

USRowing Destroying Fairness for Females: Sex drives Performance

Mary I. O'Connor MD, Anne Simpson, Carol Brown, Jan Palchikoff,
Valerie McClain, Patricia Spratlen Etem MPH
ICONS Rowing

National governing bodies of sports exist to create rules for their sport. These rules should, first and foremost, promote integrity of competition. USRowing released their updated gender identity policy on December 1, 2022.¹ We believe that many in the rowing community were unaware, as we were, that the initial policy was passed by the USRowing Board of Directors in 2016. The policy is blatantly discriminatory to females and destroys fairness in women's rowing.

The updated USRowing policy permits males, with or without testosterone suppression, who identify as girls or women, to compete in girls' and women's events. This means that males only need to state at the beginning of the racing season that they identify as girls or women. This is a simple declaration. There is no need for any medical therapy to reduce testosterone, the hormone which drives much (but not all) of the stronger, bigger, faster male body.

Restrictions to self-identification in the USRowing policy are only applied at the collegiate and elite level. Here male rowers competing in the women's category having to comply with the World Rowing policy which requires 12 months of continuous testosterone suppression to blood levels not greater than 5 nmol/l. This level is twice the high-end of the normal range for females.

This article will focus on the biology of sex and its relationship to athletic performance. An understanding of the basic biology of sex is essential to appreciate how discriminatory the USRowing policy is for girls and women and that a transgender individual can never become the opposite sex.

Every cell has a sex and sex dominates how bodies develop

Each person is born with a sex. Sex is genetic. In scientific terms, males have small reproductive cells or gametes (sperm), and females have large gametes (eggs). The presence of large or small reproductive cells is driven by sex chromosomes, XY for males and XX for females, as well as other genes.

Each cell in our body has a sex. While sex hormones such as testosterone and estrogen are well known to strongly influence the body, it is critical to appreciate that there are sex differences completely unrelated to hormones. Male embryos grow faster than female embryos and some diseases effect sexes differently in ways that cannot be explained by sex hormones. As concluded by the National Institutes of Medicine, "Thus, it is clear that **not every difference observed between male and female cells can be attributed to differences in exposure to sex hormones.**"²

Sex differences between males and females begin during development in the womb and continue throughout the lifespan. Sex differences which can impact athletic performance occur even prior to puberty. Measurement of cardiovascular capacity in pre-puberty school children show that VO_2 max is consistently higher in boys than girls, attributed to the ability of a boy's heart to pump more blood with each heartbeat.³ Physical capabilities studies in elementary children show boys outperform girls in aerobic fitness, strength, speed, and agility; girls outperform boys only in balance and flexibility.⁴ Boys have a performance advantage in throwing activities compared to girls,⁵ and girls have poorer hand-eye coordination.⁶

These physiologic differences that drive athletic performance explode with puberty. In male puberty, circulating testosterone rises to 30 times pre-puberty levels with post-puberty levels being 15-20-fold greater than females of any age.⁷ Boys undergo significant physiologic changes relative to girls: even greater height, leaner body mass, greater muscle mass, greater muscle strength, larger lungs, bigger airways, and greater cardiac capacity.⁸

In the absence of pathology (namely disease or abnormal development), testosterone levels never overlap between males and females.⁸ In healthy males, 95% have circulating testosterone concentrations of 7.7 to 29.4 nmol/l. In healthy premenopausal females, 95% have circulating testosterone concentrations of 0 to 1.7 nmol/l. This is a critical fact in assessing fairness in gender identity policies. A study by Healy et al.⁹ which claimed overlap of testosterone levels between female and male elite athletes has been widely discredited at the highest scientific levels and the Court of Arbitration for Sports for several reasons, one being the lack of genetic testing of the athletes to determine sex.¹⁰ This flawed study continues to be pulled into discussions in media, law, and sport to incorrectly suggest there is no clear delineation in testosterone levels between males and females or that testosterone thresholds are meaningless. This study should never be used in the discussion of policy related to transgender athletes.

There are disorders of sexual development (DSD) in which an individual does not have the normal genetics of male or female. It is estimated that DSD occur in 1 in 5000 live births.¹¹ The DSD most relevant to the issue of fairness for females in sports is complete androgen insensitivity syndrome (CAIS). This individual is genetically male but with cells that do not respond to testosterone and testicles which remain (undescended) in the abdomen. As a newborn this baby appears to be a girl with a vagina and labia, and without a penis or external testes. This disorder is rare, affecting 2-5 per 100,000 live births.¹² CAIS is the only DSD in which a genetic male would not have the significant physiologic advantage of male puberty, although non-testosterone related male advantage is retained. Discussion remains ongoing as to the appropriate policy related to competition by CAIS athletes.

Sex is the single most important determinant of athletic performance

Genetic sex is the dominant factor in the development of a body's capacity for athletic performance.¹³ The performance gap between males and females becomes most significant at puberty and is calculated to be 10-13% in rowing.⁸ This is consistent with differences in 2K erg

times in which the lightweight male world record holder was 14% faster than the lightweight female and the open weight male was 12% faster than the open weight female.¹⁴

Testosterone suppression does not level the playing field

USRowing has adopted the World Rowing trans gender policy for collegiate and elite athletes. This policy allows a male who identifies as a woman to compete in the women's category after 12 months of continuous testosterone suppression to levels no greater than 5 nmol/l. World Athletics has a similar policy, but just issued a "preferred option" which tightens the eligibility criteria for males who identify as women by lowering the allowable testosterone level from 5nmol/l to 2.5nmol/l and increasing the time of testosterone suppression from 12 months to 24 months.¹⁴

After one year of testosterone suppression for males there are some physiologic changes.⁸ Thigh muscle mass is reduced by 9% but remains 16% higher compared to females. Reduction in muscle strength is typically 5%. Only hemoglobin levels (the protein that carry oxygen in the blood) equalizes at one year. In the longest follow-up study published, males with 14 years of testosterone suppression remain 20% stronger and have 20% greater heart and lung capacity than females.^{16,17} **Male advantage is not erased even with over a decade of testosterone suppression.**

In further support of the persistence of male advantage in trans athletes is the effect of exercise on minimizing the impact of testosterone suppression. Men who have testosterone completely removed from their system for treatment of prostate cancer (androgen deprivation therapy) experience a loss of muscle strength and muscle mass. In what is well studied in the medical field, low- to moderate-intensity resistance and aerobic training will increase muscle strength in these men, although no difference was identified in muscle mass.¹⁸

Transgender individuals cannot become the opposite sex

Individuals are born with genetics that cannot be changed. Sex is immutable. Medical therapy to suppress testosterone will impact the body but does not make a male into a female or level the athletic playing field. Puberty blocking medications in boys will limit the growth of the penis and scrotum, decrease the growth of facial and body hair, and prevent deepening of the voice.¹⁹ However, puberty blocking medications will not change the genetics of that individual or eliminate the physiologic advantages of being male which are unrelated to testosterone. Scientific data is not yet available on the athletic performance capacity for individuals who as young boys were treated with puberty blockers compared to girls and women.

Fairness in competition

The science is brutally clear: no amount or duration of testosterone suppression can erase the advantage of being born male. And while many females can outperform males, **at any matched level all males outperform all females.**¹³ The data in rowing absolutely supports this---just look at race times or 2K results.

While some may argue that the number of male athletes who identify as women (with or without testosterone suppression) is small, that does not negate the fact that fairness in sports is completely removed by inclusion of these individuals in girls' and women's categories. As concluded by an independent think tank group in the United Kingdom, "governing bodies cannot secure both transgender inclusion and fairness for female athletes within the female category."²⁰

By permitting males, with or without testosterone suppression, to compete in the girls' and women's categories, USRowing has destroyed fairness for female rowers. USRowing is telling girls and women that they, unlike boys and men, are not worthy of integrity in competition. We urge USRowing to restore fairness for girls and women by restricting the girls'/women's categories to females. USRowing can include males who identify as girls/women in a male/open category. Such an approach supports both inclusion for all to participate in our great sport and fairness in competition for females.

Join us as we fight for fairness for girls and women in rowing. We are ICONS Rowing, a chapter of the Independent Council on Women's Sports. You can find our petition to support fairness for girls and women in rowing at:

<https://www.google.com/search?client=safari&rls=en&q=icons+rowing+petition&ie=UTF-8&oe=UTF-8>. Sign today! We cannot be silent in the face of this assault on integrity in our sport.

References

1. https://usrowing.org/documents/2022/11/28/USRowing_GenderIdentityPolicy_20221201.pdf
2. Institute of Medicine (US) Committee on Understanding the Biology of Sex and Gender Differences; Wizemann TM, Pardue ML, editors. Exploring the Biological Contributions to Human Health: Does Sex Matter? Washington (DC): National Academies Press (US); 2001. 2, Every Cell Has a Sex. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK222291/>
3. Eiberg S, Hasselstrom H, Grønfeltdt V, Froberg K, Svensson J, Andersen LB. Maximum oxygen uptake and objectively measured physical activity in Danish children 6-7 years of age: the Copenhagen school child intervention study. *Br J Sports Med.* 2005 Oct;39(10):725-30. doi: 10.1136/bjsm.2004.015230. PMID: 16183768; PMCID: PMC1725036.
4. Marta CC, Marinho DA, Barbosa TM, Izquierdo M, Marques MC. Physical fitness differences between prepubescent boys and girls. *J Strength Cond Res.* 2012 Jul;26(7):1756-66. doi: 10.1519/JSC.0b013e31825bb4aa. PMID: 22561975.
5. Thomas JR, French KE. Gender differences across age in motor performance a meta-analysis. *Psychol Bull.* 1985 Sep;98(2):260-82. PMID: 3901062.
6. Telford RM, Telford RD, Olive LS, Cochrane T, Davey R (2016) Why Are Girls Less Physically Active than Boys? Findings from the LOOK Longitudinal Study. *PLoS ONE* 11(3): e0150041. <https://doi.org/10.1371/journal.pone.0150041>

7. Handelsman DJ, Hirschberg AL, Berman S. Circulating Testosterone as the Hormonal Basis of Sex Differences in Athletic Performance. *Endocr Rev.* 2018 Oct 1;39(5):803-829. doi: 10.1210/er.2018-00020. PMID: 30010735; PMCID: PMC6391653.
8. Hilton EN, Lundberg TR. Transgender Women in the Female Category of Sport: Perspectives on Testosterone Suppression and Performance Advantage. *Sports Med.* 2021 Feb;51(2):199-214. doi: 10.1007/s40279-020-01389-3. Erratum in: *Sports Med.* 2021 Oct;51(10):2235. PMID: 33289906; PMCID: PMC7846503.
9. Healy ML, Gibney J, Pentecost C, Wheeler MJ, Sonksen PH. Endocrine profiles in 693 elite athletes in the postcompetition setting. *Clin Endocrinol (Oxf).* 2014 Aug;81(2):294-305. doi: 10.1111/cen.12445. Epub 2014 Apr 2. PMID: 24593684.
10. Ritzén M, Ljungqvist A, Budgett R, Garnier PY, Berman S, Lindén-Hirschberg A, Vilain E, Martínez-Patiño MJ. The regulations about eligibility for women with hyperandrogenism to compete in women's category are well founded. A rebuttal to the conclusions by Healy et al. *Clin Endocrinol (Oxf).* 2015 Feb;82(2):307-8. doi: 10.1111/cen.12531. Epub 2014 Jul 25. PMID: 24954211.
11. Walia R, Singla M, Vaiphei K, Kumar S, Bhansali A. Disorders of sex development: a study of 194 cases. *Endocr Connect.* 2018 Feb;7(2):364-371. doi: 10.1530/EC-18-0022. Epub 2018 Jan 31. PMID: 29386228; PMCID: PMC5825923.
12. <https://medlineplus.gov/genetics/condition/androgen-insensitivity-syndrome/>
13. Ross Tucker, PhD: <https://www.youtube.com/watch?v=69Wle-ENDAg>
14. <https://www.concept2.com/indoor-rowers/racing/records/world/2000>
15. <https://www.skysports.com/athletics/news/12040/12792423/world-athletics-proposes-tighter-rules-for-transgender-women-athletes>
16. Alvares LAM, Santos MR, Souza FR, Santos LM, Mendonça BB, Costa EMF, Alves MJNN, Domenice S. Cardiopulmonary capacity and muscle strength in transgender women on long-term gender-affirming hormone therapy: a cross-sectional study. *Br J Sports Med.* 2022 Nov;56(22):1292-1298. doi: 10.1136/bjsports-2021-105400. Epub 2022 Oct 4. PMID: 36195433.
17. <https://www.swimmingworldmagazine.com/news/new-study-scientists-find-transgender-women-retain-physical-benefits-long-after-transitioning/>
18. Chen Z, Zhang Y, Lu C, Zeng H, Schumann M and Cheng S (2019) Corrigendum: Supervised Physical Training Enhances Muscle Strength but Not Muscle Mass in Prostate Cancer Patients Undergoing Androgen Deprivation Therapy: A Systematic Review and Meta-Analysis. *Front. Physiol.* 10:1126. doi: 10.3389/fphys.2019.01126
19. <https://www.mayoclinic.org/diseases-conditions/gender-dysphoria/in-depth/pubertal-blockers/art-20459075>
20. <https://equalityinsport.org/docs/300921/Guidance%20for%20Transgender%20Inclusion%20in%20Domestic%20Sport%202021.pdf>