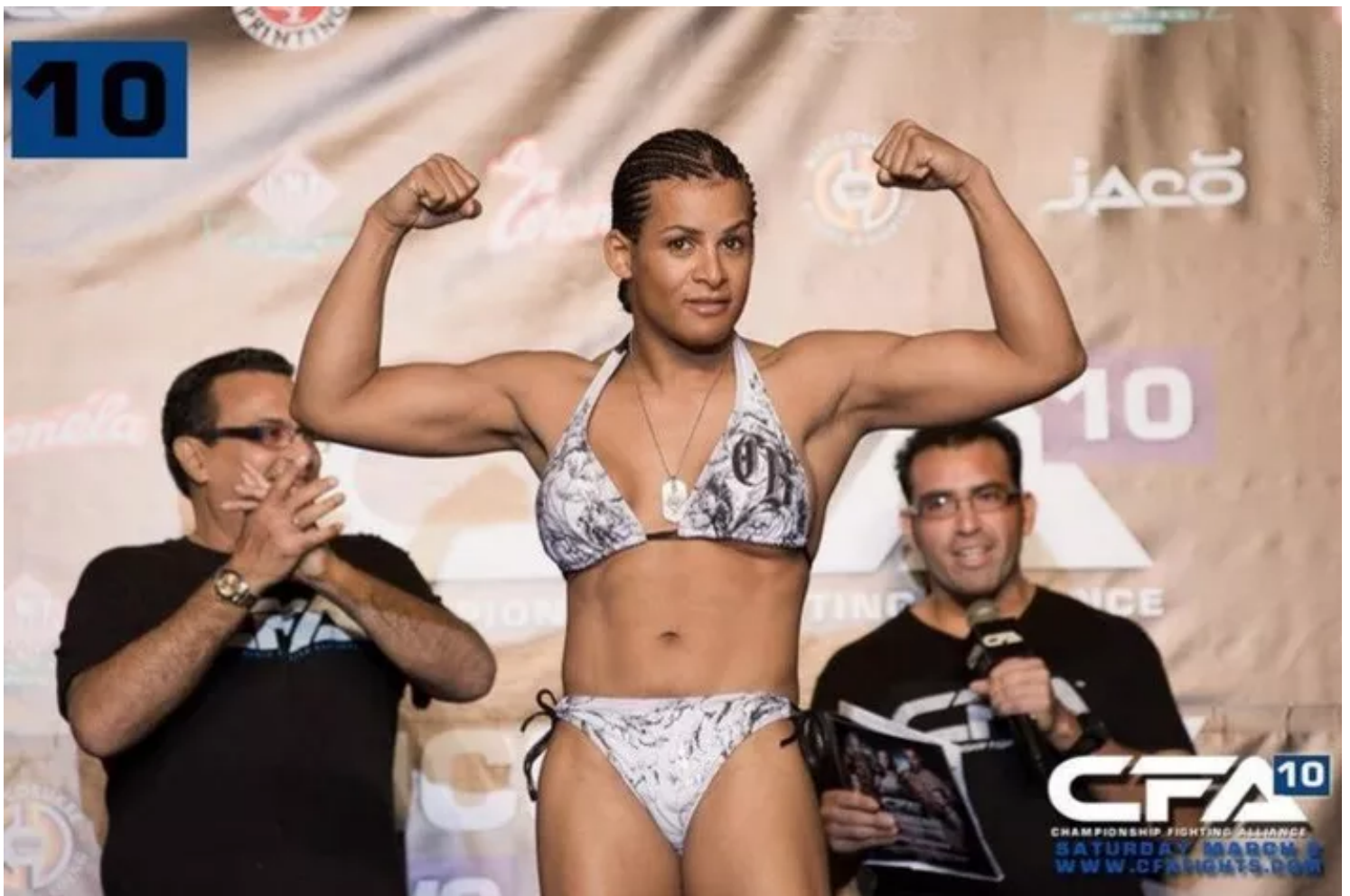




SB NATION
BLOODY ELBOW

Dr. Ramona Krutzik, M.D. discusses possible advantages Fallon Fox may have

By *Stephie Haynes* [1] @CrooklynMMA [2] on Mar 20, 2013, 10:00p



Fallon Fox - Facebook

Board certified endocrinologist, Dr. Ramona Krutzik, M.D., F.A.C.E., weighs in on the possible advantages that transgender female fighter, Fallon Fox, may have over her opponents.

As the controversy surrounding transgender fighter Fallon Fox continues to roil, with people from all aspects of the MMA community weighing in, a decision regarding whether she will be able to obtain licensure has yet to be made. With questions of safety for the females she will face being the primary concern, the athletic commission has the daunting task of sorting through the limited amount of available data to make their decision in what will end up setting a precedent in mixed martial arts.

I've been conducting a series of interviews with medical professionals to weigh in on this sensitive issue and am completing the series with this post featuring a leading, board certified endocrinologist. **Dr. Ramona Krutzik, M.D., F.A.C.E.** [4] has 11 years of experience and took the time to answer some questions for our readers, so that we can better grasp some of the physiological factors that might potentially make a difference in this particular instance with Fallon Fox. Here's what Dr. Krutzik had to say:

Gender and sex

Gender is more of an identity. It's how you identify yourself. Sex is multi-layered.

- 1. Chromosomally, what you are*
- 2. Hormonally, what you are*
- 3. Gender, how you're identifying yourself*

It's actually very complicated, and I believe that the Olympics

actually takes these on a case by case basis. In this particular instance, Fox might potentially have an unfair advantage over the females she faces, because she developed all the way into adulthood as a male. There would be increased musculature, and an increased ability to build muscle, so an advantage might be present due to years of conditioning and becoming more masculine, which includes differences in endurance and strength. The male body develops differently, both in skeletal structure and muscularly.

When pitted against an average female, I would say that there were probably some advantages that the hormonal blockade and subsequent replacement can't take away 100%, simply because she lived so much of her life as a male, and developed fully as such.

Bone Density

Here's the thing. Estrogen is what actually causes bone growth. It's not the testosterone. Men convert testosterone peripherally to estrogen. That's why we think that men who have low testosterone levels become osteoporotic. It's not because of the lack of testosterone, but because that lack of test can't be converted to estrogen. When men go on hormonal blockers for other health concerns, they can get osteoporosis, but they're not getting estrogen.

So here you have a man, who was on hormonal blockers to block testosterone, but is now taking estrogen, which is then going to prevent osteoporosis, so there wouldn't be a great percentage of bone density loss, per se. Males have higher bone density and higher mass skeletons than females. It takes a long time for that to diminish.

Typically, you're looking at about 15 years after androgen suppression and SRS to really start to see significant changes in bone density. It's been too early for her to see much of a decrease in bone mass or to make her equal to that of a female. She started off with a much higher bone density than other women her same age, and therefore will maintain a lot of that for a while. Additionally, because she is taking estrogen, that will actually help to maintain that bone mass. She may even carry that higher density much longer because of the estrogen therapy.

Women also have lighter, child bearing hips because of the difference in hormones during the body's developmental years. Her skeleton and body mass and shape developed a long time ago. Those changes cannot be undone. They are permanent.

Muscle Mass

Her testosterone levels are more than likely in the normal female range, since her adrenals are the primary source for it now. Without seeing her labs, it's hard to say for certain. How are they maintaining her levels? Are they keeping them at the very high end or at the low end? There are huge normal ranges for those values.

She developed fully into a male with normal musculature and bone structure. She didn't undergo hormone therapy and surgery until she was fully developed, as compared to someone who completes therapy and surgery in their adolescence or very early adulthood, when they haven't completely developed. Men are completely developed by the age of 22, and she didn't start her therapy until several years later. She has the potential to be significantly stronger because her muscle development reached several years

beyond full maturity, giving her the potential to be significantly stronger than other age matched women.

When you see the female bodybuilders, the ones that have built large amounts of muscle mass, they don't achieve that without androgen supplements. Women just do not have the ability to produce the same muscle mass that men do. The thing you need to consider is that everyone has different inborn abilities to develop muscle. It comes down to genetic potential and some people just have better abilities.

There's not really a way to determine how much her muscle mass will decrease over time. What can be said is that she has a naturally higher propensity to build and maintain muscle mass because she was once a fully developed, adult male. You can't ever take that away from her.

Imprinting

Something that also has to be considered is called imprinting of the brain. Male imprinting happens with testosterone during development. If no testosterone is present, you tend to have a female brain. Developing fetuses that have testosterone have male imprinting of the brain, and it does not go away after androgen suppression and sex change surgery. It is a permanent imprint on the brain.

Someone that has had male imprinting could have the potential for more aggression or more aggressive type behavior than a female brain. That's something that could affect her and possibly give her a mental edge in how she fights and how aggressive she might be, compared to a biologically born female.

As I close out this series of posts with this last interview, it should be noted that Dr. Krutzik only offered up what I consider to be her expert opinion to the best of her professional knowledge and expertise. She is well versed in pituitary conditions and hormone therapy which makes her an ideal candidate for this interview. She did not weigh in on whether Fallon Fox should be licensed, nor did she offer up any personal thoughts on the subject. She just answered my questions.

You can read the other posts in this series [here](#) [5] and [here](#) [6]

•

Latest From Our Partners



[7]

- **GSP's Top 10 Fights (BR) [8]**
- **Best UFC Fights So Far in 2013 (BR) [9]**
- **Worst Advice Offered to MMA Fighters (BR) [10]**
- **Top Apps Every MMA Fan Needs to Own (BR) [11]**
- **Worst Chins in the UFC Today (BR) [12]**
- **MMA Fighters Poised to Make Comebacks (BR) [13]**
- **Five Fights for Forrest Griffin's Return (BR) [14]**

- [0] <http://www.bloodyelbow.com/mma-interview>
- [1] <http://www.sbnation.com/users/Stephie%20Haynes>
- [2] <http://twitter.com/CrooklynMMA>
- [3] <http://www.bloodyelbow.com/2013/3/20/4128658/dr-ramona-krutzik-endocrinologist-discusses-possible-advantages-fallon-fox-has#comments>
- [4] http://www.vitals.com/doctors/Dr_Ramona_Krutzik/profile
- [5] <http://www.bloodyelbow.com/2013/3/9/4080712/dr-benjamin-not-on-board-with-transgender-female-fallon-fox-fighting>
- [6] <http://www.bloodyelbow.com/2013/3/8/4075434/leading-sex-reassignment-physicians-weigh-in-on-fallon-fox>
- [7] <http://bleacherreport.com/articles/1562457-power-ranking-georges-st-pierres-top-ten-fights>
- [8] <http://bleacherreport.com/articles/1562457-power-ranking-georges-st-pierres-top-ten-fights>
- [9] <http://bleacherreport.com/articles/1562862-ranking-the-best-fight-from-every-ufc-of-2013-so-far>
- [10] <http://bleacherreport.com/articles/1565129-just-coast-and-4-other-pieces-of-bad-advice-offered-to-mma-fighters>
- [11] <http://bleacherreport.com/articles/1562787-mma-12-apps-every-mma-fight-fan-needs-to-own>
- [12] <http://bleacherreport.com/articles/1557322-ranking-the-worst-chins-in-the-ufc-today>
- [13] <http://bleacherreport.com/articles/1563082-10-mma-fighters-poised-to-make-comebacks-in-2013>
- [14] <http://bleacherreport.com/articles/1562955-5-fights-for-forrest-griffin-to-take-upon-his-return>