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POST-PUBERTAL TRANSITIONED MALE-TO-FEMALE TRANSGENDER ATHLETES IN PROFESSIONAL COMBAT ARTS SPORTS: ATHLETIC ADVANTAGE OR NOT?

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ABSTRACT

Much has been written about transgender athletes in combat sports recently, particularly in MMA. In this literature, there are two primary questions. 1) Does a post-pubertal male-to- female transgender athlete have an advantage in combat sports? 2) When considering transgender participation in sports, should combat arts be considered different than other sports?

INTRODUCTION

Although these questions have been discussed many times, there are a few issues that remain unaddressed. This review article incorporates scientific studies and non-scientific observations, consensus statements and clinically established guidelines, tested and untested theories, and expert and non-expert opinions in the hopes of providing a broad overview of the subject, albeit one made up of different parts, each with varying degrees of science behind it. Consequently, some topics thoroughly covered in other forums are paraphrased, while others are given more explanation.

Defining Terms

The following definitions are adapted from the article, "Inclusion of Transgender Athletes on Sports Teams," (Griffin, 2007).

- Birth Sex or Assigned Sex: Sex assigned at birth based on anatomical, physiological and chromosomal characteristics.
- **Gender Identity**: A person's internal, deeply felt sense of being a man or a woman. A person's gender identity can be different from their gender assigned at birth.
- **Gender Expression**: Refers to socially constructed sets of behaviors, appearance, mannerisms, speech patterns, and dress association with men (masculine), women (feminine) or a mixture of masculine and feminine (often called androgynous), or any other less traditional expressions.
- **Transgender**: An umbrella term that describes people whose gender identity or expression does not conform to prevailing social expectations and can be used to describe people whose gender identity or expression is different from their gender assigned at birth.
- **Transsexual**: A term commonly used to refer to someone who transitions from one gender to another. It includes people who were identified as male at birth, but whose gender identity is woman or girl (MTF) and people who were identified as female at birth, but whose gender identity is a man or boy (FTM), and people whose gender identity is neither man nor woman. Transition often consists of a change in gender expression, name, and pronoun preference. Transition often also includes hormone therapy, counseling, and surgery.
- **Transitioned**: A descriptor preferred by some who have completed gender transition and no longer want to be referred to as either transgender or transsexual. Indeed, they want to be referred as the new gender to which they have transitioned (woman or man, without the qualifiers, "transgender" or "transsexual").
- Gender Non-Conforming or Gender Variant: Refers to people who are perceived to have gender characteristics or gender expressions that do not conform to traditional social expectations. Gender variant or gender non-conforming people may or may not identify as transgender.
- Sexual Orientation: A person's emotional and sexual attraction to other people based on the gender of the other person. A person may identify their sexual orientation as heterosexual, homosexual, or bisexual. Sexual orientation and gender identity are two different aspects of a person's identity. Not all lesbian, gay or bisexual people are gender non-conforming and not all transgender people identify as lesbian, gay or bisexual.

One additional term that should be included is "**intersex**". According to Wikipedia it is defined as follows: "Intersex people are born with any of several variations in sex characteristics including chromosomes, gonads, sex hormones, or genitals that, according to the UN Office of the High Commissioner for Human Rights, 'do not fit the typical definitions for male or female bodies'. Such variations may involve genital ambiguity, and combinations of chromosomal genotype and sexual phenotype other than XY-male and XX-female."

Much has been written about this particular issue, as a recent article in the British Journal of Sports Medicine showed that women with a high testosterone level, especially one that approaches those of a male, have a readily measurable and significant performance advantage in competition (Berman, 2017). Subsequently, the International Association of Athletics Federation (IAAF, 2018) then required that female athletes with such high testosterone levels lower them into a female range with medication in order to continue to be allowed to compete. Columnist Doriane Lambelet Coleman, writing for the New York Times (Coleman, 2018), makes several points regarding this politically charged topic. Some of her ideas are listed below in bullet point fashion, specifically because they provide the reader with a good philosophical groundwork for the rest of the discussion in this paper.

- "These rules apply across the board to athletes however they presented at birth. Advocates for intersex and transgender athletes have vigorously attacked the IAAF's new rules, but they are an extraordinary compromise for women's sports, including for traditional feminist proponents of equal access to sports for girls and women, guaranteed in the civil right legislation knows as Title IX.
- "These are important progressive developments, but their effects on valuable institutions like women's sport are real and they need to be understood before positions harden on bad information."
- "Replacing traditional sex classifications with classifications based on gender identity certainly has steep costs in contexts like competitive sport, where the likelihood of success is precisely about sex-specific biology."
- "Advocates for intersex athletes like to say that sex doesn't divide neatly. This may be true in gender studies
 departments, but at least for competitive sports purposes, they are simply wrong. Sex in this context is easy to
 define and the lines are cleanly drawn: You either have testes and testosterone in the male range or you don't.
 As the IAAF's rules provide, a simple testosterone test establishes this fact one way or the other."
- "There is no athletic characteristic that matters more than testes and testosterone."

While the focus of this paper is on the transgender athlete and not the intersex athlete per se, there is obvious overlap of the two subjects, and the points made by Coleman relate directly to some of the transgender issues. Specifically, the points regarding an athlete's rights, and, of course, the required management of testosterone levels.

Transgenders in Athletics

Issa (2015) in the article "Transgender Community Shifts into Athletic Mainstream," helps explain some basic concepts relative to this discussion and illustrates some of the challenges faced by sport governing bodies:

Rough estimates say there are 700,000 in the United States. Forty-one percent attempt suicide during their life. They are 4 times more likely to live in poverty. They technically aren't allowed to serve in the U.S. military. A transgender person does not identify with the gender they were assigned at birth. A person born as a male may identify as a female — making her transgender — and a person born as a female may identify as a male — making her transgender — and a person born as a female may identify as a male — making him transgender. Transgender people do not all go through operations to physically change their sex, although they may choose to complete that process as part of their transition (Issa, 2015).

The NCAA policy (2011) regarding transgender student athlete has proven to be more accepting of female to male (FTM) athletes than male to female (MTF) athletes. An FTM student-athlete is allowed to play on either a male or female NCAA team. There are no rules restricting FTM student athletes from participating on a male team. But that isn't a change to the original gender policy. The NCAA has long permitted females to play on male teams. Teams that have an FTM student-athlete on their roster are still eligible for a men's NCAA championship.

What about MTF student-athletes? That's a different case. The current NCAA policy does not give MTF student athletes the same ability to play on the team of the gender with which they identify. MTF student-athletes are not permitted to compete on a women's team. If they do, the NCAA views the student-athlete as a male, and the team is no longer eligible for a women's NCAA championship. However, if an MTF student- athlete is treated with testosterone suppression medication as part of their transition, they will be allowed to compete on the female NCAA team, but only after a year of taking the medication.

Stages and Categories of Transgender Transition

For the purpose of understanding the two classifications relevant to this article, it's necessary to categorize the physiologic types and stages of transgender transition. Stages or categories of transition include:

- 1. Male to female (MTF) or female to male (FTM)
- 2. Hormonally suppressed/regulated or not
- 3. Having undergone sex reassignment surgery or not
- 4. If 2 and/or 3 apply, then pre-pubertal or post-pubertal transitioned

Any given combination of these four categories would be a classification. For example, someone who is a "yes" to 1, but a "no" to 2 and 3 would be considered as MTF transgender, non- transitioned.

The Stockholm Consensus

In 2003 the International Olympic Committee became the first mainstream sport governing body to develop a policy on transgender athlete participation, and the IOC Medical Commission met in Stockholm to discuss and issue recommendations. The result was the Stockholm Consensus, which first went into effect in the 2004 Olympic Games in Athens Greece. The policy became the main criteria that determined participation eligibility for several major sports governing bodies. It has since been updated in 2015 at an IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism (IOC, 2015).

Under the new IOC guidelines, an athlete transitioning to a woman must undergo hormone therapy and demonstrate that the total level of male testosterone in the blood has been below 10 nanomols per litre for at least a year prior to competing. The previous rule stated that, in addition to reassignment surgery, the athlete required a minimum of two years of hormone treatment.

IOC Consensus Meeting on Sex Reassignment and Hyperandrogenism

The transgender guidelines from the IOC Consensus Statement are:

- 1. Those who transition from female to male are eligible to compete in the male category without restriction.
- 2. Those who transition from male to female are eligible to compete in the female category under the following conditions:
- 2.1 The athlete has declared that her gender identity is female. The declaration cannot be changed for sporting purposes for a minimum of four years.
- 2.2 The athlete must demonstrate that her total testosterone level in serum has been below 10 nmol/L for at least 12 months prior to her first competition (with the requirement for any longer period to be based on a confidential case-by-case evaluation, considering whether or not 12 months is a sufficient length of time to minimize any advantage in women's competition).
- 2.3 The athlete's total testosterone level in serum must remain below 10 nmol/L throughout the period of desired eligibility to compete in the female category.
- 2.4 Compliance with these conditions may be monitored by testing. In the event of non-compliance, the athlete's eligibility for female competition will be suspended for 12 months.

The Consensus Statement has not resolved all of the issues. A medical consensus statement is defined as, "public statement on a particular aspect of medical knowledge at the time the statement is made that a representative group of experts agree to be evidence-based and state-of-the-art (state-of-the-science) knowledge. Its main objective is to counsel physicians on the best possible and acceptable way to diagnose and treat certain diseases or how to address a particular decision-making area. It is usually, therefore, considered an authoritative, community-based expression of a consensus decision-making and publication process."

In essence, a consensus statement is the majority opinion of a group of experts using the science available to them at the time. Despite the appearance that the authoritative and clear language the Stockholm Consensus and the 2015 IOC Statement gave us, there was very little science available to support it. Some of it was to a degree arbitrary – the two-year time frame after gonadectomy, for example. At the time the Stockholm Consensus was created, the IOC was under significant political pressure to produce a statement on the issue. Additionally, it's clear that the IOC Consensus Statement from 2015 reflects significant non-medical influence. While that's not necessarily a bad thing, it does need to be acknowledged that it is no longer a purely scientific document, but is instead a

document that includes policy recommendations. No one can dispute that creating policies or recommendations consistent "with developing legislation and notions of human rights" has to be a part of our reality. But, from anatomic and physiologic standpoints, these consensus statements do represent very highly "educated guesses" at best and are certainly the best we have to go on at the present time.

Association of Boxing Commission's Policy on Transgender

The Association of Boxing Commission (ABC) has written policy on transgender athletes and included three important points. The first point is balance of competitive equality. In the opening sentence, it states, "The policy is aimed at allowing combat sports athletes to participate in competition in accordance with their gender identity while maintaining the relative balance of competitive equity among competitors." The balance of competitive equity is a key concept and may be an acknowledgement that blanket statements about transgender athlete participation in sports in general may not be the best policy.

The second important point in the ABC policy is that surgical transition for MTF athletes is not required in boxing but is required for MMA. Considering the nature of those respective sports, that sport-specific guideline makes a lot of common sense.

The third important point is that therapeutic use exemptions (TUE) are addressed in the context of transgender athletes. Board certified specialists are also required for hormonal management and TUE documentation for FTM athletes, but this may present problems for international competitors.



Are the Competitive Advantages of a Male Athlete Truly Neutralized by Complete Transgender Transition?

Despite the completeness of the requirements of the Stockholm Consensus, many coaches, athletes and physicians are skeptical of the idea that MTF transition neutralizes all of the competitive advantages of a male. In argument to these skeptics, Griffin (2007) states:

Most athletic teams are separated into those for boys and men and those for girls and women. Men and women compete against or with each other in far fewer sports (archery, equestrian, shooting, for example). Moreover, there are well-documented physical and physiological differences between males and females that lead to the conventional wisdom that most sports are best conducted as sex segregated activities in order to ensure that women and men have equitable opportunities to compete against others of similar physical and physiological capabilities. The actual overlap in male and female athletic performance, however, is quite large rather than clearly separated into two distinct groups. The range of physiological characteristics and athletic performance within each of the categories of female and male is also quite wide.

Refer to figure 1. Typical female athletic performance for a given athletic measure is shown by the red bell curve. Typical male athletic performance is measured by the blue bell curve. The overlap of performance between typical males and typical females is shown by the orange area – the area where the other two curves overlap. One can

Figure 1. Normalized depiction of athletic ability

readily see that there is significant overlap between the groups. (Note that this is a theoretical, hypothetical graph only and is not to any measurement or scale.)

When an MTF transgender athlete undergoes transition, the athlete's performance would shift to the left on that graph, and, quite possibly, if the athlete were under the blue part of the graph, may actually end up in the orange part – in the range of typical female athletic performance. (It is also unlikely that MTF transition would shift all the way to the left into the red area consistent with the lowest performing female-by-birth athletes.) Obviously, the overall concept and ideal situation here is for a male athlete who would be under the blue area to undergo complete transgender transition and then move into the orange area of the graph. But problems would arise under two circumstances here:

- 1. If after completed transition an MTF transgender athlete remained far to the right, firmly in the blue area where no female-by-birth athlete could reasonably compete. (For example, it's doubtful that an athlete with Brock Lesnar's habitus, an extremely muscular 130 kg former UFC champion, could undergo MTF transition and fall into the orange area the typical female range of athletic performance.)
- 2. If after completed transition, MTF athletes, as a group, were shown to be consistently to the right of female-bybirth competitors in their respective sports or weight classes as a general and consistent trend.

Physiologic and Anatomic Differences Between Male and Female Athletes

In order to understand this entire issue more clearly, the specific athletic physiologic and anatomic differences between male and female athletes need to be discussed. The most often cited differences of males relative to females are:

- Greater muscle mass and development
- Higher testosterone levels
- Heavier bone density
- Higher red blood cell levels
- Greater muscle-to-fat ratio
- Greater heart and lung capacity
- Tendency to greater aptitude in motor skills

It's been shown that after completed MTF transitioning that testosterone levels, muscle mass, bone density and red blood cell levels will be regulated or return on their own to female ranges. Muscle-to-fat ratios move towards female levels but probably not entirely and have much more variability from individual to individual. (Additionally, sports that involve weight classes and "making weight" may minimize this to some degree.) Greater heart and lung capacities remain possible advantages but have not yet been shown to make a measurable difference.

Whether the MTF transgender athlete has a greater aptitude in motor skills remains a bit more controversial, and, again, there is great variance from individual to individual with involvement in athletics as a child likely being a major factor. Also, significant overlap exists between males and females. On one hand, pre-pubertal children often play co-ed sports competitively. Many wrestling coaches have observed that girls can successfully compete on the high school level but only at the lowest two weight classes where most male competitors have not yet undergone significant pubertal changes. On the other hand, it's difficult to say that Caitlyn Jenner would not have a distinct and measurable motor skill advantage if competing in the women's decathlon. So, this *may* be a remaining advantage, and one possibly developed during adolescence and early adulthood. If that were the case, there would then possibly be a difference between pre and post- pubertal transitioned transgender athletes. Confounding and possibly defeating any possible advantage conferred by a male's possible greater aptitude for motor skills is the idea that an MTF transitioned athlete has to essentially re-learn how to use muscles that are now smaller and possibly weaker.

There is a problem with this list of physiologic and anatomic differences – a list which has become almost standard. There is little research to support the idea that the changed physiologic differences actually result in correlating changes in performance to female-by-birth ranges. This does not mean that they don't, but there is little evidence to back it up. For example, the studies on bone density looked at FTM transgender in general and compared them to male, not female, controls. In addition, they were not designed to evaluate changes in athletic performance. Instead, they examined other items such as the likelihood of the development of diseases like osteoporosis. The result is that the people developing consensus statements didn't have athletic data to go by, but only had general data derived from a group of athletes *and* non-athletes and compared against men, not women.

There is another problem with this list – it neglects two additional key differences. It can be surmised that the reason

for this is that these differences are a bit less obvious to the casual observer, and that how these differences would affect athletic performance varies from sport to sport – in some sports these would matter a great deal and in others not at all, thus making generalized statements of athletic comparisons problematic. Interestingly, these two things are quite relevant to our question about transgender athletes in combat arts sports, and they are:

- Different skeletal morphology (skeletal shape, not bone density)
- Different center of gravity

Also, of note is that skeletal morphology does not change, and center of gravity cannot change completely, even with a complete transgender transition. The major morphological differences between a male and female skeleton include, men having broader shoulders; a longer rib cage; and a smaller pelvic opening.

Do These Differences Matter in Sports in General. and Do They Matter in Combat Arts?

It's arguable that the physiologic and anatomic changes addressed in the first list above – muscle mass, bone density, etc. – are no longer issues or are not easily measurable, determinable or significant. The issues remaining concern male skeletal morphology, which is one thing that does not change during transgender transition, and male center of gravity, which cannot change completely. Questions to be addressed include:

- 1) Do these differences matter in combat arts sports and why would that be different?
- 2) Accordingly, if a MTF transgender athlete is at the same weight class as a given opponent, why do these two differences matter?

First, one needs to consider the difference between non-contact sports and contact sports. In general, the two physical aspects that definitely don't change for transitioned MTF athletes do not affect non-contact sports very much, or, at least, in less important ways than in contact sports. With contact sports, one athlete's performance is directly affected by their competitor's performance as it is applied directly to his or her body. (This is the difference between a "competitor" in a non-contact sport and an "opponent" in a contact sport.) Thus, differences in bodies become more important than in non-contact sports – an arm's reach in boxing or a defensive lineman's build in football, for example.

For the sake of this point, let's assume that two years after transition a given MTF athlete's muscle mass is equivalent to female levels. It is possible that the forces generated by similar muscles, but on different bones – that is bones that create different moments about a joint-- could generate very different forces. Having a male shoulder build, for example, regardless of male versus female bone density, could be an advantage – the shoulder distance, how and where the muscles attach to the bones (even if just millimeters), etc., would impact the forces of a punch, even with the same muscle mass.

It's not just a single muscle attaching to a single bone. Rather, the force of a punch is created via several muscles and bones, and, consequently, it uses several different fulcrums at once, as seen in figure 2. (Nguyen, 2012).



Putting it into physics terms, the force of a punch cannot be simply calculated from F=MA. Rather, a punch consists of multiple accelerations of different masses over respective fulcrums, working together simultaneously to create a final single vector composed from multiple smaller vectors, both linear and rotational.

A given muscle generates its greatest force only at a specific angle for that joint. (As an example, your bicep is "strongest" when your elbow is at approximately 90 degrees – perfectly evolved for picking something up or carrying something while walking. If you try to lift something off of a table with your arm fully outstretched, it is difficult. Bend your elbow and it's much easier because your bicep can generate maximal forces.)

During an athlete's best punch, each joint involved will, at that time, be at or near that specific angle. This creates a particular posture (as shown in the above illustration) – and it's this "posture of maximal force delivery" that determines what's referred to as a fighter's "range." In other words, a fighter's range is the distance of the arm where maximal force can be delivered – and that is in large part dependent on the

fulcrums and moments of the bones. (It's the specific combination of these

things that results in the hook punch being the most powerful – all the muscles from foot to fist are in a powerful alignment.) While muscle mass in transitioned transgender athletes may be the same as comparable females-bybirth, the moments about different bones may generate different forces, and when all of the different muscle forces involved in a punch are added together, may result in a significantly greater force. Similarly, as the ground is the point of reference from which the forces are ultimately generated, an athlete's center of gravity may also play a role in force generation and direction.

Second, among the contact sports, combat arts sports are unique in that athletes are at a specific risk of getting hurt via sport-specific injuries, some of which could be considered the actual intention of the sport. There is a profound and ethical responsibility on the part of sport-governing bodies to address any possible unfair advantages to maintain the integrity of the sport and the fairness and safety for the athletes themselves, especially if physical harm to an athlete would occur. Additionally, there are psychological aspects unique to combat sports.

Lastly there are the issues of fighting style and training opportunities. The MTF transgender athlete trains against female-by-birth athletes all the time, if not categorically, but female athletes rarely get the opportunity to train against MTF transgender athletes. (Of course, this would only matter if the discussed advantages existed to any significance.) Along similar lines, having a center of gravity that most female opponents aren't used to dealing with could also be an advantage. It would create an advantage by having a slightly (or significantly) different fighting style and possibly even an advantage of weight distribution, maybe even more so when on the mat.

Conclusions That May be Drawn

The following conclusions may be drawn from this discussion about MTF post-pubertal transitioned athletes.

- Most physiologic and anatomic differences (muscle mass and development, testosterone levels, bone density, red blood cell levels, muscle-to-fat ratio) between men and women are reversed by complete transition (as is required by the Stockholm Consensus).
- Very little scientific evidence proving corresponding changes in athletic performance exists. Therefore, it cannot be said from a proven scientific basis or with complete certainty that male athletic advantages are completely neutralized by completed transgender transition.
- Heart and lung capacity does not likely reverse completely, but it is uncertain if this confers an advantage and to what degree.
- Aptitude in motor skills is assumed to be no different for pre-pubertal transitions, but islikely different for post-pubertal transitions, and, again, it is uncertain if this confers an advantage and to what degree.
- An athlete may be at a disadvantage in this area if having to re-learn how to use muscles that are now smaller and weaker than before a transition.
- Two aspects of the male skeleton present additional issues and may create possible advantages.
- One change that cannot be reversed hardly at all is male skeletal morphology. This may result in greater forces generated by muscles over a male skeleton.
- Once change that cannot be completely reversed is male center of gravity. This may contribute to generating greater striking forces when standing and also create a different weight distribution when on the mat.
- These two skeletal differences may result in a fighting style most female-by-birth athletes are unaccustomed.
- The degree to which these any or all of these possible advantages may exist or be significant is as yet unknown and unproven.
- At this time there are no studies that I know of that compare these specific issues. Ideally, someday we could have enough transgender combat arts athletes to comprise a large academic study, but that is not likely to happen.

For there to be *no advantage* for MTF transgender athletes in combat arts per se (not necessarily other sports), every single variable listed above would have to ultimately pan out to be to "no advantage." Given the relatively high number of variables, this is highly unlikely. Then of course, if there is a cumulative advantage to them, whether it is significant or not, is another issue that is not easily resolved.

Professional Licensing of Fighters

By law and by ethics transgender athletes have a right to be athletes. One misconception, though, is that anyone and everyone has a right to be a professional fighter. Another misconception is that sex discrimination laws give anyone who is not birth sex and heterosexual the categorical right to a professional fighter's license. The truth is that no one person has a fundamental or constitutional right, transgender or not, to be licensed as a pro fighter by

a respective regulating governmental agency. Licensing is determined by the respective agency's licensing requirements as determined by statute – and an applicant for a professional license must meet those requirements. What the laws do state is that denying a person a given license because of gender identity, preference, etc., is illegal.

Where Do We Go from Here?

Let's assume, given the above, that there is a possible advantage for a given transitioned post- pubertal MTF combat arts athlete. Let's also assume that she is licensed in a given state. As commissioners and ringside physicians we are charged with two specific duties. The first is the safety of all competitors. The second, as stated in the first sentence of the ABC Policy, is to ensure "the relative balance of competitive equity among competitors." But what does this latter statement mean exactly? The answer lies in match making – the commission approval or disproval of individual match ups. It is here where variables like fighting style, sport record, age, experience, athleticism, and other considerations for both athletes can be taken into careful consideration. And approving a "good match" does not just mean a spectacular bout for the audience, but also means a "good match up," where the competitors' skills are reasonably matched up. A responsible commission would carefully evaluate fighters' records, and the trends of same. For example, if two fighters had records of 9 wins and 4 losses, it might seem a good match up. If on closer inspection the first fighter lost his first four fights by close decisions and went on to win the next nine in a row by first round knockouts, that fighter would not be a good match up for the fighter who won his first nine fights by close decisions, returned from a two-year hiatus and had been knocked out four times in a row. This is an example of examining competitive equity. Indeed, maintaining competitive equity relates directly to the first objective of fighter safety.

So how does this relate to a possible athletic advantage for a transitioned MTF transgender athlete? Using the performance graph of male and female performance, some possible competition scenarios can arise (figure 4.) A male by birth fighter starts out his career at point A and then undergoes complete MTF transition and ends up at point B. Matching that fighter up with a female fighter at point C would maintain competitive equity. Matching that fighter up with a female fighter at point D, though, would put fighter D at a reasonable and unnecessary risk of injury.





Final Thoughts

There are not yet any scientific studies that determine if possible athletic advantages exist for a transitioned postpubertal MTF combat arts athlete although advantages of some type are likely. If an advantage does exist, measuring or quantifying it will be very difficult. As stated in the IOC Consensus Statement of 2015, according to current legislative and human rights trends, transgender athletes have a right to compete and be licensed as professional fighters. As stated in the ABC Policy, the IAAF Policy and others, medical regulation is needed and requirements must be met. Lastly, the maintenance of competitive equity and the safety of all professional combat arts athletes, transgender or not, remain in the hands and skills of athletic commissions when approving matches between individual athletes.

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