

Grand Junction Police Department

LVNR Staff Study

An appropriate force option?

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Executive Summary

This document is designed to provide a framework to allow agency administrators to make an informed decision on whether to allow officers of the Grand Junction Police Department to continue to utilize the Lateral Vascular Neck Restraint as a force option. The document is divided into 5 sections: what are neck restraints and why is the LVNR different from other forms of neck restraints, the history of neck restraints in the Grand Junction Police Department, legal findings regarding neck restraints, medical opinions regarding neck restraints, a survey of Colorado agencies regarding neck restraint usage and an appendix of law enforcement agencies that are certified to teach and utilize the LVNR.

The Lateral Vascular Neck Restraint (LVNR) was approved for implementation as a force option at the Grand Junction Police Department in December of 2007. This approval was given on a trial basis, to determine if this force option was viable for the department. The initial 8 hours of training was conducted in November of 2008 and a Special Order regarding LVNR use was issued. There were no uses of the LVNR in 2009. The yearly mandatory 4 hour retraining was conducted in January of 2010. As of August 10, 2010 there have been three successful uses of the LVNR to control resistive subjects. There were no injuries to officers or suspects during these three applications. All subjects complied before being rendered unconscious.

Neck restraints can be divided into two main categories, vascular and respiratory. These types of control holds have been used in combat for thousands of years and more recently in sport, most notably Judo for over 100 years. With the current popularity of mixed martial arts many more people have been exposed to both forms of neck restraint. For law enforcement purposes a respiratory choke is usually banned by policy and is not taught. However, a bar arm choke, a type of respiratory choke, is commonly used in the sport of Judo and mixed martial arts to control and "submit" opponents.

Vascular neck restraints are designed to control subjects by limiting the flow of oxygenated blood to the brain causing unconsciousness. Vascular neck restraints by design do not restrict airflow into the lungs and do not cause "choking." One dramatic difference with the Lateral Vascular Neck Restraint is that it is designed to control resistive individuals prior to the onset of unconsciousness. Resistive individuals are only taken to unconsciousness if they fail to comply with orders given at the lower level applications of the LVNR.

Legal opinions regarding neck

Medical research on the use of neck restraints can be divided into two categories. An extensive amount of research has been conducted regarding neck restraints in the sport of Judo. This research consistently shows that there are no deleterious effects of Judo "chokes." The second body of research has come mostly from coroners and pathologists. It is inconclusive and is somewhat limited. One of the major concerns with the second type of medical research regarding neck restraints is that only applications of neck restraints that have had an adverse outcome, such as severe injury or death have been examined.

This does not take into account the hundreds of thousands of application of neck restraints that have occurred in a law enforcement setting that have had no adverse effects. Even when medical opinion is based on only on a few cases opinions vary to the safety of neck restraint. Based on these studies there is no definitive medical opinion on the safety of neck restraints.

It is the Defensive Tactics Cadre's recommendation to retain the LVNR as a force option in its current form. Many of the recommendations made by proponents of neck restraints, (mostly Judo and law enforcement practitioners) and detractors, (mainly pathologists and coroners) have been adopted by the National Law Enforcement Training Center in their guidelines for training, use and aftercare of the LVNR. The LVNR provides a force option that is similar to the Taser. Officers are able to control subjects quickly and with a reduced chance of injury to the officers and subject. Officer size and strength are not overriding factors in the successful use of the LVNR. Finally, the LVNR has a proven track record. In hundreds of thousands of applications over a 40 year service life there have been no reported deaths or serious injuries or adverse litigation specific to the LVNR.

Types of Neck Restraints

Neck restraints have been used as a control technique in combat and sport for hundreds of years. The sport of Judo has utilized vascular and respiratory “chokes” for over 100 years with no reported deaths. There are basically two types of neck restraints, a vascular and a respiratory restraint. Vascular neck restraints are commonly referred to as the carotid hold, lateral vascular neck restraint, and bilateral neck restraint. Respiratory chokes are commonly referred to as a bar arm choke or guillotine choke.

The difference between a respiratory choke and a vascular neck restraint are significant, both in mechanics and the method for gaining compliance. The respiratory choke is usually applied by directing pressure either from a body part or clothing to the front of the subject’s trachea and larynx. This choke causes unconsciousness by depriving the lungs of oxygen. Additionally, this type of choke may cause compliance through the pain associated with the hold. Research and application in the mixed martial arts has shown that the trachea is actually much more robust than is popularly believed. It has been shown that the trachea can withstand at least 36 pounds of pressure before becoming compromised. Most law enforcement agencies in the United States prohibit the use of a respiratory choke.

The vascular neck restraint, to include the Lateral Vascular Neck Restraint focuses on compression of the carotid arteries on both sides of the neck. All law enforcement neck restraint systems configure the arms in order to protect the trachea and the airway. Carotid neck restraints are successful for a combination of physiological reasons. These include carotid artery occlusion, venous compression, carotid sinus/ vagus stimulation, and the valsalva maneuver. Carotid artery occlusion is the compression of the arteries to slow blood flow in and out of the brain. The carotid arteries supply approximately 70% of the blood to the brain. The carotid arteries are very resilient and it is not possible to completely stop the blood flow through these arteries with only pressure applied with the arms. Parallel to the carotid arteries are the jugular veins. Veins push blood at a much lower pressure than arteries and are more easily compressed. The internal and external jugular veins connect to the Superior Vena Cava system which brings blood back to the right side of the heart. The venous compression impairs cranial circulation which alone can result in unconsciousness. Carotid sinus/ vagus stimulation occurs when the vagus nerve, which runs parallel to the common carotid artery, is stimulated due to the placement of the arms around the subject’s neck. The stimulation of this nerves causes a slowing of the heart beat and drop in blood pressure. The valsalva maneuver pertains to pressurization of the chest cavity through holding ones breath and compression of the diaphragm. The combination of these four physiological factors usually results in control and unconsciousness within 7 seconds.

The Lateral Vascular Neck Restraint taught by the National Law Enforcement Training Center is unique as a vascular neck restraint system in a number of ways. First, the goal of the LVNR is not to render a person unconscious but to gain compliance of the subject and to cease their resistance. The LVNR is a control hold that restrains subjects by controlling their neck and limiting their movement

which at the highest levels of resistance may or may not render the subject unconscious. The hold was developed in 1970 by Jim Lindell with the Kansas City Police Department. There are three levels of control based on the suspects resistance level and allows the officer to de-escalate at any time. Once resistance ceases compression is relaxed. Based on over 165,000 applications by the Kansas City Missouri Police Department 85% of subjects comply before being rendered unconscious. In addition to the unique aspects of the tactic itself the LVNR also addresses training and post application concerns. Training requirements for the LVNR are thorough and continuous. For academy level students initial training consists of 12 hours. For veteran officers receiving training for the first time the requirement is 8 hours. Finally, each officer is required to attend a four hour refresher once a year. Instructors are required to attend a 16 hour recertification every three years.

The LVNR system has specific after care guidelines. Officers must obtain field medical clearance for subjects who were placed in the LVNR whether they were rendered unconscious or not. There is a mandatory 2 hour observation period for anyone who has had the LVNR applied. Again, this is required whether the person loses consciousness or not. This is a critical after care component to ensure that adverse side effects do not go unnoticed until the subject is in acute medical distress. Finally, the LVNR is not to be applied to people with cardiac disorders, children, someone who has been recently rendered unconscious or subjects who have had OC spray deployed on them.

GJPD Historical Perspective of Neck Restraints

In the past 30 years the Grand Junction Police Department has utilized the Koga Carotid Control Hold and the FBI Carotid Restraint and most recently the Lateral Vascular Neck Restraint (LVNR). The following is a chronology of when and how they were used within the Grand Junction Police Department.

In the mid 70's the Grand Junction Police Department began using the Koga Institute as their model for Arrest Control and Baton Use. The Koga Institute utilized a technique called the Carotid Control Hold. The Carotid Control Hold was very similar to the current FBI Carotid Restraint and the LVNR, which relied on applying pressure against the carotid arteries of the neck in order to render a person unconscious or as in the case of the LVNR to gain compliance. Specifically, pressure against the carotid arteries stopped the flow of oxygenated blood to the brain and lead to unconsciousness in 5-15 seconds.

According to the Koga Institute (1981) "The Carotid Control Hold is a tool which officers can utilize in the apprehension of violent persons who cannot be controlled by use of a "lower-profile" technique, but where a higher level of force is not called for."

Recognizing the potential dangers when applying this technique the Koga Institute (1981) went on to state "The Carotid Control is a control of a higher level of force with more inherent risk than other techniques, and thus we are including more detailed anatomical information. An officer must be aware of these risks." The Koga Institute then outlined locations and relevance of the carotid arteries, carotid sinus nerve, vagus nerve, trachea, larynx, hyoid bone and neck.

The Koga Institute (1981) did not condone application of the Carotid Control Hold from the standing position; but rather from a seated or prone position after a takedown. Two takedowns outlined by the Koga Institute included the Hair Pull Takedown and the Rear Leg Sweep Takedown. Application of the Carotid Control Hold was either applied or not applied and there were no intermediate levels. The Koga Institute also made considerable mention of not inducing an air choke by applying the forearm across the trachea.

The Grand Junction Police Department General Orders and Polices Manual (Issued 01/01/87, Revised 11-14-91) stated: "Non-lethal weapons may be used in the application of physical force, consistent with an officer's training and assessment of the situation being dealt with; except that the use of blackjacks, saps and sap gloves is prohibited."

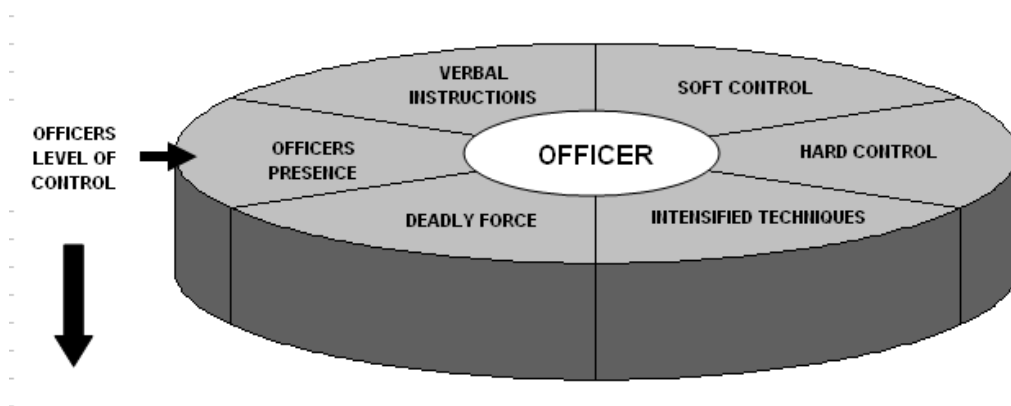
Subsection B went on to outline the authorized non-lethal weapons, which included the baton or SD-1, carotid restraint, chemical agent, tear gas, nova xr-5000 stun gun and weaponless control techniques. Special Order 516.06 explicitly outlined that "The carotid restraint may be used when other alternatives short of deadly force have failed or are inappropriate to the situation." It should be noted that in the General Orders there was no Use of Force Wheel or Use of Force Continuum.

In 1996 the Grand Junction Police department made a transition to the FBI system of Defensive Tactics. Included in the FBI's Defensive Tactics was a technique called the Carotid Restraint. Again the Carotid Restraint relied on the same points of emphasis as the Koga Carotid Control Hold and LVNR. The FBI Defensive Tactics Manual (2000) outlined how the pressure on the carotid arteries diminishes the flow of blood to the brain, rendering a person unconscious. Special note is again taken to outline the dangers of completing a trachea or air choke, instead of a Carotid Restraint.

According to the FBI Defensive Tactics Manual (2000) the purpose of the technique is "To provide the New Agent Trainee with the ability to control a violently struggling subject without resorting to deadly force." The FBI DT Manual continues to explain "The application of a Carotid Control Technique must be restricted to the situations where violent resistance is encountered or where death or serious bodily harm will be the result to the Special Agent." Per the Use of Force Continuum outlined in the FBI DT Manual, the Carotid Restraint falls into the Less than Lethal category, just before Lethal Force and after Intermediate Level of Force.

The FBI also made it clear that although the Carotid Restraint is normally applied from a kneeling or ground position, it may be applied from a standing position, but is highly discouraged. A bear hug or trip takedown is utilized by the FBI. There were also no intermediate levels of control with the Carotid Restraint.

Per Grand Junction Police Department Directives Manual (2004) the use of the Carotid Restraint was outlined in Administration Section 155, Directive 155.05: Use of Force Wheel. When analyzing a subject's behavior, the Carotid Restraint fell under the 'Resistant – Assaultive' category which was when "The subject is actively resisting arrest and/or may injure or attempt to injure the Officer or another." The Use of Force Wheel went on to outline that an Officer may respond to this level of force with Personal/Impact Weapons, which included the Carotid restraint.



Directive 155.06: Authorized Less-Lethal Physical Force and Weapons (2004) stated that the Carotid Restraint is "Authorized when other force, except deadly force, has failed or is inappropriate... A bar Arm Choke is not authorized."

In July 2007 Sgts. Pete Chapola and Pua Utu attended the National Law Enforcement Training Centers Lateral Vascular Neck Restraint Instructor certification class. A presentation regarding employment of the LVNR was given to command staff in December 2007 and approval was given to implement the force option on a trial basis. An initial 8 hour training block on the LVNR was provided in November 2008 and a Special Order governing the LVNRs use was issued on 12-12-08. There were no uses of the LVNR in 2009. The mandatory retraining was delivered in January of 2010. The LVNR was integrated into the Force-Firearms-Weapons section of the department policy manual in March of 2010. Through August of 2010 there have been three successful uses of the LVNR. Each of the suspects complied before being rendered unconscious.

Through August of 2010 there have been three successful uses of the LVNR. Each of the suspects complied before being rendered unconscious. In the first instance Cpl. Shawn Hasty arrested a female for DUI and auto theft. She elected a blood draw and was transported to St. Mary's Hospital. She became uncooperative with medical staff. Officer Hasty attempted to re-apply handcuffs to the subject and she pushed him and pulled her arm away. Officer Rayside arrived to assist in controlling the subject who was now kicking Cpl. Hasty. Officer Rayside applied the LVNR and the subject complied with the officers orders almost immediately.

The second incident involved an arrest of a mentally unstable and intoxicated parolee. Officer David Keech arrested the subject and placed him in the back seat of his police car. The subject, who was 6'2", 230 lbs. became extremely agitated and kicked out the rear passenger window of the police car. He continued to attempt to damage the car by kicking the interior of the transport area. It was determined that for the subjects and officers safety and to prevent further damage to the vehicle that a hobble restraint would be applied. Sgt. Chapola attempted to control the subject's legs but he was kicking violently in an attempt to prevent the hobble from being applied and to injure Sgt. Chapola. Officer Keech applied the LVNR and the subject immediately stopped all movement and said, "I'm complying." The subject's feet were hobbled and he was transported to the jail.

The third application of the LVNR was applied by Officer Langevin during a trespassing arrest. Officer Langevin contacted four individuals who were trespassing at Whitman Park. During the contact one of the suspects, who was intoxicated became agitated and then started threatening Officer Langevin. Officer Langevin's back up officer arrived. The one individual continued an escalating level of aggressiveness towards the officers. Officer Langevin decided to take the subject into custody. When Officer Langevin attempted to handcuff the subject but he actively resisted by attempting to pull away. Officer Langevin and the suspect both went to the ground. Both officers attempted to control the subject, but were unsuccessful. Officer Langevin was in a good position to apply the back lying LVNR. Officer Langevin applied the LVNR and progressed to level two. The suspect complied before being rendered unconscious and was taken into custody. Neither the officer nor subject was injured.

Neck Restraints – Legal Opinions

Neck restraints came under intense scrutiny in the early 1980s due to a few high profile cases. These cases though relatively few in number in relation to the number of applications of neck restraints, had a disproportionate impact on police departments authorizing the use of neck restraints to control individuals. In some of the cases at the appellate level judges deemed neck restraints deadly force. However, no legal precedent was set. The Supreme Court has never ruled on what type of force a neck restraint should fall under and still points to the landmark decision in *Graham vs. Connor* and the standard of objective reasonableness as the measuring stick for any force applied by police.

The following is a review of legal cases regarding neck restraints in law enforcement. Much of this information was obtained from the “National Study on Neck Restraints in Policing” published by the Canadian Police Research Centre.

In 1982, a civil action arose in Los Angeles and resulted in the U.S. Ninth District Court of Appeals severely restricting the use of “chokeholds” by police. In this case, Adolph Lyons complained that without cause or justification, he had been subjected to a chokehold. He sought damages from the police and the City as well as a permanent injunction barring the use of control holds. The court found that the department authorized the use of such holds when no one is threatened by death or bodily harm, that officers are insufficiently trained, that the use of the holds involves a high risk of injury or death, and that their continued use in situations where neither death nor serious bodily injury is threatened is “unconscionable in a civilized society.” The court ordered the police department only to use the hold in life-threatening situations and also ordered an improved training program and regular reporting and record keeping. The case eventually went to the US Supreme Court which decided, in April 1983, that the respondent did not have standing to seek injunctive relief in Federal District Court. Basically, the court stated that Lyons could not prove he was likely to be subjected to the hold again. Contrary to some accounts the Supreme Court never deemed neck restraints deadly force. No determination was made in this case to what level of force a neck hold should be categorized as. Additionally, it should be noted that all use of force instances are guided by the decision in *Graham v. Connor*, that force only need to be objectively reasonable.

In 1983 in the case of *McQuarter vs. City of Atlanta*, McQuarter had been subjected to a choke hold with a flashlight while being handcuffed. After the handcuffs were on him, McQuarter continued to struggle and was subjected to a carotid neck restraint until his struggling ceased. No one checked on him for fifteen minutes at which time he was discovered to have died. The court held that once he was cuffed, further use of neck restraint was unnecessary. The court said, “no one could have believed that the use of deadly force was necessary to prevent an escape, death, or serious bodily harm.” The city, superiors and four officers at the scene were held liable for showing deliberate indifference to the serious medical needs of the subject.

In 1994, a federal judge in Los Angeles issued an order temporarily prohibiting the California Highway Patrol from using the carotid restraint except in life-threatening situations after the death of a homeless Vietnam veteran. A CHP officer had used the technique on the man, whose son was later awarded \$470,000 in damages. This decision was reversed by the court in 1997.

In November 2005, a Michigan District Court handed down a verdict in the case of Griffith v. Coburn. In this case, the family of a man, Arthur Partee, who had been subjected to a police carotid hold and died, had sued police for violating Partee's constitutional rights. In essence, they claimed the police used excessive force in executing the arrest of Partee. The judge disagreed, saying that "the only question presented is whether the officers' use of the vascular neck restraint was excessive under the circumstances." He writes, "Understanding the officers' conduct in this case requires an understanding that Partee was actively resisting arrest, and that the vascular neck restraint is not considered deadly force." Indeed, the judge later notes that because Partee reached for an officer's gun, his actions actually justified the use of deadly force and writes, "If his actions justified the use of deadly force, they also justified the use of less than deadly force, such as the vascular neck restraint." The neck restraint technique itself was not called into question in the case; rather, the judge focused on whether the officers applied it correctly – which they did. The judge examined the autopsy evidence to ensure that the hold had not been applied for an excessive length of time and concluded that it had not. He also concluded that the officers were following policy in the application of the hold. Finally, he examined the question of whether or not the City was negligent in its training on the technique and concluded the following. "Plaintiff has offered no authority that would suggest that the need for post-academy training on the vascular neck restraint is so obvious that police departments would be acting with deliberate indifference if they failed to conduct further training."

It must be remembered that the number of cases that have been litigated in reference to neck restraints is relatively small in comparison to the number of times a neck restraint has been used. This number shrinks dramatically when the hold applied is a vascular neck restraint and not a bar arm choke hold. Finally, when the Lateral Vascular Neck Restraint is examined specifically for litigation the legal section of the National Law Enforcement Training Center provided information that no law suits or excessive force claims have ever been brought against an officer applying the LVNR. The NLETC provides expert testimony to any agency that has been trained by them in the use of the LVNR and throughout the 40 year use of the LVNR there has never been a request for expert testimony or even consultation regarding a law suit. Forty years would encompass hundreds of thousands of applications of the LVNR with no litigation associated with this specific technique.

Neck Restraints – Medical Research/ Opinion

Much like the legal opinions surrounding neck restraints there is no clear cut opinion on the degree of risk associated with applying a neck restraint. In fact there are varying medical opinions regarding any type of restraint even in a hospital setting. Dr. Donald Miliken Chief of the Department of Psychiatry in Victoria British Columbia wrote in 1993, "...restraint is not itself harmless; some proportion of those who are restrained may die. We do not know what this proportion is, or how many others will come near death and be revived. As clinicians we need to accept that restraint procedures are potentially lethal and to be judicious in their use." Dr. Miliken is referring to physical restraint of patients in a hospital setting, not neck restraints.

Medical opinion and research on the subject of neck holds suffers from three major shortcomings. First, there are no reliable statistics on how frequently the hold is used, how frequently it produces injury, nor on how frequently it results in or contributes to fatalities. Secondly, almost all medical opinions on the subject of neck holds are based on case reviews of fatalities associated with police restraint. Research based only on adverse outcomes cannot be exhaustive and certainly suffers from selection bias. Finally, there are almost no available studies that document non-fatal uses of the hold.

The following is a review of the available literature regarding neck restraints in law enforcement. Much of this information was obtained from the "National Study on Neck Restraints in Policing" published by the Canadian Police Research Centre.

Medical Research

There has been limited medical research regarding neck restraints. One of the first studies was conducted by the United States Military in 1943. A team of American military scientists examined the effect of acute cerebral anoxia—a short and severe lack of oxygen to the brain. To do this, they used an inflatable cervical pressure cuff designed to induce temporary arrest of circulation without affecting the respiratory tract; essentially, a mechanically created carotid pressure hold. The cuff was held down to the lower third of the neck and pressure increased to 600 mm of mercury within one-eighth second. One hundred and twenty six prison volunteers and 11 diagnosed schizophrenic patients were fitted with the cuff which was tightened until unconsciousness was induced. The average time from arrest of cerebral circulation to loss of consciousness was six to eight seconds. The study concluded that arrest of cerebral circulation in normal young men results in fixation of the eyes, tingling, constriction of the visual fields, loss of consciousness, and brief, mild tonic and clonic seizure after restoration of the blood flow. This study, though dated, is perhaps the largest study ever conducted in terms of the sheer number of participants. No deleterious effects were observed from repeated tests on these subjects.

There were a number of studies conducted in Japan during the time frame of 1958-1963 that focused on the physiological effects of choking in Judo. Judo authority Dr. E.K. Kiowai summarized the results of these studies in an article entitled, "How Safe is Choking in Judo" in which he stated that there were no negative effects following application of a Judo choke hold. For the purposes of Judo both a respiratory neck restraint and a vascular neck restraint are both deemed "chokes." Dr Koiwai who is an Associate Professor of Pathology and Anatomy at the Hahnemann University School of Medicine summarizes that

carotid holds are safe for three reasons: there have been no fatalities since Judo was invented in 1892, scientific studies have shown no deleterious effects and precautionary rules and methods make the technique safe.

In a 1963 report entitled, "Physiological Studies of Choking in Judo" a group of medical specialists and ranking educators representing several of Japan's foremost medical schools and universities as well as the Kodokan developed an experiment to determine the safety of chokes. They utilized the electroencephalograph to detect brain changes; the earoxymeter for blood oxygen saturation, the sphygmomanometer for arterial blood pressure; the plethysmograph peripheral blood vessel reaction and the micropipometer for skin temperature changes. Other studies probed the plasma protein concentration, blood water volume, hematocrit complete blood count, eosinophil count and urine 17 keto-steroid content to determine the risk associated with a Judo neck restraint. The test group consisted of 6 Judo experts. Chokes were administered using the three methods common in Judo. These included vascular and respiratory holds. This research experiment showed that there were no negative effects related to the holds. However, the researchers did recommend that a choke hold not be used against anyone with a cardiac disorder or hypertension. This was based on the increased blood pressure associated with the hold.

In 1991 the Italian Journal of Neurological Science published an article titled "The Long-term effects of boxing and judo-choking techniques on brain function." Regional cerebral blood flow (rCBF) was measured by 133-xenon inhalation in 24 amateur and 20 professional boxers, and in 10 judoka. Results were compared with those from age- and sex-matched healthy controls. Eighteen boxers (9 amateurs and 9 professionals) and all judoka also underwent electroencephalography (EEG). Mean rCBF values did not differ between either amateur boxers or judoka and controls, whereas in professional boxers rCBF was significantly ($p.001$) reduced in the whole brain, especially in the frontocentral regions. Healthy subjects, judoka, and amateur boxers showed a similar distribution of global CBF (gCBF, the mean of 32 probes) values, although 12.5% of amateurs had a significantly lower gCBF than controls. Among professional boxers, 25% showed a significantly low gCBF value; in the remaining 75%, gCBF was below the mean value of controls but did not reach statistical significance. Regional hypo perfusion, mainly in the frontocentral regions of both sides, was found in 35% of professional and in 29% of amateur boxers. A correlation between gCBF values and number of official matches was not found in boxers. EEG was normal in all judoka and amateur boxers, but it was abnormal in 3 professionals. This study shows the relevance of the neurophysiologic assessment of athletes engaged in violent sports which can cause brain impairment. In fact, while professional boxers may show brain functional impairment in comparison to normal subjects, judoka do not.

In 1998 a study was carried out to investigate possible electroencephalographic changes induced by choking in judo (shime-waza) by means of spectral analysis and brain mapping. The results were published in the magazine of Medicine and Science in Sports. Power spectral changes in Electroencephalography (EEG) were recorded in six experienced judoka who underwent a choking trial with a "shime-waza choking" technique called juji-jime. A significant increase of global field power in the delta- and theta-range occurred, while physiological alpha-power decreased. These changes in the low-frequency range reached a statistically significant level within a time span up to 20 s after choking, which was performed at an average choking time of 8 s. In no case did choking provoke neuropsychological symptoms.

Medical Opinion

In addition to the body of research on the use of neck restraints, a number of doctors have presented their theories on the use of neck restraints and the degree of risk that application of a neck hold can pose. Many of these individuals are pathologists and coroners and by the very nature of their field have usually had only exposure to the negative effects of neck restraints.

Two Washington state medical examiners, Drs. Donald T. Reay and John W. Eisele, published an article in 1982 titled, "Death from Law Enforcement Neck Holds." This article was based on two fatalities that were the result of neck control holds. The authors write that, "The two deaths reported here are the result of a carotid sleeper which became a choke hold during the struggle." They go on to argue that even a properly applied carotid can cause death.

Despite their arguments against using any type of neck hold the authors do observe, "In view of the alleged frequency of their use, there have been remarkably few reported deaths. Yet, because of the structures involved, neck holds must be considered potentially lethal under any circumstances and used only when there is no other alternative."

In 1983 Dr Reay in conjunction with the FBI conducted a study on the physiological effects of neck holds. The subjects consisted of five FBI agents who were subjected to the carotid hold, but not taken to unconsciousness. Surface blood flow was measured as well as blood pressure. It was determined that carotid blood flow to the head is restricted and there may be a slowing of the heart rate in some individuals. Dr. Reay concludes that "because of the organs involved, neck holds must be considered potentially lethal whenever applied. Officers using this hold should have proper training in its use and effects. Police officers should have continual in-service training and practices in the use of the carotid sleeper." It should be noted that Dr. Reay also wrote extensively in the early 1980s regarding positional asphyxia in law enforcement settings. Dr. Reay's findings and recommendations were later refuted by a detailed study from San Diego State University.

In 1986 Ronald Kornblum, an Associate Clinical Professor of Pathology and Medical Examiner for the City of Los Angeles wrote an article regarding the risk associated with police neck holds. He reviewed 33 deaths over an 11 year period that were associated with neck restraints. The incidents included bar arm chokes as well as carotid restraints. Kornblum determined that 10 of the cases were a carotid hold. Kornblum concludes, "Because of the dangers involved, neck restraint holds cannot be recommended medically. Although they are probably safe most of the time and for most people, they are not safe for everyone."

In the 2001 edition of Forensic Pathology, a textbook aimed at forensic pathologists, the authors, Drs. Vincent and Dominick DiMaio write that "both choke and carotid sleeper holds are safe if properly used, though the latter is safer of the two. In weighing how much force is acceptable in a situation, one must realize that any action involving force always has the potential of producing severe injury and death." They describe the mechanisms by which neck hold deaths can occur. "In theory, the carotid sleeper hold will cause rapid unconsciousness without injury to the individual. Unfortunately, in violently struggling individuals, a carotid sleeper hold can easily and unintentionally be converted into a choke hold maintenance of the pressure in a carotid sleeper hold, after loss of consciousness, becomes manual strangulation and, if continued long enough, will cause death." In addition, "the compression of the carotid arteries, with resultant decreased cerebral blood flow, can theoretically precipitate a stroke in an individual with atherosclerotic disease of the carotid or cerebral vasculature."

While most physicians acknowledge a degree of risk with the neck restraint, it is clear from the research that the vast majority of neck holds do not result in death. Even Dr. Reay, one of the most outspoken critics of the hold, admits that “in view of the alleged frequency of their use, there have been remarkably few reported deaths.” Dr R.D. Hoskins writes “although there is a possibility of a fatal outcome from neck restraints, the number of investigations is testament to the relative infrequency of fatal outcomes.” Research conducted on behalf of the Judo community attributes no deaths to the hold in over 100 years of use in the sport, and the majority of studies reviewed showed no deleterious effects from the hold. Forensic pathologists Vincent and Dominick DiMaio write that “carotid sleeper holds are safe if properly used.” Most recently, in 2005, Dr. Gary Vilke writes that the carotid sleeper hold “is an appropriate form of restraint and use-of-force method in law enforcement’s continuum.”

Recommendations

Physical altercations between resistive suspects and police are sometimes inevitable. It is a police department's responsibility to adopt arrest control systems that facilitate controlling subjects as quickly as possible with the least chance of injury to the officer and secondarily to the suspect. Arrest control systems such as the FBI system, Koga, and PPCT share many of the same characteristics when it comes to controlling resistive subjects. However, in any arrest control system there are gaps or areas that can be improved upon. This is one reason that many departments blend elements of other systems into their basic arrest control system. That is the case with the Grand Junction Police Department arrest control system. The systems foundation is the FBI model. However ground tactics has been supplemented by the Shane Pitts system. The baton portion has been augmented by ASP and Koga. Most recently the department has added the Lateral Vascular Neck Restraint. The adoption of the Lateral Vascular Neck Restraint provides an option of control that was not formerly available. Though the FBI system has a carotid control option, it has been relegated by policy to just short of deadly force that makes the use of the hold unfeasible in actual encounters. The ability to use the LVNR as a control hold at lower levels of resistance has provided all officers, no matter their size and strength a tool that allows them to control suspects quickly and safely. The LVNR system design incorporates the technique, training and aftercare procedures that have been rendered by proponents and critics of police neck restraints. With a 40 year track record of no serious injuries and no litigation the LVNR system has proven itself as a successful and defensible force option for police. Therefore, it is the recommendation of the Grand Junction Police Department Defensive Tactics Cadre that the LVNR be retained with no modifications as a force option.

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Appendix A – Agency Survey

Appendix B – Agencies Trained in LVNR 2007-2010