Sports Medicine Basics In The Judo Athlete (Part 1)
USA Judo Sports Medicine Subcommittee
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This is the first of a series of articles by the USA Judo Sports Medicine Subcommittee about sports health issues and concerns in the judo athlete. Included in this article are various important primary topics and problems encountered in judo participants and judo competition. Hopefully by raising awareness on certain topics and further educating our community on the basics of sports medicine in the judo athlete will lead to a safer and healthier environment for participation.

In Part 1 of our series, the topics to be covered includes head & spine injuries, basic emergency mat-side care, strangulation, arm-lock injuries, and blood & bodily fluid issues. One of the largest chapters in this series will involve concussions because of the relative common rate of occurrence, potential severity of injury, and the associated possible long-term disability & impairment. Future series will also cover common judo related sprains, strains, & other joint injuries, skin problems, sports nutrition, fluid replacement, and weight management. Other topics under development include judo specific injury rehabilitation and junior/youth specific issues.

The goal of USA Judo Sports Medicine is to promote and facilitate a healthy athletic lifestyle through safe participation. We believe this is in line with Professor Jigoro Kano’s (the Founder of Judo) vision. If we can improve the judo community’s fundamental knowledge of sports medicine issues in the judo athlete, then we are getting closer to this goal. With greater awareness of potential problems our coaches, instructors and officials should be able to better facilitate safe participation. However, please keep in mind that medical professionals and health consultants should still be utilized when any significant injury or health issue is encountered. Also know your limitations as a potential health provider or caregiver, and be cognizant of your qualifications to give formal sports medicine advice on serious health issues and problems. The health and safety of judo participants should always remain the number priority when advising or caring for our athletes.

The basic concept for any individual caring for judo participants is to “do no harm”. Hopefully after review of this article, you will be more aware of the important health issues and will recognize significant injuries and medical problems that require further professional medical attention and treatment. Be cognizant of your ability and qualifications to make a medical diagnosis or provide medical treatment. For example, for relatively common judo injuries, it is generally prudent to not manipulate injuries. Especially do not move a breathing athlete who is unconscious or one with a possible spinal injury without professional medical direction and assistance.
Judo is truly a “contact-collision” sport with the potential for major and catastrophic injury. Therefore it is theorized that there is significant risk for potential long-term damage and disability. Because judo is in essence a grappling sport, it is very likely that there is a similar injury profile and injury incidence to interscholastic high school/collegiate folk-style and Olympic Free-style/Greco-Roman wrestling. The USA Judo Sports Medicine Subcommittee is currently conducting research to further understand the true incidence of judo injuries and problems in the United States. We are also evaluating the validity and efficacy of current treatment recommendations and methods to enhance physical performance.

There are numerous important symptoms regarding the injured judoist. Among these there are a few significant symptoms that need to be seriously considered when encountered in the judo participant. These include pain and swelling especially when it’s severe, focal, immediate, and/or persistent. Nerve or spinal cord injury may be indicated by complaints of numbness, tingling, or weakness after injury. Finally, the loss of normal range of joint motion or significant functional disability and impairment may suggest something that’s possibly broken, torn, pinched, or dislocated all of which require physician evaluation and treatment.

### Head Injuries & Concussions

Preliminary research and anecdotal evidence suggest that head injuries, especially concussions, are relatively common significant injuries encountered in practice and competition among judo athletes and participants. It is also suspected that concussions cause significant loss of practice, training, and competition time. The spectrum of head injuries encountered in judo participation includes head contusions, concussions, brain swelling, brain contusions, intra-cranial bleeding, and skull fractures.

Concussions are really not very well understood by both the lay community and also medical professionals. There is still quite a bit of controversy and lack of consensus even among the “experts” in concussions and brain injuries for the evaluation, treatment, and the return to play recommendations. For years there was no agreement on even the definition of a concussion. However it is generally accepted that concussions are common, significant injuries encountered in any contact-collision sport. Because of the ambiguity and lack of consensus regarding concussion management, there will be potential malpractice concerns and thus reflex defensive and conservative medicine practiced by medical professionals covering judo events until future research efforts bring us closer to understanding this problem better.

Previous epidemiological studies have shown that concussion injury rates represent approximately 2-5% of all athletic injuries. The incidence is higher in contact collision sports with football associated with greater than 100,000 cases per year. Concussions have occurred in up to 20% of high school football players yearly. The exact statistics in judo athletes are not yet formally quantified in the U.S., but it is suspected that the
incidence is probably high and similar to other contact collision sports, especially wrestling.

The main goals of the sports medicine team caring for the acutely concussed or head injured athlete is to make an accurate & timely diagnosis, prevent further damage, screen for other associated injuries (especially cervical spine or neck), and allow the athlete to safely “return to play”.

Even for experienced sports medicine professionals the assessment of a concussion can be a diagnostic dilemma. This is in part due to the vagueness of the possible symptoms, which can include confusion, dizziness, clouded thinking, altered consciousness, and memory loss. Other more severe structural head injuries can have a similar symptom profile. The hallmark finding with a concussion is probably confusion. All athletes with a concussion do not necessarily have loss of consciousness or amnesia, but most will have confusion though subtle it may be. Based on our current knowledge and scientific evidence, it is difficult to identify those at risk for complications or permanent neuropsychological (brain) damage. Also there are no specific return-to-play guidelines that have been validated by medical research for any sport let alone judo. During judo competition, the evaluation of the head injured and possibly concussed judo athlete is further complicated by limited time for “on mat” assessment as per the International Judo Federation (IJF) medical rules and guidelines. The IJF does allow more time for head injury evaluations when compared to any other medical problem but still not enough in the minds of most experienced physicians without medically disqualifying the athlete for that match. Most current practices in concussion management require about 5-15 minutes or more of combined evaluation and observation before returning an athlete to play. The USA Judo Sports Medicine Subcommittee is currently investigating and developing judo specific concussion guidelines.

Recently there has been some consensus among leaders in the concussion field on the definition of a concussion. The Summary & Agreement Statement of the First International Symposium on Concussion in Sport held in Vienna, Austria in 2001 defined the concussion as “a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces”. This is difficult to translate into plain English for the lay person but one way to interpret this is to say that the brain is affected and possibly altered in a complex way after an injury, whether its from a direct blow or indirectly such as “shaking” the brain around in its “hard box” sufficiently enough to cause trauma.

We’ve previously discussed some common characteristics of a concussion including confusion and altered consciousness, memory dysfunction (can’t remember the score, weigh in weight, details of the match, etc.), and dizziness. Other classic symptoms and signs include vacant stare, disorientation (walking in the wrong direction; unaware of person, place, or time), poor coordination & balance problems, delayed reflexes, and delayed reaction times. More subtle findings include delayed responses, poor concentration and slowed thought processing, lack of awareness of surroundings, decreased alertness or inattention, visual changes (seeing “stars”, difficulty focusing), nausea, mood disturbances such as irritability or inappropriate emotionality (snapping,
appearing distraught, crying for no apparent reason), easy fatigability or lethargy, and exercise intolerance (provokes symptoms, i.e. headache or dizziness).

Sports Medicine professionals covering contact collision sports like judo take potential concussion injuries seriously with caution because there is a realistic potential for long-term sequelae or damage. The obvious worst-case scenario is death acutely after head injury due to rapid, severe brain swelling from multiple concussions or due to a severe structural head injury such as an intra-cranial hemorrhage. Significant long term disability and impairment can arise after repeated injury resulting in cumulative neuropsychological brain damage. This can be manifested as conditions similar to Parkinson’s disease and Alzheimer’s disease. Other equivalent terms and descriptions include chronic traumatic brain injury and pugilistic dementia or “punch drunk”. Also in the significantly head injured athlete or the unconscious athlete, there is a relatively good possibility that this athlete has also sustained a severe spinal (i.e. neck) injury but either cannot tell or warn you or is too “out of it” complain of it. So do not move him/her in this situation without professional medical assistance and guidance because you can potentially worsen a severe spinal injury such as a broken neck and cause permanent spinal cord injury and paralysis. In summary, if these injured athletes are not properly handled then there is a real potential for disaster.

Although chronic traumatic brain injury is a concern, we do not yet know the true incidence of this problem among judo participants. It is well established to a certain percentage of athletes involved in other high-risk sports such as boxing and hockey. However, we do not know whether it happens to judo athletes and if it does, what factors put you more at risk, such as the level of involvement or competition, training or competition surfaces, or even the specific style or throws you use. Our subcommittee is currently investigating and researching these issues. In the future genetic testing may be more easily accessible to identify those at risk for permanent brain damage after concussion(s).

**Emergency Mat-Side Care**

Medical personnel encountering an unconscious or unresponsive athlete must first follow Basic Life Support (BLS) guidelines. This is represented by the mnemonic ABC’s: Airway, Breathing, Circulation. It is highly recommended that anyone significantly involved in the teaching, coaching, supervision, caring, or officiating of judo athletes pursue formal education and certification in BLS.

Although not common, any contact collision sport has the potential for severe or catastrophic injury. If you have significant involvement in judo events in any capacity previously described, then there is always a chance to encounter such injuries and familiarity to emergency mat-side care is always prudent. In the case of the unconscious or unresponsive athlete, follow BLS guidelines and do not move this athlete without the proper medical training or assistance. If the airway or breathing of this athlete is compromised, then he/she should be moved to improve the compromise, but again ideally with proper assistance. Remember even though the athlete may have a severe head injury,
a potential severe spinal injury usually takes precedence and is the top priority in management.

If you have to move or turn over an athlete with a potential significant cervical spine injury, the log roll method is preferred. This involves the controlled and coordinated efforts of several experienced and trained individuals in spine trauma. A brief description of this method calls for qualified personnel to stabilize the head and neck of the injured patient when transferring to a back or spine board for further transport and evaluation at the emergency department. After stabilization the patient is rolled in a coordinated effort to one side while the head and neck is not allowed to move out of neutral position. The spine board is then slipped under the patient and then the patient is rolled back onto the board in a controlled manner. The head and neck is then further immobilized and secured. This is illustrated in the figure above.

The decision to the send a head injured athlete to the hospital emergency room can sometimes be a complex and difficult decision to make, not only for lay people but also for medical personnel. In general, every head injured player should be evaluated as soon as possible by an experienced medical professional for further recommendations. Persistent, severe, or worsening symptoms generally require emergency department evaluation. Other more specific head injury characteristics that require hospital transport include significant headache, significant loss or alteration of consciousness, persistent or worsening concussion symptoms (please refer to the concussion section), post head injury convulsions or twitching, persistent visual disturbance, behavioral or personality changes, and suspected significant spine or nerve injury.

Although there are various guidelines for return to play after head injury, one principle is generally agreed upon, which is any athlete still symptomatic must be held from play. If a player “blacks out” or loses consciousness, or has persistent (usually greater than 15 minutes) symptoms then they’re usually held from further play that day. After an athlete sustains a concussion, he or she should be placed in a sitting position if possible and monitored every 5 minutes for a minimum of 15 minutes or until better or asymptomatic. Every significant head injury should be evaluated by an experienced medical professional for supervised specific stepwise return to play recommendations.

The USA Judo Sports Medicine Subcommittee recommends that all judo athletes with a potential concussion or significant head injury be evaluated by and cleared by an experienced physician prior to return to practice or competition.

A return to play protocol was developed in 2001 during the First International Symposium on Concussion in Sport. This stepwise process involves advancement to every stage based on the asymptomatic completion of each task. This starts with rest. When symptom free then the athlete may proceed to the next level, which is light aerobic exercise. If symptoms develop at this or any level then the athlete steps back down to the previous level, which in this case would be rest. If the athlete is symptom free with the aerobic exercise level, then they can proceed to the next stage which is sports specific low impact training, which for the judo athlete would be judo calisthenics and shadow
uchikomi (no partner or if with partner then no lifting). If this is tolerated without developing symptoms then proceed to the next level which is non-contact training drills, but for the judo athlete “light contact” training drills such as ne-waza (ground work technique) uchikomi or light tachi-waza (standing technique) uchikomi with gradual progression to the injured athlete lifting the uke then progressing to more resistance with “three man uchikomi”. Keep in mind that the recovering athlete in this case may serve as uke but should not be thrown or take falls. Before proceeding to the next stage the athlete should again be assessed by the treating physician or athletic trainer for further medical clearance before starting full-contact training, which for the judo athlete would be ne-waza randori (full sparing), then taking falls as uke during throwing uchikomi, then tachi-waza randori. Lastly the athlete may commence competition play if he/she adequately passes each stage.

When the acutely concussed athlete goes home, certain precautions should be given to them or their guardian during the first 24 hours post injury to seek immediate medical care if certain situations present themselves. This includes recurrence of unconsciousness, presence of severe or worsening headache, persistent nausea or vomiting, progressive lethargy or drowsiness, or strange or inappropriate behavior. The injured athlete should be monitored the first night with periodic observation checks by waking the sleeping athlete to make sure they can be aroused.

**Spine Injuries**

The basic principles of spine care always starts with the protection of a potentially injured spine from further damage. This means never moving an unconscious athlete with a possible serious spinal injury, unless the injured athlete’s airway, breathing, or circulation is significantly compromised. Thus if the injured, unconscious athlete is face down he/she should only be turned over onto his/her back by experienced medical professionals that will keep the spine stabilized. The unconscious athlete can’t tell you if they have a broken neck, an unstable or dislocated neck, serious spinal cord or nerve root injury, or a severe herniated disc. Moving this individual improperly may cause worsening of the spine injury, paralysis, and/or death. Most spine injuries require further immediate evaluation by a physician for recommendations and return to play clearance.

**Chokes & Strangle Holds**

Since the creation of Judo by Professor Jigoro Kano into a safer martial art form from its more dangerous jujitsu roots, there has been scant anecdotal reports of serious injury occurring from properly executed judo choking techniques. Although, witnessing a judoka getting “choked out” to unconsciousness may appear quite distressing to the novice spectator, shime-waza or strangle techniques are generally considered safe by most in the judo community and sports medicine physicians familiar with judo.

Essentially judo chokes, when done properly and persistently, cut off the blood flow and therefore the oxygen supply to the brain. This temporary denial of oxygen to the brain, if
prolonged, causes brief loss of consciousness and occasionally brief memory dysfunction, disorientation, and confusion. Uncommonly, brief flailing, convulsions, or seizure-like activity will occur after being choked unconscious. These are usually benign in the vast majority of cases. Concern is needed if these convulsions are prolonged, especially if they occur in someone with known brain injury, epilepsy, or carotid artery abnormalities. Prompt medical evaluation should then be pursued. Crush injuries to the neck and throat are not seen unless (theoretically) kata-juji-jime or hadaka-jime is grossly applied incorrectly or aberrantly. Significant pain, difficulty swallowing, difficulty breathing, and persistent or bloody cough post choke warrants medical attention. Another uncommon situation requiring immediate medical attention is when a judo player is choked unconscious immediately after a possible head or neck injury i.e. getting thrown on his/her head and choked in rapid succession.

Although an exact duration of strangulation or time rendered unconscious deemed unsafe cannot be quoted, most healthy, adult judo athletes can tolerate relatively prolonged compromise of blood flow to the brain. Scientific research has shown that brain cell death occurs after 6 minutes of cerebral anoxia (lack of oxygen to the brain). However there is not much medical research currently available on the potential short or long-term complications specifically from judo choking techniques.

Even though the brain in a healthy adult individual can withstand prolonged oxygen deprivation (possibly up to or even over 5 minutes), any choked out athlete with prolonged unconsciousness/unresponsiveness or prolonged altered consciousness, or abnormal body posturing (such as back arching) requires the initiation of the Basic Life Support protocol and immediate medical response. A “safe” position for a choked out judo player is on their side and partially prone, but not face down. Always remember, do not move the unconscious/choked out athlete if they may also have a possible spine injury without experienced professional medical assistance and supervision.

**Arm-locks**

The USA Judo Sports Medicine Subcommittee (to no surprise) believes kansetsu-waza or arm-locks cause significant injury and loss of practice and competition time to judo competitors, if they do not submit appropriately. It is believed that most injuries occur during competition. Further research (as currently conducted by USA Judo Sports Medicine) is required to better understand any long-term damage or disability incurred by these techniques. Properly executed arm-locks puts stress (hyperextension and/or valgus stress) on the elbow joint. If this stress is applied to an extreme or too forcefully, then injury to ligaments (medial collateral ligament, anterior capsule), nerves (ulnar nerve), or cartilage/bone/joint (elbow joint or radio-capitellar joint) may occur. The majority of arm-lock injuries require further evaluation by an experienced physician, especially if the athlete cannot fully extend or straighten out his/her elbow joint, or has significant pain or numbness/tingling in the injured extremity.
Blood and Bodily Fluids
Following Universal Precautions

Always wear clean, latex gloves when handling blood, bodily fluids, or open wounds. When cleaning blood or bodily fluid contaminated uniforms or mats, please use proper disinfectants (ideally virucidal, bacteriocidal, fungicidal). Avoid spraying bleach mixtures on blue gi’s or uniforms. Cover any wounds and affected areas with properly secured sterile dressings if possible. Infectious waste should then be disposed of properly into separate appropriate bags or containers.

The most important, as well as time-honored method to stop bleeding is to apply constant gentle pressure. Remember to wear gloves and properly disinfect any contaminated surfaces. Also remember to properly cover any open wounds after the bleeding is controlled. Persistent or profuse bleeding and large or complex wounds need to be further evaluated and managed by an experienced medical professional.

Most nosebleeds are benign and usually only require gentle constant pressure below the bridge of the nose and/or simple nose plugs or packing. Brisk or profuse or persistent bleeding or significant pain may indicate a facial bone fracture or other serious problem and needs further medical attention. Remember to wear gloves and use universal precautions.

If a judo athlete sustains a bite wound, whether intentional or unintentional, bleeding must first be controlled followed by wound cleansing if possible. Bite wounds are considered “dirty” wounds with the potential for significant infection. Thus tetanus prevention and antibiotic treatment may be warranted with timely professional medical evaluation and care.

Whenever there is a potential for blood borne or bodily fluid exposure or exchange between individuals, they should each be advised to contact their personal physicians as soon as possible for further evaluation and recommendations. Any wounds or bleeding should be cleaned and treated accordingly.

Judo Maxims

The original philosophies proposed by Professor Jigoro Kano emphasize the true goals and spirit of USA Judo Sports Medicine. These basic judo maxims are “maximum efficiency for expended effort” and “mutual welfare and benefit for all”.

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PROCEDURES TO ESTABLISH THE MEDICAL STAFF FOR
NATIONAL JUDO EVENTS

USA Judo in cooperation with the Local Event Director will assist in the provision of medical services and staffing at approved sanctioned events. The following are the formal procedures to establish medical services and staffing:

1. Provide a Physician who is currently licensed in the state where the tournament is held. The Physician is responsible for the following:
   a. Should be knowledgeable in the field of Sports Medicine and familiar with the contest rules of Judo, especially the current IJF Injury & Illness Rules.
   b. Medical personnel who will be assisting the Physician in his or her duties.
   c. Keeping medical records of the injuries sustained and treated at the venue. All minor and major injuries MUST BE DOCUMENTED by the senior medical staff personnel involved using the form provided by USA Judo representatives or its Sports Medicine Subcommittee delegate. The records are to be given to the Tournament Director and they are to be retained for insurance purposes and possible legal suits. A copy of the injury reports must also be sent to the USA Judo Sports Medicine Subcommittee and the National Office in Colorado Springs.
   d. The Physician should inform the Tournament Director what medical supplies and equipment will be needed in case of injuries or illnesses, e.g. ice, bandages, tape, gloves, blood disinfectant solution, nasal tampons for nose bleeds, infectious waste bags/containers, etc (see below).

2. Provide Certified Athletic Trainers. In order to assist the Physician in charge, the Athletic Trainers must be available at all times. Trainers must be familiar with injuries and be able to tape and treat minor injuries under the direction of the Physician in charge. Trainers must also be familiar with the current International Judo Federation (IJF) Injury & Illness Rules. They (or other designated personnel) are also responsible for cleaning up blood spilled on the mat (in accordance with Universal Precautions) with a bactericidal/virucidal/fungicidal solution or other similar antiseptic. Disposable gloves and appropriate infectious waste disposal should be available for this task.

3. Have available in case of emergency, an ambulance on standby or an immediately accessible means of communication to initiate the emergency medical system. A flyer or pamphlet containing the name and address and/or map to the nearest medical facility should be available at each medical station.

4. All questions should be directed at the Chairperson of the USA Judo Sports Medicine Subcommittee who will also be readily available for any advice or assistance.

Whenever possible, the Chairperson, or designated member of the USA Judo Sports Medicine Subcommittee shall inspect, help coordinate, and inform the medical personnel concerning specific needs relative to the IJF Injury & Illness Rules.
**Recommended Minimum Supply List For Each Medical Station**

1. Ice and ice baggies
2. Latex Gloves
3. Antiseptic solution (bactericidal/virucidal/fungicidal) in spray bottles (one per mat)
4. Paper towels
5. Infectious waste disposal bags
6. Athletic tape and flexible tape (i.e. Coban, Elastoplast, Lightplast, etc.)
7. Assorted band aids and gauze pads
8. Cotton nose plugs/nasal tampons for nose bleeds
9. Injury documentation forms (shall be supplied by the USJI Director of Operations and/or Sports Medicine Subcommittee)
10. Handouts with name, phone number, directions or map to nearest medical facility

**Recommended Medical Table/Station Layout**

1. One mat-side medical table for every 2-3 mats. The table should have an easily visible medical designation. The table should be located adjacent to the mats or in an area that provides easy immediate access and unimpeded line of sight to the relevant mats/athletes/referees in case of emergency.

2. Ideally there should be a central treatment/taping station located in an easily accessible but more secluded/private area, such as behind the spectator stands or near the warm-up area.