# *Public – Police Interaction and its Relation to Arrest and Use of Force By Police and Resulting Injuries to Subjects and Officers; A Description of Risk in One Major Canadian Urban City.*

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The controversy surrounding the temporal association of subject death in custody with the use of the Conducted Energy Weapon (CEW) by law enforcement officers has identified the critical need for research to document the operational risk profile of use of force modalities, including the CEW. While several police agencies and independent research bodies in the United States have released information that suggests that the appropriate use of the CEW reduces officer and subject injuries, there is no epidemiological research that either supports or refutes this conclusion within the Canadian policing experience.

Extensive media coverage of events where subjects who have died proximal to the use of the CEW by police has heightened concerns about the safety of CEW use. This is augmented by the lack of publication of CEW uses without an adverse outcome and the absence of similarly intense media coverage of persons who die in police custody without the use of the CEW. Thus, publication bias prevents the public and stakeholder community from forming an informed opinion about the actual risk presented by the conducted energy weapon or other use of force modalities. Similar biased reporting of events has also led the lay-public to have the impression that the police use of force is frequent when compared to the overall number of police and public interactions.

Studies in the United States (Department of Justice; National Survey of Contacts between Police and the Public, 2000) have found that the relative frequency of police use of force (force applied or threatened) when compared with the number of police/public interactions occurs only 1.5% of the time. The actual frequency of events where officers actually applied force versus threatened the use of force is not known.

Other studies in the United States investigating the injury potential of use of force methods (non firearm) have consistently found that the highest citizen and officer injuries occur when physical control (hands-on) tactics are used (Alpert and Dunham 2004, Smith and Petrocelli 2001). The use of conducted energy weapons and OC spray has been found to result in lower citizen and officer injury rates (Bozeman 2007, Smith 2007, Seattle Police Department).

This study is the first in Canada to document the frequency of use of force by police compared to all police-public interactions, force by police compared to citizen arrest, and injury outcome to both citizens and police by force modality.

***Use of Force and Risk***

A clear understanding of the risk associated with any force intervention is fundamental. A contextual risk comparison considers the balance between what the likely or intended consequences are arising from the application of force (risk) and the acceptability of that risk given the circumstances of the event. A basic, universally accepted tenet of the use of force by police is that the force applied and the risk of its use must be proportional to the seriousness of the crime and the degree of resistance being offered by the subject of police interest. However, without an appreciation of the level of injury or harm likely to result from the use of any type of force modality, sound policies and practices cannot be developed. Adding to the confusion is a lack of published scientific evaluation but a large amount of publicly available incomplete or incorrect information and even intentional artifice.

Critical to the appropriate understanding of anticipated harm from the application of any particular use of force modality, is the parallel understanding that use of force incidents are typically dynamic, rapidly-evolving and often extremely violent in nature. In this regard, no use of force technique available to police officers can be considered ‘safe’. The theoretical notion of safety with respect to force intervention techniques and devices used by police is not well understood by the lay-public in Canada. Far from Merriam-Websters dictionary definition of ‘Safe’ as ‘free from risk or harm’ and ‘secure from threat of danger’ or ‘security from risk’, it must be understood that when police officers undertake their duty to preserve the public peace it may become necessary to use force. The application of force by police and the concept of ‘safety’ must therefore be viewed in a contextual framework. This framework is based on the balance between the degree of risk of harm or resistance faced by the police and the use of force options that are reasonably available to the officer and proportionately appropriate at the time force was used. As a result of these dynamic and uncontrollable variables, every use of force encounter between the police and a citizen carries with it the possibility for injury for one or all of the participants however unexpected that injury might be. In this regard, no use of force technique available to police officers can be considered ‘safe’.

Another aggravating factor faced by the community in understanding the risk of police use of force has been the intense focus on extremely rare events with a negative outcome. As Garner stated (Phoenix Study 2002) “Science and policy making are both weakest when attempting to deal with activities that occur very infrequently…..Of course when these events do occur, many are prepared to do “post-dictions” about what caused the event without examining the fact that apparently similar events occur every day without deadly outcome, injury or even complaint.”

***Methodology***

This is a descriptive study of a prospectively collected, comprehensive data set from the Calgary Police Service over the two year span from January 1, 2006 to December 31, 2007. The Calgary Police Service (CPS) is a municipal agency policing a city with a population of over one million people. There is no other police agency involved in any way with the police services to this population, thus all interactions fall within the jurisdiction of the single agency and are recorded in its database.

Police interactions are defined as; the total calls for service, on-view calls reported by officers, special duty activities and all traffic stops. Only dispatched calls for service where face to face interaction occurred are included.

It is understood that a police-public interaction does not necessarily constitute an arrest nor reflect a charge laid. The total number of police-public interactions was compared to the total number of persons charged with an offence during the same study period. The information of total number of persons charged was obtained from the relevant police databases and includes all subjects charged with criminal, provincial or municipal offences.

The total number of persons charged with an offence was subsequently compared to the number of those persons arrested by police during the same study period. The data of total persons arrested was obtained from the police service database and includes both subjects arrested-charged-released and subjects arrested-charged-incarcerated (in police custodial facilities).

The total number of subjects arrested was then compared with the total number and types of police force required to affect the arrests.

The total number and type of police use of force modalities was then compared to the resulting injuries to the subjects of police interest as well the resulting injuries to the officers.

The details of use of force in all public-police interactions were recorded prospectively on a use of force report form completed electronically at the time of the interaction as part of the police report. Electronic police reports completed at the time of the interaction cannot be submitted successfully if they are incomplete. Therefore, compliance is assured. The resultant electronic database has evaluable data accessed using simple search criteria.

Data concerning the frequency and type of police use of force was obtained from the system which captures all use of force data at levels beginning at force termed as ‘strikes and stuns’. Minor physical compulsion such as handcuffing or low-level pain compliance techniques such as joint locks (e.g. wristlocks, pressure points) are not captured and could not be included in this analysis. The

use of firearms to threaten compliance (subjects challenged by officers with gun drawn) is not included in this study although the authors did note several instances where this had occurred without the application of other force. Therefore the range of subject behaviour forming the study population includes those who are actively or aggressively resisting the officer's control attempts or are actively attempting to assault the officer or someone under the officer's protection.

Since the data base search for this report focuses on the use of force methods utilized by frontline police officers during their course of duties over the two-year study period, the data reviewed does not include the use of police service dogs (PSD/K9) or the application of tactical responses such as chemical agents, noise flash diversionary devices (NFDD) or kinetic impact projectiles.

The force response options represented in this study are: Physical Control[1], Conducted Energy Weapons[2], Baton[3], OC spray[4], and the Vascular Neck Restraint (VNR)[5]

In instances where multiple force options were used, the authors used an 'intention to treat' analysis in order to explore all outcomes from the initial use of force chosen by a patrol officer. Under the intention to treat analysis we describe, if an officer originally decided to use one force option to control the subject but was unsuccessful and had to subsequently resort to other force options, any injuries sustained were ascribed to the original force option. Thus, all cause mortality and injury is ascribed to the first force option. For example, if the first control attempt was through the use of the CEW and it was unsuccessful with the subject requiring subsequent physical control, any injuries incurred by the subject or the officer at any time would be ascribed to the CEW. It is understood that this will over estimate the injuries ascribed to the use of force option initially chosen by the officer. Subject medical charts of subjects were not assessed; it is unknown of the number of events where subjects received medical treatment for psychiatric disorders or from pre-existing injuries. As a result, the interpretation of the data may oversubscribe the frequency of injuries to the use of force modality.

Reporting of subject injuries by officers is mandated by the electronic use of force report form which cannot be submitted electronically without completion of this (and all other) sections. Subject injuries, which are pre-defined, are categorized by the completing officer as *none, minor, minor-outpatient, hospitalization or*

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[1] Physical Control means empty hand control tactics above the level of pain compliance techniques such as joint locks and pressure points. These include techniques such as nerve motor point striking and stunning techniques and grounding techniques such as arm-bar takedowns and other balance displacement methods.
[2] In the study site, the conducted energy weapon utilized is the Taser® X26.
[3] In the study site, the baton utilized is the Monadnock Autolock® expandable baton with Power Safety Tip.
[4] In the study site, the OC spray utilized is Sabre® Red (10% oleoresin capsicum).
[5] In the study site, the VNR utilized in the LVNR® as authorized by the National law Enforcement Training Center.

*fatal*)[6] Medical charts of subjects were not accessible to the police service for the analysis of this data. As a result of the large sample size and large number of subjects, we are confident that the resulting values described are precise.

Officer injuries were also obtained from the electronic use of force database (from the categories of: *none, minor, minor-outpatient, hospitalization or fatal*) as well as from aggregate data surrounding workers compensations claims and includes the total number of days of abstraction from duty from injuries resulting from use of force incidents during the study period. Medical and individual member WCB data were not accessed.

### *Study Findings*

1. The use of force by police was rare when compared to the overall number of police-public interactions, occurring only 0.07% of the time.

2. Arrests occurred in only 4.6% of all police-public interactions

3. Use of force by police occurred in 1.5% of all arrests, and arrests were accomplished without the use of force in 98.5% of arrest events.

4. Males accounted for 93.6% of all citizens on which force was used.

5. 88.1% of all subjects requiring force were under the influence of drugs and/or alcohol or some degree of emotional illness.

6. The use of OC spray, when effective, resulted in injuries in 3.7% of subjects.[7][8]. Subjects restrained by OC spray experienced a 9.2% lower frequency of medical treatment than when compared to those subjects restrained with a CEW.

7. Following vascular neck restraint (VNR), 6% of subjects required some form of medical treatment, 94% of subjects did not require medical

[6] 'Minor' injuries include visible injuries of a trifling nature which did not require medical treatment. 'Minor Outpatient' includes injuries with require medical treatment either at the scene, at cells or at the hospital but which do not result in hospitalization. 'Hospitalization' injuries includes injuries which required hospitalization for treatment.

[7] While the statistical safety profile of OC spray appears high, it must be understood that the generally accepted efficacy rate of OC spray is between 75-85%. Therefore this profile is biased by the fact that in many situations experienced officers will choose not to employ OC spray as an option in circumstances where they feel it will not have the desired result. For example, subjects under the influence of drugs, experiencing emotional disturbance or merely strongly goal-oriented are typically unaffected by OC spray.

[8] The OC safety profile is consistent with US Studies (Watson 1996, Lundgren 1996) which have found that subjects did not receive injuries (requiring medical attention) in 90% of all uses (n=908).

treatment.[9] Subjects restrained by VNR experienced a 7% lower frequency of medical treatment than when compared to those subjects restrained with a CEW.

8. The use of Conducted Energy Weapons resulted in fewer citizen and officer injuries than either physical control or the baton. 87% of all CEW uses resulted in no or minor subject injuries.[10] In 96.7% of all CEW uses, officers received either no or only minor injuries. There were 9.6% fewer officer injuries requiring medical treatment when a CEW was used when compared to when a baton was used.

9. The use of the baton was the most injurious force intervention technique in the study. Citizens received injuries requiring medical treatment in 29% of all cases and officers required medical treatment in 12.9%. 16.1% more subjects who were controlled with a baton sustained injuries requiring medical treatment than with a CEW.

***Police-Public interactions, charges and arrests***

During the study period (2006 and 2007) the agency reported 827,022 police-public interactions (2006 n= 423,707; 2007 n= 403,315).

Out of the 827,022 police-public interactions, a total of 353,899 (2006 n=182,101; 2007 n=171,798) violators were charged with an offence (including all federal, provincial and municipal offences[11]).

Out of the total 353,899 subjects charged with an offence, police arrested 37,719 subjects (2006 n=20,123; 2007 n=17,596). Thus, 10.7% of all subjects charged with an offence were subject to arrest.

When compared to all police-public interactions (n=827,022), police arrests accounted for 4.6%.

[9] Although the study agency categorizes the vascular neck restraint as physical control, for the purposes of this study it was categorized by itself due to it's higher safety profile compared to other physical control techniques.

[10] Interestingly, a post implementation study by the Phoenix Police Department, it was determined that subjects did not receive injury or received only minor injury in 87% of all CEW deployments.

[11] Charges relating to traffic offences accounted for 310,255 of the total events.

***Arrest and use of force***

In the two-year study period, general police-public interactions were extremely unlikely to result in any use of force. In 827,022 interactions, there were 562 use of force events, or 0.07% of all interactions.

When actual arrests occurred, the use of force remained low. Out of the 37,719 arrests that occurred during the study period, police utilized force (above handcuffing or low level pain compliance) to affect the arrest on 562 subjects who were resisting at some level. The number of incidents requiring force represents 1.5% of the total number of subjects arrested.

Table 1 represents the breakdown of the types or methods of use of force utilized by police during the arrests of subjects.

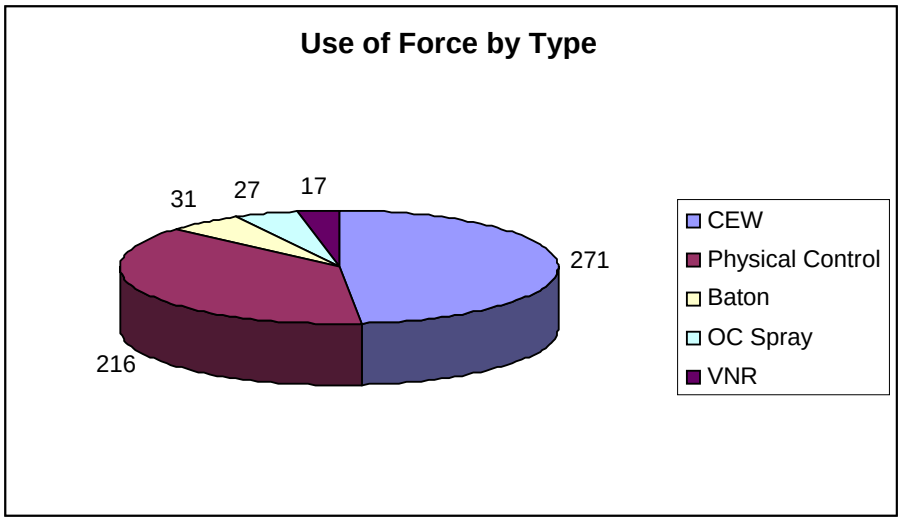



Table 1

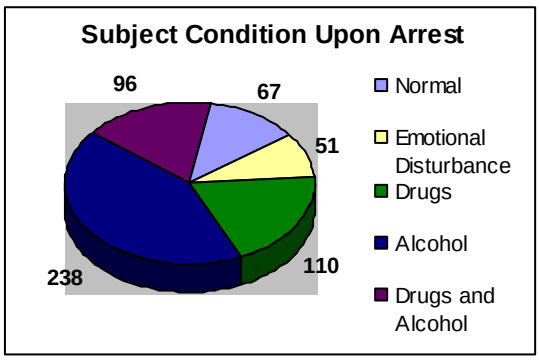
***Subject gender and condition profile***

Out of the 562 use of force events during the study period, male subjects accounted for 93.6% (n=526) of the population.

The physical condition of all subjects on which force was used is represented by the following:

*Subject condition*

| | |
|---|---|
| Normal: | 11.9% (67) |
| Emotional Disturbance | 9.1% (51) |
| Drugs and Alcohol | 17.1% (96) |
| Drugs (alone): | 19.6% (110) |
| Alcohol (alone): | 42.3% (238) |



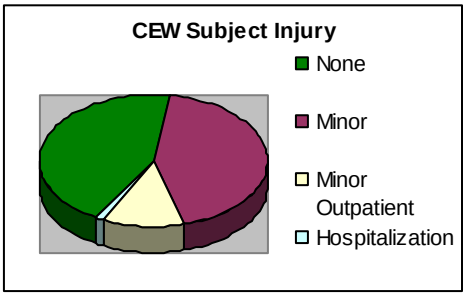
***Use of Force and subject injury***

The reasonableness of police use of force methods needs to be viewed in relation to the relative risk profile (risk of injury outcome) and the level or degree of risk of harm being offered by the subject of police interest. This section of the research describes the subject-injury profile from the five (5) force response options available to the officers in the study site.

*Conducted Energy Weapons*

During the 562 use of force related arrests, officers utilized conducted energy weapons 48.2% (n=271) of the time. The subject injury profile following the application of the conducted energy device is:

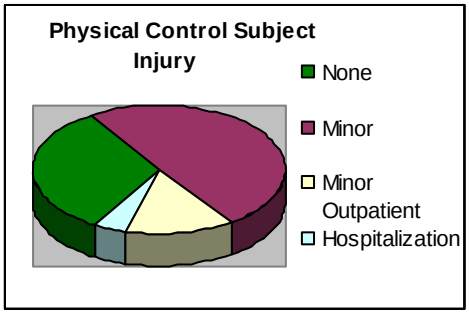
| | |
|---|---|
| None: | 44.6% (121) |
| Minor: | 42.4% (115) |
| Minor Outpatient | 11.9% (32) |
| Hospitalization: | 1.1% (3) |
| Fatal: | 0 |




*Physical Control*

During the 562 use of force related arrests, officers utilized empty hand physical control 38.5% (n=216) of the time. The subject injury profile following the application of physical control techniques is represented thusly:

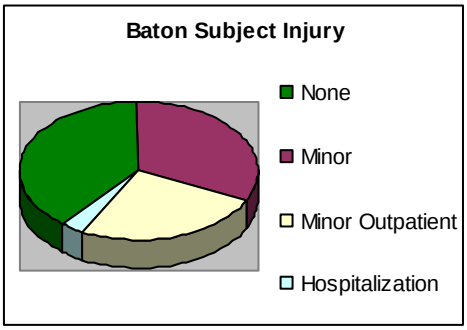
| | |
|---|---|
| None: | 32.9% (71) |
| Minor: | 49.1% (106) |
| Minor Outpatient: | 13.9% (30) |
| Hospitalization: | 4.1% (9) |
| Fatal: | 0 |




*Baton*

During the 562 use of force related arrests, officers utilized the baton 5.5% (n=31) of the time. The subject injury profile when the baton is utilized is:

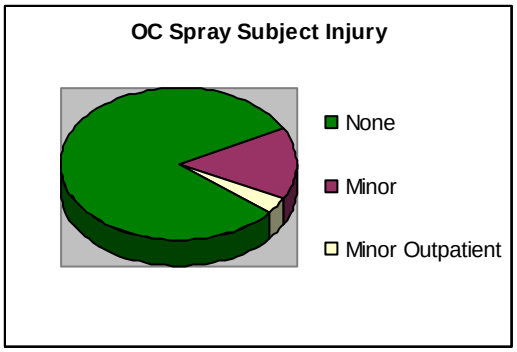
| | |
|---|---|
| None: | 38.7% (12) |
| Minor: | 32.3% (10) |
| Minor Outpatient: | 25.8% (8) |
| Hospitalization: | 3.2% (1) |
| Fatal: | 0 |



*OC Spray*

During the 562 use of force related arrests, officers deployed OC spray 4.8% (n=27) of the time. The following represents the injury profile when OC spray is utilized:

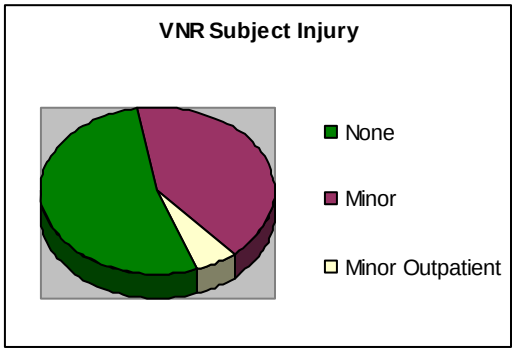
| | |
|---|---|
| None: | 81.5% (22) |
| Minor: | 14.8% (4) |
| Minor Outpatient: | 3.7% (1) |
| Hospitalization: | 0 |
| Fatal: | 0 |




*Vascular Neck Restraint*

Out of the 562 force-related arrests, police officers used a vascular neck restraint in 3.0% (n=17) of the events. The injury profile from VNR use is:

| | |
|---|---|
| None: | 52.9% (9) |
| Minor: | 41.2% (7) |
| Minor Outpatient: | 5.9% (1) |
| Hospitalization: | 0 |
| Fatal: | 0 |

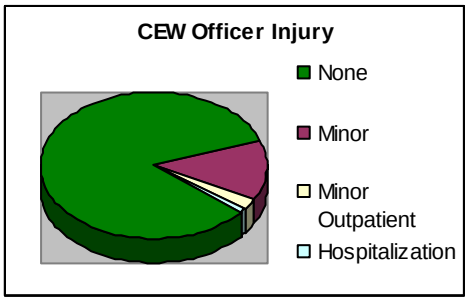


***Use of Force and officer injury***

This section presents the injury risk profile in relation to injuries sustained by police officers utilizing force to effect the arrest of subjects.

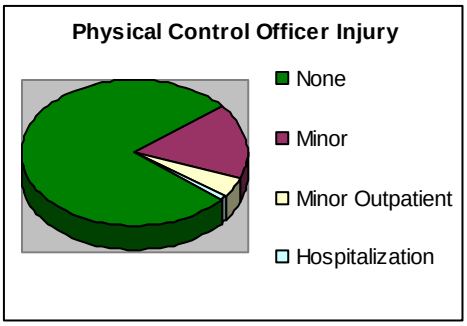
*Conducted Energy Weapons*

| | |
|---|---|
| None: | 83.4% (226) |
| Minor: | 13.3% (36) |
| Minor Outpatient: | 2.2% (6) |
| Hospitalization: | 1.1% (3) |
| Fatal: | 0 |



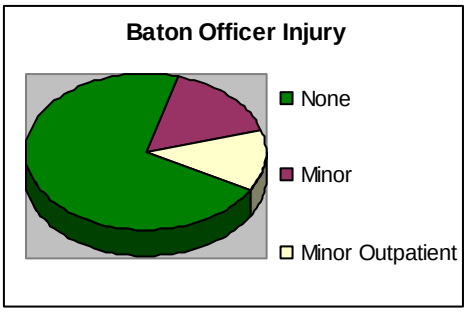

*Physical Control*

| | |
|---|---|
| None: | 77.8% (168) |
| Minor: | 16.7% (36) |
| Minor Outpatient: | 4.5% (10) |
| Hospitalization: | 1.0% (2) |
| Fatal: | 0 |



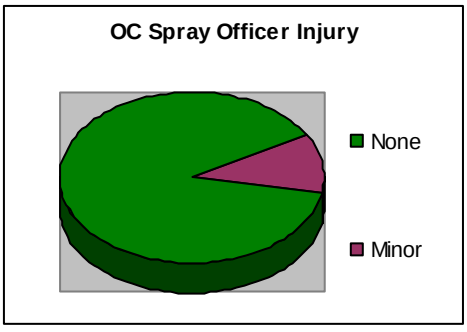

*Baton*

| | |
|---|---|
| None: | 71.0% (22) |
| Minor: | 16.1% (5) |
| Minor Outpatient: | 12.9% (4) |
| Hospitalization: | 0 |
| Fatal: | 0 |



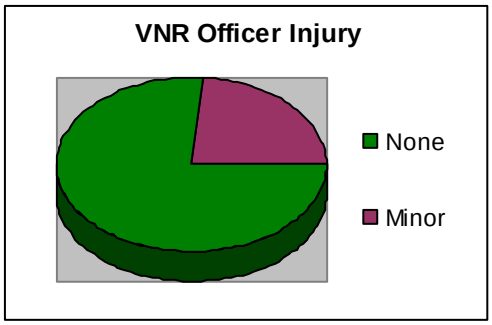

*OC Spray*

| | |
|---|---|
| None: | 88.9% (24) |
| Minor: | 11.1% (3) |
| Minor Outpatient: | 0 |
| Hospitalization: | 0 |
| Fatal: | 0 |



*Vascular Neck Restraint*

| | |
|---|---|
| None: | 76.5% (13) |
| Minor: | 23.5% (4) |
| Minor Outpatient: | 0 |
| Hospitalization: | 0 |
| Fatal: | 0 |




### *Officer Injury and Abstraction from Duty*

In addition to the foregoing, during the study period the agency reported the abstraction from duty profile resulting from injuries sustained by police officers during arrest-related events. Officers filed 195 arrest-related injury compensation reports during 2006 and 2007. To put this into a contextual comparison with the total number of use of force incidents reported (562), officers filed an injury compensation claim in 34.7% of the events.

These injuries resulted in 797[12] days of complete abstraction from duty. Modified or 'light duty' (not on patrol) resulting from arrest-related injuries reported by the agency was 2035[13] days.

### *Limitations*

While the researchers would have preferred to conduct an analysis of data from multiple police agencies across Canada, this effort was confounded by the fact that there is no consistent national database for collecting police use of force information. The statistical reporting of police use of force is not mandated by the federal government nor is it consistently collected at provincial governmental levels. Many major police agencies collect their own corporate use of force data however the nature and type of data is inconsistent from agency to agency making a direct comparison or analysis impossible.

Since this study involves only one major Canadian city, it cannot be said to necessarily reflect a broad representation of the risk profile of police use of force in Canada in general but only to those agencies whose policing methodologies and resources are similar to the study centre.

This data was confounded by the fact that in some public-police interactions reported as one interaction more than one public person was present. For example in a traffic stop, the public-police interaction is recorded as 1 although

[12] 2006 n=414, 2007 n=383
[13] 2006 n=1173, 2007 n=862

often times there is more than one person present in the motor vehicle of interest. Likewise, an ‘on view’ call of checking suspicious person is recorded as one public-police interaction although more than one person may have been present at the time. It is acknowledged that the data analyzed under represents the total number of police-public interactions. However, this under representation results in a ‘worse case’ scenario with respect to the likely or anticipated harm resulting from the police application of force.

Reports of injuries to subjects require that the officer is aware of the subject injury at the time the use of force report was completed. Injuries that were either not observed by the officer or presented with delayed onset after the police-public interaction could not be included in this analysis.

Reports of injuries to officers required that the subject officer reported or recorded the injury either on the use of force report or completed a workers compensation report. Anecdotally it is typical that many police officers work within a culture that often accepts minor (non-disabling) injuries such as soft tissue injuries to be part of ‘doing the job’ and these injuries are not reported and could not form part of this analysis.

The researchers are confident, however, that injuries to subjects and officers of a nature above those considered being ‘minor’ (no treatment or out-patient only) would be reported in the relevant police databases.

***Discussion***

The commonly held belief that the conducted energy weapon carries a significant risk of injury or death for the population of interest is not supported by the data. Within the force modality framework most commonly available to police officers, the CEW was less injurious than either the baton or empty hand physical control.

Although the study used the intention to treat analysis, when we removed the incidents where the use of the CEW was unsuccessful (n=14) (thereby requiring subsequent alternative force options – typically physical control) the safety-profile of the CEW rose to 88.7% (Subjects - no or minor injury only).

The baton was the most injurious use of force method (for both officers and subjects) utilized followed next by empty hand physical control.

The data suggests the need for agencies to seek out alternatives to hands-on physical control tactics and the baton if they wish to reduce the frequency and seriousness of citizen and police officer injuries.

Arising from this research project was a clearly identified need for a legislated national police use of force reporting system or, minimally, provincially mandated

reporting systems that are consistently aligned on a national level. The stakeholder community would be greatly served and public confidence in its policing services improved by the implementation of a national database reporting system for police use of force.

### *Further Research*

More research is needed to determine the impact of multiple agency variables on police use of force and injury outcome. Further investigation could reveal whether agencies of different size, in different geographical regions and with different resources, training and policies results in variations in the injury-risk profile from the use of force.

With respect to the use of physical control and officer and subject injury; during the data review a noticeable pattern of relationship was observed between the number of police officers present and the frequency and nature of injuries sustained by both citizens and officers. We observed, from the aggregate data, that more officer and subject injuries occurred in circumstances where only one officer was present. While by no means scientific, this pattern indicates that further research should be conducted to determine how the numbers of officers, working together to effect physical control of resisting subjects, changes the injury outcome.

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