



Association of Ringside Physicians

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Editor-in-Chief, Editorial Board



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Lisa Nelson has worked in association management for over 30 years; the past 28 years with The Rees Group. She is currently the Managing Director of the Society for Clinical and Medical Hair Removal, but spent much the last 25 years working with association publications. She is the former Managing Editor for the *Journal of Cardiopulmonary Rehabilitation* and the *Annals of Behavioral Medicine*, and continues to edit and write for several association newsletters.

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From the Editor's Desk

Dear Colleagues,

It gives me great pleasure to bring to you the fifth issue of the *ARP Journal of Combat Sports Medicine*. The COVID-19 pandemic has taken a tremendous toll on all of us, fundamentally changing the way we live our lives. Widespread cancelation or postponement of sporting events including boxing and MMA bouts followed the initial wave of the pandemic. Combat sports events have since resumed behind closed doors to reduce the risk of COVID-19 transmission from person to person at the venue. The world awaits an effective vaccine to help bring an end to this disease. In spite of the COVID-19 tragedy, we remain a strong and resilient family of athletes, trainers, coaches, cut men, referees, judges, promoters, production staff, commission staff, and ringside physicians helping and supporting each other in these truly difficult times, and we will continue to do so.

In this issue we dwell into the controversy surrounding 2-minute versus 3-minute round in professional women boxing. There are three commentaries one by Thomas Hauser the acclaimed boxing writer and International Boxing Hall of Fame inductee, the second by Dr. Michael Schwartz who serves as co-chairman medical advisory committee Association of Boxing Commissions (ABC) and the third by Sethi and Galjour. Whether women partaking in combat sports are more susceptible to concussions as compared to their male counterparts and how the duration of the round alters their risk for both acute and chronic neurological injuries needs to be urgently debated and scientifically studied by the combat sports medical community. Evidence based guidelines from organizations such as the ARP and the ABC then need to follow.

Our issues thus far have been well received in large part due to the hard work and dedication of our two Senior Editorial Managers, Lisa Nelson and Susan Rees. They continue to work tirelessly to improve the journal and make it a valuable resource for the combat sports community. The *ARP Journal of Combat Sports Medicine* is actively soliciting case reports, case series, review articles and original studies related to the field of combat sports medicine. Please consider the Journal for publication of your valuable work.

I wish you and your families good health and happiness in the New Year.

Sincerely,

Nitin K Sethi, MD, MBBS, FAAN

TWO MINUTES OR THREE FOR WOMEN?

Author: Thomas Hauser

Ronda Rousey demonstrated that a female mixed martial arts combatant can be a bigger draw than her male counterparts. But no woman boxer has come close to achieving the level of acceptance and fame that the top men have. One of many reasons for this disparity is that the overwhelming majority of women's boxing matches are waged in two-minute rounds rather than three. Most state athletic commissions default to two-minute stanzas for women, although New York, California, and Nevada have permitted three-minute rounds in instances where both boxers agreed. World Boxing Council president Mauricio Sulaiman has proclaimed that the WBC will "never" sanction three-minute rounds for women or women's bouts that are more than ten rounds in duration.

The case for two-minute rounds for women boxers rests partly on tradition and partly on an interpretation of medical data. Dramatic knockouts are largely absent from women's boxing, primarily because the women don't hit nearly as hard as men. That said, relying on medical research conducted at UCLA, Sulaiman has declared, "The bone structure of women is different than men, specifically in the neck region. Women have almost eighty percent more concussion probability than men and they have a slower recovery time. The more time you fight, the higher the dehydration and fatigue. The risk factor increases. It is also a fact that women have stronger symptoms after concussion and suffer more pain."

Jill Diamond, co-chair of the WBC Women's Championship Committee, adds, "It's not about the ability of women to fight three-minute rounds. It's a safety issue. Women are capable of doing it, but at what cost?" Diamond also maintains, "A majority of the women I've spoken with don't want three-minute rounds. And if they do want three-minute rounds, they expect to be paid more for it."

These thoughts are echoed by two-time Olympic gold-medalist Claressa Shields, who says, "If fighting three minutes will get us paid equally to the men, I'm all for it. Otherwise, I'll take two. I've been fighting for two minutes since the amateurs. With two-minutes, you don't have time to feel someone out. You start fast, you go fast, and you finish fast. I can go three minutes. I spar three-minute rounds with men all the time. But I think two is better." By contrast, Olympic gold-medalist Katie Taylor supports the idea of women fighting three-minute rounds. And promoter Barry McGuigan says of the two-minute limit, "It's disrespectful. Women are either boxers or they are not and therefore should be allowed to contest championship bouts over twelve three-minute rounds like the men. Anything less is sexist and fails to recognize the quality, commitment, and hard work that women put into the sport." Here, one might also note that, in UFC bouts, both women and men fight five-minute rounds with no difference in the number of rounds per fight based on gender.

That brings us back to the medical research. Dr. Margaret Goodman has served as chief ringside physician and chair of the medical advisory board for the Nevada State Athletic Commission and is the founder and CEO of VADA. She's one of the most knowledgeable advocates for fighter safety in the world today. "My impression," Dr. Goodman says, "Is that the WBC is relying on old data and incomplete data." This thought is backed by Dr. Charles Bernick (director of the Lou Ruvo Center for Brain Health at the Cleveland Clinic) who is overseeing the most comprehensive study to date of brain damage suffered by fighters. Last year, Bernick told writer Tom Gerbasi, "If you take a woman fighter and matched her up to a male who has the same number of fights, the same age, the same education, we don't really find much difference looking at the brain itself or even how they test out on certain reaction time and processing speed and so on. You can always find some differences, but they're not huge. Nothing has come out that women are more prone to long-term changes. The biggest risk factor is the number of blows you're on the receiving end of. Anytime you reduce that, you're going to, in some sense, improve the safety of that sport. But I don't know if it's really been established yet that, for women, that's going to make a big difference. It's making a policy change based on indirect evidence. It certainly can't hurt from a safety standpoint. But how much it's going to help, I don't know."

All of the above leads to a host of collateral issues. Would a state athletic commission countenance a men's fight with four-minute rounds if both boxers agreed to it? A twenty-round championship fight? "Look," Dr. Goodman says, "Exposure to head blows isn't good for anyone. We know that. The less the better. One-minute rounds would do less damage than two-minute rounds. With three-minute rounds for women, there would be more damage. That's a given. There would be less damage in men's boxing if rounds were cut from three minutes to two.

"But there are other ways to make boxing safer," Dr. Goodman continues, "You make boxing safer with proper pre-fight medical screening. You make boxing safer with good referees and doctors and cornermen who know when to stop a fight. I favor three-minute rounds for women." And suppose it turns out that, in fact, women are more easily concussed, suffer worse symptoms, and take longer to heal than men?

"If that's true," Dr. Goodman answers, "then maybe women shouldn't be fighting at all."

This commentary first appeared in The Ring magazine. Thomas Hauser's email address is thomashauser-writer@gmail.com. His most recent book – Staredown: Another Year Inside Boxing – was published by the University of Arkansas Press. In 2004, the Boxing Writers Association of America honored Hauser with the Nat Fleischer Award for career excellence in boxing journalism. In 2019, he was selected for induction into the International Boxing Hall of Fame.

2-MINUTE VERSUS 3-MINUTE ROUNDS IN PROFESSIONAL WOMEN'S BOXING

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DISCLOSURE: MS serves as Co-Chairman - Medical Advisory Committee, Association of Boxing Commissions (ABC) and Chief Ringside Physician, Professional Boxing & Mixed Martial Arts Mohegan Sun, Foxwoods Resorts & State of Connecticut.

Boxing is an inherently dangerous sport. There are many potential injury risks including concussion, lacerations, fractures, dislocations, and even death. Ringside physicians work very hard to identify those fighters who may be at an increased risk for injury and prevent them from competing. Pre-fight precautions are taken which include extensive medical testing on each combatant as well as many additional safety measures which are implemented at the venue itself to insure a prompt and rapid medical response should a catastrophe occur. Furthermore, the boxing medical community utilizes research and clinical data to assess what changes need to be made on a continuous basis to prevent injuries.

One change that was made to reduce the likelihood of injury was to limit female boxing two-minute rounds and make these fights no more than 10 rounds (for championships only). This regulation was based on clinical research conducted by the World Boxing Council (WBC) and some recommendations from very experienced ringside doctors. This proposal was established by looking at risk factors in men vs. women.

An important determination in making this decision was the fact that studies suggested that woman may be at a higher risk of concussions. One study looked at female soccer players who had a higher risk of concussions versus their male counterparts. Furthermore, in addition to a higher rate of concussions, it was determined that their symptoms may be more severe and may last longer than their male counterparts. This is especially concerning given our better understanding of Chronic Traumatic Encephalopathy (CTE).

Several studies suggest various reasons for these findings. One is based on higher estrogen levels in females. The thought is that estrogen may play a role in increasing the risk of developing a concussion where progesterone may be somewhat protective. Thus, depending on the date of the fight, a woman's risk might be increased or decreased depending where it falls out in respect to her menstrual cycle.

Another reason may be the size of a woman's neck. Given that the size is generally smaller than that of a male fighter, a punch might lead to a greater acceleration-deceleration of the brain resulting in a

higher concussion risk. Lastly, their may be some brain physiologic and blood flow reasons which increase a woman's risk as well.

The two- versus three-minute rounds is still very controversial, however. For example, in Mixed Martial Arts (MMA) contests, women fight a minimum of three (3) five-minute rounds while some even fight five (5) five-minute rounds. Thus far, anecdotal evidence suggests no obvious increase in concussion rates. Although MMA and boxing are different disciplines, they obviously share many similarities. As such, many people ask why we continue to limit female fighters to fight two minutes and not increase the duration to three minutes.

Most of the push-back comes from some female fighters. Their argument is compelling. They feel that most female athletes need time to "get going" and two minutes does not give them enough time to wear down their opponent. Some also believe the reason you do not see more knockouts in female fighting is because many opponents start to tire after two minutes and not allowing the third minute, prevents more stoppages. Therefore, increasing the duration of the round to three minutes would allow the stronger and better-conditioned fighter to prevail. Nevertheless, other female fighters disagree, stating that their fights would be more boring since it would slow down the pace of the fight. On another note, woman boxing is much less lucrative when compared to their male counterparts. Many blame this discrepancy on the fact that they only fight two-minute rounds. This is a very valid point as there is a disproportionate financial gender inequality. In MMA fighting (UFC, Bellator, IFL, etc.), some female fighters can make millions of dollars for a single fight. This is extremely rare in a regular boxing competition where most female fighters make less than \$50,000/year.

The Association of Boxing Commissions (of which I am the Co-Chair of the Medical Committee), agrees with two-minute rounds. The recommendations were based on all the evidence and the potential for more serious injuries with a longer round duration. Nonetheless, without more

compelling evidence, it is difficult to emphatically state that the risk between two- and three-minute rounds would absolutely increase a woman's risk of serious injury. The only answer is to obtain more medical data and the only way to get more useful information is to increase the round duration to three minutes and compare injury rates. With that being said, the first time there is a bad outcome, there will certainly be those critics who will question why the change was made given that some studies already exist which indicated that the injury risk increased with a longer round. This brings in an aspect of liability as well.

MMA has already made the change and it has not seemed to significantly increase the injury rate in these sports. Although I currently agree with the two-minute round recommendation, I would not be averse to exploring the possibility of increasing the round duration to three minutes given the success and documented safety seen in MMA bouts. Perhaps, like MMA, we need to consider shorter number of rounds if we were to increase the round duration. This way, we could better monitor these fighters while still allowing them parity with their male counterparts. Either way, there is much to debate.

2-MINUTE VERSUS 3-MINUTE ROUNDS IN PROFESSIONAL WOMEN'S BOXING: DOES IT MATTER?

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Jennifer Galjour, MD, New York State Athletic Commission

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DISCLOSURES: NKS serves as Chief Medical Officer of the New York State Athletic Commission. JG serves as ringside physician for the New York State Athletic Commission. The views expressed by the authors are their own.

Currently in most commission jurisdictions in the United States, professional women boxing consists of 2-minute rounds. Some commissions allow 3-minute rounds provided both combatants agree to this format. If either of the two combatants wishes to fight 2-minute rounds, the fight is scheduled as such. Should professional women boxers fight 3-minute rounds versus 2-minute rounds, akin to their male counterparts, has recently been debated in the combat sports media and online on social media networks such as Twitter and Facebook. The argument advanced for fighting 3-minute rounds is that this would level the playing field between men and women professional boxers. Three-minute rounds will make women boxing more exciting to watch and hence more marketable to the fans. Women boxers can then advocate for equal pay for equal work as their male counterparts. This argument for 3-minute rounds based

on gender and pay equality is countered by entities in favor of 2-minute rounds in women boxing by voicing concern that women boxers are more prone to concussions as compared to their male counterparts. Hence extending round duration to three minutes risks their health and safety.

So, does it matter if in professional women boxing rounds are 3-minutes versus 2-minutes? If one were to debate this question on pure medical grounds, the answer is a resounding yes. While scientific data with respect to combat sports is lacking, gender and sex differences in concussion incidence and outcome has been studied and showed a woman's brain to be more susceptible to concussive injuries as compared to a male brain. Similarly, children are more susceptible to concussions than adults. Mollayeva et al. reviewed these gender and sex differences in concussion in an article

published in the journal *Concussion*.¹ The increased susceptibility and vulnerability to concussion in women as compared to men is thought to be due to disparities in neck musculature and head-to-neck stability which likely lowers concussion biomechanical threshold. Hormonal factors such as estrogens may also make women more vulnerable to concussion and influence recovery time after a concussive injury. In athletes of the National Collegiate Athletic Association, Covassin et al. reported a 1.4 times greater incidence of concussions in females as compared to males in sex-comparable sports such as basketball and soccer.² Since objective measures of concussion are still not available, most studies used subjective self-reported measures and the influence of social factors (more socially acceptable for women to report physical vulnerability as compared to men) remains unclear.

Combat sports such as boxing are unique since every punch thrown at the head is thrown with the intention of winning by causing a knockout (aka a concussion). While boxing has many beneficial effects on the cardiovascular system, one cannot defend boxing by saying it is good for the brain. There is an exceedingly high risk for both acute and chronic neurological injuries. Acute neurological injuries may occur during the course of the bout or present soon after the bout is over and include subdural hematoma (SDH), epidural hematoma (EDH), subarachnoid hemorrhage (SAH), intracranial hematoma, and injury to the great vessels of the neck such as carotid or vertebral artery dissection. Chronic neurological injuries include chronic traumatic encephalopathy (CTE), dementia pugilistica (DP), chronic post-traumatic headaches, chronic posttraumatic dizziness, chronic posttraumatic cognitive deficits, and chronic posttraumatic Parkinsonism. Since chronic neurological injuries present long after the boxer's career is over, it is inherently difficult to protect a fighter from these devastating injuries. No amount of boxing is good for the brain—not one round, not 40. Some studies on boxers have suggested that boxers with long professional careers are the ones most susceptible to the above-men-

tioned chronic neurological injuries. One does not need a neurologist to opine that limiting round duration to 2-minutes protects the boxer's neurological health with respect to both acute as well chronic neurological injuries associated with boxing. Limiting the number of total rounds in a bout and the duration of each round protects the neurological health of the fighter irrespective of sex.

Gender and pay inequality are important social issues to which the boxing community cannot turn its back. These important issues are not unique to professional woman boxing and it is important to understand how these issues adversely affect the growth of women boxing and discourage many promising women boxers from pursuing a career in professional boxing. Arguably, pay disparities exist in sports with far less risk of traumatic brain injury. In 2019, Lionel Messi amassed \$141 million in salary and sponsorships, while Carli Lloyd, the highest earner in women's football, earned 272 times less than him at \$518,000. In the 1980s when there was a women's equivalent to the Tour de France, female winners took home just 1% of the prize money compared to men (in 1984 American Marianne Martin won a purse of \$1000 and a trophy while Laurent Fignon earned \$100,000 and additional prizes). As some sports begin to address these issues (e.g., the International Tennis Federation moved for equal gender pay in the Grand slams and the prize money for male and female athletes in the Ironman series is equal), boxing cannot afford to be left behind. These issues need to be addressed on an urgent basis and change needs to come from within the boxing community. The issue of 2-minute versus 3-minute rounds in women's boxing though needs to be debated, scientifically studied, and decided purely on medical grounds based on concrete evidence-based medicine whether women partaking in professional boxing are more susceptible to concussions as compared to men and how the duration of the round alters the risk for both acute and chronic neurological injuries, not just in women but also in men.

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2. Covassin T, Moran R, Elbin RJ. Sex differences in reported concussion injury rates and time loss from participation: an update of the National Collegiate Athletic Association Injury Surveillance Program from 2004–2005 through 2008–2009. *J. Athl. Train.* 2016; 51:189–194.

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General and Formatting Guidelines:

All manuscripts must be written in English, using UK or American English spellings. All materials must be submitted electronically to Nitin Sethi, Editor-in-Chief, at sethinitinmd@hotmail.com.

Submissions must:

- Be submitted in Microsoft Word format (.doc or .docx);
- Be double-spaced with 1" margins;
- Be typed in a commonly-used font (Times Roman, Helvetica, Arial, or similar), no smaller than 11 points.
- Include page numbers

Abbreviations and Acronyms

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ARP encourages the submission of photos, slides, graphs, charts, etc. that serve to complement or reinforce the information provided. At initial submission, all tables and figures may be embedded in the main document file. Materials accepted for publication must have the associated figures submitted individually and appended to the main document at final submission (see below for formatting instructions). Manuscript preparation should follow the guidelines provided in the AMA Manual of Style (10th edition or later). If a figure has been published previously, authors must cite the original source and submit written permission from the copyright holder to use it. This permission must be submitted at the time of manuscript submission.

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References

References should be listed in the order in which they appear in the article and should be formatted using the *AMA Manual of Style*.

Examples:

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Print Journal (more than six authors)

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Electronic Journal Article

Without a Digital Object Identifier (DOI)

Aggleton JP. Understanding anterograde amnesia: disconnections and hidden lesions. *QJ Exp Psychol*. 2008;61(10):1441-1471. <http://search.ebscohost.com/login.aspx?direct=true&db=pbh&AN=34168185&site=ehost-live> Accessed March 18, 2010.

With DOI:

Gage BF, Fihn SD, White RH. Management and dosing of warfarin therapy. *The American Journal of Medicine*. 2000;109(6):481-488. doi:10.1016/S0002-9343(00)00545-3.

Journal Article with No Named Author or Group Name:

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Entire Book

Rantucci MJ. *Pharmacists Talking With Patients: A Guide to Patient Counseling*. 2nd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007.

Book Chapter

Solensky R. Drug allergy: desensitization and treatment of reactions to antibiotics and aspirin. In: Lockey P, ed. *Allergens and Allergen Immunotherapy*. 3rd ed. New York, NY: Marcel Dekker; 2004:585-606.

Website

Canadian Press. Generic drugs to be bought in bulk by provinces. CBC News. <http://www.cbc.ca/news/canada/saskatchewan/story/2013/01/18/drug-costs-provinces.html>. Published January 18, 2013. Updated January 18, 2013. Accessed February 4, 2013.

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Basic science and research articles should include the following subcategories, clearly labeled in the manuscript:

1. Abstract of no more than 300 words in length, which summarizes the main points of the article. Please include 3-5 keywords that facilitate search engine optimization (SEO) and that are consistent with the title, headers, and abstract.
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