Analysis and recommendations for a Quebec police practice on the use of conducted energy devices

Standing Advisory Subcommittee on the Use of Force

December 17, 2007

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1 Mandate

In a letter dated August 28, 2006, to Mr. Michel Beaudoin, Executive Director of the École nationale de police du Québec (ENPQ) (hereinafter referred to as the "Quebec National Police School"), Mr. Paul Girard, Associate Deputy Minister of the Police Affairs, Prevention and Security Services Branch, announced the creation of the *Sous-comité consultatif permanent en emploi de la force* (SCCPEF) (hereinafter the "Standing Advisory Subcommittee on the Use of Force," or the "Subcommittee").

The Subcommittee, whose work is coordinated by the Quebec National Police School, was then given a mandate to resume the work of the Committee on Physical Intervention Techniques, including all areas related to the use-of-force continuum. The Subcommittee's role was also redefined with regard to the new process for developing the police practice that would be the responsibility of the *Direction de l'organisation et des pratiques policières* (DOPP) (hereinafter the "Police Organization and Practices Directorate") of the *Ministère de la sécurité publique* (hereinafter the "Department of Public Safety").

The Subcommittee's member police departments were selected to reflect the various operational situations of Quebec police organizations and are thus representative of all police department levels. The *Laboratoire de sciences judiciaires et de médecine légale* (hereinafter the "Forensic Science and Medicine Laboratory") and the *Centre antipoison du Québec* (hereinafter the "Poison Control Centre Quebec"). Representatives of the Department of Public Safety also took part in the work. Mr. Ronald Bélanger, the use of force consultant at the Quebec National Police School, was appointed Chair of the Subcommittee. Appendix A contains a list of the Subcommittee members and other persons who took an active part in carrying out this mandate.

In a letter dated April 17, 2007, Ms. Carole Michel, Director of the Police Organization and Practices Directorate (DOPP), gave the Subcommittee a mandate to:

Identify all relevant elements that should be included in a Quebec police practice on the use of conducted energy devices.

The Standing Advisory Subcommittee on the Use of Force held its first meeting at the Quebec National Police School on April 18, 2007.

2 Methodology

The mandate assigned to the Standing Advisory Subcommittee on the Use of Force concerning conducted energy devices (CEDs) marks the start of work that will lead to the adoption and dissemination of a police practice providing a framework for the use of that equipment by Quebec police officers. To carry out the mandate, the Subcommittee decided to make recommendations on the various aspects that it felt should be part of such a practice. Those recommendations call for a level of oversight comparable to that exercised with regard to other Quebec police practices. This approach was based directly on the content of the following police practices:

2.1.1 Use of force
2.1.2 Service weapons, support weapons, intermediate weapons
2.2.15 Excited delirium
2.3.9 Incarceration at a police station

Providing methodological support for the Subcommittee's work, the Quebec National Police School's Centre for the Integration and Dissemination of Police Activities Research prepared an initial review of the scientific and professional literature on the subject of conducted energy devices (CEDs). That review was forwarded to Subcommittee members and expanded by them in the course of their work. The following table provides a summary of the documents consulted. A full bibliography is appended to this report.

Summary of documents consulted
1. Scientific articles (91)
2. Study reports (6)
3. Directives of police organizations (24)
(a) Canada (13)
(b) United States of America (8)
(c) France (1)
(d) United Kingdom (2)
4. Documents of non-governmental organizations (15)
(a) United States of America (7)
(b) United Kingdom (8)
5. Technical documents — Taser International Inc. (8)
6. Articles from police and other publications (7)

Upon examining the nature and content of the various documents, and in order to reflect the various participants' areas of expertise, the Subcommittee decided to divide the issues into the following four component areas:

- medical component;
- operational component;
- management component;
- training component.

The core of this report contains the analyses and recommendations for each of those components.

Over the course of 11 one-day working meetings held at the Quebec National Police School, the Subcommittee members addressed each of these components and attempted to reach a consensus on what should be part of a Quebec police practice on the use of conducted energy devices. That work required extensive validation and requests for additional expertise. The School's training in the use of conducted energy devices, which is provided by the members of a containment team, was also presented to members.

This report on the Subcommittee's work is thus not a report on new research into conducted energy devices, in that it does not offer any new scientific knowledge on the issue, but rather a summary of published information on the subject.

Lastly, note that, out of concern for transparency and objectivity, the Subcommittee paid particular attention to the issue of the independence of studies and publications on conducted energy devices from their funding sources.

3 Introduction to conducted energy devices (CEDs)

3.1 DEFINITION AND SCOPE OF THE TERM *CONDUCTED ENERGY DEVICE* (CED)

The term *conducted energy device* (CED) is used to mean any weapon that operates using a system that combines the generation of conducted energy with its transmission to an individual for the purpose of interfering with the sensory and motor functions of that person's nervous system.

To our knowledge, only TASER International Inc. currently markets conducted energy devices in Quebec. Although the TASER® X26 model is the most recent and widespread, the company continues to distribute the ADVANCED TASER® M26 model. Table 2 provides a summary of the technical specifications of these two models based on the manufacturer's specifications [TASER INTERNATIONAL INC., 2007], which are provided in Appendix B of this report.

Summary of the specifications of the ADVANCED TASER® M26 and TASER® X26 models

MODEL:	ADVANCED TASER® M26	TASER® X26
APPEARANCE:		
CURRENT:	3.6 milliamperes (mA) average	2.1 milliamperes (mA) average
MAXIMUM VOLTAGE:	50,000 volts	50,000 volts
PULSE RATE:	15 to 20 pulses per second	19 pulses per second

The police practice that will govern recourse to and use of this type of intermediate weapon by Quebec police officers cannot refer solely to one product in particular. In this report, the term CED will be used to refer to this type of weapon in general. However, it is important to note at the outset that the vast majority of the scientific and professional literature on the subject refers to one or the other of the models described in the table above.

The term *conducted energy device* (CED) is also used to avoid any confusion with the term *pistol*, which is commonly used by police officers to mean their service weapon. Some specific recommendations have been made under the Operational Component to prevent any confusion in this regard. The French acronym DAI, used particularly by the Canadian Police Research Centre, was not used as it is already in use in a number of Quebec police organizations to mean the *Direction des affaires internes*.

3.2 GENERAL OPERATION OF CEDS

The human nervous system communicates by means of electric impulses. In schematic terms, the sensory nervous system sends sensory information to the central nervous system, which links the spinal column to the brain. The central nervous system in turn produces a more or less conscious response, which is returned to the muscles by the motor nervous system. The CED produces electric pulses which, when transferred to a subject, stimulate the nerves of both the sensory and motor nervous systems.

A CED may be used (1) as a deterrent (demonstration mode), (2) by bringing its electrodes into direct contact with the subject (drive stun mode), or (3) remotely, by shooting probes that then remain attached to the subject (probe mode). In drive stun and probe modes, the CED's effectiveness depends on the creation of an electrical circuit involving a more or less large part of the subject's body. The extent of the impact on the sensory and motor nervous systems is directly related to the mode used. The electric pulses follow the path of least resistance between the two electrodes: the greater the distance between the electrodes and the subject, the bigger the impact that can be expected.

3.2.1 Demonstration mode

Unlike the other two CED utilization modes, demonstration mode entails no transfer of electric current to the subject. Instead, the idea here is to present the weapon and to demonstrate its operation in order to obtain the subject's cooperation and compliance with the order given. This kind of force could be likened to that of police presence. In this mode, a police officer informs the subject that he has a CED at his disposal and that he may use it. He can present the weapon by removing it from its holster, train the laser sight on the subject or activate the CED so as to create an electric arc between the two electrodes.

The effectiveness of this mode is influenced by the subject's experience with CEDs and his or her cognitive abilities at the time of the intervention. Police officers should favour demonstration mode where they have reason to believe it will be effective and where the circumstances of the intervention permit.

3.2.2 Drive stun mode

When pushed directly against the subject and activated, the CED transmits electrical impulses that travel continuously between the two electrodes. These electrical impulses interfere with the sensory nervous system, which relays a message of pain to the central nervous system. They act simultaneously on the motor nervous system by causing involuntary contractions of the neighbouring muscle groups. The subject not only feels intense pain, but also finds it very hard, if not impossible, to control the muscle groups engaged.

Although pain and discomfort may be felt throughout the body, the muscular paralysis resulting from the drive stun mode remains local. The effect is referred to as a *local biomechanical dysfunction*. Cases have been reported in which subjects who were intoxicated, in crisis, determined or highly combative disregarded or overcame the pain and even, in some cases, continued to offer significant physical resistance.

3.2.3 Probe mode

In probe mode, a cartridge is used to propel at the subject two darts that remain connected to the CED by their respective conductive wires. Unlike the electrodes in drive stun mode, the probes are equipped with darts enabling them to penetrate the subject's skin or clothing and remain attached. A cartridge can be used only once. A number of models are currently being marketed and permit interventions from distances of up to 10.7 metres (35 feet).

The nature of the electric impulses remains the same in probe mode as in drive stun mode, as does their impact on the sensory nervous system. The pain is still intense. The impact on the motor nervous system, however, may differ depending on the distance between the two probes. In cases where that distance is greater than 10 centimetres (4 inches), the impact on the motor nervous system is such that it triggers a general physical incapacity, which is also called *neuromuscular neutralization* (NMN). The neuromuscular neutralization effect is felt throughout the subject's body, regardless of where the probes are lodged. Subjects are struck with a general paralysis that prevents them from maintaining the minimum muscular coordination necessary to remain standing, which generally has the effect of causing them to fall down. The neuromuscular neutralization effect is independent of the subject's psychological state, determination to fight, or resistance to pain.

3.2.4 Other functional considerations

It should be noted that, in both drive stun and probe modes, an electrical circuit can be formed even if the two probes are not in direct contact with the subject's skin. The electric impulses will circulate between the two probes through the parts of the body separating them that offer the least resistance, provided the total cumulative distance between the two probes in the subject's skin is less than five centimetres. This specific feature thus ensures that the CED functions as expected through a subject's clothing in most cases.

The CED user can control the duration of the electric discharge as well as the number of repetition cycles as necessary. For example, once the TASER® X26 model is activated and its trigger released, this CED will fire an electrical discharge that automatically stops after five seconds. It is also possible for users of this model to obtain a longer electrical discharge by holding down the trigger. The safety catch may also be used at any time to immediately stop activation of the CED.

In addition, electricity is not transmitted to police officers who intervene directly with a subject hit by probes, whether the device is in drive stun or probe mode, unless they come into direct contact with a probe or a part of the body located between the two probes on the subject. In those cases, the amount of electricity transmitted to the police officer is much less than that circulating in the subject's body. The officer will feel local pain or discomfort that will trigger a withdrawal reflex.

4 Conducted energy devices and use of force

4.1 USE OF FORCE BY POLICE OFFICERS

To carry out their mission of maintaining peace, order and public safety, police officers may be compelled to use force in certain circumstances. Moreover, society requires that police officers use only necessary force, that is, force that is reasonable and appropriate in the circumstances overall, that they use it without needless or gratuitous violence, and that they use their equipment with care and judgment. To meet these requirements, police officers must often size up the situation very quickly, analyze it and make a choice from among an increasing number of options at their disposal, in circumstances where errors can have significant consequences.

Police presence, the ability to communicate, and physical challenge constitute levels of force that enable police officers to defuse most situations. In other cases, these measures may prove ineffective, infeasible, inadequate or even inappropriate to the situation. This may compel police officers to resort to levels of force that literally involvie the physical control of a person. Police practice 2.1.1 on the use of force sets out the general framework for the use of force by Quebec police officers.

As is the case for any use of force, police officers must correctly select a technique or piece of equipment that is likely to enable them to control the individual in the safest possible way for all persons involved. In making that decision, police officers must consider a set of factors related to the reason for the intervention, the extent to which there is an urgent need for action, the environment, the number of persons involved, the state, conduct and characteristics of the offender and a host of tactical considerations. Failing this, there is a high risk that there will be an inappropriate, or simply disproportionate, use of force.

4.2 MECHANISMS FOR THE PHYSICAL CONTROL OF A PERSON

In an operational context, the measures selected to exercise physical control over an individual are determined on the basis of a concept broader than that of physical control mechanisms. These are procedures whereby the application of physical intervention strategies, entailing various measures or techniques available to police officers, produces a characteristic effect for the purpose of physically controlling a person. The practice identifies three physical control mechanisms:

- restricting freedom of movement;
- pain compliance;
- biomechanical dysfunction.

4.2.1 Restricting freedom of movement

The restriction of freedom of movement is a physical control mechanism designed to ensure that the person is controlled through a temporary inability to move. The mere fact of applying pressure using one's body weight can constitute a form of physical control that restricts an individual's freedom of movement. Various immobilization techniques may be used to systematically restrict the movements of the various segments of a person's body (arms, head, legs) so as to control that person physically while handcuffing or placing him or her under other types of restraint.

Team intervention, involving the intervention of a number of police officers to control a person, is a typical example of a physical intervention strategy based on restriction of freedom of movement. This strategy offers the benefit of being relatively safe for police officers and the person they are controlling, while being effective on individuals who are not very sensitive or insensitive to pain. However, depending on the ability and determination of the person they are controlling, team intervention is not without risk of falling, bruises, abrasions or greater injury for police officers and the person they are trying to subdue.

Applying a physical control mechanism by restricting the freedom of movement of a person who offers considerable resistance may require the involvement of a number of police officers acting directly on that individual. This may prove to be highly demanding physically, for both police officers and the person. This kind of intervention may also cause a state of panic in certain individuals, and, as a result of the police officer/individual ratio, may in some instances give the appearance of excessive use of force by police officers.

It is hard to determine exactly when this practice started. However, the gradual increase in the use of immobilization techniques to control individuals who display violent, bizarre or combative behaviour has given rise to a new phenomenon in police work: sudden death syndrome [ROSS, 1998, O'HALLORAN *et al.*, 2000; POLLANEN *et al.*, 1998].

4.2.2 Pain compliance

Pain compliance is a control mechanism entailing the use of force to cause pain in an individual. The effectiveness of this mechanism depends in large part on a police officer's skill in adjusting the degree of force so that the individual understands that the pain felt is directly related to the resistance he or she offers. Pain compliance involves certain empty-hand techniques such as joint holds, certain pressure point control techniques using the "pressure-touch" application

method, or certain specific types of equipment such as the police baton, where it is used as a lever.

Pain compliance is obviously of no use in controlling individuals who are not very sensitive or insensitive to pain or incapable of understanding a police officer's message. Although often effective in pain-sensitive individuals, this control method is not without risk either and can result in injuries to police officers and the individuals they attempt to control (fractures, dislocations, muscle tears, and so on). In addition, the administration of pain to control an individual can also increase aggressiveness in that individual.

4.2.3 Biomechanical dysfunction

The purpose of biomechanical dysfunction is to cause an immediate partial or full suspension of abilities or functions at an anatomical site, or in a body segment or system of the human body. This is achieved through the application of certain techniques such as strikes, chokeholds, or through the use of certain specific weapons such as capsicum spray (commonly called "pepper spray") and the baton. For example, the use of controlled strikes to overload a motor nerve with nerve impulses causes a temporary muscular disability and thus a biomechanical dysfunction.

The decision to use the biomechanical dysfunction mechanism is most often based on whether police officers feel it is necessary to put an **immediate** stop, partial or full, to any form of resistance at an anatomical site, or in a body segment or system of the human body. These kinds of situations arise when interventions involving a lesser degree of force prove to be unproductive or an individual's actions must be immediately stopped because of the potential risk that those actions present, if continued .

Biomechanical dysfunction is not an end in itself. It constitutes a diversion designed to weaken an individual's motor actions by switching his or her thought process from the offensive to the defensive. This change gives police officers a temporary advantage that then enables them to apply a technique to restrict the individual's freedom of movement (e.g., immobilization) or pain compliance (e.g., chokehold) where those techniques cannot initially be applied.

4.2.4 Conclusion

In all cases, where it is initially inappropriate to use techniques or equipment to restrict freedom of movement, it is necessary for police officers to use pain compliance or biomechanical dysfunction. However, the ultimate goal is to control the subject while being able, secondarily, to return to the use of techniques or equipment to restrict the individual's freedom of movement. Thus, the pain administered or biomechanical dysfunction caused is not an end in itself, but the necessary means to restrict the movements of an individual who offers resistance, in order subsequently to control him or her physically.

4.3 FORCE OPTIONS AVAILABLE TO POLICE OFFICERS

When police officers are compelled to use force to contain resistance or to defend themselves or others from an attack, they must choose one of the options available to them. What options do police officers currently have for intervening in this type of situation where communication, negotiation or mere physical challenge do not apply or have failed and to enable them, where necessary, to apply handcuffs or another type of restraint in order to restrict the offender's freedom of movement?

In dealing with a low-intensity degree of resistance or aggression, police officers can use what are commonly called light empty-hand techniques, that is immobilisation techniques, joint holds and certain pressure-point techniques.

When the intensity of the resistance or attack increases, it is necessary and justified for police officers to resort to hard empty-hand techniques, such as take-downs, strikes or the chokehold technique, or else capsicum spray (OCS), the baton or ultimately firearms. In addition, depending on the police unit or organization to which they belong, police officers may also have at their disposal a conducted energy device, an intermediate impact projectile weapon (IIPW) or traditional chemical irritants.

In view of the complex nature of their use, intermediate impact projectile weapons (IIPW), such as bean bags, rubber bullets or plastic bullets, are used by special squads mainly to avoid having to use firearms in the event of a serious physical attack. As for traditional chemical irritants (CS, CN), they are mainly used in crowd control situations to disperse crowds or to avoid physical confrontation with police officers.

Certain weapons, such as the "capture net," a net that is thrown over an offender, or glue or foam thrown at a person to restrict his or her freedom of movement, have so many drawbacks that they are not used by police departments.

Teleanesthesia, which is used to immobilize various species of animals using a hypodermic gun equipped with hard plastic darts, currently involves too many restrictions for it to be used by police officers to control an individual. For effective firing, the target must ideally be immobile, in the clear, at a good distance and positioned sideways so the dart strikes a large muscle mass at right angles. To determine the dosage, the shooter must be able to estimate the target's mass and sensitivity. In addition, to avoid tissue damage, preference is given to low volume anesthetics that take effect after 15 to 20 minutes. As a result of all these constraints, teleanesthesia, which could eventually be a promising option, is not currently used by police officers to bring individuals under control.

In December 1996, the United States Air Force Institute for National Security Studies [Bunker, 1997] published an exhaustive study on non-lethal weapons. It is highly likely that other weapons have since been developed or are being development. This study considered 129 intermediate weapons divided into 17 categories. However, despite this broad range of weapons and equipment, the vast majority, for the moment, have only military applications or are not yet fully developed.

In general, to date, only electric weapons have, in some cases, been added to the other intermediate weapons available to police officers to contain resistance or terminate attacks other than those causing grievous bodily harm or death.

Lastly, to protect themselves and any other individual under their protection from death or grievous bodily harm, police officers themselves are protected by the law if they use an equal degree of force. Currently, only their firearms are designed to deal with such a threat. Fortunately, even if an individual's behaviour presents a risk of death or grievous bodily harm, circumstances sometimes enable police officers to use other force options.

In practice, then, what are the force options available to police officers for controlling individuals where verbal intervention or light empty-hand techniques are insufficient or inapplicable and using their firearms would be excessive or inappropriate? What remains available to police officers are the hard empty-hand techniques (blocks, strikes and chokeholds), capsicum spray, conducted energy devices, police batons and, if a sufficient number of police officers are present, the option of intervening as a team. If they belong to a special unit, police officers may also use intermediate impact projectile weapons.

Generally speaking, police officers have two tactical options for restricting the freedom of movement of a violent or potentially violent person:

Engage the individual in close physical confrontation to:

- take the individual down;
- land an empty-hand strike to cause a diversion;
- apply a chokehold;
- intervene as a team, if reinforcements are available;

Remain at a distance and use one of the available intermediate weapons:

- capsicum spray (commonly called "pepper spray");
- a conducted energy device (CED);
- a police baton;
- an intermediate impact projectile weapon (IIPW).

Details on these tactical options are provided below.

4.3.1 Engaging the individual in close physical confrontation to…

- **Take the individual down**

  This approach is often essential where resistance is strong, but involves a risk of injury from falling. There are a number of ways to take a person down. Where resistance is weak, initial contact has been established and there is no vertical surface to support an offender, it is possible for a police officer to guide an offender gently to the ground.

  However, when the officer is in a situation at close quarters and resistance is strong, the confrontation most of the time looks like a judo or wrestling match, and the police officer is often required to take the individual down firmly in order to limit his or her freedom of movement.

  Depending on the officer's skill and the resistance offered by the offender, the takedown is done by means of a sweeping technique, a throw or simply a vigorous push or pull.

  Takedowns are not without risk. There is always a risk that the head of one of the combatants will strike the ground violently or that the fall will result in a fracture or dislocation.

  The takedown does not control an individual, but places that individual in a position that restricts his or her movements and makes it easier for an officer to apply a controlling technique.

- **Land an empty-hand strike in order to cause a diversion**

  The use of hand and leg strikes to a person is one of the hardest situations for a police officer to justify. The fact that the public perceives the use of strikes as constituting a loss of control of the situation or a loss of control on the officer's part is one of the reasons often cited in the argument that the use of these techniques is inappropriate for police officers.

  In fact, various situations can lead an officer to use a striking technique. The officer may be justified in using striking techniques in a defence situation when faced with a spontaneous assault or to cause a diversion where other less risky force options have not successfully controlled high intensity resistance.

  In practical terms, the use of striking techniques on motor points in order to cause a motor dysfunction is done bare-handed, generally with the elbow or

knee, where the situation requires close contact between police officer and offender.

Police officers are trained to aim for certain points on the human body where the application of more or less strong pressure enables them to limit the risk of injury.

In defending against an attack, police officers resort to strikes when the use of an intermediate weapon is warranted, but inappropriate, unavailable or ineffective.

The pain and/or biomechanical dysfunction caused by the striking technique in fact causes a diversion to weaken the motor actions of an offender by changing his or her thinking process from offensive to defensive. This change gives police officers a temporary advantage, enabling them to apply a technique that favours restriction of freedom of movement or pain compliance.

The effectiveness of this force option depends in particular on the degree of force used by the police officer, the place where that force is applied and the pain threshold of the person the officer is attempting to control.

- Apply a chokehold

The chokehold control technique is effective and generally safe when well executed. However, when poorly executed, this technique can result in serious medical complications and, as a result, should not be used by police officers except in a hand-to-hand combat situation to immediately control or defend against a violent person. In addition, it should only be used by police officers who have received specific training and who are skilled in the application of that technique.

In the late 1980s, use of the chokehold control technique [CPRC, 2007] was the subject of investigations following a series of deaths further to its use by police officers. At the time, the medical community was generally not very aware that an individual could die as a result of a complex set of signs, symptoms and situational factors. Death was attributed more to the incident immediately preceding it. As a result, it was often taken for granted that the said incident, usually the use of the chokehold control technique by police officers, was directly linked to the individual's death, rather than the individual's state of intoxication or high degree of agitation. In the first half of the 1990s, the same paradigm was observed in subjects who died following exposure to capsicum spray.

Intervene as a team, if reinforcements are available

Physical intervention strategies, which, like team intervention, rely on measures to restrict a person's freedom of movement, are not specific to police work. In fact, in addition to being used as a physical control mechanism in police work [REAY *et al.*, 1992], this approach is widely used in the correctional environment [U.S. DEPARTMENT OF JUSTICE, 1995] and in ambulance transportation [CHAN *et al.*, 1998; SCHMIDT and SNOWDEN, 1999; STRATTON, ROGERS and GREEN, 1995], hospitals [POLLANEN *et al.*, 1998; FRANK, HODGETTS and PUXTY, 1996] and psychiatric institutions [MOHR and MOHR, 2000; MORHR, PETTI and MOHR, 2003].

This intervention strategy consists of a simultaneous pooling of efforts in various manoeuvres designed to contain an individual by controlling the bodily segments of the arms and legs and restricting sudden head movements. Each of the intervening officers has a position and specific role in the team.

Like hospitals, police organizations use physical control techniques to restrict freedom of movement. However, it is difficult to establish accurately when this practice originated. One indicator suggests that, in the late 1970s, more frequent use was made of this approach with individuals who displayed violent and combative behaviour [ROSS, 1998; CHAN, VILK and NEUMAN, 1998].

In North America, measures and techniques designed to control an individual by restricting his or her freedom of movement are very widely used in the hospital environment. In the United States alone, these procedures are used nearly 500,000 times a day [FRANK, HODGETTS and PUXTY,1996].

This situation is related to the increase in the use of drugs such as cocaine in the general population [SCHMIDT and SNOWDEN, 1999]. Since 1975, deaths caused by the use of such chemical substances have been reported in medical literature [ROSS, 1998]. In late 1980, the number of incidents attributable to drug use increased sharply [WETLI, MASH and KARCH, 1996].

The situation is also related to the introduction of certain government mental health policies, including those on deinstitutionalization [TELINTELO, KUHLMAN and WINGET, 1983]. Many individuals who were previously kept in institutions are now living on the outside and must function in society.

The gradual increase in the use of hold-down techniques to control individuals who display violent, bizarre or combative behaviour has given rise to a new phenomenon in police work: sudden death syndrome [ROSS, 1998; O'HALLORAN and FRANK, 2000; POLLANEN *et al.*, 1998].

The problem with sudden death syndrome in cases of individuals who are agitated and violent is very real and exacerbates the difficulties involved when police officers are required to intervene using immobilization techniques, as in team work. When a death occurs, it becomes the focus of public opinion [DAY, 2002; HICK, SMITH and LYNCH, 1999]. Police organizations are singled out [STEFFEE *et al.*,

1995]. This frequently results in mediatized controversy [Ross, 1998]. In addition, inquiries conducted in an attempt to explain the causes of such incidents pose a real challenge to the individuals responsible for clarifying the problem [O'HALLORAN and FRANK, 2000; DIMAIO and DIMAIO, 2001; GLATTER and KARCH, 2004].

However, there is no support for the hypothesis that this form of technical application alone can lead to potentially fatal respiratory difficulties in any individual controlled in this manner [LAPOSATA, 1993; GLATTER and KARCH, 2004]. The studies tend to show the contrary [GLATTER and KARCH, 2004; DIMAIO AND DIMAIO, 2001; CHIN, VILK and NEUMAN, 1998; SCHMIDT and SNOWDEN, 1999].

The research suggests instead that cases of death involving positional asphyxia or asphyxia proximal to restraint are the result of a set of risk factors that may dispose those individuals to react poorly when controlled on the ground [O'HALLORAN *et al.*, 1993, O'HALLORAN and FRANK, 2000; MORRISON *et al.*, 2002; POLLANEN *et al.*, 1998; ROSS, 1998; CHAN, VILK and NEUMAN 1998; REAY, 1996; U.S. DEPARTMENT OF JUSTICE, 1995; GRANFIELD, ONNEN and PETTY, 1994].

Time seems to play against police officers in the circumstances of physical interventions. This has led some authors to say that, when police officers are required to intervene as a team, they should be aware of the potential risk of sudden death and should possess techniques enabling them to bring an individual under control quickly [ROSS, 1998].

4.3.2 Remain at a distance, using one of the available intermediate weapons, such as...

- **Capsicum spray (commonly called "pepper spray")**

  Since pepper spray was introduced in Quebec in the early 1990s, it has proven to be an effective and safe intermediate weapon for police officers in controlling individuals who resist arrest and who are violent or dangerous. It has definitely helped reduce the use of physical force and the baton and, consequently, the number and severity of injuries among both offenders and police officers.

  Unfortunately, this weapon is not effective in all situations or against all individuals. It is particularly ineffective when used on persons with reduced sensitivity to pain or who are very determined. As a result of its delayed action and the fact that it affects none of an individual's motor skills, it would be unreasonable to use it when facing a threat of death or grievous bodily harm, except in very specific circumstances.

  It is interesting to note that the current debate on the risks associated with the use of conducted energy devices, and in relation to sudden death syndrome in cases of agitated and violent individuals, has also been extended to include the chokehold control technique, team intervention and capsicum spray.

Conducted energy devices (CED)

When used in push stun mode, a CED causes intense pain and biomechanical dysfunction localized at the anatomic site to which it is applied. As a result, this type of use causes a diversion in the same way as a blow struck empty-handed or with a baton, while representing a much lower risk of injury for the individual to which it is applied. Since the biological dysfunction thus obtained is localized, the CED's effectiveness in push stun mode remains dependent on the pain threshold of the person who is to be controlled. In the case of a highly resistant person or one who simply does not feel pain, use of a CED in push stun mode does not create a window of opportunity so that the individual can be physically controlled and thus appears to be of very limited utility.

When used in probe mode, a CED acts on the sensory and motor nervous systems and generally causes complete motor dysfunction, called neuromuscular neutralization (NMN). NMN affords police officers a temporary advantage (a five-second cycle) that they must use to apply a technique that restricts that person's freedom of movement in order to control him or her physically. With such a significant impact on the motor nervous system, effective neuromuscular neutralization is independent of the subject's psychological state, determination to fight and pain tolerance.

Barring exceptional circumstances, a conducted energy device should never be used as the only means of controlling an individual through pain compliance, whether it be in push stun or probe mode. That would essentially be tantamount to attempting to overcome psychological resistance through the application of pain and would be dangerously close to torture.

While it would be relatively easy to establish a consensus on the idea that, where circumstances permit, it is desirable to use a conducted energy device to address a threat of grievous bodily harm or death and that the use of such a device in response to a low level of resistance is excessive, it is less obvious that using a CED to address an intermediate level of resistance is appropriate.

It is clear that, in the vast majority of cases, the use of CEDs has helped save lives, or at least reduce the number of injuries among both police officers and offenders. Unfortunately, however, police intervention, in the case of intermediate resistance, for the purpose of assisting or arresting the individual in accordance with standard procedure, sometimes ends in death, without it always being possible to explain the exact cause.

The baton

The baton is an appropriate, useful and often indispensable intermediate means of defence. It enables police officers to come into contact with an

offender while remaining at a certain distance, to ward off strikes or to use it as a lever in applying joint locks.

The advent of capsicum spray has definitely done much to reduce physical and baton contact, and as a result, diminish the risk of injury to both officer and offender. However, pepper spray is unfortunately not a panacea. In fact, it is less than 80% effective, hence the need for the officer to have a potentially riskier alternative than pepper spray, but less risky than firearms.

However, baton use is not without risk to the person concerned. As a result of technological progress, the baton today, whether telescopic or not, is clearly a much more effective intermediate impact weapon than its wooden predecessor. As a result, when it comes to the baton or any other type of intermediate impact weapon, medical involvement is a real concern. The risk of causing more serious damage must be carefully considered, particularly as a result of strikes that may be made to the head or to any other vital point on the human body.

The human body has a large number of sensitive points. Pressure or a more or less violent blow to one of those points is likely to cause intense pain, dislocation, fractures, unconsciousness or death. That is why these anatomic sites are designated as vital points. The charters specifically developed in the spirit of minimizing injury must therefore be complied with at all times. They form an integral part of the use-of-force training intended for police officers.

Furthermore, it is the degree of force applied, that is to say the point on the body where the pressure is exercised as well as the intensity of that pressure, that determines the severity of the damage that may be caused. However, certain factors influence the degree of force, determining whether it will be major or minor. The degree of force will thus be in relation to the biomechanical factors mentioned in the work of Gervais *et al.* [1994; 1998] and with a set of factors concerning the potential attacker. For example, a right-hand or back-hand blow, whether or not the individual is relaxed or tense, the individual's degree of pain tolerance and the precision of the action will all be factors in the dynamics of the intervention. The target point is the most important of those factors because it is directly related to the severity of injury.

Intermediate impact projectile weapon (IIPW)

There are a number of intermediate impact projectile weapons and a phenomenal diversity of projectiles. In Quebec, IIPWs are used by the members of special tactical intervention groups and by special crowd control units where they think, on reasonable grounds, that the use of such force is necessary to protect themselves and any other person from an imminent threat of grievous bodily harm or death. In fact, where circumstances permit,

IIPWs are an alternative to firearms in that they have the advantage of being less lethal than the latter.

The purpose of IIPWs is to disable by means of the contusive impact of the projectile. The extent of that impact is determined in part by the kinetic energy transferred to the projectile by the weapon and ammunition. The extent of the propulsive charge of the ammunition, the length of the barrel and the mass of the projectile are the three most decisive factors of velocity, and thus of the energy transferred to the projectile as it leaves the barrel. The form and mass of the projectile also determine its trajectory and the loss of velocity through air friction. When it leaves the barrel, every IIPW projectile has enough kinetic energy to cause grievous bodily harm or death. Although developed to minimize the risk of death associated with their use, intermediate impact projectile weapons can prove lethal in certain circumstances. As noted by Voiglio *et al.* [2004], it is unrealistic to think that such a weapon can both incapacitate and be entirely safe.

4.3.3 Conclusion

The use of physical force and its health consequences have always been central social concerns. Over time, questions have arisen about the risks associated with the chokehold control technique, positional asphyxiation, capsicum spray and team intervention and their possible contribution to what is referred to in the literature as "in-custody death syndrome."

It is clear that, regardless of the option police officers select to gain control of a violent person, there is always a more or less serious risk to that individual's physical integrity.

The risk of injury, and the possibility that a police officer may be disarmed, associated with hand-to-hand combat and the smaller stature of police officers today have resulted in the use of equipment called *intermediate weapons*. These weapons make it possible to cause a diversion, from a certain distance, which gives police officers a temporary advantage, enabling them to approach and control the individual.

However, the effectiveness of pepper spray depends on the pain threshold of the person to be controlled. While the pain caused produces the desired effect in individuals who feel it, it is clearly not very useful in controlling those who are insensitive or not very sensitive to pain. This is often the case of individuals under the influence of drugs and alcohol or those who suffer from mental health problems.

Only biomechanical dysfunction can, from a certain distance, cause an effective diversion in individuals who are insensitive or not very sensitive to pain. That dysfunction can be caused through the use of the baton, conducted energy devices and an intermediate impact projectile weapon.

Over time, many terms have been used to designate the categories or intermediate weapons police officers use, causing confusion even for informed individuals. Terms such as "non-deadly," "non-lethal," "less than lethal" and "less lethal" have appeared.

The risks associated with the use of one intermediate weapon relative to another can definitely vary. As a result, a number of specialists see a clear difference between less lethal and non-lethal weapons. They feel that "plastic bullet" projectiles come under the heading of less lethal weapons, because, even when properly used, they have the potential to cause grievous bodily harm or death, unlike other weapons such as pepper spray, conducted energy devices and the baton, which are considered non-deadly weapons when properly used.

In the current state of knowledge, conducted energy devices, when used appropriately in an actual situation, are not considered to be weapons likely to cause grievous bodily harm or death. There is currently no research or evidence establishing a causal relationship between the use of a CED and the death of a person who has been exposed to it.

5 Analysis of medical component and recommendations

Conducted energy devices have been used in an increasingly frequent manner in Quebec and the rest of the world in recent years. This weapon, which is classified as an *intermediate weapon* on the use-of-force continuum, makes it possible to avoid using firearms in certain circumstances. As the principle of a CED's operation is to transmit an electrical charge to the human body, it is therefore essential to consider the medical aspects of its use. Thus far, we have used the study on CEDs conducted by the Canadian Police Research Centre (CPRC) in 2005 as a guide to the operational and medical aspects of the problem [CPRC, 2005]. In recent years, a number of studies on CEDs have been published, shedding new light and, to a certain degree, providing better guidelines for their use and minimizing their impact on persons exposed to them.

5.1 CURRENT KNOWLEDGE OF MORBIDITY AND MORTALITY RELATED TO CONDUCTED ENERGY DEVICES (CEDS)

Although the vast majority of cases in which CEDs are used are without serious medical consequences, a number of deaths have occurred in subjects subjected to the devices, resulting, on numerous occasions, in a questioning of the weapon's presence in the police officers' arsenal. An attempt must therefore be made to understand the morbidity and mortality factors that may be directly or indirectly related to their deployment to assist users in optimizing management of their use and the moments following such use.

5.1.1 Morbidity

As shown in a poster entitled "Injury Profile of Taser® Electrical Conducted Energy Weapons (CEWs)" [BOZEMAN *et al.*, 2007], which was presented by W.P. Bozeman *et al.*, of Wake Forest University in Virginia, in cooperation with the U.S. Department of Justice (DOJ), at the October 2007 Congress of the American College of Emergency Physicians (ACEP), significant undesirable effects related to the use of CEDs are the exception. That poster presented the results of a multidisciplinary study conducted over two years (July 2005 to June 2007) to determine the incidence and severity of injuries caused by the CED in question (TASER® X26 or M26, in probe and drive stun modes). The main findings were as follows:

IMPACT ON THE HEALTH OF PERSONS EXPOSED TO CEDS

- No injuries: 743 (77.2%).
- Mild injuries: 216 persons (22.5%) with 408 injuries:[1] 337 puncture wounds caused by probes, 40 contusions, 26 lacerations, 2 fractures and 4 "other."
- Moderate injuries: 2 (0.2%): one case of rhabdomyolysis and one cerebral contusion.
- Severe injury: 1 (0.1%): one epidural haematoma (post-traumatic bleeding between cranium and brain).

Number of cases: 962

The study also identified two cases of in-custody death, although neither occurred immediately after CED use. Investigation and autopsy findings established no connection with CED use.

5.1.2 Mortality

Since CEDs have been in use, a number of persons have died after being subjected to them, all in a resisted arrest context and never in a situation of experimentation with volunteers in good health [HO *et al.*, 2007; DAWES *et al.*, 2007; VILKE *et al.*, 2007; VILKE *et al.*, 2007a; VILKE *et al.*, 2007b; SLOANE *et al.*, 2007; LEVINE *et al.*, 2007; MCDANIEL *et al.*, 2005; SAUL *et al.*, 2005; CHAN *et al.*, 2004] or even presenting health problems [Ho *et al.*, 2006]. Many people inevitably concluded that CEDs were the cause of those deaths and their use should stop. In the vast majority of cases, however, analysis of the deaths did not find any direct or indirect link between CEDs and the fatal outcomes. In the rare cases where it was believed that CEDs had some role to play, the finding came from a deduction by the coroner or pathologist responsible for the case, not from typical injuries found at autopsy [KORNBLUM AND REDDY, 1991]. Very often, however, toxicological analyses revealed the presence of drugs (cocaine, phencyclidine, amphetamines) in the victims' blood [STRATTON *et al.*, 2001; ROSS, 1998; POLLANEN *et al.*, 1998]. In other cases, there were mental health problems such as paranoid schizophrenia. Analysis of the circumstances of the deaths revealed in most cases that the victims were experiencing significant mental confusion at the time of their arrest and were in a state of agitation, a phenomenon often called excited delirium [WETLI, MASH and KARCH, 1996].

And yet the scenario is virtually the same even today: the individuals are agitated, confused and considered a danger to themselves and those around them; a CED is used once or a number of times, then officers have difficulty keeping the individuals under control in a prone position when they continue to offer unexpected resistance. Then, once the individuals calm down, officers turn them over and realize that they are in cardio-respiratory arrest. However, it should be noted that this same scenario also occurs in other situations of in-custody death, in a psychiatric setting, for

1 More than one injury was observed in a single subject.

example [PATERSON *et al.*, 2003], even if a CED has not been used and even if the individual is not brought under control by being placed in the prone position for an extended period of time following strenuous efforts by those involved. One interesting study in this regard was published in 2005. Its authors reviewed 100 cases of in-custody death. Of that number:

- 60 individuals had displayed bizarre behaviour; 53 of that number were confirmed as having taken drugs;
- Use of force:
  - None: 16
  - Manual force: 35
  - Intermediate force: 48
    - Chemical: 11
    - Impact weapon: 8
    - CED: 29
  - Lethal force: 1

This study clearly illustrates the fact that deaths occur in custody following the use of various use-of-force options and, in certain cases, even when no force is used. In the 29 cases in which a CED was used, no deaths occurred in the moments following its use [HO, REARDON and HEEGAARD, 2005].

Although there is currently no research or evidence establishing a causal relationship between the use of CEDs and the deaths of individuals exposed to them, current medical literature offers some explanation as to the safety of those weapons. With animals, researchers have managed to trigger cardiac arrhythmia in pigs in certain circumstances:

WHERE THE HEART LIES BETWEEN THE TWO PROBES

Where the heart lies between the two probes, and therefore in the path of the electric charge, that charge can trigger a malignant arrhythmia, which, however, corrects itself in most cases once the electric charge stops. Some pigs even went into cardiac arrest (ventricular fibrillation) when they were simultaneously administered a solution containing adrenaline to simulate the abnormalities in an individual in a high state of agitation or under the influence of drugs [NANTHAKUMAR, *et al.*, 2006; MASSE *et al.*, 2006].

WHERE THE ELECTRIC CHARGE IS OF LONG DURATION

A number of animals presented an arrhythmia when they were subjected to two 40-second cycles at very close intervals, with the probes placed on the front of the thorax [DENNIS *et al.*, 2007], which suggests that the heart may become more vulnerable if the electric charge is of extended duration. In addition, the electric stimulation prolonged by means of a CED, even elsewhere than to the thorax, causes sustained muscle contractions that can result in declines in blood pH, or at the very least exacerbate pre-existing abnormalities. The blood becomes acidic, which can reduce cardiac performance and increase the risk of malignant cardiac arrhythmia or asystole (cardiac arrest).

When a CED is properly used, with the probes elsewhere than in the anterior region of the thorax and without the heart lying on the path of the electric charge, the probability of triggering a cardiac arrest is very low [WU *et al.*, 2007; IDEKER and DOSDALL, 2007; LAKKIREDDY *et al.*, 2007]. If cardiac arrest were in fact caused, the individual's brain would be completely deprived of oxygen and he or she would lose consciousness in seven or eight seconds. To date, one case of ventricular fibrillation has been reported in an individual who was hit by the probes in the anterior region of the thorax and who died shortly thereafter [SADHU *et al.*, 2006]. Another case of ventricular fibrillation was reported in a teenager when ambulance attendants had just taken charge of him [KIM and FRANKLIN, 2005]. However, both cases are poorly documented and do not mention the period of time between the electric charge and the arrhythmia or the location of the probes on the individuals hit. It must be considered, however, that the effect of surprise, fear, anger and other emotions may also trigger cardiac arrhythmia [BRODSKY *et al.*, 1987; STOPPER *et al.*, 2007].

Certain factors may increase the risk of malignant arrhythmia if the probes land in the anterior region of the thorax:

PERSONS WHO ARE THIN OR OF SMALL STATURE, WHERE A PROBE IS EMBEDDED NEAR THE APEX OF THE HEART

In pigs, researchers have managed to trigger arrhythmia when the probe was an average of 17 mm from the heart. In humans, the cardiac apex may be located between 10 and 57 mm from the end of the probe [Wu *et al.*, 2007]. A CED supplies very little amperage despite its high voltage, which reduces the risk of malignant arrhythmia.

WHEN THE HEART LIES BETWEEN THE TWO PROBES, PARTICULARLY IF THE ELECTRIC STIMULUS IS PROLONGED [NANTHAKUMAR *et al.*, 2006; DENNIS *et al.*, 2007]

WEARERS OF PACEMAKERS AND IMPLANTABLE DEFIBRILLATORS

In both cases, there would be a risk of interference and poor operation of the implanted device, particularly for the duration of the electric charge [CAO *et al.*, 2007], especially if it is prolonged [HAEGLI *et al.*, 2006]. To date, however, there have been no studies on humans showing that CEDs have triggered malignant arrhythmia or sustained malfunction of pacemakers or implantable defibrillators. It should be noted, however, that, in reported human cases, individuals were generally subjected to a single CED cycle, whereas the animals studied were often exposed to a number of cycles. Consequently, it cannot be confirmed that an individual with a pacemaker who is exposed to a CED over a prolonged period of time would run no risk of device malfunction. There would be a potential risk that they would activate and incorrectly defibrillate the wearer because they would interpret the CED's prolonged electric charge as a ventricular fibrillation. There are grounds to believe that the device would be more influenced by a single prolonged stimulation than by a number of short electrical charges, but as yet there is no literature on the subject. However, an inappropriate defibrillator charge does not mean that cardiac arrest or death would result.

Medical history is also a factor to consider. One study designed to assess the cardio-vascular and physiological consequences of a five-second charge on volunteers with histories of cardiac problems isolated no significant undesirable effects on their health [HO *et al.*, 2006]. The more an individual's state of health is altered at the time he or she receives the CED charge, the greater the risk because that individual's ability to recover is reduced. However, the risk is nevertheless offset by the fact that individuals with significant and incapacitating health problems are generally not those offering the greatest resistance to law enforcement agencies, unless they have lost touch with reality as a result of a mental health problem or drugs.

It can be stated that the risk of death directly caused by CEDs is extremely low where the devices are used on an individual who does not present any risk factors. Furthermore, it is recommended in this report that police officers identify and consider persons at risk before deciding to use CEDs.

5.2. MEDICAL CONSIDERATIONS FOR THE USE OF CEDS

5.2.1 Morbidity

CEDs are generally considered a safe and effective weapon, even when used to neutralize individuals with mental health problems [Ho *et al.*, 2007a]. Since CEDs are a means to achieve neuromuscular neutralization and the probes of the device can penetrate the skin, it is normal that its use sometimes produces various undesirable effects.

- **WOUNDS**

  For the electric charge to be transmitted to the individual, the probes must be close to or penetrate the skin. Where the skin is penetrated, the resulting 1 mm diameter wounds may be 9 to 10 mm (3/8 in) deep. These wounds, which close quickly, may subsequently become infected, like any wound, and require care.

  The scientific literature on the subject reports a number of instances of CED use following which undesirable effects were reported. However, it is the underlying structures that are important:

  - **Cranium:** One individual had to undergo an operation because a probe had penetrated into the brain [REHMAN, YONAS and MARINARO, 2007].
  - **Eyes:** In one case, a probe pierced a lower eyelid and perforated the eye, with serious consequences [CHEN *et al.*, 2006]. It is readily understood why officers must avoid aiming above the shoulders. The neck also contains vulnerable structures (veins, arteries, nerves).
  - **Fingers:** In one instance, a probe embedded itself in a finger bone and had to be surgically removed [DEARING and LEWIS, 2005].

- **Genitals:** One case of torsion of the testicle was reported [ORDOG *et al.*, 1987].

- **FRACTURES**

  Fractures may be caused by falls resulting from neuromuscular neutralization. It was also reported that one volunteer suffered fractures to two vertebrae as a result of intense muscular contractions caused by a CED in a training experiment [WINSLOW *et al.*, 2007].

- **ABORTION**

  One woman six weeks pregnant received one probe in the abdomen and the other in a hip. She aborted one week later without a causal relationship being established [MEHL, 1992].

- **EYE INJURIES**

  One individual received an electrical charge, in drive stun mode, to the upper right eyelid and subsequently developed glaucoma and retina damage in the right eye as well as a cataract in the left eye [SETH *et al.*, 2007].

- **RHABDOMYOLYSIS**

  Rhabdomyolysis is a breakdown of striated muscle cells that may occur as a result of a prolonged electric charge from a CED. The breakdown may be more or less proportionate to the total duration of the cycles (based on the number of cycles, their duration and the time intervals between them). But it can also be caused by a host of factors including intense muscular activity, muscular trauma, hyperthermia (increased temperature), certain drugs and so on. The muscle breakdown potentially caused by a CED can therefore be in addition to that related to other risk factors already present [HUERTA-ALARDIN, VARON and MARIK, 2005].

- **OTHER**

  Where a CED is used in drive stun mode, and even more so if direct contact with the skin is prolonged, superficial burns and redness of the skin may sometimes subsequently be noted [ANDERS *et al.*, 2003; BURDETT-SMITH, 1997]. In addition, one individual reportedly swallowed a probe, wanting to use it as evidence [KOSCOVE, 1987].

These observed facts concerning morbidity following the use of CEDs shed light on the importance of the anatomic site where the probes penetrate and the total duration of cycles, as well as the need to assist individuals who are hit when they fall. It should also be borne in mind that there will be greater risk of injury to an important structure if a probe hits the neck, face, head or genitals. The risk will

be all the greater if the subject is not a large person (child, thin individual) because the skin shield will not be as thick.

5.2.2 Mortality

How to explain the cardio-respiratory arrests that occur when individuals appear to be under control, that is to say generally a number of minutes after a CED is used? One could almost answer with another question: why have no cases of cario-respiratory arrest been reported among the thousands of volunteers who agreed to subject themselves to CEDs during their training? The first part of the answer to that question probably comes from the studies on maximum-intensity exercise physiology. It has been shown that individuals in good health or subjected to a physical activity of maximum intensity, even for a single minute, immediately show disturbing blood abnormalities: highly acid pH values, increased lactic acid concentrations and very low bicarbonate concentrations [MEDBO and SEJERSTED, 1985]. Following a prolonged period of maximum-intensity exercise, even cerebral oxygenation can be impaired [NYBO and RASMUSSEN, 2007; GONZALEZ-ALONSO *et al.*, 2004].

An individual of sound mind who feels exhausted has the ability to decide to rest in order to recover. Cardiac arrest cases have nevertheless been reported among untrained individuals who had just completed intense physical activity. The phenomenon is explained as being the result of a sudden imbalance in the autonomic nervous system as it switches from activating the sympathetic system (maximum effort) to the parasympathetic system, the effects of which are opposite (rest) [HIRATA *et al.*, 1987]. For volunteers who submit to a CED experiment, conditions are most often optimal: the probes are well located and the context is not hostile. Volunteers can stand up on their own minutes later [HO *et al.*, 2006; HO *et al.*, 2007C; VILKE, 2007].

A study conducted on rats that had been injected with cocaine showed that the mortality rate was distinctly higher in the rats that did not have any freedom of movement following the injection than in those that did and than those that did not receive any cocaine. The authors concluded that restraint during convulsions and the motor agitation induced by cocaine were strongly contraindicated and that the survival rate would be increased by reducing the stress of the intoxicated subjects [PUDIAK and BOZARTH, 1994].

In an individual who is drugged or has a mental health problem causing that state of excited delirium, there appears to be no rest reflex induced by exhaustion [HICK, SMITH and LYNCH 1999]. Subjects therefore continue to resist when officers try to handcuff them, and subsequently try to break free. During that time, these blood abnormalities are exacerbated. The prognosis is all the more uncertain:

IF THE ELECTRICAL CHARGE CYCLES ARE PROLONGED, RENDERING THE SUBJECT'S BLOOD MORE ACIDIC

The fact that the subject subsequently continues to resist no doubt has much worse consequences. One study conducted on animals subjected to repeated charges revealed significant abnormalities in lactate levels in

particular [JAUCHEM *et al.*, 2006], and it is those lactate levels that make the blood acidic during intense physical activity. In an individual in a state of excited delirium, that physical activity is prolonged when he or she resists police officers. For obvious reasons, no well-structured study can ever be conducted on subjects in a state of excited delirium resisting arrest after a CED has been used to control them. Most studies conducted on volunteers show a significant methodological limit resulting from experimental conditions different from actual conditions of CED use [MICHALEWICZ *et al.*, 2007].

IF THE SUBJECT IS IN THE PRONE POSITION, PARTICULARLY IF HE OR SHE IS OBESE [PALMON *et al.*, 1998]
The prone position has the effect of slowing the return of blood to the heart (veinous return) and of aggravating pre-existing conditions, particularly since exhaustion also causes diminished veinous return. This abnormality will result in lower heart rate and blood pressure [MOTAZ, 2007].

IF SIGNIFICANT PRESSURE IS PLACED ON THE SUBJECT'S BACK AND THE SUBJECT MUST MAKE AN ADDITIONAL EFFORT TO BREATHE WHERE HE OR SHE IS ALREADY HAVING TROUBLE BREATHING
When the blood becomes too acidic, the heart slows down and does not contract as well, which may have significant consequences for the individual's health.

IF THE SUBJECT'S TEMPERATURE AND THAT OF THE SURROUNDING AREA ARE HIGH
Intense physical activity, particularly effort against resistance (isometric effort), may increase body temperature very quickly to disturbing levels. In addition, stimulating drugs (cocaine, etc.) increase physical activity, and consequently body temperature, while preventing the body from adequately fighting fever. It is therefore not surprising that so many deaths occur among individuals under the influence of drugs.

If it is taken for granted that the use of a CED was the most appropriate solution for a given individual, it must be kept in mind that the longer the individual remains agitated, the greater the risk of death will be. To increase the individual's chances of survival, officers should ideally:

REQUEST MEDICAL ASSISTANCE AS SOON AS POSSIBLE
In an ideal world, the individual would be calmed before force is even used, which is most often impossible. It is clearly impossible to prevent all deaths, even with rapid medical intervention, because a number of deaths (which are given less media coverage, however) occur in hospitals in a context of severe mental confusion together with agitation (excited delirium), and CED has not been used [PATERSON *et al.*, 2003]. Furthermore, before the era of neuroleptics (drugs used, among other things, to calm agitation), people died suddenly in similar circumstances. The terms used

at the time were maniac exhaustion, Bell's mania, and others [PATERSON *et al.*, 2003].

TAKE IT FOR GRANTED THAT, OFTEN, A CONFUSED AND AGITATED INDIVIDUAL WHO DOES NOT COOPERATE IS, UNTIL PROVEN OTHERWISE, A PERSON WHO FIRST NEEDS HELP

This presupposes adequate training. It should be borne in mind, however, that a person who tries to bite or who spits constitutes a potential danger of injury and infection; police officers must take this into account.

REMEMBER THAT REPEATED CED CYCLES CAN AGGRAVATE THE INDIVIDUAL'S BLOOD ABNORMALITIES AND CONDITION, ALL THE MORE SO IF THE INDIVIDUAL IS SICK

The medical literature provides no opinion on the optimum number of CED cycles, perhaps because prolonged agitation against resistance causes the same type of abnormalities [HICK, SMITH and LYNCH, 1999]. The sedation and cooling process should ideally start on site. Ketamine has been successfully used in a context of agitation and violence, in both the hospital and pre-hospital environments [HICK and HO, 2005; ROBERTS, 2001; GREEN, 1999]. In hospitals, agitated individuals, even if they have lost touch with reality, often calm down when they hear a familiar or calming voice.

AVOID THE PRONE POSITION FOR PROLONGED PERIODS OF TIME, FOR THE REASONS CITED ABOVE

AVOID PUTTING PRESSURE ON THE BACK IF THE PERSON IS ALREADY HAVING TROUBLE RESTORING NORMAL BREATHING

GET OXYGEN AS SOON AS POSSIBLE, EVEN DURING THE INTERVENTION

5.3 PROBLEMS ASSOCIATED WITH PROBE WITHDRAWAL AND MEDICAL FOLLOW-UP

When a CED is used on an individual, that individual may need medical care as a result of either a pre-existing medical condition or health problems related to the intervention itself. In addition, a directive of the Collège des médecins requires that probes be withdrawn by medical personnel (physician or nurse) [Appendix C]. Furthermore, in an arrest context, the individual's pre-existing medical condition is not necessarily known to the police officer. Consequently, it is recommended that the person who has been subjected to neuromuscular neutralization as a result of the use of a CED undergo a medical assessment as soon as possible.

Where the subject's health has clearly been undermined, the need for a medical assessment is obvious, and necessary care must be provided quickly. However, an absence of any clear signs of health problems in the subject does not mean

medical assessment is any less necessary. This is particularly the case when subjects do not complain or their condition is classified as not urgent once they are under the responsibility of health professionals.

- **SITUATION DOES NOT APPEAR THREATENING, THE SUBJECT DOES NOT COMPLAIN**

  Since CED use is sometimes associated with a certain degree of morbidity and because the individual in custody is not necessarily cooperative, it is better to have a health professional assess the individual's physical and mental condition.

- **CLASSIFIED NOT URGENT**

  Currently, individuals entering emergency departments under police escort are generally sorted in accordance with the same criteria as other patients, which means that, if they are classified "not urgent," they will have to wait their turn. This may therefore mean that police officers cannot do their regular work because they are required to wait for the individual in custody to be released following the medical assessment. Consequently, potential solutions must be found so that individuals who have just been subjected to a CED undergo appropriate medical assessment as soon as possible to enable police officers to continue their work in the circumstances.

5.3.1 Cooperation of hospital medical staff

Emergency sorting is generally done quickly, but medical assessment may be postponed for a number of hours if the patient's condition raises no fears. Emergency medical staff should be made aware of the fact that the final medical assessment of a person exposed to a CED should be done on a priority basis so that the person can then be released, even if triage does not reveal an imminent threat to the individual's life or health. In case of doubt, the physician should obviously get involved depending on the degree of urgency of the situation and to the extent he or she is available. Even if there were a waiting period, health professionals would at least already be aware of the issue.

Talks should be undertaken with professionals, their professional associations and probably at the departmental level so that everyone is made aware of this issue and takes part in developing and implementing solutions. Current emergency sorting standards leave room for optimism in this regard [ORDRE DES INFIRMIÈRES ET INFIRMIERS DU QUÉBEC, 2007].

5.4 MEDICAL RECOMMENDATIONS FOR A QUEBEC POLICE PRACTICE ON CEDS

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

Before using CEDs:

- **Police officers consider a highly agitated person as a medical emergency, since the state of delirium cannot be diagnosed or treated until the person has been controlled and assessed by medical staff.**
- **Police officers call upon medical services, if possible, before intervening physically with this type of person.**
- **Police officers recognize persons at risk: pregnant women, persons who are elderly, thin or of small stature.**
- **Police officers try to avoid parts of the body at risk: head, neck, heart area and genitals.**

While using CEDs:

- **Police officers use as few cycles as possible, avoiding continuous cycles exceeding 15 to 20 seconds.**
- **Police officers inform the individual that a CED has been used and that its effect is of short duration.**
- **Police officers use physical intervention techniques that interfere as little as possible with breathing, from the moment the subject's ability to put up resistance is reduced by the effect of the CED. Police officers should avoid placing the subject in the prone position for extended periods of time.**

After using a CED and having controlled the individual:

- **Police officers, as far as possible, transmit all relevant information to medical personnel, including the circumstances of the CED use, the anatomic area where the probes were deployed, the number of cycles, the duration of the physical intervention and the individual's reaction (fall, exhaustion).**
- **Police officers ensure that every person who has been subject to neuromuscular neutralization undergoes a medical assessment as soon as possible, even if the probes are no longer in place.**
- **Police officers ensure that any probe or probes that have penetrated and are still embedded in the skin are withdrawn by medical personnel.**
- **Police officers provide medical personnel with CED technical specifications.**

6 Analysis of operational component and recommendations

6.1 GENERAL FRAMEWORK FOR THE USE OF CONDUCTED ENERGY DEVICES (CEDS)

The use of conducted energy devices (CEDs) is part of the philosophy on the use of minimum force that gives priority to communication and negotiation. CEDs must be used in a manner consistent with the orienting principles and practices for applying the police practices concerned, particularly police practice 2.1.1 *Use of Force,* police practice 2.2.15 *Intervention in Cases of Excited Delirium* and police practice 2.3.9 *Incarceration at a Police Station*.

A CED is a weapon that represents an additional option for the use of physical force or another intermediate weapon. Despite the fact that CEDs can be used in certain specific situations where lethal force might be warranted, they constitute first of all an intermediate force option for controlling a high degree of resistance or aggression. They do not replace firearms.

While the CED's effectiveness in quickly containing dangerous behaviour has been demonstrated, and its use, in certain circumstances, constitutes the safest controlled method, its use nevertheless represents a relatively physical and psychological intrusion. Furthermore, from an operational standpoint, apart from the factors related to the safety of the persons concerned, CED users must consider a number of other risk factors related, in particular, to flammability, falls and the effects of involuntary muscle contractions.

6.1.1 CED use on an individual

A CED is not infallible and, in a number of circumstances, can cause an unexpected result. When the electrical current is not transmitted to the person exposed to the CED, that is considered an operating fault. This may occur, for example, where at least one of the probes does not permit adequate electrical contact with the individual, a cartridge is defective, at least one probe misses its target, the subject has low muscle mass, there is a break in at least one of the electrical wires linking the probes to the cartridge, and so on.

The use of a clearly identifiable CED can help reduce the risk of a successive escalation in the resistance and types of force used. A clearly identifiable CED also makes it less likely that support officers will confuse it with a firearm.

However, some special units might prefer dark-coloured CEDs for tactical reasons relating to camouflage, for example.

Where communication and negotiation have failed or are not applicable, a CED should be used to control a violent or potentially violent person whose behaviour presents an imminent and significant risk of bodily harm. It cannot be used, for example, in a crowd control situation as a means to control or disperse a crowd or to control passive resistance, defensive resistance or a low-intensity attack.

It is also possible that, in certain exceptional circumstances, an individual's behaviour, without being violent, may nevertheless present a significant risk to his or her own safety, that of the police officer or that of another person.

It is up to the officer to exercise judgment and use the CED where that option is reasonable, appropriate and necessary, having regard to all the circumstances. It would be unwise to develop a police practice specifically stating the kinds of circumstances in which a CED may or may not be used.

Consequently, the members of the Subcommittee recommend that it be included in the police practice on CEDs that:

- **Police officers should give priority to communication and negotiation at all times.**
- **Police officers may use CEDs where that option is reasonable, having regard to all the circumstances, in order to:**
  - **control an individual whose resistance presents a significant risk to his or her own safety, that of the officers or those of another person;**
  - **protect themselves or protect another person from an imminent threat of bodily harm.**
- **Even if a CED can, in some cases, where reasonable and appropriate, be used to counter a danger of grievous bodily harm or death, it does not replace a firearm.**
- **Barring any specific tactical considerations, a CED should be worn in a holster on the side of the body opposite the service weapon.**
- **CEDs should be clearly identifiable so as to prevent them from being confused with firearms.**
- **Some special units might prefer dark-coloured CEDs for tactical reasons.**

6.1.2 Using CEDs on animals

Conducted energy devices can be used to defend oneself or another person from an animal. In this type of situation, and depending on the circumstances, the user must consider a number of factors that should be addressed in training.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers may use CEDs when they, a colleague or another person is attacked or about to be attacked by an animal.**

6.2 CED UTILIZATION MODES AND THEIR OPERATIONAL IMPLICATIONS

6.2.1 Demonstration mode

In demonstration mode, police officers may use a CED to deter a person from carrying on a dangerous action by presenting the device, using the laser sight or demonstrating the electrical arc. It is important to note, however, that, when users demonstrate the electrical arc, they must withdraw the cartridge from the firing housing and not have it in hand when the CED is activated, both when demonstrating the electrical arc and when using the device in drive stun mode. The cartridges may go off if they are within 5 cm of a CED that is charging up. The user must also consider the time necessary to replace the cartridge in the firing housing and prepare to intervene.

6.2.2 Drive stun mode

In drive stun mode, the distance between the police officer and the person he or she wishes to control must be very short. This application mode affects the sensory nervous system by creating intense, localized pain, and the motor nervous system by causing a localized biomechanical dysfunction. Using a CED in drive stun mode may, where circumstances permit, cause an effective diversion that may make it possible to control a person who is resisting physically. For police officers using the device, this means:

- direct contact with the individual concerned and a greater risk of direct physical confrontation with that person;
- maintaining firm, continuous pressure with the CED on the person, who may continue to offer significant physical resistance (localized muscular neutralization);

- handling the CED, which monopolizes the dominant hand, making it virtually impossible for officers using it to use both hands to control the person; consequently, the support of one or two colleagues is usually essential;
- the possibility of dealing with a person whose pain response is inhibited by drugs, prescription medication or alcohol, or a mental health problem;
- the possibility, as when using other hard physical diversion techniques, of causing intense pain, which may in turn provoke a violent reaction from the individual concerned.

6.2.3 Probe mode

Depending on the cartridge used, probe mode can permit an intervention from a distance of up to 10.7 metres (35 feet). When used in probe mode, a CED affects the sensory nervous system by causing intense, localized pain, as well as the motor nervous system by causing a generalized biomechanical dysfunction or neuromuscular neutralization. Using a CED in probe mode results in neuromuscular neutralization, which causes the person hit to fall, thus promoting control of a person who resists physically. For police officers using the device, this means:

- a greater intervention distance between the officer and the individual that officer is seeking to control and a lesser risk of direct physical confrontation with that person;
- an impact on the motor nervous system (neuromuscular neutralization) of the person hit, independent of that person's sensitivity to pain;
- the person hit falls, creating an opportunity to approach and control him or her quickly, even in the face of strong resistance;
- handling the CED, which monopolizes the dominant hand, making it virtually impossible for the officer using it to use both hands to control the individual; consequently, for the purpose of safe, effective intervention, the intervention of one or more support officers is necessary;
- the possibility, when only one probe reaches its target, of causing the neuromuscular neutralization effect by using the CED in drive stun mode with the person in order to close the circuit.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Where tactical circumstances permit, police officers using CEDs:**
  - **inform the individual that a CED will be used;**
  - **show the CED and train the laser sight on the individual;**
  - **demonstrate the electrical arc.**
- **Probe mode is favoured over drive stun mode for achieving neuromuscular neutralization (NMN).**

- **CEDs may be used in drive stun mode to produce an NMN in combination with probe mode.**
- **In exceptional circumstances, drive stun mode may also be used where circumstances require that a physical diversion be caused.**
- **Officers using CEDs ensure, where possible, that one or more officers are present to provide support.**

6.3 OPERATIONAL RISKS ASSOCIATED WITH CED USE

6.3.1 Flammability risks

Whether a CED is used in drive stun or probe mode, its electrical impulses create an arc that can penetrate clothing. This electrical arc can clearly constitute a danger when produced around flammable or explosive materials such as gasoline vapours, natural gas or propane. These products can be found during interventions at clandestine laboratories in particular.

Pepper spray (OCS), which is likely to be used before CEDs in a police intervention, may also constitute a flammable substance. Pepper spray is an atomiser containing a propulsive agent (butane, propane, nitrogen, etc.), a carrier-compound (water, isopropyl alcohol, ethanol, mineral oils, etc.) and a group of substances (capsaicinoids), the most irritating of which is capsaicin (a pungent and highly irritating crystalline alkaloid, generally extracted from *Capsicum annum*, a variety of red pepper).

Pepper spray (OCS) is made from oil or water. The manufacturer of oil-based OCS requires a high concentration of industrial solvents to ensure the capsaicinoids are uniformly dispersed. The product is usually flammable. The manufacturer of the water-based product requires only a weak concentration of solvents to ensure dispersion of the capsaicinoids. Given the high concentration of water and the low concentration of solvents, this pepper spray is usually not flammable.

As for OCS, certain other types of chemical agents, such as chemical irritants (orthochlorobenzalmalonitrile - CS), tear agents (chloroacetophenone – CN) and smoke agents (hexachloroethane - HC), may also be flammable, even though the manufacturer states the contrary on their labels. Any concomitant use of a CED with a flammable chemical agent must therefore be prohibited.

There is currently no certification guaranteeing the non-flammability of the various chemical agents that might be used together with a CED. In the absence of specific standards on the subject, Quebec police organizations are left to their own devices and must ensure the non-flammability of chemical agents by sharing information or

through invitations to tender when purchasing such products by requiring the supplier to certify that its product is non-flammable.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers must avoid using a CED in the presence of flammable or explosive substances such as alcohol or gasoline vapours, natural gas or propane, particularly in interventions at clandestine laboratories.**
- **The police department must do everything in its power to ensure that chemical agents that may be used together with CEDs are not flammable.**

6.3.2 Risks associated with falling by the person hit

The use of CEDs, particularly in probe mode, presents a significant risk of falling by the person hit. Since probe mode causes neuromuscular neutralization and, consequently, virtually total loss of voluntary motor skills, it is likely that individuals hit will be unable to protect themselves in the event of a fall.

The CED user must therefore take into account the environment and all circumstances in order to prevent significant secondary injuries that might result from a fall.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers using CEDs must, considering the immediate environment, take into consideration the risk of secondary injury that a fall by the person hit could cause.**
- **CEDs should not be used on persons in control of a moving vehicle.**

6.3.3 Risks associated with involuntary muscle contractions

In most cases, CED use causes a series of involuntary muscle contractions as a result of which the person hit may be unable to follow a police officer's orders. For example, in the electrification phase, individuals may be unable to drop the knife in their hand, even though they hear the police officer's orders.

In addition, the muscle contraction caused by the effect of a CED may result in involuntary pressure on the trigger of a firearm held by an individual. Police

officers must also consider the fact that, when they handcuff an individual, that person may offer muscular resistance as a result of an involuntary contraction caused by the CED.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Following the use of a CED, police officers must take into account involuntary muscle contractions in a person who is armed or at the time of handcuffing that person.**

6.3.4 Risks associated with the simultaneous use of two CEDs

The literature is not very clear on the effects of the simultaneous use of two conducted energy devices. Although there does not appear to be any accumulation of electrical intensity when two CEDs are used simultaneously on a single individual, the effects of the contraction of a larger muscle mass have yet to be clarified.

Despite the Subcommittee's efforts to clarify the specific consequences, if any, of the simultaneous use of two conducted energy devices, the question remains. It may also occur that the behaviour of an individual is so risky that immediate police intervention is essential. As an example, we can cite the case in which one individual advances toward another intending to stab the latter or the case of an individual whose behaviour is such that he is about to be struck by a motor vehicle.

It is possible that this type of situation may not give police officers a second chance to use a CED, in the event the first shot is ineffective. Consequently, this kind of situation could, in some cases, lead to the use of a riskier force option or, in others, the inability of police officers to prevent the individual from compromising his or her own safety.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **The simultaneous use of two CEDs be reserved for exceptional situations in which the urgent need to stop the high-risk behaviour of the person concerned does not give the police officer the time needed to use a second cartridge in the event that the first shot is ineffective.**

6.4 TACTICAL CONSIDERATIONS IN THE USE OF CEDS

The prudent and effective use of CEDs requires that police officers conduct an accurate assessment of the situation, plan their intervention the best way possible, make a rational choice to use a CED and, when it becomes necessary, intervene so as to control the person as quickly and safely as possible.

In their assessment, police officers must consider, in particular:

- the situation (reason for intervening, environment, number of persons involved, state and characteristics of the offender, knowledge of the subject, time-distance ratio, signs of potential attack, etc.);
- the offender's behaviour (level, intensity and risk associated with resistance or attacks);
- their perception of their ability to deal with the situation;
- all tactical considerations (physical and technical capabilities of police personnel, experience, number of officers present, potential reinforcements, offender's clothing, etc.).

The choice whether to use a CED over another use-of-force option or combined with another option requires an in-depth knowledge of the capabilities, limits and implications of each of those options. Police officers must continually assess the situation and be ready to use another use-of-force option if they consider a CED ineffective.

The CED user and supporting officers must know in particular that multiple, consecutive discharge cycles of a CED can have negative effects on a person, in the same way as any intense physical effort.

Although there is no predetermined limit on the duration of neutralization or the number of neutralization cycles in order to be effective, intervention planning must make it possible to take advantage of the window of opportunity provided by the use of a CED to limit the number of cycles to what is reasonably necessary in order to safely approach and handcuff the individual in question.

Where firing is imminent, the CED user should, where possible, warn supporting police officers so that they are ready to intervene together and to prevent the detonation of a cartridge from being confused with the sound of a firearm.

In the process of controlling a person, police officers must bear in mind that, during the act of five-second cycle, the individual remains conscious and hears instructions given, but is physically unable to comply. Moreover, particularly as a result of an altered mental state, the individual may be unable to understand the police officer's instructions even if he hears them.

It is not up to police officers to remove the probes that have penetrated an individual's skin. They must therefore leave the probes in place and cut the wires

at their base. A probe that has penetrated an individual's skin must be handled with the same precaution as a dirty needle. Officers must dispose of it safely in a container provided for that purpose.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers plan an intervention strategy in order to take advantage of the window of opportunity that the use of a CED provides and to limit the number and duration of cycles to what is reasonable and necessary in order to approach and handcuff the person in question safely.**
- **Police officers must constantly assess the situation and be ready to use another use-of-force option if they consider a CED ineffective.**
- **As far as possible, the CED user advises all personnel concerned of his or her:**
  - **position;**
  - **intention to deploy the CED;**
  - **the moment when the probes are discharged.**
- **Faced with a situation in which they must control a person, before using a CED, police officers must ensure that:**
  - **the individual has refused to comply;**
  - **there are valid grounds to use a CED, by assessing, in particular:**
    - **the individual's potential for violence;**
    - **the degree of injury that the individual represents for himself or for others;**
    - **the weapons that person possesses;**
    - **the benefits of using a CED compared to other use-of-force options;**
    - **the CED's capabilities based on the context and environment.**
- **Police officers must remember that the subject may be confused and disoriented for several seconds immediately after receiving the electric discharge of a CED, or that the subject may be unable to understand an officer's verbal instructions as a result of a language barrier or altered mental state, even if an individual can hear.**
- **Police officers must leave probes in place and cut the wires at their base.**
- **A blood-covered probe must be handled with the same precaution as for a dirty needle. Police officers must dispose of probes safely in a container provided for that purpose.**

7 Analysis of management component and recommendations

Conducted energy devices (CEDs) are prohibited weapons within the meaning of the Criminal Code and therefore require strict supervision by police organizations that choose to use them. The recommendations under the management component have been made to establish an administrative framework for CEDs that will promote use of the weapons that is consistent with expectations, follow-up for such uses and management of these intermediate weapons within Quebec police organizations.

7.1 FOLLOW-UP AND MONITORING OF CED USE

New generation conducted energy devices are equipped with functional capabilities that make it possible to record and subsequently extract data on each use. It is therefore possible to determine the exact moment when a device was used and the duration of that use. Although interesting, this information is only really useful from the moment it is possible to determine the user and the context in which the device was used on each occasion. To ensure adequate monitoring of CED use, police organizations will have to establish control mechanisms to determine which police officers have used the devices. A sample utilization record is presented in Appendix D.

In addition, each cartridge used in probe mode has a single serial number that can be used to establish utilization follow-up measures. However, such measures would only make it possible to monitor probe mode utilizations, since the cartridges are not required for use in demonstration or drive stun mode.

Instead, the cartridge serial numbers will make it possible to monitor inventories between suppliers, distributors and the various police organizations. When a CED is used in probe mode, the probes are projected at the target from the cartridge, which simultaneously releases a quantity of multicoloured confetti. Each piece of confetti bears the unique serial number of the cartridge from which it comes, thus ensuring a kind of reverse utilization traceability where necessary.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers must enter every test and utilization in a utilization record provided for that purpose.**

Monitoring CED use requires that it be possible to match utilizations entered in a record with the police interventions warranting them. Police officers are regularly required to complete incident reports of various kinds in which they record their interventions. To date, there is no obligation or standard regarding the desired degree of detail for reporting the use-of-force aspect of those interventions.

Effective monitoring of utilizations requires that all CED utilizations be recorded, regardless of the mode officers used in an incident. Remember that there are three main CED utilization modes: demonstration mode (presenting the weapon, using the laser sight and demonstrating the electrical arc), drive stun mode and probe mode.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers inform their immediate supervisor after each CED utilization.**
- **Police officers enter every utilization in the report identified by their organization, stating, in particular, the utilization mode used:**
  - **demonstration mode:**
    - **present the weapon;**
    - **use the laser sight;**
    - **demonstrate the electrical arc;**
  - **drive stun mode;**
  - **probe mode.**

7.2 STORAGE AND TRANSPORTATION

The prohibited weapon status of conducted energy devices also requires that they be transported and stored safely. Locked premises with limited and controlled user access would meet this requirement. In the event a CED under a police officer's responsibility is not carried by that officer during his or her shift, it must be stored in a locked case and stowed in the trunk of a patrol car, where possible.

Basic safety rules must be followed when a CED must be sent to a supplier for maintenance or repairs. It is therefore important to deal with known businesses that can guarantee parcel delivery and that have the required permits to transport weapons.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **CEDs be stored safely in a place with limited or controlled user access.**
- **If a CED is not carried by the user during his or her shift, it should be stowed in a locked case in the trunk of the patrol car, where possible.**

7.3 MAINTENANCE AND DATA DOWNLOAD

Conducted energy devices are very different intermediate weapons from what currently exists in the arsenal of Quebec police officers. It is therefore important that police organizations be well informed of the various obligations respecting the acquisition and maintenance of such weapons. Note, for example, the fact that users do not automatically have the necessary authorization to download utilization data recorded in a CED or the option of altering data content. In addition, some specific precautions must be taken when changing batteries and regulating the internal clock. All these considerations must be passed on to the gunsmith, who will be responsible for maintaining these weapons. A recommendation on the training of gunsmiths is provided for this purpose in the section on training.

Users must ensure that the CED operates properly when they take possession of it. To that end, they check the status of the battery and conduct the electric arc test before inserting the cartridge. They then complete the utilization record by entering the required information.

Utilization data must be downloaded as soon as possible after each utilization, regardless of the utilization mode used. This procedure is consistent with recommendations made by a number of North American organizations to promote the keeping of data on every utilization. The onus is on police organizations to keep a record of utilization data downloaded from every CED in their possession and to establish the necessary procedures for keeping that information. Note that data must be downloaded by a person who has the required training and skills.

Lastly, in the event a CED requires maintenance by a supplier, it is recommended that data be downloaded, as a precaution, before the device is shipped.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Every time they take possession of a CED, police officers must ensure that the device operates properly by checking the status of the battery and conducting the electric arc test before inserting a cartridge.**
- **It is recommended that utilization data be downloaded from a CED before it is entrusted to another organization or to a supplier.**
- **Data download and CED maintenance must be performed by a person who has received the appropriate training.**
- **Police departments keep a record of utilization data from every CED in their possession and establish the necessary procedures for the keeping of that information.**
- **Following every police intervention in which a CED has been used, it is recommended, regardless of the utilization mode used, that the data be recorded as soon as possible.**

7.4 LOSS OR THEFT

The loss or theft of a CED requires that the same procedure as for a firearm be put in place. The incident must be reported as soon as possible to the police department serving the area where the theft or loss occurred. In addition, the CED must be registered as soon as possible with the Quebec Police Information Centre by the police department receiving the complaint.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police officers report the loss or theft of CEDs under their responsibility as soon as possible with the police department serving the area where the incident occurred.**
- **The police department concerned ensures that the incident is reported to the Quebec Police Information Centre.**

7.5 USE OF CED CAMERAS

Certain models of conducted energy devices may be equipped with cameras, specifically designed for that purpose, which make it possible to film certain aspects of a police intervention in which a CED equipped with such a camera is used. These cameras are installed under the grip of the weapon and can be activated independently of the weapon. However, the firing techniques taught in Quebec train police officers to place their hands on the CED in such a manner

that they obstruct the camera's viewing field. This technology is relatively recent and also appears to pose some reliability problems. For the moment, systematic use of such cameras is not necessary. The introduction of cameras in police work nevertheless raises numerous issues concerning work organization and various legal, administrative and financial aspects.

8 Analysis of training component and recommendations

Police training is not developed accidentally or randomly. The legal, social and moral responsibilities are too great for that to be the case. In Quebec, as elsewhere in the world, greater specialization and professionalism are now required when it comes to the conduct of police practice. These requirements call for greater knowledge and a significant raising of standards. The word used now in reference to police knowledge is competencies, no longer mere knowledge or technical skills.

When a need is expressed and can be met through training action, it is important to implement a rigorous, systematic process to clarify that need. In general, the use of advisory committees or multidisciplinary task forces consisting of experts is the preferred way of clearly defining the nature and scope of the need in question. In some instances, studies and analyses of the area of practice are conducted to achieve the same objective. In all cases, consultation and validation mechanisms must be established and implemented so that each of the steps taken to clarify the study subject is exactly consistent with expressed expectations.

The Subcommittee's work has helped clarify the expectations expressed with regard to the relevant elements that should be included in a Quebec police practice on the use of conducted energy devices, but also the essential elements that must be addressed in the area of training.

It is important that these expectations be clearly understood and well applied by all persons required to intervene in the CED utilization process, but also in the supervision of CED use. Supervisors and management personnel should receive training to enhance their awareness of CEDs and to be able to make informed administrative decisions.

The professional use and supervision of conducted energy devices necessarily require adequate training.

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- **Police departments ensure that their officers receive the necessary training in the use of CEDs under the supervision of a monitor accredited by the École nationale de police du Québec.**

- **Police department heads ensure that all police officers to whom they issue CEDs requalify at least once a year, in accordance with the standards established by the École nationale de police du Québec.**
- **Police department heads ensure that all individuals required to intervene in the CED utilization process and in the supervision of CED utilization are trained.**

9 Conclusion and further recommendations

To carry out their mission, police officers may be compelled to use force in certain circumstances. Police presence, an ability to communicate and physical challenge are levels of force that enable police officers to defuse most situations. In other cases, these measures may prove ineffective, inapplicable, insufficient or indeed inappropriate to the situation. That may force officers to resort to levels of force literally involving physical control of an individual.

Police officers must correctly select a technique or piece of equipment likely to enable them to control the individual in the safest possible manner for all persons concerned. In making that decision, police officers must consider a set of factors. Society moreover requires that they resort only to necessary force, that is to say force that is reasonable and appropriate in the circumstances as a whole, that it be used without needless or gratuitous violence, and that they use their equipment with prudence and judgment.

It is also clear that, regardless of the use-of-force option selected to control a violent individual, there is always some risk to the individual's physical integrity and that of the intervening police officers.

On the whole, the use of conducted energy devices by the police forces of a number of countries has raised many entirely legitimate questions and concerns in recent years. Those concerns relate to improper use of CEDs by police officers, excessive use of force or the potential links between CEDs and individual deaths, whether as a direct cause or contributing factor.

In Quebec, the general use of force framework is set out in police practice 2.1.1, *Use of Force*, and forms the basis of the message given to future police officers of the École nationale de police du Québec and to the officers on duty in the province's various police departments. Chapter 8 of this report contains a number of recommendations for police departments to ensure the qualifications of police officers who will be required to intervene in the process of using conducted energy devices. The École nationale de police du Québec will guarantee the relevance, coherence and quality of that training based, in particular, on the content of this report.

Consequently, Subcommittee members recommend:

- **That the École nationale de police du Québec develop training for the various contexts in which CEDs are used in police work.**

- **That the École nationale de police du Québec develop monitor training to ensure the skills of CED users are maintained. The monitor will also ensure that training is provided for all persons required to intervene in the CED utilization process and in the supervision of CED utilization.**

While training is essential in developing the skills of the various CED users, it alone cannot guarantee that this intermediate weapon will be correctly used by Quebec police officers. The level of direct involvement of officers using CEDs is often cited as a reason for excessive use of force. Chapter 7 of this report provides a number of recommendations for police departments to ensure rigorous monitoring and control of CED utilizations. Internal (internal affairs) and external (Commissioner for the code of police conduct) control mechanisms moreover have a mandate to address all allegations of excessive use of force by a police officer, regardless of the technique or tool that may have been used.

Consequently, Subcommittee members recommend:

- **That the Department of Public Safety assess whether it is appropriate to introduce a process for analyzing and validating new police weapons and that such a process constitute a prerequisite to the adoption of any new weapon by a Quebec police organization.**

Concerns expressed about the impact of CEDs on the health of individuals exposed to them have led to numerous scientific studies on the subject. In the current state of knowledge, conducted energy devices, when used appropriately in an actual situation, are not considered likely to cause grievous bodily harm or death. There are currently no research findings or evidence establishing a causal relationship between CED use and the death of an individual exposed to the device. Furthermore, police officers are at times required to intervene with persons who show the signs and symptoms of excited delirium.

In accordance with police practice 2.2.15, *Intervention in Cases of Excited Delirium*, the state of excited delirium must be considered a medical emergency that cannot be diagnosed or treated until the individual is controlled and assessed by medical personnel. This condition unfortunately does not prevent the individual that displays its symptoms from acting in such as way as to cause a significant danger for his or her safety, that of police officers or that of another person. Nor does it constitute an exemption to the obligation of a police officer to act in such a situation. The situation is then all the more problematical when communication proves ineffective and the individual is insensitive or not highly sensitive to pain. Regardless of the technique or tools used in such situations, the consequences for the individual's health are often significant and raise the broader issue of what the literature calls "in-custody death syndrome".

Consequently, Subcommittee members recommend:

- **That the École nationale de police du Québec cooperate in the announced update of the study on conducted energy devices by the Canadian Police Research Centre.**
- **That the École nationale de police du Québec cooperate in all research efforts to conduct an epidemiological analysis of the medical results of police interventions requiring the use of force, particularly in cases where a pan-Canadian perspective can be considered.**
- **That the École nationale de police du Québec monitor research work on conducted energy devices and in-custody death syndrome and keep Subcommittee members informed of findings.**

In addition to scientific knowledge, operational data are a source of essential information for monitoring issues regarding the use of force by police officers, the use of CEDs and in-custody death. The work conducted under the Subcommittee's mandate has shed light on major difficulties involved in obtaining standard operational data for both Quebec and Canada.

Consequently, Subcommittee members recommend:

- **That the Department of Public Safety revise the section of its annual questionnaire on "the administration of police departments" so that the questions concerning CED utilization make it possible to determine utilization modes (demonstration, drive stun and probe) and the results obtained from each utilization.**
- **That the Department of Public Safety assess the appropriateness of requiring a single report on the use of force from all Quebec police departments and give the Subcommittee the mandate to propose its content, as necessary.**

The various recommendations set out in the preceding sections of this report will enable the Direction de l'organization et des pratiques policières [Organization and Police Practices Directorate - Tr.] of the Department of Public Safety to prepare a draft police practice to provide a framework for CED utilization by Quebec police departments and the police officers who work there. The Subcommittee remains available for the purpose of validating such a draft police practice and to carry out the various mandates that the Department of Public Safety may assign it concerning any one of the recommendations provided in the conclusion to this report. A summary of recommendations is provided in Appendix E hereto.

Lastly, we note that a number of analyses and investigations are currently underway in Canada into police operations in which a conducted energy device has been used. It goes without saying that the findings of those efforts and of other scientific research underway could shed significant new light that would

require a reconsideration of the consensus here presented. The Subcommittee will closely monitor the findings of those efforts and the state of scientific knowledge on the subject.

Appendix A
LIST OF SUBCOMMITTEE MEMBERS AND ASSOCIATES

Subcommittee members

- **Mr. René ALLARD, Inspector**
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  City of Thetford Mine Municipal Police Department - Tr.]

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From the École nationale de police du Québec: regular guests and management

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  Adjoint par intérim du directeur du soutien pédagogique et de la recherche
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Educational Support and Research Directorate
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- **Mr. Luc PELLERIN, Director**
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  École nationale de police du Québec
  [Educational Support and Research Directorate
  Quebec National Police School - Tr.]

Appendix B
SPECIFICATIONS FOR TASER INTERNATIONAL INC.'S M26 AND X26 MODELS

TASER **ADVANCED TASER® M26 SERIES ELECTRONIC CONTROL DEVICE SPECIFICATION**

Law Enforcement Models[5]

Model	Model No.	Color	Battery Tray	Label Color
ADVANCED TASER® M26 (Law Enforcement)	44000	Black	8 AA cells	Yellow
ADVANCED TASER® M26 (Law Enforcement)	44005	Yellow	8 AA cells	Black

Specifications[5]

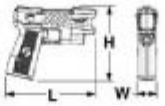
1. Output characteristics[3]:
   Wave form: Damped oscillation /"blunt" pulse with 17 µs decay time constant.
   Pulse rate:
   20 PPS ± 25% with NiMH rechargeable cells
   15 PPS ± 25% with alkaline cells
   Pulse duration: 40 microseconds full waveform 10 microseconds primary phase
   The trigger activates a 5-second cycle. The cycle can be stopped by placing the safety lever in the safe position.
   Peak open circuit arcing voltage: 50,000 V
   Peak loaded voltage: 5,000 V, avg. voltage over duration of main phase 3400 V, avg. over full phase 320 V, avg. over one second 1.3 V.
   Current: 3.6 mA average
   Energy per pulse:
   Nominal at main capacitor: 1.76 joules
   Delivered into load: 0.50 joules
   Power rating:
   Nominal at main capacitor: 26 watts at 15 PPS
   Nominal delivered into load: 7.39 watts at 15 PPS
2. Power source: 8AA NiMH[7] or alkaline cells
3. Temperature range:
   NiMH cells: -4 °F [-20 °C] to 122 °F [50 °C]
   Alkaline cells: 32 °F [0 °C] to 122 °F [50 °C]
4. Relative humidity: 15% to 80%
5. Housing: High impact polymer
6. Patent: U.S. 6,636,412 and other patents pending

Features

1. Integrated 650 nm laser (used for target acquisition).
2. Capable of drive-stun with or without TASER Cartridge installed.
3. Electrical charge can penetrate up to 2" [5 cm] cumulative of clothing, or one inch per probe.
4. Ambidextrous safety levers.
5. Warranty: 1-year standard, with extended warranties available at time of purchase.[2]
6. Unit stores firings, date and time for approximately 585 firings. Data can be downloaded using an M26 dataport download kit, which can be ordered separately.
7. For NiMH cells, a charger is available, TASER part number: 44710 or as a kit with NiMH cells and charger order 44705.
8. Compatible with all TASER Cartridges[6,7], but it will not be compatible with the TASER C2 Cartridge.
9. The LED indicator shows that the laser is on and the device is capable of firing, but does not indicate that there is sufficient battery power to fire or discharge.

Physical Dimensions[1]

Dimensions (Without Cartridge)				Dimensions (With Cartridge)[1,6]
Length (L)	Height (H)	Width (W)	Weight	Length (L2)
7.13" [18.11 cm]	6.00" [15.24 cm]	1.75" [4.44 cm]	19.2 oz [544.31 g]	8.30" [21.10 cm]



1. Dimensions are in English [metric].
2. Additional terms and conditions may apply (for additional information, contact a TASER International sales representative or visit online at: www.TASER.com).
3. Product specifications may change without notice; actual product may vary from picture.
4. Material Safety Data Sheet (MSDS) concerning nickel metal hydride and alkaline cells available upon request.
5. M26 not available for sale to the general public. Additional models available. Please contact a TASER International sales representative for more information.
6. For standard cartridges, see TASER specification RD-SPEC-CRTG-001.
7. TASER Cartridges available up to a maximum range of 35' [10.67 m]. Use of cartridges not authorized by TASER International will void the product warranty.
8. TASER recommends only Duracell® Ultra alkaline or Energizer® NiMH replacement cells
9. Output specifications may vary dependant upon temperature, battery charge and load characteristics.
10. Duracell® is a registered trademark of P.R. Mallory and Co.
11. Energizer® is a registered trademark of Eveready Battery Co.
12. ADVANCED TASER® and TASER® are registered trademarks of TASER International, Inc. All rights reserved.

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TASER® X26E SERIES ELECTRONIC CONTROL DEVICE SPECIFICATION (Law Enforcement X26)

Law Enforcement Models[5]

Model	Model No.	Color	Magazine Type	Grip color/style	Holster
TASER® X26E (Law Enforcement)	26000	Black	DPM	Black on Stainless	eXoskeleton
TASER® X26E (Law Enforcement)	26005	Yellow	DPM	Stainless on Black	eXoskeleton
TASER® X26E (Law Enforcement)	26004	Clear	DPM	Black on Stainless	eXoskeleton
TASER® X26E (Law Enforcement)	26013	Black	XDPM	Black on Stainless	eXoskeleton
TASER® X26E (Law Enforcement)	26025	Yellow	XDPM	Stainless on Black	eXoskeleton
TASER® X26E (Law Enforcement)	26019	Clear	XDPM	Black on Stainless	eXoskeleton

Specifications

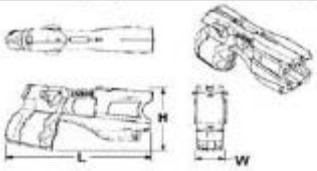
1. Output characteristics[3,8]:
   Wave form: Complex shaped pulse
   Pulse rate: 19 pulses per second (PPS)
   Pulse duration: 100 microseconds
   The trigger activates a 5-second cycle. The cycle can be stopped by placing the safety lever in the safe position.
   Peak open circuit arcing voltage: 50,000 V
   Peak loaded voltage: 1,200 V, avg. voltage over duration of main phase 400 V, avg. over full phase 350 V, avg. over one second 0.76 V.
   Current: 2.1 mA average
   Energy per pulse:
   Nominal at main capacitors: 0.36 joules
   Delivered into load: 0.07 joules
   Power rating:
   Nominal at main capacitors: 6.84 watts
   Delivered into load: 1.33 watts
2. Power source: Digital Power Magazine (DPM)[4,8] a battery of two 3-volt cells, or Extended Digital Power Magazine (XDPM)[4,8]
3. Temperature range: -4 °F [-20°C] to 122 °F [50 °C]
4. Relative humidity: 15% to 80%
5. Housing: High impact polymer
6. Patent: U.S. D508,277, D504,489, and other patents pending

Features

1. Integrated ultra-bright LEDs (low intensity illumination).
2. Integrated 650 nm laser (used for target acquisition).
3. Capable of drive-stun with or without TASER Cartridge installed.
4. Electrical charge can penetrate up to 2" [5 cm] cumulative of clothing, or one inch per probe.
5. Central Information Display (CID): 2-digit LED displays remaining DPM energy percentage, burst time, warranty expiration, unit temperature, illumination status, and current time and date.
6. Ambidextrous safety levers with Safe "S" and Fire "F" denotation.
7. Warranty: 1-year standard, with extended warranties available.[2]
8. Unit stores time, date, burst duration, unit temperature, and remaining DPM energy percentage for approximately 1,500 firings. Data can be downloaded using a USB data interface module or TASER CAM™, which can be ordered separately.
9. Compatible with all TASER Cartridges[6,7], but not the TASER C2 Cartridge.
10. Video/Audio recorder capable with optional TASER CAM™.

Physical Dimensions[1]

Dimensions (Without Cartridge)				Dimensions (With Cartridge)[1,6]
Length (L)	Height (H)	Width (W)	Weight	Length (L2)
6.00" [15.24 cm]	3.20" [8.13 cm]	1.300" [3.30 cm]	7.20 oz [204.12 g]	7.250" [18.52 cm]



1. Dimensions are in English [metric].
2. Additional terms and conditions may apply (for additional information contact a TASER International sales representative or visit online at: www.TASER.com).
3. Product specifications may change without notice; actual product may vary from picture.
4. Material Safety Data Sheet (MSDS) concerning lithium cells available upon request.
5. TASER X26E not available for sale to the general public. Additional models available. Please contact a TASER International sales representative for more information.
6. For standard TASER Cartridges, see TASER specification RD-SPEC-CRTG-001.
7. TASER Cartridges available up to a maximum range of 35' [10.66 m]. Use of cartridges not authorized by TASER International will void the product warranty.
8. Output specifications may vary depending upon temperature, battery charge, and load characteristics.
9. TASER® is a registered trademark of TASER International, Inc. All rights reserved.

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Appendix C
LETTER FROM THE COLLÈGE DES MÉDECINS DU QUÉBEC CONCERNING THE REMOVAL OF PROBES

COLLÈGE DES MÉDECINS DU QUÉBEC

Quality medicine at the service of the public

March 20, 2006

Sergeant Roger Bujold, Intervention
Groups Instructor
Operational Planning Section
Montreal Police Department
1441 Saint-Urbain Street
Montreal, QC H2X 2M6

Subject: Conducted energy devices

Dear Sir,

Further to your letter of December 14, 2005 and the consultation conducted with the Office des professions du Québec and the Ordre des infirmières et infirmiers du Québec, following please find the conclusion that we have reached.

As I mentioned in my letter of January 20 last, statutory amendments were made to the professional system in the health field in January 2003. Certain major principles were used to establish which procedures may be performed, and which activities may be carried on, by the professionals contemplated by the Professional Code and by specific statutes such as the Medical Act, the Nurses Act and the Pharmacy Act. If an activity may only be carried on by a professional, no one may carry on that activity without authorization, failing which that person is liable to be sued for illegal practice by the professional association concerned.

One of the principles agreed upon in the interpretation of those statutory provisions is that a professional may perform an invasive procedure, that is to say cross physiological barriers such as the skin, with the aid of an instrument or by using invasive energy forms. The professional authorized to introduce an instrument is, implicitly, also authorized to remove it.

2170, boul. René-Lévesque ouest, Montréal (Québec) H3H 1R6
Tél.: (514) 933-4441 - Sans frais: 1-800-633-3246 - Téléc.: (514) 933-3112

Sergeant Roger Bujold 2
Intervention Groups Instructor
Montreal Police Department

In the case before us, although police officers may use a conducted energy device in the performance of their duties, in accordance with the regulations in effect, they may not withdraw the darts. The *Regulation respecting the professional activities that may be engaged in within the framework of pre-hospital emergency services and care*, of the Collège des médecins du Québec, authorizing ambulance technicians to engage in certain medical activities, does not permit them to withdraw the darts.

Accordingly, under the acts and regulations in effect in Quebec, any person whose skin has been penetrated by darts must unfortunately be transported to a nearby institution or doctor's office so that a qualified professional (physician or nurse) may assess that person's condition and subsequently take the appropriate measures.

However, having regard to the organization of pre-hospital services in Montreal, including doctor availability, you would probably be able to enter into an agreement with the Corporation d'Urgences-santé.

Please contact me, [redacted], for any further information you may require.

Note:
Shaded area:
Personal information.

Yours sincerely,

Claude Ménard, M.D.
Medical Assistant to the Office of the Director General

Appendix D
SAMPLE CED UTILIZATION RECORD

CONDUCTED ENERGY DEVICE UTILIZATION RECORD

DESCRIPTION OF DEVICE

Brand of device

Date of battery change
Year Month Day

Serial number of device

Date of last data download
Year Month Day

USAGE

No.	Date	Time	Mat.	Test	Show weapon	Laster pointed only	Demonstrate arc	Drive stun mode	Probe mode	Cartridge serial number	Incident no.	Use of force report

Appendix E
LIST OF RECOMMENDATIONS

MEDICAL COMPONENT

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

Before using CEDs:

- Police officers consider a highly agitated person as a medical emergency, since the state of delirium cannot be diagnosed or treated until the person has been controlled and assessed by medical staff.
- Police officers call upon medical services, if possible, before intervening physically with this type of person.
- Police officers recognize persons at risk: pregnant women, persons who are elderly, thin or of small stature.
- Police officers try to avoid parts of the body at risk: head, neck, heart area and genitals.

While using CEDs:

- Police officers use as few cycles as possible, avoiding continuous cycles exceeding 15 to 20 seconds.
- Police officers inform the individual that a CED has been used and that its effect is of short duration.
- Police officers use physical intervention techniques that interfere as little as possible with breathing, from the moment the subject's ability to put up resistance is reduced by the effect of the CED. Police officers will avoid placing the subject in the prone position for extended periods of time.

After using a CED and having controlled the individual:

- Police officers, as far as possible, transmit all relevant information to medical personnel, including the circumstances of the CED use, the anatomic area where the probes were deployed, the number of cycles, the duration of the physical intervention and the individual's reaction (fall, exhaustion).
- Police officers ensure that every person who has been subject to neuromuscular neutralization undergoes a medical assessment as soon as possible, even if the probes are no longer in place.
- Police officers ensure that any probe or probes that have penetrated and are still embedded in the skin are withdrawn by medical personnel.
- Police officers provide medical personnel with CED technical specifications.

OPERATIONAL COMPONENT

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- Police officers should give priority to communication and negotiation at all times.
- Police officers may use CEDs where that option is reasonable, having regard to all the circumstances, in order to:
  - control an individual whose resistance presents a significant risk for his or her own safety, that of the officers or those of another person;
  - protect themselves or protect another person from an imminent threat of bodily harm.
- Even if a CED can, in some cases, where reasonable and appropriate, be used to counter a danger of grievous bodily harm or death, it does not replace a firearm.
- Barring any specific tactical considerations, a CED should be worn in a holster on the side of the body opposite the service weapon.
- CEDs should be clearly identifiable so as to prevent them from being confused with firearms.
- Some special units might prefer dark-coloured CEDs for tactical reasons.
- Police officers may use CEDs when they, a co-worker or another person is attacked or about to be attacked by an animal.
- Where tactical circumstances permit, police officers using CEDs:
  - inform the individual that a CED will be used;
  - show the CED and train the laser sight on the individual;
  - demonstrate the electric arc.
- Probe mode is favoured over drive stun mode for achieving neuromuscular neutralization (NMN).
- CEDs may be used in drive stun mode to produce an NMN in combination with probe mode.
- In exceptional circumstances, drive stun mode may also be used where circumstances require that a physical diversion be caused.
- Officers using CEDs ensure, where possible, that one or more officers are present to provide support.
- Police officers must avoid using a CED in the presence of flammable or explosive substances such as alcohol or gasoline vapours, natural gas or propane, particularly in interventions at clandestine laboratories.
- The police department must do everything in its power to ensure that chemical agents that may be used together with CEDs are not flammable.

- Police officers using CEDs must, considering the immediate environment, take into consideration the risk of secondary injury that a fall by the person hit could cause.
- CEDs should not be used on persons in control of a moving vehicle.
- Following the use of a CED, police officers must take into account involuntary muscle contractions in a person who is armed or at the time of handcuffing that person.
- The simultaneous use of two CEDs be reserved for exceptional situations in which the urgent need to stop the high-risk behaviour of the person concerned does not give the police officer the necessary time to use a second cartridge in the event the first shot is ineffective.
- Police officers plan an intervention strategy in order to take advantage of the window of opportunity that the use of a CED provides and so as to limit the number and duration of cycles to what is reasonable and necessary in order to approach and handcuff the person in question safely.
- Police officers must constantly assess the situation and be ready to use another use-of-force option if they consider a CED ineffective.
- As far as possible, the CED user advises all personnel concerned of his or her:
  - position;
  - intention to deploy the CED;
  - the moment when the probes are discharged.
- Faced with a situation in which they must control a person, before using a CED, police officers must ensure that:
  - the individual has refused to comply;
  - there are valid grounds to use a CED, by assessing, in particular:
    - the individual's potential for violence;
    - the degree of injury that the individual represents for himself or for others;
    - the weapons that person possesses;
    - the benefits of using a CED compared to other use-of-force options;
    - the CED's capabilities based on the context and environment.
- Police officers must remember that the subject may be confused and disoriented for several seconds immediately after receiving the electric discharge of a CED, or that the subject may be unable to understand an officer's verbal instructions as a result of a language barrier or altered mental state, even if an individual can hear.
- Police officers must leave probes in place and cut the wires at their base.
- A blood-covered probe must be handled with the same precaution as a dirty needle. Police officers must dispose of probes safely in a container provided for that purpose.

MANAGEMENT COMPONENT

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- Police officers must enter every test and utilization in a utilization record provided for that purpose.
- Police officers inform their immediate supervisor after each CED utilization.
- Police officers enter every utilization in the report identified by their organization, stating, in particular, the utilization mode used:
  - demonstration mode:
    - present the weapon;
    - use the laser set;
    - demonstrate the electric arc;
  - drive stun mode;
  - probe mode.
- CEDs be stored safely in a place with limited or controlled user access.
- If a CED is not worn by the user during his or her shift, it should be stowed in a locked case in the trunk of the patrol car, where possible.
- Every time they take possession of a CED, police officers must ensure that the device operates properly by checking the status of the battery and conducting the electric arc test before inserting a cartridge.
- It is recommended that utilization data be downloaded from a CED before it is entrusted to another organization or to a supplier.
- Data download and CED maintenance must be performed by a person who has received the appropriate training.
- Police departments keep a record of utilization data from every CED in their possession and establish the necessary procedures for the keeping of that information.
- Following every police intervention in which a CED has been used, it is recommended that the data be recorded as soon as possible, regardless of the utilization mode used.
- Police officers report the loss or theft of CEDs under their responsibility as soon as possible with the police department serving the area where the incident occurred.
- The police department concerned ensures that the incident is reported to the Quebec Police Information Centre.

TRAINING COMPONENT

Consequently, Subcommittee members recommend that it be included in the police practice on CEDs that:

- Police departments ensure that their officers receive the necessary training in the use of CEDs under the supervision of a monitor accredited by the École nationale de police du Québec.
- Police department heads ensure that all police officers to whom they issue CEDs requalify at least once a year, in accordance with the standards established by the École nationale de police du Québec.
- Police department heads ensure that all individuals required to intervene in the CED utilization process and in the supervision of CED utilization are trained.

FURTHER RECOMMENDATIONS

Consequently, Subcommittee members recommend:

- That the École nationale de police du Québec develop training for the various contexts in which CEDs are used in police work.
- That the École nationale de police du Québec develop monitor training to ensure the skills of CED users are maintained. The monitor will also ensure that training is provided for all persons required to intervene in the CED utilization process and in the supervision of CED utilization.
- That the Department of Public Safety assess whether it is appropriate to introduce a process for analyzing and validating new police weapons and that such a process constitute a prerequisite to the adoption of any new weapon by a Quebec police organization.
- That the École nationale de police du Québec cooperate in the announced update of the study on conducted energy devices by the Canadian Police Research Centre.
- That the École nationale de police du Québec cooperate in all research efforts to conduct an epidemiological analysis of the medical results of police interventions requiring the use of force, particularly in cases where a pan-Canadian perspective can be considered.
- That the École nationale de police du Québec monitor research work on conducted energy devices and in-custody death syndrome and keep Subcommittee members informed of findings.
- That the Department of Public Safety revise the section of its annual questionnaire on "the administration of police departments" so that the questions concerning CED utilization make it possible to determine utilization

modes (demonstration, drive stun and probe) and the results obtained from each utilization.

- That the Department of Public Safety assess the appropriateness of requiring a single report on the use of force from all Quebec police departments and give the Subcommittee the mandate to propose its content, as necessary.

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