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Calgary Police Service Neck Restraint Literature Review

*A Review of Medical, Legal, and Police Literature on
Carotid Neck Restraint Techniques*

August 2006

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Calgary Police Service

Neck Restraint Literature Review

*A Review of Medical, Legal, and Police
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Techniques*

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Date: 09 August 2006



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EXECUTIVE SUMMARY

The Lateral Vascular Neck Restraint has recently been reintroduced into the Calgary Police Service training curriculum for recruits, and plans are underway to expand the training to include all CPS frontline members. While the use of LVNR has never been expressly forbidden or formally rescinded, CPS officers have not been trained on the technique since the introduction of OC Spray in 1992. LVNR training is currently being offered to recruits so that CPS officers have access to an additional means of controlling uncooperative suspects without resorting to an increased level of force. Because the Service is considering expanding LVNR training, it is timely to review both the risks and the benefits of neck restraints. This report is a compendium of all the available research on neck restraints from a medical, legal, and police perspective and is intended to help articulate benefits and controversies associated with these holds. Having reviewed the available literature on neck restraint techniques, this paper then makes some recommendations for the consideration of the CPS Executive.

Medical Opinion¹

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

injuries associated with the use of this technique. Despite these shortcomings, it would be wise to consider the published counsel of the medical community with regard to the risks of neck restraints.

Overall Degree of Risk

In order to put the issue of neck holds into its proper medical context, it is important to understand that there is an ongoing discussion amongst health professionals about the risks of *any* kind of restraint. In an editorial published in the Canadian Medical Association journal, Dr. Donald Milliken, Chief of the Department of Psychiatry in Victoria BC, observes that

...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. (Milliken, Donald, 1993, p. 1611)

In the quotation above, Milliken is referring to restraint conducted by medical personnel in hospitals. If restraint can be lethal even in a hospital setting, it is not surprising that no groundbreaking study exists in which police neck holds are deemed risk-free and safe for use in all instances and with all people. Instead, there is a range of opinion on the degree of risk associated with the carotid hold technique. There have undeniably been fatalities associated with the use of neck holds, and almost all medical experts advise caution in their use. Indeed, some physicians suggest that there are risks "inherent in every neck restraint." (Crime and Misconduct Commission, 2005, p. 27). Noted medical examiners Reay and Eisele write that a crucial part of the problem of neck holds is predicting who will have an adverse outcome:

¹ It must be stressed from the outset that the medical literature has been reviewed by an analyst with no medical background.

Use of neck holds must be viewed in the same way as firearms; the potential for a fatal outcome is present each time a neck hold is applied and each time a firearm is drawn from its holster. The neck hold differs in that its fatal consequence can be totally unpredictable. (Reay & Eisele, 1982, p.257)

Even physicians like Dr. E.K. Koiwai, a well-respected Judo researcher, who believe that a properly applied hold is “quite harmless” underscore the fact that while the carotid hold may be safe in the Judo context, it is subject to improper use in the law enforcement context. In Judo, participants are likely more experienced than police officers in the use of the hold, and they are using the hold in a closely controlled and sterile situation. In the world of Judo, combatants are closely monitored by judges who can put a stop to a hold gone/going wrong and who can quickly administer first aid if necessary. This is not the case in the police context where subjects are not playing by any rules and where many other factors may come into play. Koiwai advises law enforcement to use this hold as a last resort and suggests that “if enforcement officers are to use the choke holds ... they should be properly trained and supervised by trained certified Judo instructors. Then possibly there will be less misuse or abuse of the techniques of choking which when used improperly results in fatalities.” (Koiwai, 1987, p.431)

While most physicians acknowledge a degree of risk with the neck restraint, it is clear 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.” In a review of a neck hold case, 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.” (Crime and Misconduct Commission, 2005, p. 26) 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 medical experiments reviewed for this paper showed no deleterious effects from the hold. Forensic pathologists Vincent and Dominick DiMaio write that “... carotid sleeper holds are safe if properly used.” (2001, p. 275)

Types of Risk

The medical literature reviewed for this report revealed two categories of risk associated with neck restraint. First, there is evidence to suggest that during a struggle the carotid neck hold can become a respiratory or true choke hold. Second, there is evidence to suggest that certain individuals are predisposed to negative outcomes because of the physiology involved in the hold.

1. Problems with Technique

In their textbook, *Forensic Pathology*, Drs. Vincent and Dominick DiMaio observe “in theory, the carotid sleeper 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, as the individual twists and turns to break the hold.” (2001, p.274) In the fourteen fatalities reviewed by Dr. E.K. Kowai and the two reviewed by Reay and Eisele, this seems to have been the case. Koiwai makes several training recommendations to help solve the problems with technique. (See Section 2.4 for a list of his recommendations.) In an interview, Dr Reay, also concerned with this subject, suggests that police receive retraining on the technique at specified intervals, with specific emphasis on how to avoid slipping into a bar arm choke (Puder, 1993, p. 35).

2. Risk Factors Inherent in Human Physiology

The medical literature reviewed for this report indicates that while the carotid hold may be safe for most people, there are some people for whom the hold could prove dangerous. Dr. Kornblum, in his review of 33 deaths due to neck holds, 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.” (Part 2, p. 59) In order to explain why the hold may hold risks for some people, it is important to understand the physical effects of a lateral vascular neck restraint. They are as follows:

- Carotid Occlusion (obstruction of the common carotid arteries reducing the flow of oxygenated blood to the brain).
- Carotid Sinus Stimulation (The carotid sinus, located just above the bifurcation of the common carotid artery, is composed of nerve endings that are extremely sensitive to pressure changes. Nerve impulses are directed to the region of the brain that reflexively controls the heart.)²
- Venous occlusion (Pressure on the side of the neck can occlude the jugular veins, which prevents drainage of depleted blood from the brain and can impair cranial circulation, congest arterial flow, and reduce blood oxygen saturation.)
- The Valsalva Maneuver (the Valsalva maneuver is achieved by holding one’s breath and contracting the diaphragm, which limits the volume of blood returning from the brain and results in

² It must be noted that while some medical experts believe carotid sinus stimulation to be a potential cause of death in neck hold fatalities, others, like Dr. Gary Vilke, dismiss this idea as “an interesting theory” (Vilke, p. 29) but no more.

arterial blood flow inhibition.) (Puder, 1993, p. 10-11)

It is recognized that sudden or severe pressure on the carotid arteries may, in some individuals, cause the heart to stop beating abruptly – a phenomenon that has been described as “reflex cardiac arrest.” (CMC 25) Coronary artery disease and cardiac rhythm disorders are also particularly vulnerable to reflex carotid sinus stimulation and hypoxia, and individuals with underlying cardiac disease will be at greater risk from a neck restraint than others. (Reay and Eisele, 1982, p.256). In addition, in people with diseases that affect the carotid arteries, most commonly atherosclerosis, occlusion of carotid arteries can result in thrombosis or stroke (DiMaio, 2001, p.275). As an example of this, in expert testimony to the RCMP, Dr Reay provided the Commission information about a case involving an instructor at a Florida Police Academy who suffered partial paralysis after the application of a hold in a training exercise. The paralysis was apparently caused by a stroke (Commission for Public Complaints against the RCMP, 1992, p.17).

Reay and Eisele postulated that the technique also poses greater risks to the following persons:

- Men over 40
- Persons with seizure disorders
- Mentally disturbed persons
- Street drug users
- Persons taking prescription drugs

To mitigate the risks to the persons listed above, Reay and Eisele advise police to use the hold only in “those situations where the officer or another person’s life is in immediate danger” (Reay and Eisele, 1982, p.258). They further insist that “it is imperative that the officer who would use a neck hold have proper training in its use,” and recommend that “any law enforcement agency who prescribes to the policy of using

the carotid sleeper should have frequent reinstruction in its use and continued reinforcement of the potential fatal results.”

Medical opinion from the early 1990s would seem to indicate that the technique poses a somewhat greater risk to persons who are suffering from excited delirium. Indeed, in 1993, a task force assembled to study the issue of in-custody deaths determined that “persons who exhibit symptoms of excited delirium are also among those who are most likely to be at increased risk of death following the application of a neck hold.” (IACP, 1993, p. 52). This is because the carotid hold constricts blood vessels and “constriction of the blood vessels is one of the major causes of death of persons experiencing excited delirium.” (IACP, 1993, p. 52) More recent research on the phenomenon of excited delirium suggests that the state of ED itself, rather than forms of police restraint, is more often responsible for in-custody deaths. Dr. Darrell Ross, an Associate Professor in the Department of Criminal Justice at East Carolina University argues that “it should be recognized that in many cases of excited delirium, deaths occur without significant police restraint.” (Ross, 2006, p. 163) Until more is known about excited delirium, it would be wise to review and be aware of the IACP’s recommendations. In response to the risks associated with neck restraints, the IACP recommended the following:

- The hold not be used as a “control” hold but that it be employed with the intent of rendering the person unconscious.
- Full pressure be applied no longer than 30 seconds.
- If the individual is rendered unconscious within 30 seconds, pressure be reduced to the carotid arteries so they are not compressed but the neck remains immobilized.
- The carotid hold not be used on the same individual more than twice during a single enforcement contact.

- Whenever possible, the restraint be applied using two officers, one of whom is responsible for monitoring the hold to ensure that it is applied correctly.
- In addition, any prisoner who is considered at risk because of bizarre behaviour or suspicion of drug use should be transported by 2 officers, one of whom should monitor the prisoner for skin colour, breathing and level of consciousness.
- Any prisoner exhibiting symptoms of cocaine psychosis should be transported to an emergency medical facility for observation.
- After hours of darkness, the officer should use an interior light to monitor the prisoner.
- If the booking process will be lengthy, an officer should remain with the prisoner and keep him under supervision. (p. 52)

In the summer of 2005, Dr R.D. Hoskins reviewed the available medical literature and wrote that the following conditions will shorten the duration for which it is safe to apply a neck hold:

- Oxygen debt as a result of physical activity such as running or fighting
- Increased metabolic rate as a result of physical activity
- Increased metabolic rate as a result of consumption of stimulant drugs
- Raised body temperature
- Compromised respiration due to (partial) occlusion of the mouth or nose, (partial) obstruction of the structures of the throat, limitation of movements of the chest, limitation of movements of the abdomen.
- Shock from blood or fluid loss due to trauma, dehydration or burns
- Bradycardia.

Hoskins notes that “at rest the brain will be permanently damaged if it is deprived of oxygen for more than about four minutes. The “safe period” will be considerably less

in a subject with excited delirium.” He recommends that lateral vascular neck restraints “not be used in such subjects if at all.” (CMC, 2005, p.33)

Use of Force Continuum

Some medical experts insist that all neck restraints carry an inherent risk and that they must be understood to be “potentially lethal.” (Reay and Eisele, 1982, p. 257). This is not to say that they should not be used by police. Indeed, in an interview conducted in 1993, Dr Reay “stated unequivocally that vascular/carotid restraints were “good” holds, and he supported their availability for use by police officers” with certain caveats. (Puder, 1993, p. 35) Reay is adamant, however, that the hold be classified as lethal force. Dr R.D. Hoskins, on the other hand, argues: “From the perspective of the medical probability of an undesirable outcome there is merit in differentiating neck restraints from use of firearms... It seems to me there is scope for a further category that separates “high probability” lethal force from “slight probability” lethal force.” (CMC, 2005, p. 26)

Legal Experience

According to the available information, there have been numerous inquiries associated with neck hold fatalities since the 1980s in Canada. These include the following cases: Lorne Halldorsen (1984), Gaston Harvey (1986), David Nicholl (1993), Stephen Griffin (1999), and Christopher Ecklund (2004). There have also been a number of complaints associated with the use of neck holds that include

- Drda v. R.,
- Juris Laufers,
- Caroline Halliday,
- Steward v. Martay,
- R. v. Magiskan, and
- Robert A’Court.

It is clear from a review of all these cases that neck holds are characterized as extreme, and even potentially lethal, measures by many judges and by most Boards of Inquiry. In the case of David Nicholl, the Coroner’s jury ruled that Nicholl died as a result of the carotid hold, marking the first time in Canada that a death had been attributed to the specific hold. “Means of death was the result of police action in the administration of the carotid hold,” wrote the jury. In *Steward v. Martay*, Judge Curtis referred to the neck restraint as a “drastic technique.” In *R. v. Magiskan*, Judge Zelinski felt that “there was no necessity to resort to a choke hold” implying that the hold should only be used as a last resort. In *Drda v. R.*, Judge Huddart wrote that the use of the neck hold had been “grossly excessive” and “unwarranted.” In the case of *Juris Laufers*, the Board of Inquiry accepted “the evidence of Dr Yaphe that the use of the carotid artery restraint is a potentially life-threatening technique.” It found that an officer who administered this hold showed “reckless disregard of the health and safety of Mr. Laufers.” The Commission for Public Complaints Against the RCMP likewise found that the technique carries “a small but significant risk of death or serious bodily harm.”³

Where police use of a neck hold leads to a formal inquest or civil action, the Courts/ Boards tend to focus on several questions:

1. Was the use of a neck hold reasonable and appropriate given the totality of the circumstances? In order to answer this question, the Courts/Boards of Inquiry reviewed in this paper typically concentrated on the following:

³ It must be noted that in many of the cases reviewed, those sitting in judgment make no distinction between “choke holds” and “carotid restraints.” Whether this is a gap in understanding or simply convenience is unclear. Choke holds are widely regarded as dangerous because they put pressure across the windpipe, while the carotid restraint puts no pressure on the front of the neck. The confusion of one with the other may perhaps explain, in part, why courts react so strongly to the use of a carotid hold.

- the ability of the complainant/decedant to harm the officer(s) involved,
 - the level and type of resistance offered by the suspect,
 - the purpose of the neck hold (i.e. self-defence or as a “come-along” hold),
 - the number of officers present, and
 - the perceptions of the officers involved in the struggle.
2. Did the officers follow policy?
 3. Did the officers use the hold as they were trained to?
 4. Did the officers act in good faith, conscious of their responsibility for the health and safety of their prisoner?

As an example of how the above line of reasoning works in an actual case, we can review the complaint of Caroline Halliday. In this case, Caroline Halliday had been stopped by the RCMP for a traffic offense. The arresting officer had intended to make a roadside suspension of her driver’s license. Ms. Halliday gave the officer the impression that she was going to attempt to evade his authority, and he subjected her to a carotid hold to place her in his police cruiser. As a result, she made a complaint to the Commission for Complaints against the RCMP. In their review of the complaint, the Commission specifically noted that Halliday was 5’3” and 100 lbs, while the arresting officer was six feet tall and weighed 185 pounds. They noted that Halliday’s resistance was not combative and could have posed no physical threat to the officer. In light of these facts, their decision was that the use of the neck hold was “an application of more force than was necessary.” However, the Board also agreed that the officer involved felt, based on his recruit training, that he was using the technique in an appropriate manner to effect an arrest. RCMP policy specifically authorized the use

of the carotid control hold and had not “given much guidance to its members with respect to the circumstances in which it is appropriate to use the technique.” The officer stated that he used the carotid control technique to enable him to place Ms. Halliday into the police cruiser without causing any injuries to her. Further, the officer stated that he was unaware of potentially dangerous consequences of the hold. In light of all these facts, while the Board found that the force used was excessive, it did not find the officer guilty of misconduct.

Using a similar kind of analysis, Judge Zelinski, in *R. v. Magiskan*, found that the measures of force used against Mr. Boissoneau were so excessive as to render the arrest unlawful. In this case, the police, called to a domestic assault, had attempted to extricate Mr. Boissoneau from his car, where he was sitting with the engine turned off. During the course of the struggle, the officers subjected Boissoneau to a carotid hold. His fiancée, an off-duty police officer, attempted to stop the struggle and was charged with obstruction and assault. She was convicted and appealed the conviction. During the course of her appeal trial, Ms. Magiskan argued that she had been entitled to intervene in the arrest of Mr. Boissoneau because the arrest itself was unlawful. The judge agreed, noting “there was no evidence of urgency” in the removal of Mr. Boissoneau from his car and that “there were no reasonable grounds to believe that the officers had reason to consider that they themselves were in danger of death or grievous bodily harm from Mr. Boissoneau.” Further, the type of resistance posed by Mr. Boissoneau was “mainly resistive, more than assaultive.” The officers themselves did not appear to have perceived Mr. Boissoneau as a threat. The judge further noted that the carotid control technique is “not something taught in police use of force training.” The injuries sustained by Mr. Boissoneau were, in the judge’s view, both serious and caused by the police officers.

With all these facts articulated, the Judge found that the use of the neck hold failed the test of reasonable necessity. Ms. Magiskan was thereby acquitted.

In the appeal based on the Juris Laufers complaint, the Judge used a similar line of reasoning and thereby granted the appeal of two officers who had been found guilty of misconduct by a Board of Inquiry. In this case, Juris Laufers had been arrested for driving while intoxicated. During booking, Laufers struggled against the police, biting, kicking and scratching. He was subjected to a carotid hold and he later made a formal complaint against the Toronto Police Service (TPS). Although the TPS dismissed the complaint, the Toronto Public Complaints Commissioner ordered a Board of Inquiry. The Board found the officers guilty of misconduct. The two officers appealed. The appeal judge, Judge O'Driscoll, noted that the level and type of resistance posed by Laufers was sufficiently high to warrant the use of force against him. The judge observed that Laufers was intoxicated, strong, and belligerent and that he was "raising his head, snapping at and attempting to bite anyone and anything that came in range." The judge asked if, in this age of AIDS, the complainant was entitled to "one free bite" before the officers could use appropriate force to restrain him. He also observed that the officers were actually *compelled* to restrain Laufers under Toronto Police Administrative Procedures. The Judge also noted that there had been no orders rescinding or restricting the use of the carotid hold and that all officers hired between 1970 and 1992 had, in fact, been trained to use the hold. And finally, he noted that both officers involved were genuinely of the belief that their use of force was warranted by the circumstances. He further observed that the original Board of Inquiry erred in condemning the use of the carotid restraint because it was "potentially dangerous" and noted that "most physical force has the like potential."

In cases where recommendations are made to law enforcement, most focus on neck restraint training and policy. The recommendations arising from Canadian litigation and inquiries can be summarized as follows:

- Training on the carotid hold should be provided on a continuous basis,
- In training, officers should be informed of the hold's potential for lethality/serious bodily harm,
- The hold should be limited by policy to situations where officers or others are in danger. For instance, the hold should be used for the purpose of self-defense but not be used as a "come-along" hold. In addition, one Inquest report recommended that the hold not be used where visibility is an issue and the officer cannot see the impact the hold has had on his subject,
- Police agencies should record when the hold has been used and review this data periodically to ensure that officers are following policy, and
- Ongoing review and research should be conducted on the proper use of neck restraints and changes implemented where appropriate.

Policing Perspectives

Since 1981 when a federal appellate court ordered the Los Angeles Police Department to cease using neck restraints, police agencies across the continent have wrestled with the question of whether to use the technique or not. From a policing perspective, there are arguments both in favour of and against using the hold.

Advantages of the LVNR

A review of the police literature reveals four major advantages of the hold:

1. Neck restraints can be used effectively regardless of the size of either the

person to be controlled or the size of the police officer.

In his 1987 book, *Police Nonlethal Force Manual*, police trainer Bill Clede writes, "I saw a film of a 125-pound female police officer restrain, take down, and cuff a 210-pound construction worker using the Lateral Vascular Neck Restraint." (p. 59) In its promotional literature, the National Law Enforcement Training Centre – who, it must be noted, sell their LVNR training —writes that "regardless of any size or strength, the officer can employ LVNR against any subject because its use is target-specific to the neck during application. During active resistance, non-target specific attempts can expose officers to personal attack and takedown, allowing for personal and weapon assault by an aggressive subject."

2. Applied properly, the neck restraint can resolve confrontations very quickly thus enhancing officer and suspect safety.

Medical literature suggests that a properly applied carotid hold can induce a brief unconsciousness within approximately ten seconds. Charles Braden and James Lindell note that "once applied, it [the neck restraint] provides more protection to the officer than any other known method of control, and it concludes physical resistance without injury to the subject faster than any other restraint means known." (1982, p. 59) Logic dictates that the quicker a confrontation ends, the less likely the officer or arrestee will be injured.

3. The hold can be used in close quarters.

According to an AELE bulletin, the lateral vascular neck restraint does not require a lot of room; it is possible to employ neck restraint in close contact, in narrow or cluttered premises. This is in contrast to other methods, like batons, which require room for striking distance. Similarly, OC Spray requires that a certain distance be

maintained between the arresting officer(s) and the subject. As a noted American law enforcement trainer observed, "because weapons are not always at hand or justifiable, they must be rejected when seeking a close quarter fighting system." (Puder, 1993, p.27)

4. Neck holds are a "humane" alternative to impact weapons and/or deadly force.

In their article on neck restraints, Charles Braden and James Lindell note that all forms of weapons "constitute potential means of inflicting traumatic injury on any subject upon whom they are used for control." (1982, p. 54) Indeed, an example of injuries due to weapons use during arrests can be seen in Los Angeles. In the early 1980s, the LAPD banned the use of neck holds from routine use; essentially, they categorized them as lethal force. According to police tactics consultant Greg Meyer, this effectively made "the baton a tool of aggression instead of merely self-defense." (1999) Then-chief Darryl Gates, speaking about police batons to the L.A. Police Commission was quoted as saying that "if used, these would result in injury in almost every case, a result which does not occur from employment of (choke) holds." Two years after the ban, Gates provided the LA City council with information that injuries to suspects had climbed from an average of 3.1 per week prior to the choke hold moratorium to 23.6 per week afterward, a 661% increase. Similarly, injuries to police officers had increased 521%. Proponents of the neck hold argue that neck restraints are an attempt to provide "humane" means of controlling combative persons without the necessity of striking them, thus minimizing the risk of broken bones, lacerations and other impact-related trauma. This, proponents argue, benefits both the arresting officer as well as the arrestee. Some LVNR supporters argue that in the case of very violent offenders, rendering them unconscious is the only way to subdue them safely. This would be particularly true

in the case of individuals under the influence of street drugs, mentally ill persons, and those experiencing an adrenaline rush who therefore do not feel pain. (Kelly, 1998, p. 82)

Disadvantages of the LVNR

Risks and disadvantages of the LVNR include the following:

1. In some instances, neck restraints have been associated with deaths or injuries.

While proponents of the hold argue that, used correctly, it rarely injures a person, it is true that there have been deaths attributed to the carotid hold. This review alone has identified five Canadian deaths associated with neck hold techniques since 1984. (To put this into some context, the recently released TASER study has identified 13 Canadian deaths associated with CED use.⁴) (CACP, 2005, p.17) Statistics are not kept on the frequency of injuries related to the use of the LVNR technique.

2. Due to the dynamics of a violent struggle, it may be difficult to correctly use such methods.

A potential problem with the hold is the fact that it is difficult to properly administer the hold during a violent struggle. Essentially, during a violent altercation, the carotid hold can become a chokehold/respiratory hold. In their textbook, *Forensic Pathology*, Vincent and Dominick DiMaio observe “in theory, the carotid sleeper 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, as the individual twists and turns to break the hold.” In the fourteen fatalities reviewed by Dr. E.K. Kowai and

⁴ Although the report does not specify when CEDs began to be used, the TASER website indicates that TASERS were developed for police in 1998. (<http://www.taser.com/about/info.htm>)

the two reviewed by Doctors Reay and Eisele, this was reported to have been the case.

3. Several instances of “unexplained” death have followed the use of the technique, unaccompanied by any discoverable physical injuries. This phenomena, known as “custody death syndrome” is not understood and research is still ongoing.

Essentially, opponents of the LVNR technique are concerned that the technique can be blamed for sudden deaths even in the absence of evidence that implicates a causal relationship between the use of the hold and death. In their section on Excited Delirium, the authors of the textbook, *Forensic Pathology*, make several observations about the issue of death in custody which explain how this happens.

When someone dies in custody, the natural question is why. An explanation involving catecholamines, alpha and beta receptors, and potassium levels, is difficult for most people to understand. Choke holds and positional asphyxia can be demonstrated and are simple to understand, therefore it is normal to gravitate to this simpler explanation for a death. Even if there is absolutely no evidence of use of a choke hold or positional asphyxia, and the law enforcement personnel deny using either, the denials are sometimes dismissed as a cover-up. The concept of death caused by a choke hold is very popular because, when no evidence of trauma to the neck is found, this would seem to “prove” that the choke hold was “expertly” applied. (2001, p. 503)

4. Perpetual and time-consuming training is needed to maintain minimum proficiency.

Most supporters of the LVNR technique recommend that officers be reinstructed on its use at regular intervals. At the CPS, recruit training on the technique currently lasts 12-14 hours with refresher training scheduled to take one to two hours. This may be prohibitive to police services both in terms of the time taken to train as well as the cost of this training.

5. During litigation, it is difficult to precisely explain to a jury the physiological effects of neck restraint procedures due to an inadequate base of medical evidence.

Essentially, opponents of the hold argue that there is an inadequate base of medical evidence to support the use of the hold. A brief examination of Canadian litigation reveals that there is no consensus among medical professionals as to the safety of the hold or even, in the case of deaths following the application of a neck hold, cause of death. Even in cases where autopsies have been performed more than once, doctors have failed to agree on cause of death.

6. It is difficult for an officer to monitor and control the amount of pressure used during the procedure.

This objection should be paired with the observation that it can be difficult to correctly use the method during a violent struggle. This is an issue that has been raised by many of the medical researchers reviewed in the previous section of this report.

7. Once the restraint has been applied, there is a need to closely monitor the arrestee. This may be impractical.

Even supporters of the hold often recommend that persons subjected to a LVNR be either closely monitored by the arresting officer, or, indeed, transported to the hospital to be checked by a doctor. This may not be practical in terms of the time it

may take for the arresting officer, who would then not be working the street.

Recommendations

It is unfortunate that medical research does not provide any definitive answer to the question of whether the LVNR technique is safe. From a medical point of view, the technique has both supporters and detractors. Likewise, from a legal standpoint, the technique is neither firmly endorsed nor fully condemned. This review must therefore leave the question of whether to continue using the technique in the hands of executive level policy makers. It can, however, make some recommendations.

1. Further Review of Existing Research

It must be stressed that this report has been prepared by an analyst with no medical background. Consequently, there may be gaps both in content and in understanding of the medical research. It is strongly recommended that further review be undertaken by someone in the field of medicine.

2. New Research

The existing medical research on the subject of neck restraint techniques suffers from a number of shortcomings. There is, first, no national statistical data that would allow law enforcement to review the relative risks of this technique as compared to other subject control techniques. In addition, there is virtually no published research on the potential for injuries with this technique. Finally, almost all the medical research on police use of the technique comes from an analysis of fatalities associated with the neck hold. The Calgary Police Service should identify an appropriate research body or council and propose that research be undertaken to accomplish the following:

- Collect use of force data on a national level. This should include the type of force used, frequency of use, on whom it is used, and, most importantly, outcomes.
- Medical analysis and review of the LVNR technique itself.

3. Review of Training Protocols

Although opinion is varied on the degree of risk associated with the lateral vascular neck restraint, most experts agree on the importance of proper training on the use of the technique. Based on the expert opinion, the Calgary Police Service should review its training protocols to ensure that the following is accomplished:

- Training includes recognition of the potential for fatalities.
- Training includes a section specifically on how to prevent the LVNR from becoming a choke hold.
- There should be frequent reinstruction in the use of LVNR. Members should be retrained at regular intervals.
- “High risk” persons should be identified – that is, officers should be taught to recognize persons who have been consistently identified by the medical research as being at higher risk from the LVNR technique.
- During training, officers should be taught to assume a triple role as the restrainer, the restrained, and the referee.
- Officers should be trained to recognize symptoms of distress and to administer CPR if necessary.

4. Placement in Use of Force Continuum

Most written medical opinion on the technique advises law enforcement only to use the LVNR as a last resort to subdue violent suspects. Even the IACP, who would recommend retaining the LVNR, suggest that the hold not be used as a control hold but with the intent of rendering a person

unconscious –that is, used only in self-defense but not be used as a “come-along” hold. (IACP, 1993, p.52) Some medical experts would advise that the LVNR be placed in the category of lethal force, along with firearms. Others would recommend that law enforcement place the technique in a “low probability” lethal force category. The Calgary Police Service may wish to consider these alternatives.

5. Prohibitions/Restrictions - Duration

While the research was inconclusive as to how long a neck restraint may be safely applied, a “normal” person will suffer permanent damage or death if the brain is deprived of oxygen for four minutes or longer. This time will be shorter in persons who have been in a struggle. With regard to neck holds, the IACP recommends that full pressure be applied no longer than 30 seconds. The Service may wish to review the length of time that a suspect can be placed in a hold with an eye to placing limits on allowable maximums.

6. Prohibitions/Restrictions – High Risk Persons

Some researchers feel that the LVNR poses greater risks to persons in certain health categories including those suffering from Excited Delirium. While it is, of course, impossible for officers to know for sure a suspect’s state of health, it may be wise to advise officers not to use the technique on those persons they suspect of being in “higher risk” categories unless no other options but lethal force are available to them.

7. Prohibitions/Restrictions - Repeated Uses

More than one author has indicated that there are dangers associated with repeated use of the LVNR on the same subject (IACP, Kornblum). It is therefore

recommended that the hold should not be used twice on the same individual.

8. Prohibitions/Restrictions - Use on Secured Prisoners

The legal cases reviewed for this paper have indicated that courts have an aversion to the use of LVNR upon a subject who is already handcuffed. It is therefore recommended that the LVNR not be used on a subject who is handcuffed or secured unless the prisoner is demonstrating assaultive behaviour that cannot be controlled otherwise.

9. Two-Officer Technique

To enhance the safety of this technique, some research suggests that, wherever possible, the LVNR be a “two officer technique” with one officer applying the hold and the other monitoring the condition of the suspect. In addition, any prisoner who is considered at risk because of bizarre behaviour or suspicion of drug use should be transported by two officers, one of whom should monitor the prisoner for skin colour, breathing and level of consciousness. After hours of darkness, the officer should use an interior light to monitor the prisoner.

10. Subject Aftercare

Research suggests that a medical examination be offered to a subject who has had a carotid hold applied to them. This applies to all persons subjected to the hold regardless of whether or not they were rendered unconscious. Currently, the CPS Policy Manual advises that whenever a lateral vascular neck restraint has been used, “the APU paramedic will be advised of the incident.” In addition, policy states that when a subject has been rendered unconscious, that person be placed under constant observation for two hours following the incident. The research reviewed for this report suggests taking this a step further

and actually directly offering medical attention to the subject. Of course, any subject who does not revive after 30 seconds or who exhibits signs of medical distress must receive immediate medical attention –this is already in policy. The research reviewed for this paper suggests that all officers be trained in the use of CPR so that in these instances, the on-scene officers may begin the CPR process while awaiting the arrival of EMS. This is also already in place.

11. Regular Review of the Use of the LVNR

Given the risk factors associated with LVNR, it is imperative that the Service monitors the use of the technique. Recently, Use of Force forms have been updated to include LVNR, among other things. It is important that the information gathered in these forms be stored in a database so that the use of LVNR can be reported on and reviewed on a regular basis. This will help to ensure that officers are following policy and that the hold is being used appropriately.

1.0 INTRODUCTION

The Lateral Vascular Neck Restraint has recently been reintroduced into the Calgary Police Service recruit training curriculum with plans underway to offer the training to serving officers. While the use of LVNR has never been expressly forbidden or formally rescinded, CPS officers have not been trained on the technique since the introduction of OC Spray in 1992. Following concerns that OC Spray is ineffective in certain instances, particularly with individuals under the influence of methamphetamine, LVNR training is in the process of being reinstated so that CPS officers have access to an additional means of controlling uncooperative suspects without resorting to higher levels of force. There are, however, a number of concerns surrounding the use of the technique, including the critical issue of whether or not it is safe, how to classify it in the use of force continuum, and issues of public opinion and litigation. It is therefore timely to review the LVNR technique. This paper will review medical, legal, and police literature on the LVNR and will make some recommendations for the consideration of the CPS Executive.

1.1 Purpose of this report

This report was prepared in response to internal interest in the reintroduction of lateral vascular neck restraint training at the Calgary Police Service. Essentially, the report is a compendium of all the available research on neck restraints from a medical, legal, and police perspective. It is intended to help articulate benefits and controversies associated with carotid holds. It is also hoped that this report will serve as a foundation for future work.

1.2 Methodology

The research was conducted by using Internet databases and search engines and by hand-searching the bibliographies of relevant articles and books. The following sites were searched: PubMed (which includes MEDLINE and OLDMEDLINE references), NCJRS (National Criminal Justice Reference System), ProQuest Criminal Justice Periodicals Index, FPinformart, ACPR (Australasian Centre for Policing Research), NIJ (National Institute of Justice), the Home Office, and CANLII (Canadian Legal Information Institute). In addition, the Google search engine was used. The following search terms were employed: lateral vascular neck restraint, LVNR, carotid hold(s), choke hold(s), neck hold(s), neck restraint, police restraint, deaths in custody, custody deaths, and police use of force. For relevant, but out of circulation articles, publishers were contacted and articles were special-ordered.

1.3 Description of the Technique

The Lateral Vascular Neck Restraint is a police defense tactic used to restrain violent individuals. Typically, the officer applying the technique will be at the rear of the subject and will encircle the subject's neck with his/her arm, with the radial surface of the forearm on one side and the upper bicep/anterior deltoid on the other. The throat of the subject rests in the elbow fold of the officer. Pressure is applied equally to either side of the neck with the intention of creating transient unconsciousness. The LVNR has been called by many names including the carotid hold, the upper body control hold, and the sleeper hold. It is sometimes confused with a choke hold, although the two techniques are quite different. Choke holds work by impeding the flow of oxygen to the lungs as pressure is applied across the front of the neck. Carotid holds, on the other hand, do not put pressure on the windpipe.

2.0 MEDICAL LITERATURE⁵

2.1 Introduction

In order to put the issue of neck holds into its proper medical context, it is important to understand that there is an ongoing discussion amongst health professionals about the dangers of *any* kind of restraint. In an editorial published in the Canadian Medical Association journal, Dr. Donald Milliken, Chief of the Department of Psychiatry in Victoria B.C., observes that

...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. (1998, p. 1612)

In the quotation above, Milliken is referring to restraint conducted by medical personnel in hospitals. If restraint can be lethal even in a hospital setting, it is not surprising that no groundbreaking study exists in which the carotid hold is deemed risk-free and safe for use in all instances and with all people. Instead, there is a range of opinion on the degree of risk associated with the technique. Scientific research on neck holds essentially comes from two main sources, the Judo community (sports medicine) and the community of medical examiners (coroners). In 1964, Judo became an Olympic discipline, and since then it evolved into a popular sport worldwide. Neck hold or “choking” techniques are commonly taught and used in the sport. All Judo chokes but one are a version of the carotid hold that is very similar to that used by law enforcement. For that reason, medical research on Judo

⁵ The following section contains many medical terms. For definitions of these terms, please see the Glossary of Terms on page 55-58.

“choking techniques” is highly relevant to this review. The other major branch of research into the neck hold comes from forensic pathologists and coroners who are researching the issue of death proximal to police restraint. Both branches of research are concerned with the safety of neck holds, and some support their use while others recommend caution. The following section will summarize the published medical opinions on the subject of neck restraints.⁶

2.2 Early Medical Studies 1940s

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—in humans. 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*

⁶ The reader is cautioned that this review has been conducted by a researcher with no medical background. While I have done my best to summarize the articles, I personally can draw no medical conclusions from the results of the experiments conducted, particularly where the authors themselves draw no conclusions.

repeated tests on these subjects. (Rossen 1943, p. 510-528)

2.3 Judo Studies

As Judo gained in popularity in the mid 20th century, a number of concerns were raised about its safety, particularly with respect to its “choking” techniques. Between the years 1958 and 1963, a number of Japanese studies were conducted in which researchers studied the physiological effects of choking in Judo.⁷ According to noted Judo authority Dr. E.K. Koiwai, the results of their research suggests that there were no negative effects following the application of the choke hold. Koiwai summarizes the studies’ findings in an article entitled “How Safe is Choking in Judo” found on the Judo Information Site of the Encino Judo Club. He notes that the studies found the following physiological effects from choking:

1. Unconsciousness occurs approximately 10 seconds after choking and the subject regains consciousness spontaneously without difficulty in 10-20 seconds.
2. The hadaka-jime techniques (respiratory hold) produced excruciating pain but there was no pain with the shime-waza (carotid hold).
3. The unconsciousness is due to lack of oxygen and metabolic disturbances created in the brain as a result of disturbance of cerebral circulation.

⁷ These experiments were conducted using the electroencephalograph to detect brain changes; the earoxymeter for blood oxygen saturation, the sphygmomanometer for arterial blood pressure; the plethysmograph for peripheral blood vessel reaction, the micropipometer for skin temperature changes, examination of the plasma protein concentration, blood water volume, hematocrit complete blood count, eosinophil count, and urine 17 keto-steroid content. (Koiwai, 2005, ¶7,)

4. The appearance of flushing of the face is due to disturbance in pressure in the carotid arteries and jugular veins.
5. When convulsions occur, the EEG (electroencephalographic) findings are very similar to a short epileptic seizure.
6. Tachycardia (increased heart rate), hypertension (increased blood pressure), and mydriasis (dilation of the pupils) were caused by stimulation of the sympathetic nervous system or vagus nerve.
7. Tachycardia and hypertension may also be attributed to the carotid sinus reflex.
8. Choking results in changes that are similar to conditions accompanying central shock.
9. No deleterious effects remained after being “choked.” (Koiwai, 2005, ¶8)

In 1963, a team of doctors associated with the Tokyo University and the Tokyo Jikei-kai Medical School published a study entitled “Physiologic Studies on “Choking” in Judo—Studies on “choking” with reference to the Hypophysio-Adrenal System.” In this article, the writers detail an experiment conducted to gauge the effect of “choking” on the “hypophysio-adreno-cortical system.” The results of the study showed that while choking produces, to a certain extent, a condition of stress, the changes “are only temporary and mild.” Specifically, the doctors found:

1. Variations in blood pressure indicate that the unconscious state following “choking” is very similar to conditions accompanying central shock.
2. Variations in oxygen saturation in the blood of the helix of the ear suggest that hypoxia in the central nervous system is an important causative factor in the unconsciousness resulting from choking.
3. The mirror image relationship between the progress in changes of blood water volume and plasma protein concentration indicates that directly after

falling unconscious, increased permeability of blood vessels results.

4. The circulating eosinophile count increased slightly, directly after falling unconscious, however, thereafter, a decrease typical during moments of stress is observed and after four hours a minimum decrease of -50% -30% is seen.
5. Changes in the amount of 17 keto-steroid excreted in the urine follows a somewhat similar pattern to that of changes in eosinophile count, evidencing that "choking" acts as a stressor. However, its influence only lasts 6-8 hours. (Ogaway et al. 1963, p. 114)

In 1970, Dr. Leonard Lapinsohm (MD) published an article in Black Belt Magazine in which he describes the technique of "strangling" and urges precautionary measures to be taken. He writes,

Blows to the side of the neck and shime-waza⁸ can be extremely dangerous. Therefore, precautionary measures should be taken to insure proper care in application and supervision in teaching. Shutting off respiration may also bring about changes of a reflex nature which may cause serious heart and respiratory reactions. Shutting off the air intake may cause an inadvertent Valsalva maneuver (forced expiration with the glottis closed), which will set in motion other reflex changes and cardiovascular effects resulting in dangerous and even irreversible physiologic changes. (¶16)

He concludes that shime-waza should only be applied with proper care and with an understanding of the basic physiologic principles, dangers, and precautions.

⁸ Shime-waza is a Judo neck hold that puts pressure on the carotid artery.

In 1991, the Journal of Sports Medicine and Fitness published an article by a team of researchers based out of the Institute of Sports Medicine in Genoa, Italy. This team had conducted a study assessing the potential for damage to the central nervous system as a result of Judo by using the EEG and rCBF measurements to assess cerebral function. Seven Judoko were rendered unconscious using a carotid hold. During unconsciousness, EEG readings were taken, while rCBF was measured immediately after recovery. Baseline conditions were normal, but during choking the EEG showed "diffuse 2-3 Hz. High voltage waves... then the EEG gradually recovered to normal." After choking, rCBF decreased in all but one subject, slightly in four and more markedly in two. The study concludes that "there is no evidence of permanent CNS [central nervous system] functional changes due to Judo practice and choking." The authors go on to note that "this sport, despite the violent characteristics of some of its attack techniques, does not seem to be accompanied by modifications of the cerebral function appreciable with our systems. It is interesting to underline that in other sports, such as boxing, both structural and functional pathological modifications were seen." (Rodrigues et al, 1991, p. 610)

The year of the Genoa study's publication saw another contribution to the debate by two medical researchers based in England. In their paper, "Judo as a possible cause of anoxic brain damage," R. Glynn Owens and E.J. Ghadiali describe an injury whose cause may be "linked specifically with the kind of strangulation procedure unique to Judo." (p. 627) The patient in question was a 33 year-old male who was an international class Judo expert. His symptoms included episodes of altered awareness, occasional loss of consciousness, and poor memory. Psychometric evidence confirmed the presence of a lesion in his brain. The researchers conclude that,

The present case had apparently been frequently strangled into unconsciousness during his Judo career and it was surmised that the cumulative effect of such strangulation had been, at least in part, the cause of the anoxic brain damage. (p. 628)

The writers agree that while it is possible that some other factor was responsible, they could find nothing other than Judo in the patient's case history to account for sustained anoxia. They advise "caution to Judo players regarding such techniques."

Another Judo expert, Dr. E.K. Koiwai, who is also an Associate Professor of Pathology and Anatomy at the Hahnemann University School of Medicine in Philadelphia, published an article entitled "How Safe is Choking in Judo?" He concludes that the choking techniques used in Judo—basically the carotid hold—are safe for three reasons: there have been no fatalities since the advent of Judo; scientific studies show no deleterious effects; and precautionary rules and methods make the technique safe. The scientific studies he is referring to are the earlier studies conducted in Japan in the late fifties and early sixties which are summarized above. Koiwai goes on to observe that Judo chokeholds are considerably less dangerous than a "knock-out" in boxing and there is no necessity of excluding the choke from Judo matches provided necessary precautions are taken. He notes,

There are four main reasons why fatalities do not occur:

- 1. Choking, whether in practice or competition, is supervised and observed by qualified trained instructors and officials.*
- 2. The contestant submits before unconsciousness occurs.*
- 3. After choking the contestant regains consciousness naturally*

and spontaneously without difficulty in ten to twenty seconds.

- 4. The immediate application of artificial respiration by the qualified instructor or official prevents prolonged hypoxia."(¶ 11)*

In a study published by the magazine of Medicine and Science in Sports and Exercise in 1998, three scientists conducted spectral analysis and brain mapping of electroencephalographic changes after choking in Judo. The researchers wished to learn "can disturbances of brain function after choking be objectivized with electroencephalographic means and if so how long do these changes last?" In this study, six experienced Judo practitioners were subjected to the juji-jime choking technique (a carotid hold) and various measurements were taken. The researchers discovered that a "significant increase of global field power in the delta and the 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. Yet spectral EEG-analysis revealed sub clinical changes of brain function." The researchers conclude that "choking in Judo may induce sub clinical electroencephalographic perturbations."⁹ (Rau et al, 1998)

2.4 Studies in Forensic Pathology

In the early 1980s, the United States experienced a number of highly publicized cases of deaths of individuals while in police custody. Restraint by police was one of many factors involved in the deaths, and neck restraints were among the types of restraint used. The deaths launched a series of forensic investigations and led to a

⁹ Unfortunately, as a non-medical researcher, I can draw no conclusions as to whether this change is potentially dangerous or not.

prolonged debate about the safety of various techniques used to subdue individuals. A key contribution to the debate came from Drs. Donald T. Reay and John W. Eisele, respectively the Chief Medical Examiner and the Medical Examiner of King County Washington. In 1982, they published an article entitled "Death from Law Enforcement Neck Holds" in the American Journal of Forensic Medicine and Pathology.¹⁰ This article was a review of two fatalities resulting from the use of neck control holds. Despite the fact that in these two cases, "the two deaths reported here are the result of a carotid sleeper which became a choke hold during the struggle," (1982, p. 255) the authors argue that even a properly applied carotid sleeper hold can result in death. One reason for this, they argue, is related to the carotid sinus. The carotid sinus is located in the internal carotid artery and is composed of nerve endings that are readily stimulated by pressure changes such as those induced by a neck restraint. "A second factor working to produce cerebral ischemia in the carotid sleeper is carotid sinus stimulation which can produce bradycardia and sometimes cardiac arrest," note the authors. (p.255)

Additionally, serious injuries to the vertebral arteries can be produced by any kind of stretching neck movement but especially the combination of hyperextension and excessive contralateral rotation... Neck holds as described in this report have a similar potential for damage to vertebral arteries with devastating neurological consequences. (p.257)

The authors caution, "Fatal consequences of neck holds can be anticipated because of their physiological effects. Pre-existing natural diseases increase the likelihood of a fatal outcome, even when a hold like the carotid sleeper is applied correctly." (p.256)

¹⁰ Reay, D. and J Eisele. Death from law enforcement neck holds. American Journal of Forensic Medicine and Pathology. Vol3. No 3. September 1982.

For example, persons who suffer from underlying cardiac conditions are particularly vulnerable to reflex cardiac stimulation and hypoxia. Reay and Eisele explain that while all neck holds should be considered "potentially fatal" there are some conditions where the risk of neck holds increases. They summarize the risks as follows:

- 1) Men over 40... The incidence of coronary artery disease increases sharply over age 40. This group would be particularly vulnerable to carotid sinus stimulation and/or hypoxia which could trigger a fatal heart dysrhythmia.
- 2) Persons with seizure disorder... Epileptics can have a seizure promoted or precipitated by violent activity, cerebral ischemia, or hypoxia. Although not necessarily fatal, a grand mal seizure can lead a person to writhe and jerk against the force about his neck, leading to complications.
- 3) Mentally disturbed persons... They offer greater resistance leading to the potential for the neck hold to be tightened. "A neck hold about such a person will have no direction and may only tighten indiscriminately to occlude the airway as well as the neck vessels." These persons must receive medical intervention.
- 4) Street drug users... These people, like those above, may take drugs that produce violent and unpredictable behaviour. Same risks as above.
- 5) Persons taking prescription drugs. Side effects of many prescription drugs may predispose their users to cardiac arrhythmias. Two examples include digitalis preparations and tricyclic antidepressants.

The authors observe, "In view of the alleged frequency of their [neck holds] use, there have been remarkably few reported deaths. Yet, because of the structures involved, neck holds must be considered potentially lethal under any circumstance and used

only when there is no other alternative.” They go on to make some recommendations for law enforcement:

- The use of neck holds be restricted to situations where the officer’s or another’s life is threatened.
- In addition, it is “imperative that the officer who would use a neck hold have proper training in its use.”
- “Any law enforcement agency who prescribes to the policy of using the carotid sleeper should have frequent reinstruction in its use and continued reinforcement of the potential fatal results.”

In the year following the publication of the preceding article, Dr. Reay (in conjunction with the FBI) conducted a study on the physiological effects of neck holds. The study was designed to assess the effects of the carotid sleeper on blood flow. Five FBI agents were subjected to a carotid hold, although none were choked to unconsciousness. Surface blood flow was measured by a continuous laser Doppler attached to the left cheek while EEG and blood pressure readings were taken during the test period. The study concludes that carotid blood flow to the head is severely restricted during the proper application of the carotid sleeper. In fact, there was a mean decline of 89.4% of blood flow in all subjects. The heart rate slowed in two of the test subjects, possibly the result of carotid sinus stimulation. Although his study only measured the effects of the carotid sleeper on carotid blood flow, Reay concludes,

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 practice in the use of the carotid sleeper. ... Officers should recognize that death can result

if the carotid sleeper is incorrectly applied, and there may be instances where sudden and unexpected deaths occur when the carotid sleeper is properly used. (Reay, 1983, p.15)

In 1986, Ronald N. Kornblum, an Associate Clinical Professor of Pathology and an acting Medical Examiner, published a two-part article in Trauma Magazine on police neck holds. The articles assess the potential medical dangers of chokeholds based on case records of 33 deaths associated with their use over an eleven-year span. The cases studied include incidents of bar-arm chokeholds as well as carotid holds, and Kornblum makes a significant point that “distinguishing between a bar-arm control hold and a carotid control hold on the basis of the injury pattern alone is not possible.” (Kornblum, Part 2, p.28) The carotid hold was used in 10 cases for certain, while in 12 cases the type of choke hold was not specified. In 31 of the 33 cases reviewed by Kornblum, death was attributed to compression of the neck, either directly or indirectly.

Cause of Death

Asphyxia	21
Anoxic Encephalopathy (brain death)	6
Fracture/Dislocation of the Spine	3
Carotid Sinus Reflex	1
PCP	1
Sickle Cell Disease	1

In 21 cases, death was directly due to asphyxia. According to Kornblum, death from asphyxia implies that

- (1) Too much force was applied to the neck by the police officer; or
- (2) Too much resistance was offered on the part of the suspect; or
- (3) A combination of both. (Kornblum, Part 2, p. 45)

While the brain can generally survive up to three minutes without oxygen, this time span does not take into account the effect of violent activity on the part of the suspect who may be acting strangely, in a manic state, or be fighting so as to burn up more oxygen than a normal person at rest. (Kornblum, Part 2, p. 46) Following asphyxia, the next leading cause of death was irreversible brain damage. Fractures or dislocation of the cervical spine with injury to the spinal cord or spinal shock accounted for three deaths. "Such injuries are indicative of excessive force to the neck," writes Kornblum. (p. 46) One person died as a result of carotid sinus reflex. The carotid sinus reflex is an autonomic reflex that helps regulate the pulse and blood pressure. Experiments have shown that the carotid sinus can be stimulated by mechanical pressure to the outside of the neck. "Pressure over the carotid sinus area of the neck, as can occur during the carotid control hold, can set off the reflex arc and lead to slowing of the heart, and a fall in blood pressure." (Kornblum, Part 1, p. 54)

Concerned with the mechanics of how neck compression can become fatal, Kornblum notes that in most of the cases, death is not instantaneous. In fact, "the suspect dies minutes to hours after the choke hold has been applied." Kornblum observes that according to the police reports, most victims died after "the altercation is over, the choke hold has been applied and released, the suspect has been subdued, handcuffs have been applied to the wrists and often restraints have been applied to the ankles." (Kornblum, Part 2, p. 46) Death appears to result from a combination of:

- (1) *Decreased oxygen supply to the brain;*
- (2) *Exhaustion; and*
- (3) *Cardiac inhibition.* (Kornblum, Part 2, p. 46)

While the exact mechanism of death is unclear, writes Kornblum, "it appears to be a

combination of asphyxia, carotid sinus reflex and mental and physical exhaustion." (Kornblum, Part 2, p. 63) The mechanism of death varies with the circumstances and the individual, and alcohol, drugs and underlying health conditions play their parts in causing death. However, "the one underlying theme which is present in all these deaths is the use of the choke hold. The choke hold, therefore, is the cause of death which best fits the concept of proximate cause."

In terms of injuries, Kornblum notes that in the 33 cases reviewed, there was no real pattern. He says,

The injuries ranged from abrasions and contusions of the skin, hemorrhages into the muscles, fractures of the laryngeal cartilages, and hemorrhages of the thyroid gland and the carotid sheath, to fractures and dislocations of the cervical vertebral spine. (Kornblum, Part2, p. 14)

Kornblum also notes the following specific injuries in the 33 cases:

- 19 petechial hemorrhages
- 12 skin abrasions and contusions
- 12 soft tissue hemorrhages
- 9 hemorrhages in sternocleidomastoid muscle
- 9 hemorrhages in strap muscle (front of the neck)
- 9 posterior muscle/ligament injuries
- 8 contusion hemorrhages in subcutaneous tissue
- 7 cervical vertebral injuries
- 6 fractures of thyroid cartilage
- 6 contusions of the esophagus/hypopharynx

In addition, Kornblum notes 5 tongue laceration contusions, 4 non specific miscellaneous muscle hemorrhages, 4 thyroid gland hemorrhages, 1 contusion of salivary gland, and 1 fracture of the cricoid

cartilage. While there were some cases of contusions around the laryngeal nerve, the carotid sheath was seldom injured. He also observes that there were no fractures of trachea or hyoid bone, no injuries to tracheal rings, no injuries to jugulars or vagus nerve, no sign of carotid sinus injury, no vertebral artery injuries, no phrenic nerve injuries, and no hypoglossal nerve injuries. (p.19-27)

Based on his review of these cases, Kornblum concludes that injuries resulted from a variety of factors including the degree of force used, the length of time the force was applied, the location of the force, and the amount of resistance on the part of the suspect. "Generally, the location and severity of the injuries to the neck varied considerably from case to case and no pattern emerged," he writes (Kornblum, Part 2, p. 14) In five of the cases, there was no evidence of any injury to the neck at all.

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. The young, healthy, drug-free individual probably will experience no ill effects either at the time of the incident or later. Chokeholds, however, may be hazardous to individuals with medical problems and those under the influence of alcohol or other drugs. (Kornblum, Part 2, p. 59)

According to Kornblum, the following people may experience an adverse outcome as a result of a neck restraint:

- Plus-40 individuals as older people have a higher incidence of heart disease and atherosclerosis
- Individuals with cardiac problems (it must be noted that in 15 of the 31

cases, there was some underlying cardiac disease)

- People with atherosclerotic carotid arteries (plaque material adhering to the inside of the blood vessel wall can be dislodged by the mechanical pressure on the neck, and travel with the blood flow into the brain causing a stroke.)
- Persons with seizure disorders. These persons run the risk of developing a seizure while the choke hold is being applied. In addition to the potential hazards of the seizure itself, officers may interpret seizure activity as resistance and increase the amount of force they are applying to the person's neck.
- Persons with hypersensitive carotid sinus reflex. This condition, although rare, does occur and can lead to sudden stoppage of the heart and death from even mild compression of the neck.
- Psychotic persons
- Drug and alcohol users
- Persons with debilitating diseases – any debilitating disease which makes the body less resistant to injury and stress also makes it more vulnerable to choke holds. This would include cirrhosis of the liver (a contributing cause of death in 3 of the 31 cases) as well as sickle cell disease.

Kornblum suggests that if law enforcement is to continue to use the holds, certain precautions should be taken to minimize the risks. These include the following:

- Never use the hold more than once – "The choke hold must never be used more than once. Repeated applications compound the danger."
- Use holds only to subdue – "When the suspect resists, it is instinctive on the part of the officer to increase the pressure. They should be trained in how to break the positive feedback cycle of escalating force."
- Do not lift subject off the ground –this may place too much weight on the

spinal column and can lead to fractures or dislocations of the neck.

- Avoid application to seizure victim – police officers should be trained to recognize epileptic seizures so that they will not confuse them with resistance on the part of the victim. A choke hold should never be applied to a person who is having a seizure.
- Let respiration return to normal –“After a choke hold has been used, the suspect should be allowed time to recover before he is placed face down on the floor of the police car.”
- Be ready to give CPR– If a suspect goes into cardiac arrest, life saving procedures must be administered immediately.
- Take suspect to medical exam before jail. (Kornblum, Part 2, p. 60)

In 1987, Dr E.K. Koiwai contributed to both branches of neck hold research –Judo and forensic– when he examined 14 cases of deaths allegedly caused by the use of choke holds. Thirteen of these cases were law-enforcement related while one occurred in a martial arts setting (not Judo). At the beginning of his study Koiwai observes that the use of choke holds or shime-waza in Judo is similar or identical to the techniques used by law enforcement. He notes that a review of Judo deaths showed that although 19 deaths had occurred since the sport's inception in 1882, none was related to the use of neck holds. Koiwai concludes that when the technique is properly applied, “unconsciousness occurs in approximately 10 seconds. After release, the subject regains consciousness spontaneously in 10 to 20 seconds.” (p. 430) Koiwai observes later in the paper that the execution of a properly applied hold is “quite harmless.” (p. 430) The hold requires “neck pressure of 250 mm of Hg or 5 kg of rope tension ... to occlude carotid arteries. The amount of pressure to collapse the airway is six times greater.” In the fourteen cases examined, there were “injuries to the structures of the

neck from bruises, ecchymosis, (ruptured blood vessels), hemorrhages, fractures of the cartilage of the neck, intervertebral discs, submucosal or mucosal injuries to the larynx. “ He goes on to observe, “All these findings indicate that tremendous force was exerted on the necks of the suspects.” Although he refrains from saying so directly, Koiwai's findings suggest that the technique used by the police officers was not, in fact, a properly applied carotid hold. Had a carotid hold been correctly applied, his words imply, there should be no evidence of trauma to the decedents' necks. Koiwai attempts to explain this:

The enforcement officers, although trained, have great difficulty in subduing violent and uncooperative suspects. ... These suspects may have had greater tolerance for pain, thus, making it more difficult to restrain them and to recognize whether the state of unconsciousness is due to drugs rather than to the restraining holds. In other words these suspects were not cooperative. (p. 431)

Koiwai suggests that in Judo, by contrast, the participants all have the ability to realize the effects of choking before unconsciousness ensues and that judges and coaches can recognize the player when he is “choked out.” He advises, “if enforcement officers are to use the choke holds to subdue violent suspects as a last resort, they should be properly trained and supervised by trained certified Judo instructors. Then possibly there will be less misuse or abuse of the techniques of choking which when used improperly results in fatalities.” (p. 431) In short, Koiwai's investigation suggests carotid holds have been proven to be safe in the Judo community, but are subject to improper use in the law enforcement context. To reduce the chance of fatalities, Koiwai further recommends the following:

1. Choke holds be taught by trained and certified instructors
 - a. To be familiar with the anatomical structures of the neck and where pressure is to be applied (carotid triangle).
 - b. To know that [in the] physiology of choking only a small amount of pressure is needed to cause unconsciousness.
 - c. To recognize immediately the state of unconsciousness and to release the pressure immediately.
 - d. To learn proper resuscitation methods if unconsciousness is prolonged.
 - e. To prevent aspiration of vomitus and not to place the restrained subject face down. Keep the subject under constant observation.

2. To revise police training manuals to emphasize the above procedures. These are the procedures and principles taught by Judo instructors which have prevented deaths cause by shime-waza in the sport of Judo for over 100 years. (p. 432)

In 1993, the International Association of Chiefs of Police published an article in their Training Key series entitled Custody Death Syndrome. In this article, they summarize the findings of a task force assembled to study the phenomenon of sudden deaths in custody. They note an important fact about the connection between neck hold deaths and excited delirium:

The task force also found that persons who exhibit symptoms of excited delirium are also among those who are most likely to be at increased risk of death following the application of a neck hold. Constriction of the blood vessels is one of the major causes of death of persons experiencing excited

delirium. For this and other reasons, it is advisable for officers to transport individuals to a hospital for medical evaluation if a carotid restraint is applied to a person suspected to be under the influence of any drug. (p. 52)

The task force study of sudden in-custody deaths made several recommendations to law enforcement. Specifically, the authors recommend that the carotid restraint *should be retained as a method of restraining individuals who are actively resisting arrest or who are assaultive*. However, when using the hold the task force recommends that:

- The hold not be used as a “control” hold but that it be employed with the intent of rendering the person unconscious.
- Full pressure be applied no longer than 30 seconds.
- If the individual is rendered unconscious within 30 seconds, that pressure be reduced so that the carotid arteries are not compressed but the neck remains immobilized.
- The carotid hold not be used on the same individual more than twice during a single enforcement contact.
- Whenever possible, the restraint be applied using two officers, one of whom is responsible for monitoring the hold to ensure that it is applied correctly.
- In addition, any prisoner who is considered at risk because of bizarre behaviour or suspicion of drug use should be transported by two officers, one of whom should monitor the prisoner for skin colour, breathing and level of consciousness.
- Any prisoner exhibiting symptoms of cocaine psychosis should be transported to an emergency medical facility for observation.
- After hours of darkness, the officer should use an interior light to monitor the prisoner.
- If the booking process will be lengthy, an officer should remain with the

prisoner and keep him under supervision. (p. 52)

Five years after the publication of the Training Key, in 1998, Dr. Reay contributed another article to the restraint debate entitled "Death in Custody." In this article, he outlines the procedures to be followed by coroners after a restraint-related death. He observes that the most common "pathway responsible for a neck hold death... is one of asphyxia." (Reay, 1998, p. 12) That is, when deaths occur, they are frequently due to "lack of cerebral oxygenation because of restriction of the cerebral arterial blood flow or collapse of the airway." (p. 12) Neck hold deaths can also result from carotid sinus stimulation. Reay writes,

This reflex neural pathway through the vagus nerve can cause bradycardia¹¹ and cardiac standstill, and it may account for some deaths that occur rapidly following application of a neck hold. The sensitive carotid sinus syndrome is a well-recognized but uncommon clinical condition. (p. 12)

Reay makes the following suggestion for certification of deaths following neck hold use:

Because neck holds by their nature obstruct cerebral circulation or the airway or both, in addition to the potential of triggering a reflex parasympathetic cardiac standstill, they are inherently fatal. If death results following their use, then the death should be certified as homicide. (p. 18)

In the same year of Reay's article, four physicians published an article in the Journal of the Canadian Medical Association in which they reviewed the

issue of unexpected death related to restraint for excited delirium. They examined 21 cases of unexpected death for excited delirium which had been investigated by the Office of the Chief Coroner for Ontario between 1988 and 1995. They found that in all 21 cases, the deaths had been associated with restraint. Of these cases, three people (14%) had been subject to a neck restraint. The authors conclude the following:

Restraint may contribute to the death of people in states of excited delirium, and further studies to test this hypothesis are recommended. Meanwhile, law enforcement authorities and others should bear in mind the potential for the unexpected death of people in states of excited delirium who are restrained in the prone position or with a neck hold. (Pollanen et al., 1998, p. 1603).

In the 2001 edition of Forensic Pathology, a textbook aimed at forensic pathologists, the authors, Doctors 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." (p.275) 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." (p. 274) In addition, "the compression of the carotid arteries, with resultant decreased cerebral blood flow, can theoretically precipitate a stroke in an

¹¹ Bradycardia is a slow heart action.

individual with atherosclerotic disease of the carotid or cerebral vasculature.” (p. 275)

A recent medical review of neck hold literature was conducted in Australia in the summer of 2005 by R.D. Hoskins, Director of the Queensland Clinical Forensic Medicine Unit. The research was done on behalf of the Queensland Crime and Misconduct Commission. Dr. Hoskins was asked for his opinion on what caused the irreversible coma of Samuel Hogan, a 20 year-old male who was permanently injured while being arrested. Hoskins concluded that Hogan’s condition was most likely due to “carotid sinus stimulation due to neck restraint.” He writes: “This risk, as well as others, is inherent in every neck restraint.” (CMC, 2005, p. 27) He does, however, take issue with the notion of classifying neck restraints as lethal:

It is intriguing and possibly worrying that neck restraints are completely undifferentiated from use of firearms. Both are lumped together as lethal use of force options. Although there is a possibility of a fatal outcome from neck restraints, the number of investigations such as this one is a testament to the relative infrequency of fatal outcomes. The same cannot be said of delivering a large calibre hollow point projectile into any body cavity at short range. From the perspective of the medical probability of an undesirable outcome there is merit in differentiating neck restraints from use of firearms... It seems to me there is scope for a further category that separates “high probability” lethal force from “slight probability” lethal force. (p. 27)

Asked to recommend ways in which to avoid this tragedy, Dr Hoskins says, “All of the available medical information suggests that modern electrical stunning (electro-

mechanical disruption) devices are a safer option than neck restraints.” (CMC, p. 27)

In an addendum to the report, Dr Hoskins notes that there are many factors that could shorten the period for which a lateral vascular neck restraint could be applied safely:

- Oxygen debt as a result of physical activity such as running or fighting,
- Increased metabolic rate as a result of physical activity,
- Increased metabolic rate as a result of consumption of stimulant drugs,
- Raised body temperature,
- Compromised respiration due to (partial) occlusion of the mouth or nose, (partial) obstruction of the structures of the throat, limitation of movements of the chest, limitation of movements of the abdomen,
- Shock from blood or fluid loss due to trauma, dehydration or burns, and
- Bradycardia.

Hoskins observes that the condition of excited delirium would contribute to cerebral hypoxia but takes issue with that the idea that these persons (i.e. persons in the throes of excited delirium) would have died anyway. Indeed, he notes, “there have been many cases of successful litigation following such incidents.”

Of the LVNR technique, Hoskins concludes:

The lateral vascular neck restraint is intended to deprive the brain of oxygen. At rest the brain will be permanently damaged if it is deprived of oxygen for more than about four minutes. The “safe period” will be considerably less in a subject with excited delirium. I can’t say what the safe period is and nor could anyone ethically study it. It may be more prudent to suggest that lateral neck restraints should not be used in such subjects if at all. However, such a

suggestion necessarily means that an alternative would have to be part of standard procedure. Deciding the relative risk of that alternative would be difficult without primary research. (p. 33)

He makes one very important recommendation vis-à-vis restraint models used by police,

There is a need for research within law enforcement circles to broadly monitor the consequences of various restraint models in order to document their relative safety and the frequency with which adverse events occur. As it selects only adverse outcomes as a starting point, the medical literature will never achieve this goal. We need to be aware of the denominator as well as the numerator. (p. 33)

The most recent medical review of neck holds can be found in a 2006 textbook entitled *Sudden Deaths in Custody*, edited by Darrell Ross and Theodore Chan. It includes a chapter on neck holds authored by Gary M. Vilke, a Professor of Clinical Medicine at the University of California at San Diego. Although this chapter does not contain new research, it takes a different view of some of the existing medical findings on neck holds. In this chapter, Vilke reviews the forensic and the Judo literature on the subject of neck holds.

In his review of the forensic literature, Vilke notes that neck holds have been found to have several potential medical dangers including airway compromise, vascular injury, carotid sinus stimulation, and spinal injury. His stand on these issues is divergent from some of his medical colleagues in that Vilke does not appear to see the carotid hold as terribly risky. He agrees that airway compromise is an issue but only when a

carotid hold is misapplied and becomes a bar arm hold. As he says, “a carotid sleeper hold is designed to better protect the airway, however, care must be used to maintain appropriate positioning... as the hold could shift into more of a bar hold.” (Ross, 2006, p. 27) In terms of vascular injury, Vilke writes,

When a neck hold is used on patients with a significant medical history of atherosclerotic disease, they may be at risk for disruption of atherosclerotic material or plaque. This disruption of plaque can result in a stroke from blockage of blood flow of the carotid arteries. (Ross, 2006, p.27)

Vilke notes that medical research on carotid sinus massage supports this theory but that this effect is very rare. For instance, in one study of 5000 patients subjected to carotid sinus massage, five people exhibited neurological weaknesses after the treatment and two exhibited visual field defects. All but two cases resolved spontaneously. Vilke observes that “atherosclerotic disease in the carotid arteries is most commonly found in the elderly population, a group less likely to require the use of a neck hold.” (Ross, 2006, p. 28) He does acknowledge, however, that the “disease could be present in younger individuals” and that it would be impossible for anyone restraining these people to be aware of their condition.

Vilke also takes issue with the notion that neck hold deaths can result from carotid sinus reflex. The belief that compression of the carotid arteries can slow the heart (bradycardia) to the point of cardiac arrest is, to Vilke, based on theory and not fact. He responds to Kornblum’s statement that “in rare instances, pressure to this area can lead to reflex cardiac arrest and sudden death” by observing that Kornblum provides no references for his arguments. In fact, Vilke notes, “the medical literature is replete with studies examining the use of carotid sinus massage as a diagnostic and

therapeutic examination tool.” (p. 29) He concludes that “although an interesting theory, the carotid sinus stimulation cannot be blamed for these sudden deaths.” (p. 29)

Vilke notes that spinal injuries associated with neck holds appear to “be those in which bar holds were employed.” (p. 29) In general, he writes, when a neck hold is employed properly it is “extremely unlikely” to cause spinal cord injuries. In fact, he determines that “the carotid sleeper hold, when utilized in younger subjects appropriately, has a relatively solid safety profile and is an appropriate form of restraint and use of force method in law enforcement’s continuum.” (Ross, 2006, p. 35)

2.5 Discussion of Medical Findings

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. Indeed, the topic would benefit from a review in which law enforcement circles “broadly monitor the consequences of various restraint models in order to document their relative safety and the frequency with which adverse events occur.” (CMC, 2005, p. 33) Such a review would place the hold into context and would assist law enforcement in determining the relative risk of the technique compared to other subject control techniques. Secondly, almost all medical opinions on the subject of neck holds are based on research stemming from fatalities associated with police restraint. Research based *only* on adverse outcomes can be viewed as inexhaustive and certainly suffers from selection bias. Finally, there are no available studies that document non-fatal injuries associated with the use of this technique. Despite these shortcomings, it would be wise to consider the published

counsel of the medical community with regard to the risks of neck restraints.

Overall Degree of Risk

There is no general medical consensus that neck holds are safe; however, this should not be surprising as “any action involving force always has the potential of producing severe injury and death.” (DiMaio, 2001, p. 275) There have undeniably been fatalities associated with the use of neck holds, and almost all medical experts advise caution in its use. Indeed, many physicians suggest that there are risks “inherent in every neck restraint.” (CMC, 2005, p. 27) Reay and Eisele note that part of the problem is predicting who will have an adverse outcome as a result of a neck hold:

Use of neck holds must be viewed in the same way as firearms; the potential for a fatal outcome is present each time a neck hold is applied and each time a firearm is drawn from its holster. The neck hold differs in that its fatal consequence can be totally unpredictable.” (Reay & Eisele, 1982, p. 6)

Even physicians who believe that a properly applied hold is “quite harmless” (Koiwai, 1987, p.430) underscore the fact that while the carotid hold may be safe in the Judo context, it is subject to improper use in the law enforcement context. In the world of Judo, combatants are closely monitored by judges who can put a stop to a hold gone/going wrong and who can quickly administer first aid if necessary. This is not the case in the police context where subjects are not playing by any rules and where many other factors may come into play. Koiwai advises law enforcement to use this hold as a last resort and suggests that “if enforcement officers are to use the choke holds ... they should be properly trained and supervised by trained certified Judo instructors. Then possibly there will be less misuse or abuse of the techniques of

choking which when used improperly results in fatalities.” (Koiwai, 1987, p. 431) He further suggests that officers receive training:

- To be familiar with the carotid triangle,
- To know that only a small amount of pressure is needed to cause unconsciousness,
- To recognize immediately the state of unconsciousness and to release the pressure immediately,
- To learn proper resuscitation methods if unconsciousness is prolonged.

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 experiments reviewed for this paper showed no deleterious effects from the hold. Forensic pathologists Vincent and Dominick DiMaio write that “... carotid sleeper holds are safe if properly used.” (p. 275) 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.”

Types of Risk

The medical literature reviewed for this report revealed two categories of risk associated with the lateral vascular neck restraint. First, there is evidence to suggest that during a struggle the hold can become

a respiratory or true choke hold. Second, there is evidence to suggest that certain individuals are predisposed to negative outcomes because of the physiology involved in the hold.

1. Problems with Technique

In their textbook, *Forensic Pathology*, Vincent and Dominick DiMaio observe “in theory, the carotid sleeper 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, as the individual twists and turns to break the hold.” In the fourteen fatalities reviewed by Dr. E.K. Kowai and the two reviewed by Reay and Eisele, this seems to have been the case. Koiwai confirms this finding when he suggests that there was evidence that “tremendous force was exerted on the necks of the suspects.” A properly applied carotid hold requires only 5 kg of rope tension, which is not a great deal of force. Koiwai makes several recommendations regarding training to help solve the problems with technique. (See the previous section for a list of his recommendations.) Dr Reay, also concerned with this subject, suggests that police receive retraining on the technique at specified intervals, with specific emphasis on how to avoid slipping into a bar arm choke. (Puder, 1993, p. 35)

2. Risk Factors Inherent in Human Physiology

The physical effects of a lateral vascular neck restraint include the following:

- Carotid Occlusion (obstruction of the common carotid arteries reducing the flow of oxygenated blood to the brain).
- Carotid sinus stimulation (The carotid sinus, located just above the bifurcation of the common carotid artery, is composed of nerve endings that are extremely sensitive to pressure changes

which direct nerve impulses to the region of the brain that reflexively controls the heart).¹²

- Veinous occlusion (Pressure on the side of the neck can occlude the jugular veins, which prevents drainage of depleted blood from the brain and can impair cranial circulation, congest arterial flow, and reduce blood oxygen saturation).
- The Valsalva Maneuver (the Valsalva maneuver is achieved by holding one's breath and contracting the diaphragm, which limits the volume of blood returning from the brain and results in arterial blood flow inhibition). (Puder, 1993, p.10-12)

Many medical experts hold to the opinion that sudden or severe pressure on the carotid arteries may, in some individuals, cause the heart to stop beating abruptly – a phenomenon that has been described as “reflex cardiac arrest.” (CMC p. 25) Reay and Eisele observe that coronary artery disease and cardiac rhythm disorders are also particularly vulnerable to reflex carotid sinus stimulation and hypoxia, and they conclude individuals with underlying cardiac disease will be at greater risk from a neck restraint than others. (Reay and Eisele, p. 256). In addition, in people with diseases that affect the carotid arteries, most commonly atherosclerosis, occlusion of carotid arteries can result in thrombosis or stroke (DiMaio p. 275). As an example of this, in expert testimony to the RCMP, Dr Reay provided the Commission information about a case involving an instructor at a Florida Police Academy who suffered partial paralysis after the application of a hold in a training exercise. The paralysis was apparently caused by a stroke. (Commission for Public Complaints against the RCMP, 1992, p.17)

¹² While some medical experts believe carotid sinus stimulation to be a potential cause of death in neck hold fatalities, others, like Dr. Gary Vilke, dismiss this idea as “an interesting theory” (p. 29) but no more.

Reay and Eisele postulated that the technique also poses greater risks to the following persons:

- Men over 40,
- Persons with seizure disorders,
- Mentally disturbed persons,
- Street drug users,
- Persons taking prescription drugs.

To mitigate the risks to the persons listed above, Reay and Eisele advise police to use the hold only in “those situations where the officer or another person's life is in immediate danger.” (Reay and Eisele, p. 258) They further insist that “it is imperative that the officer who would use a neck hold have proper training in its use,” and recommend that “any law enforcement agency who prescribes to the policy of using the carotid sleeper should have frequent reinstruction in its use and continued reinforcement of the potential fatal results.”

In the early 1990s, medical opinion on neck restraints indicated that the technique poses a somewhat greater risk to persons who are suffering from excited delirium.¹³ Dr Darrell Ross, writing in 2006, suggests, on the other hand, that “in many cases of excited delirium, deaths occur without significant police restraint.” (Ross, 2006, p. 162) That is, persons who are experiencing excited delirium die, not from being restrained, but from complications arising from the syndrome itself. There is currently, however, an absence of empirical data absolving neck restraints from playing a role in in-custody deaths of excited delirium patients. Until such data becomes available, it is important to review the precautions suggested by a 1993 task force assembled to study the issue of in-custody deaths. The

¹³ The phenomenon of excited delirium is becoming increasingly well recognized, although “despite growing recognition of the hallmarks of excited delirium syndrome, some question the actual existence of this clinical entity.” (Ross, 2006, p. 99)

task force determined that “persons who exhibit it symptoms of excited delirium are also among those who are most likely to be at increased risk of death following the application of a neck hold.” (IACP p.52) This is because the carotid hold constricts blood vessels and “constriction of the blood vessels is one of the major causes of death of persons experiencing excited delirium.” (IACP, p.52) In response to this identified risk, the IACP recommended the following:

- The hold not be used as a “control” hold but that it be employed with the intent of rendering the person unconscious.
- Full pressure be applied no longer than 30 seconds.
- If the individual is rendered unconscious within 30 seconds, that pressure be reduced so the carotid arteries are not compressed but the neck remains immobilized.
- The carotid hold not be used on the same individual more than twice during a single enforcement contact.
- Whenever possible, the restraint be applied using two officers, one of whom is responsible for monitoring the hold to ensure that it is applied correctly.
- In addition, any prisoner who is considered at risk because of bizarre behaviour or suspicion of drug use should be transported by two officers, one of whom should monitor the prisoner for skin colour, breathing and level of consciousness.
- Any prisoner exhibiting symptoms of cocaine psychosis should be transported to an emergency medical facility for observation.
- After hours of darkness, the officer should use an interior light to monitor the prisoner.
- If the booking process will be lengthy, an officer should remain with the prisoner and keep him under supervision. (p. 52)

In the summer of 2005, Dr R.D. Hoskins wrote that the following conditions will

shorten the duration for which it is safe to apply a neck hold:

- Oxygen debt as a result of physical activity such as running or fighting,
- Increased metabolic rate as a result of physical activity,
- Increased metabolic rate as a result of consumption of stimulant drugs,
- Raised body temperature,
- Compromised respiration due to (partial) occlusion of the mouth or nose, (partial) obstruction of the structures of the throat, limitation of movements of the chest, limitation of movements of the abdomen,
- Shock from blood or fluid loss due to trauma, dehydration or burns, and
- Bradycardia.

He notes that “at rest the brain will be permanently damaged if it is deprived of oxygen for more than about four minutes. The ‘safe period’ will be considerably less in a subject with excited delirium.” He recommends that lateral vascular neck restraints “not be used in such subjects if at all.”

Use of Force Continuum

Some medical experts insist that all neck restraints carry an inherent risk and that they must be understood to be “potentially lethal” (Reay, 1983, p.15). This is not to say that they should not be used by police. Indeed, in an interview conducted in 1993, Dr Reay “stated unequivocally that vascular/carotid restraints were ‘good’ holds, and he supported their availability for use by police officers” with certain caveats. (Puder, 1993, p.34) Reay is adamant, however, that the hold be classified as lethal force. Dr R.D.Hoskins, on the other hand, argues: “From the perspective of the medical probability of an undesirable outcome there is merit in differentiating neck restraints from use of firearms... It seems to me there is scope for a further category that

separates “high probability” lethal force from
“slight probability” lethal force.”

3. LITIGATION/ PUBLIC INQUIRIES

In the late 1970s and early 1980s, there were a number of fatalities attributed to law enforcement neck holds in Canada and in the United States. These fatalities resulted in intense media scrutiny as well as in a number of court actions. (Puder, 1993, p. 4) The following section will review a number of important neck hold cases and investigations in Canada and the United States and will briefly outline some recent developments in both countries.

3.1 Canadian Experience - Fatalities

There have been numerous inquiries associated with neck hold fatalities since the 1980s. They include the following:

- Public Inquiry into the Death of Lorne Halldorsen (1984),
- Inquest report into the death of Gaston Harvey (1986),
- Inquest into the Death of David Nicholl (1993),
- Manslaughter Case in the Death of Stephen Giffin (1999)¹⁴,
- Inquest into the death of Christopher Ecklund (2004).

*Lorne Halldorsen (Alberta, 1984)*¹⁵

a) Circumstances

Mr. Halldorsen allegedly assaulted an RCMP officer without provocation and was subsequently restrained by two RCMP members. The struggle resulted in the application of a carotid hold. The decedent

did not regain consciousness and was pronounced dead upon arrival at the High Prairie Hospital.

b) Results/Outcome

The autopsy report attributed the cause of death to be "... the result of application of pressure around the neck (throttling)." The mechanisms involved in a throttling death were summarized as follows: airway obstruction, carotid occlusion, and vagal inhibition (where pressures on structures of the neck may lead to neurological reflexes which may slow or stop the heart). The Inquiry Report found that the officer who applied the hold "acted in good faith, conscious of his responsibilities for the health and the safety of his prisoner and accordingly the manner of death was found to be accidental." (RCMP p. 18) The Inquest report did make two recommendations:

1. A review be undertaken by the RCMP to determine whether it was appropriate to apply the carotid control technique where it was impossible for an officer to tell whether the subject had lapsed into unconsciousness because of darkness and being on the ground.
2. A review be undertaken by the RCMP to determine if there should be mandatory communication between officers as to what each is doing when both are engaged in restraining the same subject.

The RCMP responded in memorandum that "it would be most difficult, if not impossible, to limit the circumstances under which a carotid control should be applied." They argued that it is far better for their members to be well-trained to correctly apply the neck restraint; to properly understand how much force to use; to understand the physiological

¹⁴ Please note that this researcher was unable to obtain official documents on the Giffin and Ecklund cases, so this paper relies on newspaper reports.

¹⁵The information on this case is from the RCMP's Complaint Commission's Final Report into the complaint of Caroline Miller/Stephen Halliday, 1993.

effects to the body; to understand when to conclude the restraint from a safety point of view; and to ensure proper after care in the event of unconsciousness.

*Gaston Harvey (1986)*¹⁶

a) Circumstances

This death occurred when members of the Quebec Provincial Police were called to intervene at a labour dispute. The decedent, who was moderately intoxicated, became involved in an altercation with several police officers. A neck hold was placed on him for the purpose of getting him into a police car. He continued to struggle and a second hold was placed on him for the purpose of putting him in handcuffs. He lost consciousness after the second hold and was driven 3 or 4 minutes to the police station where it became apparent that he required medical help. He was subsequently taken to hospital where death was pronounced.

b) Results/Outcome

Because of the intensely political nature of the incident, over 2000 people attended Harvey's funeral. Several autopsies were performed, one of which indicated that the brain suffered a lack of oxygen. The Inquest Report found that the immediate cause of death was an indeterminate neck hold which led to cardio-respiratory arrest. In addition, the report noted that the officer who applied the hold did not have specific training on the use of the carotid hold. The report recommended the following:

- Every police officer in Quebec should be informed of the dangers of neck holds.
- No police officer should apply a hold without adequate training.
- Training should be provided on a continuous basis.

¹⁶ *ibid*

*Inquest into the Death of David Nicholl (1993)*¹⁷

a) Circumstances

In October of 1993, David Nicholl used a metal pipe to escape from a Calgary hospital. He eventually ended up on a Kamloops bus where he began spitting on passengers and telling them he had AIDS. Although handcuffed and placed in the back of a police car, he became violent and kicked out the rear window. He was subdued by an RCMP officer who used a carotid hold on him. He died shortly after.

b) Results/Outcome

A Coroner's jury heard from two pathologists as to the cause of death. Dr Laurel Gray, a Vancouver pathologist hired by the RCMP, testified that Nicholls died of asphyxiation, suffocating on his own vomit, while Dr. J.D. McNaughton, also a forensic pathologist, said Nicholl suffered cardiac failure secondary to stimulation of the carotid sinus, a complication of the carotid restraint hold. The jury ruled that Nicholl died as a result of the carotid hold, marking the first time in Canada that a death had been attributed to the specific hold. "Means of death was the result of police action in the administration of the carotid hold," wrote the jury. During the course of the inquest, the jury heard that no refresher courses in carotid holds were available to RCMP officers at that time. The jury recommended that certain safeguards be in place before such a hold be used. They specifically recommended that officers be certified to use the hold and retrained at least every three years. Certification should include instruction on how to recognize possible complications, monitoring of vital signs and level of consciousness, and basic life support techniques. The jury also

¹⁷ The information on this case comes from a series of articles published in the Vancouver Sun 1994-1995 and from the Office of the Chief Coroner, case No. 92-560-0210.

recommended that the use of the hold be reported on and tracked. Furthermore, they recommended that police cars be made more secure. Specifically, they suggested that bars be installed in the prisoner compartment, and that all police cars be equipped with proper leg restraints and first aid equipment. In response to the Inquest, the RCMP hired a former judge to review the results: former Justice George Murray's report indicated that the carotid hold was, in fact, not to blame for the death. Media coverage surrounding the release of the report was critical of the RCMP.

*Manslaughter Trial in the Death of Stephen Giffin (1999)*¹⁸

a) Circumstances

According to newspaper reports, the decedent, Stephen Giffin, had been drinking at a bar when he allegedly fondled a woman. This resulted in an altercation between Giffin and the manager and bouncer resulting in his forcible expulsion from the establishment. During the struggle, Giffin became unresponsive and paramedics were unable to revive him. The autopsy concluded Giffin died when the carotid artery in his neck was stimulated, making his heart stop.

b) Results/Outcome

Two defendants were charged with manslaughter in the death. During the course of the trial, the defence produced a toxicologist who cast doubt on the manner of death. The defendants were found not guilty.

¹⁸ The information on this case comes from The Halifax Daily News, Saturday, July 7, 2001.

*Inquest into the death of Christopher Ecklund (2002)*¹⁹

a) Circumstances

According to newspaper reports, Vancouver police officers were called to an apartment to deal with a man threatening to kill himself. When the officers arrived, they found two men in the apartment, one of them hostile. When pepper spray had no effect, officers used a vascular neck restraint to subdue the man, Christopher Ecklund. He subsequently could not be revived.

b) Results/Outcome

The lawyer for the coroner testified that the decedent died of a heart attack as a result of the neck restraint. A Vancouver Police internal probe concluded that the officers acted appropriately and the use of force to restrain Ecklund was reasonable. The regional Crown Counsel also examined the case and no charges were laid. The final Inquest report is pending.

3.2 Canadian Experience - Complaints

In addition to the fatalities discussed above, the application of neck holds has also resulted in several complaints and civil suits against police in Canada. These cases include the following:

- *Drda v. R.* (1990),
- The complaint of *Juris Laufers* (1992),
- Public Hearing into the complaint of *Caroline Halliday/Michael and Steven Cooper* (1993),
- *Steward v. Martay* (1993),
- *R. v. Magiskan* (2003), and
- Review Board Inquiry into the Arrest of *Robert A'Court* (2005).

¹⁹ The information on this case comes from The Province, Friday September 17, 2004.

*Drda v. R. (1990)*²⁰

a) Circumstances

At 2:00 am on June 28, 1989 Paul Drda attempted to pass a vehicle on the right and collided with an unmarked police car which was parked so as to block the curb lane. An officer immediately advised Mr. Drda that he was being investigated as an impaired driver. Mr. Drda attempted to walk away and when told to remain, he replied loudly and profanely that he could go wherever he wanted. The officer grabbed Mr. Drda from behind and attempted to steer him towards the police car. Mr. Drda resisted by trying to turn around, and the officer placed Mr. Drda in a carotid hold, causing him to become unconscious for 15-20 seconds. He was taken to the police station where he refused to blow into the breathalyzer.

b) Results/Outcome

Mr. Drda was eventually convicted of refusing a lawful demand to provide a breath sample. He appealed the conviction. In her ruling, Madam Justice Huddart commented “the facts in this case provide an example of police conduct that many will consider reprehensible.” She writes,

... the choke-hold and subsequent unconsciousness endured by Mr. Drda deprived him of his liberty and fundamental dignity as an individual. In my view, this invasion of his rights was neither necessary nor reasonable given the nature of the situation. Although Mr. Drda was unpleasant, the evidence does not suggest that he was attacking or threatening either of the officers in any way..... The grossly excessive, unwarranted use of a choke-hold to render Mr. Drda unconscious, took this act beyond the scope of police powers at common law and rendered it unlawful.

²⁰ The summary is based on *Drda v. R.* 1990 Can LII 2112 (BC S.C.)

The judge’s ruling also noted that there had been no evidence that the choke hold was the least invasive means of restraining Mr. Drda from leaving the scene. She concurred with Mr. Drda that his reasons for refusing to blow into the breathalyzer were reasonable given the circumstances of the evening where “the behaviour of Constable Carter may not have been malicious, but it was such as to render Mr. Drda uncooperative toward Constable Carter and his demand, because it was outside the scope of what Mr. Drda could reasonably have anticipated in the circumstances.” She writes that “Constable Carter’s actions demonstrated a total disregard for Mr. Drda’s bodily integrity which easily passed the threshold of unfairness.” Drda’s appeal was therefore granted.

*Complaint of Juris Laufers (1992)*²¹

a) Circumstances

On December 4, 1987, a car driven by Juris Laufers failed to stop at a stop sign and was pursued by the Toronto police. After a brief pursuit, the car stopped and Laufers exited the vehicle. Because he appeared intoxicated, officers proceeded to arrest Laufers and a struggle ensued. Laufers was eventually brought to a police cell where he continued to struggle against police, biting, kicking, and scratching. An officer attempted to apply a carotid hold for approximately seven seconds but was interrupted. Eventually, Laufers was controlled by an officer who pinned his head down to the floor with his foot. At no time was Laufers rendered unconscious. Doctors who later examined him found soft tissue trauma of the neck, arms, and legs; he had complained of a sore throat, difficulty swallowing, and a hoarse voice. Although eventually convicted of the offense of

²¹ Summary based on *Laufers v. Toronto (Metropolitan) Police Force* (Ont. Div Ct.)

operating a motor vehicle while intoxicated, Laufers launched a complaint against police. His complaint stated, in part, "I felt that the degree of mistreatment and the injuries suffered for the violation that I have committed is not justified."

b) Results/Outcome

The Toronto Chief of Police dismissed the complaint, but the Public Complaints Commissioner ordered a Board of Inquiry to hear the allegations that the arresting officers "... used unnecessary violence against the complainant ... by employing a carotid artery restraint on his neck contrary to subsection 1(g)(ii) of the Code of Offences set out in the Police Act..." During the course of the Inquiry, the carotid neck hold technique was subject to scrutiny and several experts brought in. A Dr Yaphe testified as to the potential risks of using the carotid hold. He stated:

- 1) In a person with arteriosclerotic disease, plaque could be dislodged, move to the brain, and cause a stroke.
- 2) If a person's blood supply is tenuous, a clot could form.
- 3) With an intoxicated person, the application of pressure to the carotid arteries is dangerous and potentially life-threatening because intoxicated persons do not have appropriate reflexes to guard their airways.

The Board of Inquiry also heard the testimony of Sgt. Mark Finkelstein, a police officer with the Toronto Police Service (TPS) and the author of "Self Defence Training: The Carotid Restraint." It was his opinion that the hold was "potentially dangerous" rather than "dangerous" and that given the situation in which the police officers found themselves, he would have used the hold himself.

The Board also heard from Sgt. Wes Ryan, who had been a TPS member for 20 years and was presently an instructor at C.O.Bick College. He testified that at the college, instructions into the use of the carotid hold technique had ceased because there was no mechanism in place to keep officers current on the proper application of the technique. He described the LVNR as a "very effective technique, if properly applied, but one that could prove dangerous – officers should be updated every 6 months."

Judo evidence was also introduced to the Board by William Manson, the former Executive Director of Judo Ontario. He testified that in 26 years of Judo in Canada, the hold had been applied many times with no deaths or serious repercussions. He acknowledged that the hold could potentially be dangerous.

The Board of Inquiry accepted "the evidence of Dr. Yaphe that the use of carotid artery restraint is a potentially life-threatening technique" and felt that the evidence of neck hold use in Judo had "no meaningful application to the use of neck restraints in law enforcement." The Board found the officer who applied the hold to have acted with "reckless disregard of the health and safety of Mr. Laufers." He was consequently found guilty of misconduct. The officer appealed. During the appeal to the Ontario Court of Justice, Judge O'Driscoll focused his interest on whether or not the carotid artery restraint had been "allowed, prohibited, condoned or suffered" at the time it had been used on Mr. Laufers. He found that all officers hired between 1970 and 1992 had been taught the technique at some time and that there had been no orders rescinding or restricting its use. He noted that in the age of AIDS, officers were aware of becoming infected through bites and asked "were the subject officers obliged to let JRL... have "one free bite" before they used appropriate force..." He then wrote:

In my view the Board,

a) condemned the use of the carotid artery restraint because it was “potentially dangerous.” Most physical force has the like potential.

...

c) failed to view the totality of the circumstances from the perspective of “it is the belief of the police officer, in the light of all the circumstances, that is important.” (R. v. Bottrell, supra)

The Judge concluded that the Board did not consider the case as it was required to do – from the perspective of the officers who had to act in the heat of the moment. He quashed the finding of misconduct and granted the appeal.

Public Hearing into the complaint of Caroline Halliday/Michael and Steven Cooper (1993)²²

a) Circumstances

Caroline Halliday was stopped for a traffic light offense on the night of November 4, 1989. The RCMP officer believed that she had been drinking alcohol, and he planned to make a roadside suspension of her driver’s license. A discussion ensued in which the officer perceived that Caroline Halliday intended to disregard his orders and get into her car to drive away. Believing she was about to commit an indictable offense, the officer grabbed Ms. Halliday about the throat in what he intended to be a carotid hold. She made choking sounds and he realized that the hold was applied incorrectly. He adjusted his hands’ position but was unable to maneuver her into the police car. Backup arrived shortly and the Constable released Ms. Halliday. Of note is the fact that Ms. Halliday was 5’ 3” and 100

²² From the Commission for Complaints against the RCMP Chairman’s Final Report after a Public Hearing Complainant: Caroline Miller Halliday. 1992.

lbs and the arresting officer was six feet tall and weighed 185 lbs.

b) Results/Outcome

Ms Halliday complained to the RCMP. Her primary complaint was that the application of the carotid control technique constituted an unreasonable and excessive use of force. The RCMP conducted an internal investigation that concluded that the Constable had been acting within the law and that it was not possible to determine if a breach of the RCMP Code of Conduct had occurred. Ms. Halliday was dissatisfied with this response and took her complaint to the Commission for Public Complaints Against the RCMP.

Because the complaints of Caroline Halliday and Michael and Steven Cooper stemmed from the use of a carotid control hold, the complaints were consolidated into one public hearing. At the hearing, the Commission first directed itself to an examination of the hold from a physiological perspective. It examined Dr Donald T. Reay and asked his opinion on the potential medical consequences of the hold. (See medical section for a detailed review of Dr Reay’s research.) The Commission then reviewed the following cases: Juris R. Laufers, Lorne Hallderson, Gaston Harvey, and Eric Luther. Based on Reay’s expert testimony and on their review of the aforementioned cases, the Commission made the following findings about the medical implications of the carotid hold:

- *The use of the carotid control technique, even when properly applied, carries a small but significant risk of death or serious bodily harm. Death or bodily injury may occur where the hold*

i) is initially applied in a proper manner but the struggles of the subject cause the hold to slip or cause injury to the subject

ii) is properly applied but the subject is suffering from certain physiological or medical conditions.

- *The use of the carotid control technique is a preferable alternative to the use of a firearm or a blow to the head by a baton or similar object.*

The Commission then reviewed the RCMP training on the carotid hold technique. Based on testimony from several instructors and ex-instructors as well as on the training manual, the Commission made several findings:

- *No distinction is made in the Recruit Training Program of the RCMP between the use of carotid control*
 - a) for the purpose of self-defense of the officer or the defence of others from physical attack; and*
 - b) for the purpose of controlling uncooperative suspects.*
- *RCMP members are not adequately educated about the risk of death or serious injury that may follow the proper application of the carotid control technique.*

After reviewing the circumstances of Caroline Halliday's case, the Commission found that "the use of the carotid control technique on Caroline Halliday in the circumstances of this complaint constituted an application of more force than was necessary and any escape by flight could have been prevented by other reasonable means in a less violent manner." However, they also found that the Constable involved believed, based on his training, that the technique was an acceptable means of effecting an arrest at the time and that the hold was without risk of dangerous consequences.

In the end, the Commission made 16 recommendations. Of importance to this

review are recommendations 1, 3, 4, 5, 6, and 7:

1) The RCMP should develop and provide in-service training on the use of compliance techniques and come-along holds (including carotid holds). These programs should be provided at regular intervals, should include an evaluation of the officers' skills, retraining where required, and instruction with respect to new information and techniques.

3) The RCMP consider the use of a form on which any use of the carotid control technique will be recorded. This data should be periodically reviewed.

4) The RCMP should conduct a review of the literature concerning the physiological effects of the carotid hold having particular regard to

(a) its use when RCMP policy otherwise authorizes the use of lethal force.

(b) the safety of the officer or other persons who may be in danger by reason of the conduct of the person on whom it is proposed to use the carotid hold technique.

(c) the availability and suitability of other methods of effecting an arrest ... that have less potential to cause harm; and

(d) not using the carotid control technique either as a method of merely controlling an uncooperative suspect or as a come-along technique where less dangerous means of accomplishing the RCMP member's objective may be used.

5) The RCMP consider reintroducing its policy on the use of application of the carotid control technique ... into the Operations Manual or other document

where it will be readily available to all members of the RCMP.

6) RCMP members be advised of the potentially dangerous consequences that may occur even from a proper application of the carotid control technique.

7) The self-defence component of the Recruit Training Program be reviewed and, if advisable, revised having regard to the factors enumerated in Recommendation Four. (above)

*Steward v. Martay (1993)*²³

a) Circumstances

On the evening of April 19th, 1989, Charles Steward and Terrance Noonan attended a night club and became embroiled in a struggle with the club's two bouncers. During the course of the struggle, Steward attempted to scratch and hit a bouncer who then applied a lateral vascular neck restraint and rendered Steward unconscious. When he regained consciousness about ten seconds later, Steward threatened to sue. A passing police officer intervened, ordering the bouncers back into the bar. He told Steward and Noonan, whom he concluded were intoxicated and agitated, that they could make a complaint in the morning if they wanted and threatened to arrest them for causing a disturbance if they did not leave the area.

b) Results/Outcome

Noonan and Steward sued the bar. In his ruling, Judge Curtis accepted that *most* of the techniques used to subdue Noonan and Steward were reasonable given that the plaintiffs were being aggressive. However, the Judge found that the "use of the lateral neck restraint upon Mr. Steward to render

²³ Steward v. Martay. 1993. Can LII 1587. (BC S.C)

him unconscious went beyond the degree of force reasonably required." He further found that the bouncer "could have used a less drastic technique to control Mr. Steward." He writes,

There has for some time been considerable debate about the use of the lateral neck restraint. Mr. Carty is of the opinion that it is safe when properly applied. There is no question he applied it properly, however, whether it is safe or not is another matter.

In the end, Charles Steward was found to be entitled to recover damages from the club in the amount of \$1500. The claim for aggravated and punitive damages was dismissed since the plaintiffs were found to have provoked the incident.

*R. v. Magiskan (2003)*²⁴

a) Circumstances

On the night of December 27th 1997, the Thunder Bay Police were called to attend a domestic disturbance. Receiving the impression that a domestic assault had occurred, two constables attempted to arrest and thereby became embroiled in a struggle with Mr. Stewart Boissoneau, who was sitting in his car. During the course of the struggle, Mr. Boissoneau was pepper sprayed, hit with an asp, and subjected to a "choke hold." (Although described as a choke hold, it is clear that this was a carotid hold in this case.) His fiancée, Patricia Magiskan, an off-duty police officer, attempted to stop the struggle and was charged with obstruction and assaulting a police officer.

b) Results/Outcome

²⁴ R v. Magiskan. 2003, Can LII 859. (On S.C.)

Although she was initially convicted of the above offenses, Ms. Magiskan appealed the conviction. In his judgment, Judge Zelinski found that the police officers had used excessive force to arrest Mr. Boissoneau. In his words, "There was no necessity to resort to a chokehold..." Because the constables' actions were deemed unreasonable, the judge agreed that Ms. Magiskan was entitled to intervene under sections 25 and 27 of the Criminal Code. He quashed the convictions and acquitted the appellant.

A'Court has also launched a civil suit against the city of Truro claiming officers used "excessive force" in making the arrest and "intentionally harmed him." That case has yet to come to court.

*Review Board Inquiry into the Arrest of Robert A'Court (2005)*²⁵

a) Circumstances

According to newspaper reports, on June 1, 2003, Robert A'Court was arrested for allegedly pushing an officer who was walking through an unruly crowd in a bar parking lot. A brief scuffle ensued during which A'Court was pepper-sprayed, subjected to a wrist lock, and put into a neck restraint before being handcuffed and subdued. He was later acquitted of the charge of assaulting a police officer.

b) Results/Outcome

Mr. A'Court launched a complaint of excessive force against each of the four arresting officers. In July 2005, the Nova Scotia Police Review Board cleared three of the four officers but found one guilty of excessive force for using pepper spray on A'Court. The penalty is yet to be determined. In its decision, the Board also recommended that the police chief,

- Review the level-of-force policy,
- Review current training and development protocols on the proper use of neck restraints, and
- Implement any changes such a review may endorse.

²⁵ From The Daily News (Truro). Saturday, July 2, 2005.

*Unnamed Complainant 2001-2002 Annual Report of the Commission for Public Complaints against the RCMP*²⁶

a) Circumstances

Members of the RCMP pulled over the complainant to investigate possible impaired driving. While checking his documents, another RCMP cruiser arrived on the scene. The officers realized the complainant was possibly the subject of an outstanding immigration warrant. A scuffle ensued during which the complainant was kned in the thigh, had a neck hold applied and had a pain compliance technique applied to his eyes. The identity of the complainant was later clarified and he was released.

b) Results/Outcome

A complaint was launched against the RCMP for excessive use of force. The RCMP's internal investigation ignored the allegation of the neck hold and found the other force measures appropriate. The Commission for Public Complaints against the RCMP Commission found that, given that there were three officers on the scene, the physical force used against the complainant was excessive. The Commission further found that the use of the neck hold likely culminated in a choke hold, a hold which was banned by the RCMP in 1979. Further, the Commission found that the neck hold was not used in accordance with policy since the control hold is only authorized when an individual's life is at risk. The RCMP Commissioner, in his response, rejected these findings and found that the use of force was in accordance with policy. In her final report, the Commission Chair was deeply troubled by this response "since it was clear that a neck hold was administered to the complainant."

²⁶ From the From the Commission for Complaints against the RCMP. 2001-2002 Annual Report

3.3 U.S. Experience

In the United States, neck holds became a public issue in the late 1970s and early 1980s as a result of several deaths following the application of neck holds. Accompanying the fatalities was intense media coverage and a number of court actions. Compounding the problem were the intense racial and political overtones inherent in the cases, particularly those which had occurred in Los Angeles. 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. The court did, however, characterize the hold as "use of deadly force" and implied that Lyons had an adequate case to sue the city for damages. Judge White, delivering the opinion of the court, wrote, "The individual States may permit their courts to use injunctions to oversee the conduct of law enforcement authorities on a continuing basis. But this is not the role of a federal

court, absent far more justification than Lyons has proffered in this case.” (Los Angeles v. Lyons, 461 U.S. 95 (1983))

Another major legal challenge to neck holds occurred in federal court in Georgia 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.²⁷ This case is significant because, as with Lyons, the court characterized the neck hold as lethal force.

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.

According to an AELE training bulletin, there have been a number of costly lawsuits that have arisen due to the use of the carotid hold. In 1983, a Chicago family accepted a \$500,000 settlement for the death of a man who died from a bar-arm hold. The city offered this payment despite the fact that it did not authorize the hold and instead teaches the carotid restraint method.²⁸ In 1981, an off-duty California sheriff's deputy received \$13,360 after being choked by city

police officers who did not know he was a police officer and believed him to be armed. In another incident in the early 1980s, California officers observed a man kissing a male friend. When they asked him for identification, a verbal confrontation ensued which led to the application of a choke hold. The man received \$250,000 for abnormal brain waves which were attributed to the hold. As recently as September 2005, the Dallas Morning News reported that the City of Dallas “may pay \$800,000 ... to the family of a 23-year old man killed after two police officers used a controversial neck hold on him.” The City's legal team said several important factors led them to approve the payment including the following:

- The arresting officers did not attempt CPR on the victim.
- One of the officers had failed his state police exam three times after being hired by the department but was allowed to become an officer anyway.
- The Dallas Police Department has now banned the hold entirely.

The Dallas Police department intends to replace the hold with Tasers® as a method to subdue combative suspects.

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

²⁷ As summarized in Bill Clede's Police Nonlethal Use of Force Manual.

²⁸ *Nethery v. City of Chicago*

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.”

3.4 Discussion of Legal Findings

Based on this review, it is clear that neck holds are characterized as extreme and even potentially lethal measures by many judges and by most Boards of Inquiry. In the case of David Nicholls, the Coroner’s jury ruled that Nicholl died as a result of the carotid hold, marking the first time in Canada that a death had been attributed to the specific hold. “Means of death was the result of police action in the administration of the carotid hold,” wrote the jury. In *Steward v. Martay*, Judge Curtis referred to the neck restraint as a “drastic technique.” In *R. v. Magiskan*, Judge Zelinski felt that “there was no necessity to resort to a choke hold” implying that the hold should only be used as a last resort. In *Drda v. R.*, Judge Huddart wrote that the use of the neck hold had been “grossly excessive” and “unwarranted.” In the case of *Juris Laufers*, the Board of Inquiry accepted “the evidence

of Dr. Yaphe that the use of the carotid artery restraint is a potentially life-threatening technique.” It found that an officer who administered this hold showed “reckless disregard of the health and safety of Mr. Laufers.” The Commission for Public Complaints Against the RCMP likewise found that the technique carries “a small but significant risk of death or serious bodily harm.” It must also be noted that in many of the cases reviewed, those sitting in judgment make no distinction between “choke holds” and “carotid restraints.” Whether this is a gap in understanding or simply convenience is unclear. Choke holds are widely regarded as dangerous because they put pressure across the windpipe, while the carotid restraint puts no pressure on the front of the neck. The confusion of one with the other may perhaps explain, in part, why courts react so strongly to the use of a carotid hold.

Where police use of a neck hold leads to a formal inquest or civil action, the courts/boards tend to focus on four questions:

1. Was the use of a neck hold reasonable and appropriate given the totality of the circumstances? In order to answer this question, the Courts/Boards of Inquiry reviewed in this paper typically focus on
 - the ability of the complainant/decedent to harm the officer(s) involved,
 - the level and type of resistance offered by the suspect,
 - the purpose of the neck hold (i.e. self-defence or as a “come-along” hold),
 - the number of officers present, and
 - the perceptions of the officers involved in the struggle.
2. Did the officers follow policy?
3. Did the officers use the hold as they were trained to?

4. Did the officers act in good faith, conscious of their responsibility for the health and safety of their prisoner?

In the Halliday case, the Board felt that the use of the neck hold was “an application of more force than was necessary.” They specifically noted that Caroline Halliday was 5’3” and 100 lbs, while the arresting officer was six feet tall and weighed 185 lbs. They noted that her resistance was not combative and could have posed no physical threat to the officer. However, they also agreed that the officer involved felt, based on his recruit training, that he was using the technique in an appropriate manner to effect an arrest. RCMP policy specifically authorized the use of the carotid control hold and had not “given much guidance to its members with respect to the circumstances in which it is appropriate to use the technique.” The officer stated that he used the carotid control technique to enable him to place Ms. Halliday into the police cruiser without causing any injuries to her. Further, the officer stated that he was unaware of potentially dangerous consequences of the hold. In light of all these facts, while the Board found that the force used was excessive, it did not find the officer guilty of misconduct.

Using a similar kind of analysis, Judge Zelinski, in *R. v. Magiskan*, found that the measures of force used against Mr. Boissoneau were so excessive as to render the arrest unlawful. He notes “there was no evidence of urgency” in the removal of Mr. Boissoneau from his car and that “there were no reasonable grounds to believe that the officers had reason to consider that they themselves were in danger of death or grievous bodily harm from Mr. Boissoneau.” Further, the type of resistance posed by Mr. Boissoneau was “mainly resistive, more than assaultive.” The officers themselves did not appear to have perceived Mr. Boissoneau as a threat. The judge further notes that the carotid control technique is “not something taught in police use of force

training.” The injuries sustained by Mr. Boissoneau were, in the judge’s view, both serious and caused by the police officers. With all these facts articulated, the Judge found that the use of the neck hold failed the test of reasonable necessity.

In the appeal based on the *Juris Laufers* complaint, the Judge used a similar line of reasoning and thereby quashed the convictions of misconduct against two officers. Judge O’Driscoll noted that the level and type of resistance posed by Laufers was sufficiently high to warrant the use of force against him. The judge observes that Laufers was intoxicated, strong, and belligerent and that he was “raising his head, snapping at and attempting to bite anyone and anything that came in range.” The judge asks if, in this age of AIDS, the complainant was entitled to “one free bite” before the officers could use appropriate force to restrain him. He also observed that the officers were actually compelled to restrain Laufers under Toronto Police Administrative Procedures. The Judge also notes that there had been no orders rescinding or restricting the use of a carotid hold and that all officers hired between 1970 and 1992 had, in fact, been trained to use the hold. And finally, he noted that both officers involved were genuinely of the belief that their use of force was warranted by the circumstances. He further observes that the Board of Inquiry erred in condemning the use of the carotid restraint because it was “potentially dangerous” and noted that “most physical force has the like potential.”

In cases where recommendations are made to law enforcement, most focus on neck restraint training and policy. The recommendations arising from Canadian litigation and inquiries can be summarized as follows:

- Training on the carotid hold should be provided on a continuous basis.

- In training, officers should be informed of the hold's potential for lethality/serious bodily harm.
- The hold should be limited by policy to situations where officers or others are in danger. For instance, the hold should be used for the purpose of self-defense but not be used as a "come-along" hold. In addition, one Inquest report recommended that the hold not be used where visibility is an issue and the officer cannot see the impact the hold has had on his subject.
- Police agencies should record when the hold has been used and review this data periodically to ensure that officers are following policy.
- Ongoing review and research should be conducted on the proper use of neck restraints and changes implemented where appropriate.

4. POLICING PERSPECTIVES

Since 1981 when a federal appellate court ordered the Los Angeles Police Department to cease using any neck restraints, police agencies across the continent have wrestled with the question of whether to use the technique or not. In 1989, a poll conducted amongst law enforcement agencies of varying sizes across the U.S. revealed that at that time, only 30% of agencies used the hold while 30% had a ban on its use. (Sharp, 1989, p. 31) From a policing perspective, there are arguments both in favour of and against using the hold.

4.1. Arguments for Using the Hold

A review of the police literature reveals several advantages of the hold:

- Neck restraints can be used effectively regardless of the size of either the person to be controlled or the size of the police officer.
- Applied properly, the neck restraint can resolve confrontations very quickly thus enhancing officer and suspect safety.
- The hold can be used in close quarters.
- Neck holds are a “humane” alternative to impact weapons and/or deadly force.

Neck restraints can be used effectively regardless of the size of either the person to be controlled or the police officer.

In his 1987 book, *Police Nonlethal Force Manual*, police trainer Bill Clede writes, “I saw a film of a 125-pound female police officer restrain, take down, and cuff a 210-pound construction worker using the Lateral Vascular Neck Restraint.”(p.59) In its promotional literature, the National Law Training Centre—who, it must be noted, sell their LVNR training—writes that “regardless of any size or strength, the officer can employ LVNR against any subject because its use is target-specific to the neck during application. During active resistance, non-

target specific attempts can expose officers to personal attack and takedown, allowing for personal and weapon assault by an aggressive subject.”

Applied properly, the neck restraint can resolve confrontations very quickly.

As we have seen from the medical literature, a properly applied carotid hold can induce a brief unconsciousness within approximately ten seconds. Charles Braden and James Lindell note that “once applied, it [the neck restraint] provides more protection to the officer than any other known method of control, and it concludes physical resistance without injury to the subject faster than any other restraint means known.” (1982, p. 59) Logic dictates that the quicker a confrontation ends, the less likely the officer or arrestee will be injured.

The LVNR can be used in close quarters

According to an AELE bulletin, the lateral vascular neck restraint does not require a lot of room; it is possible to employ neck restraint in close contact, in narrow or cluttered premises. This is in contrast to other methods, like batons, which require room for striking distance. Similarly, OC Spray requires that a certain distance be maintained between the arresting officer(s) and the subject. As a noted American law enforcement trainer observed, “because weapons are not always at hand or justifiable, they must be rejected when seeking a close quarter fighting system.” (Puder, 1993, p.27)

Neck holds are a “humane” alternative to impact weapons and lethal force.

In combative situations with unruly subjects, officers have a range of options from which to choose to effect an arrest. These can be divided into two main categories: weaponless techniques and weapons. In their article on neck restraints, Charles Braden and James Lindell explain that most

weaponless methods are too difficult to apply safely,

The ability to apply only the proper amount of force required at any given moment in a physical resist situation is highly desirable but relatively difficult to achieve with most restraint methods. For example, the use of wrist locks, arm bars, and arm locks is largely dependent upon the position in which the resister happens to be at the moment of application and the kind and degree of resistance offered at the time. ... Successful control with any locking technique requires a relatively high degree of skill to apply. Most police officers do not have the training, experience or confidence to apply these kinds of control methods. (p. 54)

Because of this fact, many officers rely on weapons to arrest unruly subjects. Braden and Lindell note that all forms of weapons “constitute potential means of inflicting traumatic injury on any subject upon whom they are used for control.” (p. 54) Indeed, an example of injuries due to weapons use during arrests can be seen in Los Angeles. In the early 1980s, the LAPD banned the use of neck holds from routine use; essentially, they categorized them as lethal force. According to police tactics consultant Greg Meyer, this effectively made “the baton a tool of aggression instead of merely self-defense.” Then-chief Darryl Gates, speaking about police batons to the Police Commission was quoted as saying that “if used, these would result in injury in almost every case, a result which does not occur from employment of (choke)holds.” Two years after the ban, Gates provided the LA City council with information that injuries to suspects had climbed from an average of 3.1 per week prior to the choke hold moratorium to 23.6 per week afterward, a 661% increase. Similarly, injuries to police officers had increased 521%. (Meyer, 1999) Proponents of the neck hold argue that neck

restraints are an attempt to provide “humane” means of controlling combative persons without the necessity of striking them, thus minimizing the risk of broken bones, lacerations and other impact-related trauma. This, proponents argue, benefits both the arresting officer as well as the arrestee. Some LVNR supporters argue that in the case of very violent offenders, rendering them unconscious is the only way to subdue them safely. (Kelly, 1998, p. 82) This would be particularly true in the case of individuals under the influence of street drugs, mentally ill persons, and those persons experiencing an adrenaline rush who therefore do not feel pain.

4.2 Arguments against Using the Hold

According to the AELE Law Enforcement Legal Center, risks and disadvantages of the LVNR include the following:

1. Neck restraints, if used improperly, have caused death or paralysis.
2. Due to the dynamics of a violent struggle, it is often difficult to correctly use such methods.
3. Several instances of “unexplained” death have followed the use of the technique, unaccompanied by any discoverable physical injuries. This phenomena, known as “custody death syndrome” is not understood and research is still ongoing.
4. Perpetual and time-consuming training is needed to maintain minimum proficiency.
5. During litigation, it is difficult to precisely explain to a jury the physiological effects of neck restraint procedures due to an inadequate base of medical evidence.
6. It is difficult for an officer to monitor and control the amount of pressure used during the procedure.
7. Once the restraint has been applied, there is a need to closely monitor the arrestee. This may be impractical. (AELE, Issue #3)

Neck restraints, if used improperly, have caused death or paralysis.

While proponents of the hold argue that, used correctly, it rarely injures a person, it is true that there have been deaths attributed to the carotid hold. This study alone has identified five Canadian deaths associated with neck hold techniques since 1984. (To put this into some context, the recently released TASER study has identified 13 Canadian deaths associated with CED use.) (CACP, 2005, p.17) Statistics are not kept on the frequency of injuries related to the use of the LVNR technique.

Due to the dynamics of a violent struggle, it is often difficult to correctly use such methods.

The medical literature reviewed for this report identified this as a potential problem with the hold. Essentially, the carotid hold can become a chokehold/respiratory hold. In their textbook, *Forensic Pathology*, Doctors Vincent and Dominick DiMaio observe “in theory, the carotid sleeper 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, as the individual twists and turns to break the hold.” (p. 274) In the fourteen fatalities reviewed by Dr. E.K. Kowai and the two reviewed by Doctors Reay and Eisele, this seems to have been the case.

Several instances of “unexplained” death have followed the use of the technique, unaccompanied by any discoverable physical injuries. This phenomena, known as “custody death syndrome” is not understood and research is still ongoing.

Essentially, opponents of the LVNR technique are concerned that the technique can be blamed for sudden deaths even in the absence of evidence that implicates a

causal relationship between the use of the hold and death. In their section on Excited Delirium, the authors of the textbook, *Forensic Pathology*, make several observations about the issue of death in custody which explain how this happens.

When someone dies in custody, the natural question is why. An explanation involving catecholamines, alpha and beta receptors, and potassium levels, is difficult for most people to understand. Choke holds and positional asphyxia can be demonstrated and are simple to understand, therefore it is normal to gravitate to this simpler explanation for a death. Even if there is absolutely no evidence of use of a choke hold or positional asphyxia, and the law enforcement personnel deny using either, the denials are sometimes dismissed as a cover-up. The concept of death caused by a choke hold is very popular because, when no evidence of trauma to the neck is found, this would seem to “prove” that the choke hold was “expertly” applied. (DiMaio,2001,p.503)

Perpetual and time-consuming training is needed to maintain minimum proficiency.

Most supporters of the LVNR technique recommend that officers be reinstructed on its use at regular intervals. At the CPS, recruit training on the technique currently lasts 12-14 hours with refresher training scheduled to take one to two hours. This may be prohibitive to police services both in terms of the time taken to train as well as the cost of this training.

During litigation, it is difficult to precisely explain to a jury the physiological effects of neck restraint procedures due to an inadequate base of medical evidence.

Essentially, opponents of the hold argue that there is an inadequate base of medical

evidence to support the use of the hold. A brief examination of Canadian litigation reveals that there is no consensus amongst the medical profession as to the safety of the hold or even, in the case of deaths following the application of a neck hold, cause of death. Even in cases where autopsies have been performed more than once, doctors have failed to agree on cause of death.

It is difficult for an officer to monitor and control the amount of pressure used during the procedure.

This objection should be paired with the observation that it can be difficult to correctly use the method during a violent struggle. This is an issue that has been raised by many of the medical researchers reviewed in the previous section of this report.

Once the restraint has been applied, there is a need to closely monitor the arrestee. This may be impractical.

Even supporters of the hold often recommend that persons subjected to a LVNR be either closely monitored by the arresting officer, or, indeed, transported to the hospital to be checked by a doctor. This may not be practical in terms the time it may take for the arresting officer, who would then not be working the street.

4.3 Police Agency Recommendations

Any police review of the LVNR technique that argues for continuing to use the hold generally makes recommendations in four areas: training, placement of the hold in the use of force continuum, safety enhancements, and post-application health precautions.

4.3.1 Training Recommendations

In his book, *The Thinking Officer's Guide to Police Defensive Tactics*, Perry William

Kelly makes several training recommendations for law enforcement agencies that wish to use the LVNR technique. They are as follows:

- Specify where the technique fits in the use of force continuum. (i.e. is it level 3 (weaponless control) or level 5 (deadly force))
- Devote sufficient time to teaching and practicing the technique.
- Adjust course content to include the following:
 - a) Anatomical structure and weaknesses of the throat and neck area
 - b) Physiological effects
 - c) Method of applying hold (3 levels of force)
 - d) Duration of the hold when applied
 - e) Improper method of applying hold and resulting dangers
 - f) Potential fatal consequences of hold even when properly applied
 - g) Historical information concerning lawsuits that have resulted from its use (i.e. Adolph Lyons case in the US)
 - h) First aid procedures following cessation of the hold
 - i) That the hold should not be used with an impact tool
 - j) Why the hold is preferred over respiratory chokes
 - k) Proper body positioning during the application of the hold so that the subject's weight is not left hanging
 - l) The dangers of repeated uses of the hold
 - m) The danger of applying the hold on some people (e.g. those with cardiac disorders, hypertension, undeveloped nervous systems, those using street drugs)
 - n) The effect of adrenaline in both the officer and the subject resulting in high stress situations that impede the proper use of the hold
 - o) The effect of ego in hampering the police officer from realizing that the goal of the technique is control of the

individual, not his or her unconsciousness.

Other training recommendations include the suggestion that during training officers be taught to assume a triple role as the restrainer (competitor), the restrained (subject), and finally as the evaluator (referee). (Braden, 1982, p.58) In this fashion, police officers will become highly knowledgeable about the technique's application, safety, and the care and medical attention required by the subject. Other studies on the restraint recommend actually having officers certified in the technique. Finally, most research on the hold makes the point that refresher courses be held at regular intervals, although there is no consensus on how often that might be.

4.3.2 Use of Force Continuum – When to Use

Many police researchers observe that because the LVNR technique has been associated –albeit infrequently—with deaths, it should be classified as deadly force, along with firearms. Others feel that the LVNR is a “justified weaponless control technique,” and it should be classified as an unarmed controlling technique. (Kelly, 1998, p. 75) In 1992, the San Diego Custody Death Task Force recommended that the carotid restraint be retained as a method of control but that it be used only on individuals who were actively resisting or assaultive. The task force further recommended that the technique be used only with the intention of rendering individuals unconscious, and not as a control (come-along) hold. The San Diego Police Department guidelines cite four situations in which the neck hold is acceptable: (Sharp, 1989, p. 33)

- When an officer is physically attacked.
- When an officer has to stop a physical attack on another person.

- When the officer has attempted a less forceful method and found it inadequate.
- If the officer, after evaluating the particular circumstances, has decided a weaker level of force would be inadequate.

The BC Commission of Inquiry recommended that the neck hold be defined as potentially deadly force, distinguished from deadly force (i.e. firearms and head strikes with an impact weapon.) (Puder, 1993, p.32)

4.3.3 Safety Enhancements

The San Diego Custody Death Task Force also made several recommendations to enhance the safety of the technique including

- The hold should not be applied for more than 30 seconds,
- The hold should not be used twice on the same individual.
- Wherever possible, it should be a “two officer” technique with one officer applying the hold and one monitoring the application and the condition of the suspect.

Where there are many kinds of neck restraints, the two-arm carotid restraint – such as the one used by the CPS -- is considered by many to be the safest because the officer's head and neck “act like a cervical collar preventing lateral movement.” This prevents the subject's neck from being injured. (Clede, 1987, p. 62)

4.3.4 Subject Aftercare - Health Precautions

Most police research on the subject of the carotid hold makes some kind of recommendation regarding monitoring the health of the individual on whom it has been applied. The San Diego task force

recommended that any individual exhibiting the symptoms of cocaine psychosis or any similar drug-induced syndrome should be taken to a medical facility prior to transport to a police facility. In addition, where it is suspected that a prisoner is "high risk," he should be transported by two officers, one of whom should monitor him for skin colour, breathing, and level of consciousness. (IACP Training Key, 1993, p.52) In addition, after hours of darkness, the officer should use an interior light to assist in monitoring the subject during transportation. During the booking process, the task force further recommends, an officer should remain with the prisoner and keep him under supervision.

In an article in Law and Order magazine, Arthur Sharp writes,

Considering past controversies, it is a wise idea to seek hospital examinations for any person ... in a situation where an officer uses the neck hold. It might prevent the onset of physical and emotional complications, reduce the amount of negative publicity involving its use, and lessen the risk of liability.

In his training manual, Bill Clede advises officers that when subjects revive, they should be asked if they want medical attention and, if they do, they should be taken to a medical facility. (p.63)

5. RECOMMENDATIONS

It is unfortunate that medical research does not provide any definitive answer to the question of whether the LVNR technique is safe. From a medical point of view, the technique has both supporters and detractors. Likewise, from a legal standpoint, the technique is neither firmly endorsed nor fully condemned. This review must therefore leave the question of whether to continue using the technique in the hands of executive level policy makers. It can, however, make some recommendations at a lower level.

1. Further Review of Existing Research

It must be stressed that this report has been prepared by an analyst with no medical background. Consequently, there may be gaps both in content and in understanding of the medical research. It is strongly recommended that further review be undertaken by someone in the field of medicine.

2. New Research

The existing medical research on the subject of the lateral vascular neck restraint technique suffers from a number of shortcomings. There is, first, no national statistical data that would allow law enforcement to review the relative risks of this technique as compared to other subject control techniques. In addition, there is virtually no published research on the potential for injuries with this technique. Finally, almost all the medical research on police use of the technique comes from an analysis of fatalities associated with the neck hold. The Calgary Police Service should identify an appropriate research body or council and propose that research be undertaken to accomplish the following:

- Collect use of force data on a national level. This should include the type of force used, frequency of use, on whom

it is used, and, most importantly, outcomes.

- Medical analysis and review of the LVNR technique itself.

3. Review of Training Protocols

Although opinion is varied on the degree of risk associated with the lateral vascular neck restraint, most experts agree on the importance of proper training on the use of the technique. Based on the expert opinion, the Calgary Police Service should review its training protocols to ensure that the following is accomplished:

- Training includes a recognition of the potential for fatalities.
- Training includes a section specifically on how to prevent the LVNR from becoming a choke hold.
- There should be frequent reinstruction in the use of LVNR. Members should be retrained at regular intervals.
- “High risk” persons should be identified –that is, officers should be taught to recognize persons who have been consistently identified by the medical research as being at higher risk from the LVNR technique.
- During training, officers should be taught to assume a triple role as the restrainer, the restrained, and the referee.
- Officers should be trained to recognize symptoms of distress and to administer CPR if necessary.

4. Placement in Use of Force Continuum

Most written medical opinion on the technique advises law enforcement only to use the LVNR as a last resort to subdue violent suspects. Even the IACP, who would recommend retaining the LVNR, suggest that the hold not be used as a control hold but with the intent of rendering a person unconscious –that is, used only in self-defense but not be used as a “come-along” hold. Some medical experts would advise

that the LVNR be placed in the category of lethal force, along with firearms. Others would recommend that law enforcement place the technique in a “low probability” lethal force category. The Calgary Police Service may wish to consider these alternatives.

5. Prohibitions/Restrictions - Duration

While the research was inconclusive as to how long a neck restraint may be safely applied, a “normal” person will suffer permanent damage or death if the brain is deprived of oxygen for four minutes or longer. This time will be shorter in persons who have been in a struggle. With regard to neck holds, the IACP recommends that full pressure be applied no longer than 30 seconds. The Service may wish review the length of time that a suspect can be placed in a hold with an eye to placing limits on allowable maximums.

6. Prohibitions/Restrictions – High Risk Persons

Some researchers feel that the LVNR poses greater risks to persons in certain health categories including those suffering from Excited Delirium. While it is, of course, impossible for officers to know for sure a suspect’s state of health, it may be wise to advise officers not to use the technique on those persons they suspect of being in “higher risk” categories unless no other options but lethal force are available to them.

7. Prohibitions/Restrictions - Repeated Uses

More than one author has indicated that there are dangers associated with repeated use of the LVNR on the same subject (IACP, Kornblum). It is therefore recommended that the hold only be used once to render a subject unconscious. That

is, the hold should not be used twice on the same individual.

8. Prohibitions/Restrictions - Use on Secured Prisoners

The legal cases reviewed for this paper have indicated that courts have an aversion to the use of LVNR upon a subject who is already handcuffed. It is therefore recommended that the LVNR not be used on a subject who is handcuffed or secured unless the prisoner is demonstrating assaultive behaviour that cannot be controlled otherwise.

9. Two-Officer Technique

To enhance the safety of this technique, some research suggests that, wherever possible, the LVNR be a “two officer technique” with one officer applying the hold and the other monitoring the condition of the suspect. In addition, any prisoner who is considered at risk because of bizarre behaviour or suspicion of drug use should be transported by 2 officers, one of whom should monitor the prisoner for skin colour, breathing and level of consciousness. After hours of darkness, the officer should use an interior light to monitor the prisoner.

10. Subject Aftercare

Research suggests that a medical examination be offered to a subject who has had a carotid hold applied to them. This applies to all persons subjected to the hold regardless of whether or not they were rendered unconscious. Currently, the CPS Policy Manual advises that whenever a lateral vascular neck restraint has been used, “the APU paramedic will be advised of the incident.” In addition, policy states that when a subject has been rendered unconscious, that person be placed under constant observation for two hours following the incident. The research reviewed for this report suggests taking this a step further and actually directly offering medical

attention to the subject. Of course, any subject who does not revive after 30 seconds or who exhibits signs of medical distress must receive immediate medical attention –this is already in policy. The research reviewed for this paper suggests that all officers be trained in the use of CPR so that in these instances, the on-scene officers may begin the CPR process while awaiting the arrival of EMS. This is also already in place.

ensure that officers are following policy and that the hold is being used appropriately.

11. Regular Review of the Use of the LVNR

Given the risk factors associated with LVNR, it is imperative that the Service monitors the use of the technique. Recently, Use of Force forms have been updated to include LVNR, among other things. It is important that the information gathered in these forms be stored in a database so that the use of LVNR can be reported on and reviewed on a regular basis. This will help to

Glossary of Terms

Arrhythmia: Any variation from the normal rhythm of the heart beat, including sinus arrhythmia, premature beat, heart block, atrial fibrillation, atrial flutter, pulsus alternans and paroxysmal tachycardia.

Atherosclerosis: The progressive narrowing and hardening of the arteries over time.

Bar arm hold: A restraint technique in which the forearm is placed straight across the front of the neck.

Bifurcation: Split into two parts.

Bradycardia: A slow heart action.

Carotid: Pertaining to the carotid artery.

Carotid artery: A key artery located in the front of the neck that carries blood from the heart to the brain.

Carotid hold, carotid sleeper hold: A restraint technique in which symmetrical force is applied by the forearm and upper arm to the front of the neck such that there is compression of only the carotid arteries and jugular veins and not the trachea.

Carotid occlusion: The act of closing the carotid artery.

Carotid sheath: The dense fibrous investment of the carotid artery, internal jugular vein, and vagus nerve on each side of the neck, deep to the sternocleidomastoid muscle; the layers of cervical fascia blend with it.

Carotid sinus reflex: A normal reflex relating to the carotid sinus syndrome, which results from hypersensitivity or hyperactivation of the carotid sinus.

Carotid sinus: A slight dilation in the carotid artery at its bifurcation into the external and internal carotid arteries, it contains baroreceptors (pressure sensors) that when stimulated, will cause a reflex slowing of the heart, vasodilation and a fall in blood pressure.

CBF: Cerebral or coronary blood flow.

Cerebral anoxia: A reduced supply of oxygen to the brain.

Cerebral ischemia: Deficiency in blood supply to the brain.

Choke hold: A restraint technique in which the forearm is placed straight across the front of the neck. The term is sometimes incorrectly used to refer to the carotid hold, particularly in the legal context.

Clonic seizure: A seizure characterized by repetitive rhythmical jerking of all or part of the body.

CNS: Central nervous system

Contusion: A bruise, an injury of a part without a break in the skin.

Cricoid cartilage: The lower most of the laryngeal cartilages, may be palpated just below the thyroid prominence. Adjacent to the cricoid cartilage and the first tracheal ring is the cricothyroid membrane, a site used for rapid emergency airway access (cricothyroidotomy).

Deleterious: harmful often in a subtle or unexpected way

Doppler: An augmented listening device for the purpose of detecting the pulse in an extremity. Use in the evaluation of peripheral (occlusive) vascular disease.

Dysrhythmia: Defective rhythm.

Ecchymosis: A small haemorrhagic spot, larger than a petechia, in the skin or mucous membrane forming a nonelevated, rounded or irregular, blue or purplish patch.

EEG A graphic record of the electrical activity of the brain as recorded by an electroencephalograph. Also called encephalogram.

Electroencephalograph: A system for recording the electric potentials of the brain derived from electrodes attached to the scalp.

Eosinophil: A type of polymorphonuclear leukocyte containing eosin-staining granules. Although the activity of eosinophils is not entirely clear, they are known to destroy parasitic organisms and play a major role in allergic reactions. They also secrete chemical mediators that can cause bronchoconstriction in asthma. Eosinophils make up one to three percent of the total white blood cell count.

Esophagus: That part of the alimentary canal between the pharynx and the stomach; the gullet.

Hematocrit: haematology, investigation> Relative volume of blood occupied by erythrocytes. An average figure for humans is 45ml per cent, i.e. A packed red cell volume of 45ml in 100ml of blood.

Hemorrhage: The escape of blood from the vessels, bleeding.

Hyoid bone: A U-shaped bone lying between the mandible and the larynx, suspended from the styloid processes by slender stylohyoid ligaments..

Hypoglossal nerve: The hypoglossal nerve innervates the muscles of the tongue.

Hypoxia: Reduction of oxygen supply to tissue below physiological levels despite adequate perfusion of the tissue by blood. (cf. Anoxia).

Intervertebral discs: The intervertebral discs or nucleus pulposus are a fibro-cartilaginous disc that lie between the vertebral bodies in the spine.

Keto-steroid: A steroid-like chemical which is a by-product of the breakdown of certain steroids. They are found in urine and measuring them can give a good indication of the level of androgen production in the body. The major ketosteroids are: androsterone, etiocholanone and oestrone.

Judoko: Practitioner of Judo.

Jugular: Of or pertaining to the throat or neck; as, the jugular vein. Of or pertaining to the jugular vein; as, the jugular foramen

Lateral vascular neck restraint (LVNR®): This is a type of carotid hold technique developed by Jim Lindell of the National Law Enforcement Training Center.

Laryngeal nerve: Branches of the vagus nerve (the tenth cranial nerve). The superior laryngeal nerves originate near the nodose ganglion and separate into external branches, which supply motor fibres to the cricothyroid muscles, and internal branches, which carry sensory fibres. The recurrent (inferior) laryngeal nerve originates more caudally and carries efferents to all muscles of the larynx except the cricothyroid. The laryngeal nerves and their various branches also carry sensory and autonomic fibres to the laryngeal, pharyngeal, tracheal, and cardiac regions.

Micropipometer: An instrument for measuring minute changes in the volume of a part as a result of blood flow into or out of it.

Mucosal: Pertaining to a mucous membrane.

Neck restraint: An upper body restraint hold used by police to overcome resistance on the part of a suspect. From a medical perspective, there are two kinds of holds: carotid holds and bar arm holds.

Neuropsychological: Pertaining to neuropsychology.

Neuropsychology: A branch of psychology which investigates the correlation between experience or behaviour and the basic neurophysiological processes. The term neuropsychology stresses the dominant role of the nervous system. It is a more narrowly defined field than physiological psychology or psychophysiology.

Parasympathetic: Pertaining to a division of the autonomic nervous system.

Petechial: Characterized by, or pertaining to, petechiae

Petechia: A pinpoint, nonraised, perfectly round, purplish red spot caused by intradermal or submucous haemorrhage.

Phrenic nerve: The motor nerve of the diaphragm. The phrenic nerve fibres originate in the cervical spinal column (mostly c4) and travel through the cervical plexus to the diaphragm.

Plasma protein: One of the hundreds of different proteins present in blood plasma, including carrier proteins (such as albumin, transferrin and haptoglobin), fibrinogen and other coagulation factors, complement components, immunoglobulins, enzyme inhibitors, precursors of substances such as angiotensin and bradykinin and many other types of proteins.

Psychometric: Assessment of psychological variables by the application of mathematical procedures.

Salivary gland: Any of the saliva-secreting exocrine glands of the oral cavity.

Sickle cell disease: Disease common in races of people from areas in which malaria is endemic. The cause is a point mutation in the allele that codes for the beta chain of haemoglobin with a substitution of (valine for glutamic acid at position 6. The defective haemoglobin (HbS) crystallizes readily at low oxygen tension. In consequence, erythrocytes from homozygotes change from the normal discoid shape to a sickled shape when the oxygen tension is low and these sickled cells become trapped in capillaries or damaged in transit, leading to severe anaemia.

Sphygmomanometer: An instrument used for determining arterial blood pressure indirectly. The two types are aneroid (dial face) and mercury (column).

Sternocleidomastoid: This is one of two muscles located on the front of the neck which serve to turn the head from side to side.

Subcutaneous: Under the skin.

Submucosal: Situated under a mucous membrane.

Thrombosis: The formation, development or presence of a thrombus.

Thrombus: An aggregation of blood factors, primarily platelets and fibrin with entrapment of cellular elements, frequently causing vascular obstruction at the point of its formation. Some authorities thus differentiate thrombus formation from simple coagulation or clot formation.

Tonic seizure: Sustained contractures of skeletal muscle as occur during convulsions.

Trachea: The windpipe. A fibrocartilaginous tube lined with mucous membrane passing from the larynx to the bronchi.

Tracheal rings: The 16 to 20 incomplete rings of hyaline cartilage forming the skeleton of the trachea; the rings are deficient posteriorly for from one-fifth to one-third of their circumference.

Transient unconsciousness: unconsciousness lasting only a short time

Vascular: Pertaining to blood vessels or indicative of a copious blood supply.

Vertebral artery: Paired arteries which supply the muscles of the neck, spinal cord and cerebellum.

Vagus nerve: The vagus nerve enervates the gut (gastrointestinal tract), heart and larynx. Lesions of the tenth nerve usually result in a horse voice, but may also cause difficulty in swallowing or talking.

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