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Commentary

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Making combat sports safer-mandatory concussion education for all stakeholders

Abstract

Concussive head injuries are exceedingly common in combat sports. To prevent all concussive injuries would require fundamental changes to the very nature of these sports such as no punches or kicks to the head. These radical changes would likely not be acceptable. Hence a more practical approach would be an attempt to make these sports safer by reducing the number, severity and ensuring better management of concussive head injuries. Mandating concussion education for all combatants, coaches, trainers and referees is a practical, cost-effective and easy-to-implement intervention.

Volume 8 Issue 3 - 2025

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Received: October 21, 2025 | **Published:** October 27, 2025

Introduction

Professional combat sports such as boxing, mixed martial arts (MMA), Muay Tai, bare knuckle boxing, kick boxing all carry a high risk for concussive head injuries. In combat sports punches or kicks thrown at the opponent's head are thrown with the intention of winning by causing a knockout (KO). A KO leads to a sudden loss of body tone, the combatant drops to the canvas and suffers loss of consciousness (LOC) of varying duration. This type of concussive head injury is common in combat sports. Medical associations have thus called for a ban on these sports citing the sports intent to cause physical harm. This commentary explores whether combat sports can be made safe by mandating concussion education for all athletes, coaches, trainers, referees and other stakeholders. Concussion education should focus on recognizing the signs and symptoms of concussion and appropriate management of concussive head injuries both in and out of competition.

Commentary

Concussive head injuries are common in combat sports. In these sports, where every punch and kick thrown at the opponent's head is thrown with the intention of winning by a KO, the reason why this form of head injury is common is not difficult to fathom. Various medical associations have thus called for a ban on these sports citing the sports intent to cause physical harm.[1] Concussion is generally considered to be a mild form of traumatic brain injury (TBI) with no structural damage visualized on conventional neuroimaging such as computed tomography (CT) head or magnetic resonance imaging (MRI) brain.[2,3] In combat sports more severe TBIs such as subdural hematoma can also occur at times leading to the death of the combatant.[4] The 6th international conference on concussion in sports defined sport-related concussion (SRC) as follows:

"SRC is a traumatic brain injury caused by a direct blow to the head, neck or body resulting in an impulsive force being transmitted to the brain that occurs in sports and exercise-related activities. This initiates a neurotransmitter and metabolic cascade, with possible axonal injury, blood flow change and inflammation affecting the brain. Symptoms and signs may present immediately, or evolve over minutes or hours, and commonly resolve within days, but may be prolonged.

No abnormality is seen on standard structural neuroimaging studies (computed tomography or magnetic resonance imaging T1- and T2-weighted images), but in the research setting, abnormalities may be present on functional, blood flow or metabolic imaging studies." [5]

The clinical presentation of a concussive head injury can vary in combat sports. It can present in a rather dramatic fashion. As soon as the combatant experiences a head impact exposure (HIE), it leads to a sudden loss of body tone. The combatant falls to the ring canvas accompanied by LOC and tonic posturing of the arms and legs. The LOC is brief lasting from a few seconds to a minute or two followed by abrupt arousal. The combatant is usually confused and disoriented after arousal and sometimes has to be gently restrained by the referee or the ringside physician. Milder grades of concussive head injuries have a more subtle and entirely subjective presentation. After experiencing a HIE (such as a stiff jab to the head or a hook), the combatant may experience headache, feel dizzy, experience photophobia, look dazed and appear confused. Objective signs such as gross motor instability may be lacking.

It is important to remember that subjective signs cannot be assessed by the referee, ringside physician or the trainer/coach. So, unless the combatant volunteers the information of experiencing signs and symptoms of a concussion, the head injury may go unrecognized. Herein lies the importance of concussion education. Amateur and professional boxers, coaches and trainers need to be educated about the subjective nature of symptoms of concussive head injuries. If you feel something, say something should be the new mantra in combat sports. Combatants should be encouraged to volunteer their symptoms. For this to occur, the boxing culture needs to change. There should be no shame in saying "no mas" and the combatant should not be ridiculed and shamed for giving up either in competition or in sparring sessions. Honest reporting of concussion symptoms should be encouraged and supported. The emphasis should be to prioritize the boxer's health above everything else. Neither should a referee or a ringside physician be booed, ridiculed and shamed on social media for stopping a fight on medical grounds.

Concussion education should be made mandatory for everyone who partakes in combat or contact sports where HIEs are common. This includes professional combatants as well as the casual participant pursuing these sports as a hobby or for fitness. There are many ways this education can be imparted. In-person workshops led by a neurologist specializing in concussion in sports would be ideal. The Centers for Disease Control (CDC) offers free "Heads Up" online concussion training for coaches. There is also information available on

the CDC website for athletes, sport officials and parents (https://www.cdc.gov/heads-up/communication-resources/training.html).6 Posters detailing the signs and symptoms of concussion should be mandatory in every boxing and MMA gym and locker rooms. The combat sports community should invest in interactive apps and video-based learning platforms which can be accessed by the athletes at any time, at no cost. These apps and platforms should be designed to engage the athletes and improve knowledge retention. Physicians involved in these sports should have pocket concussion assessment tools so as to standardize concussion evaluation and management of amateur and professional boxers during the fight. An attempt should be made to incorporate revised and new tools such as the Concussion Recognition Tool-6 (CRT6) and Sport Concussion Assessment Tool-6 (SCAT6, Child SCAT6), as well as the Sport Concussion Office Assessment Tool-6 (SCOAT6, Child SCOAT6) into current concussion evaluation and management strategies.[6]

Conclusion

Concussions and at times more severe forms of TBIs are common in combat and contact sports. These sports can be made safe by mandating concussion education for all athletes, coaches, trainers, referees and other stakeholders. Concussion education should focus on prompt recognition of signs and symptoms of concussion and appropriate management of concussive head injuries both in and out of competition.

Author contributions

NKS drafted the manuscript

Study funding

No targeted funding reported.

Disclosures

The views expressed are those of the author and do not necessarily reflect the views of the organizations he serves. The author serves as Chief Medical Officer of the New York State Athletic Commission.

Data sharing statement

The author has no additional data to share.

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Citation: Sethi NK. Making combat sports safer-mandatory concussion education for all stakeholders. *MOJ Sports Med.* 2025;8(3):93–94.
DOI: 10.15406/mojsm.2025.08.00190