



Guidelines for the Prevention & the Management of Strangulation in Olympic Wrestling

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Definition of Strangulation

Strangulation, chokehold, choke, stranglehold, throat hold or, in Judo **shime-waza** (Japanese: 絞技; English: constriction technique)¹ is a general term for a grappling hold that critically reduces or prevents either air (choking)² or blood (strangling) from passing through the neck of an opponent. The restriction may be of one or both and depends on the hold used and the reaction of the victim. The lack of blood or air often leads to unconsciousness or even death if the hold is maintained.³



Strangulation in wrestling, rules and regulations

Strangulation and throat hold in wrestling are forbidden; there are circumstances when it happens accidentally, sometimes even intentionally. This latter case draws penalty to the principal. Generally, all actions, gestures or holds intending to make the opponent suffer from forcing him or her to withdraw are forbidden.⁴ All actions that cause unconsciousness are, therefore, also forbidden in wrestling. On contrary to other martial arts including Judo chokehold is part of the technique or it is a goal for defeating the opponent but with strict and continuous supervision by the referee^{1,3}.

Mechanisms and techniques that result in Strangulation

Headlock can result in strangulation. It happens when a wrestler wants to stop the attacking opponent by holding the neck. Generally, this defending maneuver takes some seconds. Further continuation of headlock may result in strangulation.



Basic pathophysiology of the strangulation

Most chokeholds featured in combat sports and martial arts are blood circulation chokes, although some airway chokes or combinations occur as well.³ In Judo Shime-waza or the “chokehold,” when is properly applied for 10-20 seconds causes unconsciousness. In this technique, the superior carotid triangle, which contains important vascular structures, is compressed causing strangulation.



In a study by Rodriguez and his colleagues, ten judoka were examined at rest by EEG and regional Cerebral Blood Flow (rCBF) measurement (133-Xenon inhalation method); in seven of them a syncope was induced by choking, and EEG was recorded during the loss of consciousness while rCBF was measured immediately after the recovery.⁵ Baseline EEG and rCBF examinations were normal. During choking, EEG showed diffuse 2-3 Hz high voltage waves, predominantly at the anterior regions, before gradually recovered to normal. A slight decrease in rCBF has been observed in four cases and a more significant reduction in two cases. No evidence of permanent CNS functional changes due to judo practice and choking were identified.

Raschka and his colleagues investigated the registration and analysis of cognitive parameters in the alarm phase of the stress reaction during a conventional judo cross choking technique. 57 judoka (41 males, 16 females; mean age 23.1 ± 6.7 years) underwent a standardized cross-choking maneuver (juji-jime), which lasted for 6 - 8 s until giving up, carried out by a black belt physician. The Stroop inference test was performed before and twice after the intervention. The reading velocity of the interference task was reduced by an average of 77.4 s to a mean of 74.4 s ($p < 0.01$), and the number of reading errors decreased by a mean from 2.9 to 2.1 ($p < 0.01$), finally increasing to 2.4 s. The data show the most important improvement in performance after 25 seconds of choking in the male judoka. In the female judoka, increasing performance started 25 seconds before choking and continued for 25 seconds after the intervention. The alarm reaction following the potential life-threatening stressor with an attack upon the throat improves selective attention before (female subjects) and after choking (female and male subjects) depending on gender.⁶



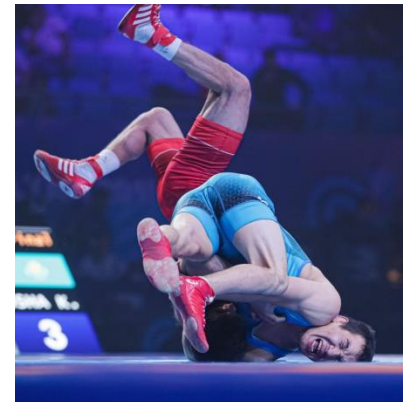


Risks and dangers of strangulation

Although neck chokes may result in syncope, hypoxic brain injury, delayed airway obstruction, embolic cerebrovascular events, and even death, their transient application and seemingly stringent regulation in Mixed Martial Arts probably avert prolonged deficits in cerebral blood flow and neuropsychological status.⁷



It has been shown that sudden forceful head-holds may cause cervical spine and spinal cord injuries resulting in quadriparesis and quadriplegia. Therefore, elimination of the more dangerous holds should be taken seriously in wrestling.⁸



No fatalities as a result of shime-waza have been reported in the sport of judo since its inception in 1882.⁹

UWW-Medical Commission Action plan on prevention of strangulation in wrestling

By proper training, wise coaching, and understanding the rules and importantly, by good and cautious refereeing we can avoid strangulation injuries. We realize that establishing proper guidelines is necessary to prevent strangulation in wrestling. In this regard we have taken the following steps:

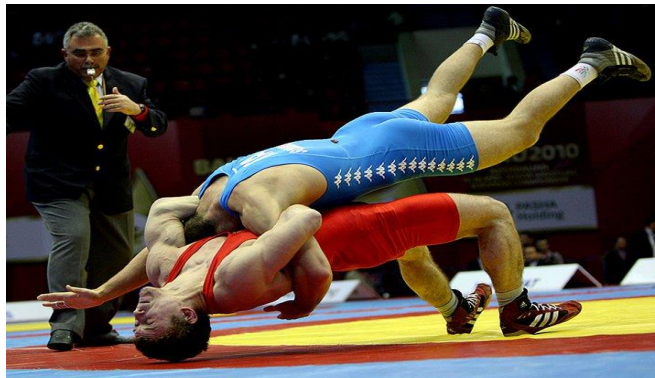
1. Injury surveillance - We have been collecting data on choking and strangulation injuries from our cloud-based surveillance system (Athena) during recent years.
2. Literature review - All related literatures were reviewed.
3. Risk factors - All data and recorded videos of strangulation cases were carefully reviewed to identify mechanisms of injuries and risk factors of strangulations.



4. To prevent strangulation injury, we implement 4-5 seconds as the recommended time for head-lock. We should also further focus on educating referees and improve their awareness of the significance of proper refereeing in the prevention of strangulations.
5. The new measures should be implemented in new versions of UWW wrestling rules and medical regulations.

First aid on the mat when a wrestler is affected by a strangulation

1. The referees should be aware of the risk of strangulation when head and neck holds are taken. They must loudly inform the attacking wrestler to release the hold. If a hold with the risk of strangulation continues, the referee should immediately blow the whistle and stop the match. The referee must inform the wrestler who had taken a hold with the risk of strangulation about the illegality of the hold according to the wrestling rules.



2. When the defending wrestler takes a high-risk hold, the bout should not be interrupted, but the wrestler must be ordered to release this hold immediately.
3. In case of losing consciousness by choking or strangulation:
 1. The match doctor must request to stop the bout.
 2. Resuscitation and stabilization of the injured wrestler must be started immediately.
 3. Upon stabilization of the injured wrestler, neurological examination and evaluation of the injury are the next steps.
 4. When necessary, the recorded video of the injury should be reviewed and analyzed to identify the mechanism of injury and to measure the duration of unconsciousness.





Aftercare, further investigations and time to regain activities and return to sport. When a match should be stopped following a strangulation? How to decide?

4. In our opinion a wrestler can continue a bout after a mild strangulation with no neurological symptom and no unconsciousness situation if S/he wants, and the match doctor confirms that S/he is capable of continuing.
5. If the decision is to continue:
 1. The wrestler should be observed by the medical team for 10 minutes after completion of the match.
6. If there is any doubt, the bout should be suspended, and the wrestler should be transferred to the hospital for further investigations and care.
 1. Any strangulation_injury that is referred to the Hospital should be monitored for at least six hours for cardiovascular and neurological conditions. In particular, it is important to make sure there is no risk of neck injury, seizure and neural disfunction.
7. In case of losing consciousness, the wrestler who makes a strangulation should be penalized and become disqualified; the injured athlete should be announced as the winner. If the injured wrestler become fine, confirmed by the UWW Doctor, S/he will continue the competition.
8. It is obliged that athletes < 18years (cadet) are not allowed to continue competitions during the same day and one-week rest is ordered.
9. Athletes who are > 18 years (junior, senior) can continue competitions if they are capable of wrestling, confirmed by the match doctor.

Following circumstances are necessary:

 1. No neurological sign.
 2. Exact orientation.
 3. Stable vital signs.
 4. No shortness of breath.

Conclusion

Although choking and strangling are forbidden in wrestling they may happen accidentally, and sometimes even intentionally. There are few available data in the combat sports literature without presenting any evidence of later consequences.

This document is prepared to provide baseline information on strangulation and its prevention and management in wrestling. Understanding and respecting wrestling rules and regulations by wrestlers and coaches, cautious and pro-active refereeing, and proper medical management are key elements to prevent this potentially dangerous condition in wrestling.

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