classifications of persons that already receives the ”heightened” scrutiny protection, but the U.S. Supreme Court has been reluctant in recognizing new suspect classifications, so it is very difficult to determine whether if faced with such a case, the Court will choose to apply “intermediate” scrutiny to gender discrimination.

2. Discrimination Statutes Based on Sex

American Law provides statues that protect against discrimination on the bases of sex and gender identity. Sex discrimination statues, most notably in sports and educations is Title IX, and Title VII, which applies to employers and state statutes that prohibit sex discrimination in all public accommodations. Richards v. United States Tennis association is the only case to hold that a sex discrimination statute protects a transgender athlete’s right to participate in a sex-

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47 See, e.g., City of Cleburne v. Cleburne Living Ctr., 473 U.S. 432, 440 (1985) (“The general rule is that legislation is presumed to be valid and will be sustained if the classification drawn by the statute is rationally related to a legitimate state interest.” (internal citation omitted)). Erin E. Buzuvis, Transgender Student-Athletes and Sex-Segregated Sport: Developing Policies of Inclusion for Intercollegiate and Interscholastic Athletics, 21 Seton Hall J. Sports & Ent. L. 1, 59 (2011)
48 Id.
49 Id.
50 Buzuvis supra note 2.
segregated sport on the basis of the athlete’s newly assigned sex. However, the Court’s decision in Richards focused narrowly on the method of sex-verification testing the United States Tennis Association used to exclude Richards from participating in the Sutra’s female championships. Other cases that the Supreme Court or lower courts have dealt with have not yet addressed sports governing bodies’ policies for excluding transgender athletes from actual participation in the sport itself as opposed to whether excluding a transgender from using the same bathroom is a reasonable means of discrimination based on sex.

III. Discussion

A. The Science that Affects Formation of Transgender Athlete Participation Policies

Although policy makers for transgender athlete participation in sports, it affects acknowledge that empirical data provides an advantage to males over females; sex-based physical traits for males present at birth or have been modified by a specific type of surgery or hormonal therapy. When addressing the role of science in transgender athletic participation policies, generalizations of the physiological difference in male and female sexes must be acknowledged. Men have taller, leaner, and more muscular bodies, characteristics of greater

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53 Michaela C. Devries, Do Transitioned Athletes Compete at an Advantage or Disadvantage as Compared with Physically Born Men and Women?: A Review of the Scientific Literature, AthletesCan 4-5 (May 18, 2008), http://www.athletescan.com/content/publications.asp.
anaerobic capacity, the ability to sustain bouts of maximal performance absent oxygen, and the ability to generate a far greater amount of force and strength than women.\textsuperscript{54}

Some of the important distinguishing factors from a pure athletic standpoint are potent to why men are more “athletic” than women. Men have a greater lung capacity and high levels of hemoglobin that more efficiently deliver oxygen to the muscles.\textsuperscript{55} This allows for men to use their muscles are full speed with muscle fatigue setting in far later than that of a female’s failure to deliver oxygen to the muscles.\textsuperscript{56} Studies show that Men’s oxygen-to-muscle delivery operates at four times the speed and last for three times as long than their female counterparts. Men have a higher percentage of type II muscle fibers. These fibers are responsible for greater contractions, which results in greater strength and power. Further, men have thicker and denser bones, which can increase stability and decrease risk of injury.

1. \textit{Hormone-Based Transitions Has Said to Reduce “Athletic Imbalance” Between males and Females}

Even if sex-based physiological differences provide a compelling reason to exclude transgender athletes from participating with their newly assigned sex rather than their birth sex, some have argued that hormone therapy (also known as hormone-based transitions) can virtually take away any physiological advantages male-to-female transgender athletes have over their opponents. Many physiological differences between men and women result from men’s higher testosterone levels and women’s higher estrogen levels. Testosterone is considered the “muscle building” hormone, which is responsible for the assimilation of lean body mass with the decrease

\textsuperscript{54} \textit{Id.} at 5-6.
\textsuperscript{55} \textit{Id.}
\textsuperscript{56} \textit{Id.}
in body fat percentage on the human body. Contrarily, estrogen has the opposite effect where the muscle to fat ratio decreases significantly compared to higher testosterone levels in the body.

**B. Readdressing the “Fast Twitch Muscle Fiber Development” In Males compared to Females**

The human body contains two distinct types of muscle fibers in the body (the second type of muscle fibers are broken down into two sub-categories.)\(^57\) Type-I Muscle fibers are responsible for endurance and the ability for a muscle to function as a steady pace for a long period of time.\(^58\) Type-II muscle fibers are responsible for the muscle’s ability to contract and generate force in short-bursts, whether in repeated bouts or a single contraction.\(^59\) The development and number and Type-II muscle fibers in the body is responsible for the athlete’s ability to excel in sports that require a lot of speed, strength and explosive power, done either multiple times or just a singularly.\(^60\) Further, Type-II fibers are broken down into either Type-IIa ("IIa") or Type-IIb ("IIb")\(^61\) IIa are regarded in the science world as the “endurance” fast twitch muscle fiber whereas the IIb is the pure power fiber. Athletes set up strength and conditioning programs to recruit IIa or IIb based on their sport.\(^62\) A sport such as Olympic weightlifting which requires an athlete to hoist a barbell loaded with weights overhead would benefit from training program that trains the IIb fibers. A sport like Soccer which requires repeated bouts of high intensity sprints and movements (striking the ball, jumping up for a header, slide tackling an

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58 Id.


60 Id.

61 Id.

62 Id.
opponent) would require far more endurance due to the duration of the match, and since repeated
bouts of strength and power are needed throughout the match, it is beneficial for the soccer
player to construct a program that trains their IIa fibers.63

C. Science Research Demonstrates the Uncertainty Transgender Participation in Female
Sports Provides as it relates to “competitive balance”

There is agreement between all International governing bodies there is no real must
perform routine testing to verify an individual’s sex, but the guidelines and test that must be
administered to determine whether that individual should participate in her newly assigned sex’s
segregated-sport.64 This section will briefly discuss the initial studies done in Olympic female
Volleyball, and rebut the conclusions based on subsequent science data and explain what must be
done.65

A study by the international governing body of volleyball failed to correlate a
relationship between height (supposed to give the female volleyball players a distinct advantage
and success of elite teams.66 There was only one time in Olympic history where the women’s
volleyball team with the tallest average height won the gold medal.67 The study also noted from
the men’s side as a caveat that the men’s volleyball teams who medaled in the Athens Olympics

63 See generally Chad Tackett. Factors Affecting Strength. Personal Health Zone. Last Updatd
64 J.C. Reeser. Correspondence to Dr. Reeser Mashfield Clinic, Department of Medicine. Gender
http://bjsm.bmj.com/content/39/10/695.full#sec-3.
65 Id.
66 L.J. Gooren & M.C. Bunck, Transsexuals and Competitive Sports, 151 Eur. J. Endocrinology
425, 426-27 (2004); J.M. Elbers et al., Effects of Sex Steroid Hormones on Regional Fat Depots
as Assessed by Magnetic Resonance Imaging in Transsexuals, 276 Am. J. Physiology 317, 320-
21 (1999).
67 Id.
was inversely proportional to the team’s average height.68 The conclusion drawn from the study was that height shown on average to be greater than women, is an indeterminate factor in determining a transgene’s advantage, male-to-female, of what she may have over athletic competition based on her being taller.69

The decision to categorically restrict male to female transgender athletes from competing in a sport as females mostly rests on two assumptions.70 First, most people exposed to testosterone from puberty onward will develop physical and or physiological attributes that contribute to a distinct performance advantage over most women.71 Although most performance boundaries are between male and female athletes have been getting smaller for several years due to developed surgeries for females to undergo, still distinct gender differences cannot be changed through science.72 Second, to justify restricting male to female transgender athletes from female sports participation, the attributes such as testosterone, bone density, and far superior upper body strength potential must withstand hormone therapy and sex reassignment surgery. If the transgender athlete maintains the “secondary characteristics” that distinguish a male from a female following such surgeries, it will give the athlete an unfair advantage in competition against natal females.73 The gender discrepancy in height in male versus a female, that cannot be changed through hormonal therapy or sex reassignment change following puberty. This advantage.74 This assumed advantage is what the previous study with the Olympic volleyball

68 *Id.*
69 *Van Der Luit-Drummond supra* note 6.
70 *Reeser supra* note 64.
71 *Id.*
72 *Id.*
73 *Id.*
teams hinged its assumptions on, but overall could never solidify a result. From the study surely other factors play into the policy maker’s decision to allowing transgender females to participate in female competition.\textsuperscript{75}

There are several factors that play a role in giving an athlete a fair advantage in athletic competition. New technology and performance enhancing supplements have for decades been considered a sure path to cheating, but only recently has male-to-female transgender participation been under scrutiny. Physical stature of persons is always assumed to be a distinct advantage in some sports but the results from the volleyball study can show that even the deepest assumptions can be rebutted. However, physical stature on the whole is indeterminate of peak athletic performance or human performance potential. As noted in Section II, the vast majority of sports require some degree if not all of strength and explosive power potential. Mixed Martial Art’s fighter Fallon Fox’s manifested policymaking for transgender male-to-female athletic participation again, and is a huge catalyst for further scientific research and discussion.

D. Science Analysis of Fallon Fox competing as a Transgender male-to-female in MMA and her competitive advantage

AS usually the questions for transgender participation are, the main questions surrounding Fox’s participation in female MMA is whether she should fight, and is a generalization, should male-to-female fighters have an advantage over born-female opponents?\textsuperscript{76}


The crux issue is whether Fox, born as a male, has a distinct physical advantage over her genetically female opponents? Great scientific research has found that muscle strength, or the force it can generate, is directly proportional to its cross sectional area. Bigger muscles can generate stronger forces. Therefore, if Fox had bigger muscles, than theoretically should generate far more force than her opponents. This conclusion simplifies the genetic make-up and demonstration of the concept behind the male and female muscle and how it relates to human performance.

The equation that would depict the distinguishing facts is the amount of force that can be generated by a male versus a female. The equation boils down to a simple equation of physics. Force is the product of mass multiplied by acceleration. Persons that have male genetics have far greater amounts of lean muscle mass, less body fat, and more dense bones than females. If Fox were born a male then she would be bringing those attributes into a fight against natal females. More since Fox was endured hormonal therapy and sex reassignment surgery far after puberty (at 30, Fox underwent hormonal therapy and sex reassignment surgery.) The effects of hormonal therapy done on a transgender a male-to-female transgender, result in the transgender to encompass additional secondary qualities. Some of these qualities include having less lean muscle mass, more fat mass, and thinner bones than natal males. However, science research is minimal as to the impact hormonal therapy and sex reassignment surgery has on male-to-female

\[^{77} \text{Id.} \]
\[^{78} \text{Id.} \]
\[^{79} \text{Id.} \]
\[^{81} \text{Id.} \]
\[^{82} \text{Aerobic exercise does not compromise muscle hypertrophy response to short-term resistance training} \text{J. Appl. Physiol. January 1, 2013 114 (1) 81-89} \]
\[^{83} \text{Id.} \]
transgender persons who desire to externally look like a female.\textsuperscript{84} Medical practitioners have performed research not to compare transgender male-to-female persons to females not to measure the results but rather to test whether the hormonal therapy can lead to bone diseases such as osteoporosis or thinning of the bone structure.\textsuperscript{85}

In Section II in 2004 the IOC ruled that transgender athletes might compete as their re-assigned gender provided they have undergone hormonal therapy for over 2 years (The two years of therapy can be performed at any point in their life, or the surgery occurred before puberty.) The governing bodies of rugby in and also International Tennis Organizations have also adopted this policy.\textsuperscript{86} The effects of hormonal therapy over time, with transgender male-to-female being testosterone deprivation and estrogen supplementation, are uncertain.\textsuperscript{87} The empirical data on the results are miniscule in measuring the effect of hormonal therapy as it relates to human performance. What has been clear is that transgender individuals who undergo surgery after puberty will retain some male features, such as increased height.\textsuperscript{88} Transgender male-to-female patients on whole retain more muscle mass than what female-to-male transgender patient’s gain, suggesting some gender-specific attributes are retained by the certain genders.\textsuperscript{89} This became apparent after the Fox fight. The maintenance of the male bone structure, fast twitch fiber amount, cross-sectional musculature, and strength and power potential from muscle contraction

\begin{flushright}
\textsuperscript{84} Id. \\
\textsuperscript{86} Id. \\
\textsuperscript{87} Id. \\
\textsuperscript{88} Id. \\
\textsuperscript{89} Reeser \textit{supra} note 64.
\end{flushright}
has been shown through science research to stick with the newly assigned female following hormonal therapy and sex reassignment surgery.\textsuperscript{90}

1. \textit{Cross Sectional Musculature: Key Difference in Male and Female Musculature}

Studies have been done to measure the gender differences in strength and muscle fiber characteristics.\textsuperscript{91} The study conclusively found that greater strength in males compared to females is due primarily to larger muscle fibers. Specifically, the larger fibers found in males account for 60 percent more type II fibers; the fibers that are responsible for strength and power development.\textsuperscript{92}

In the study, strength and muscle characteristics were examined in the biceps brachii and vastus lateralis of eight men and eight women.\textsuperscript{93} The aforesaid muscle groups are commonly known as the biceps and the quadriceps muscles found in the legs.\textsuperscript{94} Leg muscles are the narrowest correlation between male and females, but upper body is said to differ significantly with the men possessing far superior strength ability in the upper body.\textsuperscript{95} The measurements included in the study were motor unit number, size and activation and voluntary strength of the elbow flexors and knee extensors.\textsuperscript{96} Fiber areas and type determined from needle biopsies and


\textsuperscript{92} Id.

\textsuperscript{93} Id.

\textsuperscript{94} Id.

\textsuperscript{95} Id.

\textsuperscript{96} Id.
muscle areas by computerized topographical scanning. The females were approximately 52% and 66% as strong as males in the upper and lower body respectively. In the study, a significant correlation was found between strength and muscle cross-sectional area. The women were found to have percentages ranging from 45-25 percent smaller muscle cross-sectional area for the biceps, elbow flexors, quadriceps and total knee extensors respectively.

As far as muscle fiber count, the experiment measured the relevant muscle areas between men and women and the study concluded that the men had far greater musculature on average in all of the categories. The categories measured for comparison were type 1 fiber areas all over the body, mean fiber areas in the biceps, mean fiber areas in the quadriceps, and type 2 fiber areas all over the body. The data highly suggested that the greater strength of men was due primarily to the larger muscle fibers, and that the upper body strength difference between the two sexes could be attributed to the fact that women tend to have a lower proportion of their lean tissue distributed in the upper body.

A second area that is rarely discussed outside of the sports exercise science industry is the ability for the human body to engage in “triple extension” to generate force and explosive power. When discussing the correlation between strength and cross-sectional area of human skeletal muscle. In an additional study, the maximal strength which could be produced by the knee-extensor muscles (intricate muscles in order to perform a triple extension, with the knee

97 Id.
98 Id.
99 Id.
100 Id.
102 Id.
held at a right angle, was measured in a group of young adults comprising of 25 males and 25 females. Both legs were tested, and the strong leg in each subject was the only one tested on in the study. Computed tomography was used to obtain a cross-sectional image of the subjects’ legs at mid-thigh level, measured as the mid-point between the greater trochanter and the upper border of the patella. The test subject’s height and eight were all taken, and the men were found to be on average taller, leaner, stronger, and possessed a lower body fat percentage than its female counter parts. No significant correlation was found to exist between strength of the knee-extensor muscles and body weight in male or female subjects. However, males but not the females manifested a positive correlation between strength and lean body mass the ration was 5:1 strength to lean body mass ratio. In females, the correlation was only 2:1 for strength to lean body mass ratio. Moreover, a wide variation in the ratio of strength to muscle cross-sectional area was found. The medical practitioners concluded from this that strength is not a useful predictive index of muscle cross-sectional area, because the ratios will vary depending on the amount of certain fiber types found in different cross-sectional muscle areas.

In relation back to the first study, similar results came about as in the second study. In significantly larger amount muscle fibers, specifically type 1 fibers were apparent in the bicep cross-sectional muscle area (primary cross sectional area for upper body strength) and significantly larger amount of specifically type 2 muscle fibers found in the quadriceps area.

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(primary cross-sectional area for lower body strength) in males than females. Type 1 muscle fibers are significant for males as compared to females, specifically being located in the upper body, is beneficial in the majority of sports and/or physically demanding occupational activities. The type 1 muscle fiber abundance in males allows them to contract their upper body muscles quickly in a long period of time if conditioned properly. This is why for example; the United States Marine test is the ability to perform maximum pull-ups. Additionally, the universal test of upper body strength across most countries is maximal push-ups. For instance, even at the interscholastic level before male and female reach the stage of puberty, the test for bone strength and upper body development is the push up. The parameters that females have to meet in order to be considered “healthy” are far lower than that of the male test subjects. Type 1 fibers in the upper body allow persons to push and pull repeatedly at a high rate, with steady contractions for a long period of time, beneficial for just about any sport in the world except for soccer which is played with the lower limbs. The study as noted also resulted in a significantly larger number of type 2 muscle fibers in male quadriceps muscles than in females. Type 2 muscle fibers are what is needed to generate the greatest amount of strength in power as quickly as possible, in short bursts of energy. Type 2 muscles are helpful for running fast in sprints, performing heavy weight squats, performing jumping exercises, kicking a


114 Id.


117 Id.
soccer ball or kicking an opponent in mixed martial arts, and other activities that require a high degree of force in separate distinct bursts, as opposed to moderate to low intensity repeated contractions over a long period of time like what type 1 muscle fibers are responsible for.\textsuperscript{118} In athletics, especially high spectator sports such as those performed in the Olympics and international sports (soccer, rugby, and many track and field events.)\textsuperscript{119}

Leg muscles on the whole naturally have a large amount of type 1 muscle fibers, which are used constantly everyday by walking.\textsuperscript{120} As mentioned, type 1 fibers are meant to sustain repeated low to moderate muscular contractions over a long duration.\textsuperscript{121} Type 1 fibers in the quadriceps (the core cross-sectional musculature in the lower body) are worked constantly by walking around every day.\textsuperscript{122} Type 2 muscle fibers are relatively difficult to tap into due to the constant recruitment of type 1 fiber in the legs.\textsuperscript{123} To recruit the type 2 fibers in the leg muscles, they must be trained in a certain way. That is, the leg muscles must be recruited by an external load or through high intensity running (i.e. wind sprints, stair runs, and uphill sprints.) This is difficult to do for females because there is little to no Type 2 fibers in the leg muscles, but for males, they have a far easier time recruiting these fibers and training as such. The success from

\textsuperscript{119} Id.
training these fibers are apparent in athletic competition. Men will perpetually be faster in track and field events that require strength and explosive power such as the 100m sprint and hurdles, javelin, shot put, and 400m sprint.

For contact sports, the fiber types that are enhanced in the natal males, both upper and lower extremities are advantageous in contact sports. If a male competed against a female, and the male has enhanced physiological muscle fibers in their upper and lower bodies compared to that of the female, it would seem virtually impossible for the female to win. In Fallon Fox’s situation, given a sport like Mixed Martial Arts where the nature of the sport involves constant punching, kicking, tackling, and movements that involves triple extension (thrusting the body forward, tackling, slamming an opponent into the ground.)

In addressing a male-to-female transgender, once the athlete has gone through puberty and has had a few years of circulating testosterone in their body following the pubescent stage, this is an irreversible hormone conversion to make with science. Hormone replacement therapy is for transgender or transsexual people which is use to change the balance of sex hormones in their bodies (testosterone is the sex hormone for men and estrogen is the sex hormone for women.) Intersex people at time will also receive Hormone replacement therapy, either starting in childhood to confirm the sex to which they were assigned or later, if this assignment has proven incorrect.

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125 Id.
The primary purpose of Hormone replacement therapy causes developing the secondary sex characteristics of the desired sex. Secondary sex characteristics are those that are distinguished from the male and female reproductive organs but other physical features on the body. In humans, visible secondary characteristics include enlarged breasts of females and facial hair and Adam’s apple of males.

As a background, sexual differentiation begins during gestation, when the male or female gonads are formed. General habitus and shape of body and face, and sex hormone levels rise. Differences appear, though puberty causes some similar changes in and female bodies. In males, the elevated levels of testosterone directly induce growth of the male reproductive organs and Diehdrotesterone (“DHT”). DHT is a sex steroid and androgen hormone abundant in males. During the stage of embryogenesis, DHT has an essential role in the formation of the male external genitalia, while the adult DHT acts as the primary androgen in the prostate and in hair follicles. An example illustrating the significance of DHT to develop secondary sex characteristics is congenital deficiency. This gene lesion can cause a condition results in underdeveloped male genitalia and prostate. This has significant carryover to direct increases of size and mass of muscles, vocal cords, bones, deepening of the voice, and changing the shape of the face and skeleton. DHT plays a role in the male skin as well. DHT is directly responsible for accelerating growth of androgen-responsive facial and body hair, but may slow and eventually stop with growth of head hair.


In females, breasts are a manifestation of higher estrogen levels. Estrogen is also responsible for widening the pelvis and increases the body fat in hips, thighs, buttocks, and breasts. Estrogen also induces growth of the uterus, proliferation of the endometrium, and menses.

Relevant to this discussion, here are the factors that are affected in a male-to-female hormonal therapy treatment.

- Breast Development: Within the first couple months of hormone therapy, a nodule-like formation behind the nipple develops and with this significant tenderness/sensitivity much as it does in adolescent females.\(^\text{129}\)
- Fat Distribution: Over first one to two years of hormone therapy, a change in subcanteous fat (located just beneath the skin) will occur.\(^\text{130}\) Muscle Mass: The process of feminization causes much of the upper body muscle mass to disappear.\(^\text{131}\) - Genitals: Following hormonal therapy treatment, the testes will significantly decrease in size. The production of testosterone and sperm will substantially decrease.\(^\text{132}\)
- Cardiovascular- Coronary heart disease is the leading cause of death in the United States.\(^\text{133}\)

In Fallon Fox’s case, she had already developed the full elves of testosterone, and all of the secondary sex characteristics that males possess prior to her hormonal therapy and gonadal surgery. Fox had fully accumulated all secondary characteristics that testosterone and DHT is responsible for; increased muscle mass and size, bone density, tall stature, and upper body girth.

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\(^{133}\) Raphael Kellman, M.D. Practicing the medicine of tomorrow. Hypothyroidism(Low Thyroid) and Associated Conditions. Subsection; Symptoms of Hypothyroidism. http://raphaelkellmanmd.com/hypothyroidism-low-thyroid-and-associate.d-conditions/.
Further, the type of muscle fibers in her body is that of a fully grown male. This gives Ms. Fox an unfair advantage over her opponents whether or not she meant to gain this advantage. Even if Fox and her opponents undertook the same training and nutrition program to enhance her muscle development and power synergy, Fox could achieve substantially greater girth than that of her counterparts.

This could carry-over into any sport that require substantial strength and explosive power. Mixed Martial Arts is the perfect demonstration of this concept because the sport is high intensity, one-on-one so there is no assistance from any teammates, and requires extreme power and strength in the lower body and upper body. In the lower body, Fox had already developed the full type 2 muscle fibers from being a male, possessing Male sex hormones such as testosterone and DHT responsible for these secondary characteristics for over 30 years. This cannot be changed even if Fox underwent hormonal replacement therapy. The androgen suppressing hormones would not be able to counteract her male secondary sex characteristics after being a male for 30 years.

Analytic evidence demonstrating the athletic advantages of male hormones in athletics as opposed to female hormones raise issues relating to the biggest legal headaches in the sports industry to date; the health and safety of athletes competing in professional and amateur competition. Whether or Not Title VII or other federal laws disallow discrimination based on gender, the legitimate health and safety interests of having persons that have primarily male-developed bodies against female bodies, where there is a clear physical difference between the two that cannot be changed even with both athletes enduring identical training and nutrition, may substantially outweigh the probativity of gender identification.
IV. Changes to the Current Rules and Regulations for Participation of Male-to-Female Transgender Athletes

After analyzing the physical advantages of the male hormone and bone structure to that of a female, it is necessary to recap current rules and regulations regarding male-to-female participation in female sports. For one, The Kick It Out campaign, which is supported and funded by the game’s governing bodies, including the Professional Footballers Association (PFA) the Premier League and the Football Association (FA,) believes that while the FA’s policy on transgendered players was probably introduced with good intentions and to prevent footballers from lying about their gender and thereby ensuring that the game was played fairly, discrimination was always at issue. Under FA’s (along with other sports organizations’) there is a requirement that an individual must have extensive surgery to be allowed to partake in the sport of their choosing. As noted, this is similar to the NCAA’s policy requiring the athlete have surgery at least two years prior to petitioning to participate in a certain sport, however this two year stringency has evolved into a “seasonable and reasonable” time. The case for this sort of surgery is understandably quite expensive but also reduces the accessibility of transgender athletes form playing in their acquired gender. Associations like the FA could therefore be accused of denying some the chance of playing a particular league even if they had the required hormonal treatment. This would in the United States, in all likelihood run afoul Title VII (the Civil Rights Act of 1964,) perhaps the Fourteenth Amendment if the school of professional league or sanctioning body is a “state actor,” or other discriminatory state laws.

Furthermore, the majority of associations in Europe hold that even if an individual has the surgery they must have had it for two years prior to even beginning the application process. This demonstrates issues, in that a European football player’s career is only a few years similar to that of an average Professional NFL player lasting up to three years. The test, treatment, and
negative publicity that can come with such a surgery can cost and athlete their career, and it has been found that the negative publicity comes with and only impacts male-to-female athletes rather than female-to-male athletes. In other words, if both persons undergo gender identification surgery, research suggests male-to-female transgender athletes’ careers are affected by negative publicity but the female-to-male athletes are not. A recent case that addressed this issue was Caster Semenya’s issue in August 2009. Semenya was a South African athlete who won the gold medal in the 800-meter event of the World Track and Field Championships only to face weeks of humiliating psychological, gynecological and physical testing to prove that she was in fact a female.

The IOC adopted its first set of gender tests in the 1960s, with “nude parades: where female athletes were made to walk nude before a panel of IOC judges. The IOC later realized that the external make-up of an athlete may contradict the internal make-up of an athlete. AS a result of this realization the IOC decided to test an athlete’s chromosomal make-up in determining whether the athlete was in fact a male or female. However, once it was shown that women can have a single X chromosome that too was abandoned. Following this testing was SRY gene detection, but following the Atlanta Olympic Games in which 8 women tested positive for it but were all cleared for competition it was deemed that this method was also not fir for purpose. The accepted laboratory testing of verifying an athlete’s gender during the period leading up to the Sydney Olympic Games relatively frequently, and unfairly, singled out female athlete whose genetic make-up although not “normal” did not provide them with an undue competitive advantage?

Some legal experts argue gender should not be an issue at all in competitive sport. Former Canadian Olympian and professor of physical education and health at the University of
Toronto, Bruce Kidd, publicly declared his opposition to gender testing in sport prior to the London Olympic Games in 2012. Kidd stated that women’s success in sports is too often seen as unnatural and a threat to male dominance. Kidd suggests sport should stop separating women and men as two separate groups. Instead, Kidd contended that society should think of humans as a spectrum of variation and that sports should be re-organized in such a way that athletes would compete solely on the basis of ability and not their gender. As Rebecca Jordan-Young and Katrina Karkazis noted in the New York Times, some and strength could, in the future, provide a better basis for groupings than sex alone. They suggest that by protecting the principle of sex segregation can undermine female athletes, and example of this would be a recent rule by the International Association of Athletics Federation (IAAF) that women’s marathon records cannot be set in races that include male competitors. This rule would have effectively eliminated Paula Redcliffe’s best time in which she beat the record by three minutes. It should be noted however, that the event in which Radcliffe broke a record was a marathon, a sport requiring pure endurance and red blood cellular efficiency. Endurance and red blood cell development are relatively equal in males and females at gestation and through adolescence, and identical training of a male and female can enhance both anatomical attributes at the same rate, thus reaching identical efficiency.

V. Conclusion

The question arose and it need be addressed, “under what conditions do transgender athletes be allowed to participate in sports in their acquired gender?” As, noted countries across the globe provide mechanisms for achieving legal recognition as belonging to the new gender of an
individual. Thus, the number of transgender athletes has rapidly increased; allowing and transgender athlete to request a participation in any sport for their new gender identity. However, athletes such as Fallon Fox and Caster Semenya, two male-to-female transgender athletes who participated and dominated sports that require strength and power raised questions as to the policies, procedures, and regulations that sports leagues and governing bodies around the world answer that aforesaid question.

The experts, Jordan-Young and Karkazis in their New York Times article further suggested that sex segregation is probably still a good idea in some sports and at some levels. They are that it might e time to refocus policy discussions at every level so that sex segregation is only one means to achieve fairness and not the ultimate goal.

There is little doubt that the issue of transgendered or transsexual athletes in sport is a difficult one to legislate. Athletes, the general public, and sports clubs do not have the power to ‘legislate’ and sport governing bodies are more involved in the ‘regulation’ of sport often taking their cues from actual legislation such as the Gender Recognition Act of 2004. Yet even so all parties appear to struggle to grapple with the complexity and wide variety of cases and the issues that are raised in this area especially as science and society’s understanding of the human body and what defines us as male or female continues to change. The landscape of transgender participation, specifically in male-to-female transgender participating in female sports, is likely to be a hot debate for the next fifty years. The IOC in conjunction with other European leagues and United States leagues may want to work in conjunction to review its regulations on the issue of transgender participation and regulation in sport in order to ensure that sport does indeed exist for everyone, including a relevant minority of the population. But rest assured, even though gender testing prior to athletic participation has certainly evolved for the better since the “nude
parade” in the 1960s, overlooking copious scientific evidence in human anatomy, kinesiology, and sports and exercise science will surely detriment the issue rather than aid it. Fox and Semenya demonstrate the distinct physical advantage that cannot be changed that males from gestation have over females in sports that require short bursts of energy, fast twitch muscle fiber and power muscle fiber development. If equality is the goal, the policies, procedures, and the means by which sports leagues and sanctioning bodies ‘legislate’ the participation of a transgender athlete should be re-examined. The sports industry in 2013 and moving forward already has two unresolved issues that need be addressed moving forward; doping and match fixing. Let’s not make something that deals with a foundational principle in society, gender equality, to become a third problem in perhaps the industry that aids the worldwide economy the most; sports at all levels.