Pepper Spray Evaluation Project

Results of the Introduction of Oleoresin Capsicum (OC) into the Baltimore County, MD, Police Department

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EXECUTIVE SUMMARY

Violent encounters between police officers and individuals resisting arrest have historically been a source of injury to officers and subjects. These violent encounters have often resulted in complaints of the level of force used by the police. Concern for these issues along with increased civil liability and court imposed limitations on the use of deadly force have necessitated the search for safe and effective less-than-lethal (LTL) force alternatives. One alternative that has gained popularity is Oleoresin Capsicum (OC) spray, or as it is commonly called, pepper spray.

Despite extensive field application in virtually hundreds of police departments, few evaluative studies of OC have been conducted. To address this issue, the National Institute of Justice (NIJ) awarded a grant to the International Association of Chiefs of Police (IACP) to evaluate the effectiveness of pepper spray. The IACP, in turn, partnered with the Baltimore County, Maryland, Police Department (BCPD) as the site agency for pepper spray implementation and evaluation. Key elements of the study include pre- and post-introduction assessments of assaults on officers, subject injuries and the number of use-of-force complaints. Implementation/process issues, including product selection, training and operational considerations, were also examined.

I. LITERATURE REVIEW

Various forms of chemical agents have been used in war as offensive weapons for centuries. After World War I, however, officials expressed an interest in extending the use of chemicals into the realm of law enforcement. It was hypothesized that these agents could effectively control criminals and riotous crowds as effectively as they controlled enemies during warfare.

Chloroacetophenone (CN)

This organic compound, in its most pure form, is a white crystalline solid resembling salt or sugar. It is available in many forms (e.g., mist, vapor or dust), and must be projected into the air to disperse the lacrimating (tear-producing) material. For use as a liquid aerosol, CN must be mixed with alcohol or ether. CN is a tearing agent that causes the eyes to water profusely and the respiratory passages to become irritated. Breathing thus becomes shallow and difficult. Other physical symptoms include tightness in the chest, stinging sensations on the skin and nausea. Psychological effects of fear and panic may also occur (Jones, 1976).

As an irritant that relies on pain compliance, CN is most effective on those individuals who are lucid and have a normal pain threshold. Those who are intoxicated, extremely agitated and/or mentally ill are generally less affected by the agent because of their greater tolerance for pain (Jones, 1976).

Although humans are susceptible to agent effects, animals suffer little, if any, from the

symptoms induced by CN. In addition, CN effectiveness is temperature-dependent. Although the agent is useful in any temperature over 50° F (Oleoresin Capsicum Chemical Agent Study, 1991), it is most effective when utilized in temperatures of 72° F and above (Jones, 1976).

CN presents an additional problem of decontamination. The microscopic particles can remain airborne for some time after being discharged. Dissipation time depends upon the amount of the agent dispensed, the air current, temperature and humidity.

Finally, CN cross-contamination between subjects and police officers is common. Officers note that they are often contaminated by the agent when arresting and transporting sprayed subjects. This cross-contamination is purportedly responsible for officers' reluctance to use this agent.

Ochlorobenzylidene-Malononitrile (CS)

The U.S. Army and the National Guard continued to use CN as a riot control agent until 1960, whereupon it was replaced with the ochlorobenzylidene-malononitrile (CS). Officials held that CS was considerably less toxic and more effective than CN (Jones, 1976). Following military protocols, American law enforcement agencies subsequently adopted CS in 1965.

In pure form, CS is a white, crystalline substance similar to talcum powder that can be discharged in smoke, liquid or dust form. Like CN, it is classified as a solid, not a gas, since it requires a carrying agent to disperse it into the desired target area.

CS is a lacrimating irritant that immediately affects the mucous membranes producing tears, runny noses, and persistent coughing and/or sneezing. Additional symptoms include respiratory distress accompanied by tightness in the chest, a burning sensation on the skin, and nausea or vomiting. In addition to the physical effects, CS also causes intense fear, panic and cognitive disorientation.

According to military and law enforcement personnel, CS is a preferred alternative to CN (Selected Military Reports on CS Riot Control Agent). It produces immediate effects and is less toxic (Jones, 1976). Like CN, CS is also more effective on those areas of the skin that are moist (Compton, 1987) and virtually ineffective on animals.

Unlike CN, CS is considered to be effective over a wide temperature range. The microparticulate nature of CN results in agent persistency and thus can make decontamination problematic, especially in enclosed/confined spaces.

Serious injury to an individual is improbable if CS is used properly. Extensive toxicological testing indicates that in spite of the potency of CS, it is a more safe, less toxic and more effective alternative to CN (Special Summary Report on the Toxicology of CN, CS and DM).

Oleoresin Capsicum (OC)

CN and CS are still used by many law enforcement agencies, especially for tactical use in crowd control situations. However, some law enforcement officials contend that these chemical agents are neither effective nor reliable. The potential risk of injury and cross-contamination, as well as decontamination problems, have led law enforcement officials to seek a safer, more effective alternative chemical agent. Another less-than-lethal alternative that has recently gained popularity and acceptance is Oleoresin Capsicum (OC), also referred to as pepper spray.

Although OC has been available since the mid-1970s, it has become widely used only within the past few years. Unlike the synthetic chemicals CN and CS, OC is a naturally occurring substance derived from the cayenne pepper plant.

OC is considered an inflammatory agent, unlike the traditional chemical irritants (i.e., CN and CS). Upon contact with OC, the mucous membranes of the eyes, nose and throat become inflamed and swell. The symptomatic swelling produces involuntary eye closure, nasal and sinus drainage, gagging, coughing and shortness of breath. A burning sensation occurs on any exposed skin areas.

Because OC is an inflammatory agent, it is purportedly more effective than CN and CS on violent, intoxicated/drugged and mentally ill individuals. Moreover, the symptomatic involuntary closing of the eyes and the automatic irritation of the respiratory tract explain why OC is so effective on animals.

No special decontamination protocols are required for OC because it is biodegradable. Unlike chemical irritants, OC will not persist in clothing or affected areas.

Examination of in-custody deaths that occurred subsequent to OC use has excluded the agent as a contributory factor. To date, OC has not caused any deaths, even among persons with pre-existing conditions (Granfield, Onnen and Petty, 1994). Finally, unlike the other chemical agents, OC use will not result in dermatitis, skin depigmentation or burns.

Currently, OC spray does not fit into a category or classification that would place it under the jurisdiction of any federal regulatory agency. Many people within the OC industry and law enforcement officials would like to see OC spray come under the jurisdiction of a regulatory agency so issues of product standards and safety could be more extensively examined. Clinical studies employing human subjects are needed; however, until such studies are conducted, information will be derived solely from experience in the field.

II. THE RESEARCH SETTING

Baltimore County, Maryland, site of this research project, has a population of approximately 695,000 people and covers an area of 612 square miles. The county covers urban, suburban and

rural areas. The Baltimore County Police Department (BCPD) has sole responsibility for delivery of police services to Baltimore County. The department has an authorized strength of nearly 1,500 officers, 80 percent of whom are assigned to the Field Operations Bureau. These officers responded to 442,436 calls for service in 1993, which included 44,074 Part I offenses. Police service is generally provided through the Patrol Bureaus' nine precincts.

BCPD Interest in a Force Alternative

As a result of a strong commitment by the chief and the executive corps for experimentation and research into police functions and technology, and more importantly, a significant concern for officer and public safety, an examination of less-than-lethal alternative weapons was initiated. A committee was established that subsequently gathered information from other police departments and agent vendors. They analyzed concerns relative to legal and medical issues, product selection, training requirements, funding ability and safety. The committee decided that OC was a safe and effective alternative that, relative to existing forms of force, could result in a lowered incidence of officer and citizen injury. Moreover, it was suggested that civil liability suits and citizen complaints would diminish as OC use: (1) does not produce lasting injury; and (2) would not result in any overt visible signs of injury to the suspect like those associated with normal officer and subject struggles.

III. PROJECT METHODOLOGY

This evaluation was designed to examine two major components: (1) how OC was adopted and implemented by BCPD; and (2) the impact that OC use had on police and subject injuries and brutality/use-of-force complaints and its effectiveness in subduing uncooperative or physically resistant subjects.

Process Evaluation

In order to examine OC project development, officers and command staff members who initiated and were critically involved with the project were identified. Those identified met intermittently throughout the entire project. Formal and informal meetings were continually held by BCPD during which specific OC-related issues were addressed. Research staff attended these meetings and collected information on the process of OC adoption and implementation. The issues addressed during the process evaluation included:

- selection of pepper spray product line
- development of written use policy
- development of training program and materials

- implementation of documentation for post-use reporting
- identification of required follow-up (in-service) training needs.

Outcome Methodology

Outcome evaluation was concerned with assessing the impact of OC spray in confrontations between police officers and citizens, as well as police officers and animals (dogs). Five principle research questions were developed:

1. Would assaults on officers be reduced in arrest and other confrontational encounters?
2. Would injuries to police officers be reduced in arrest and other confrontational encounters?
3. Would injuries to suspects be reduced in arrest and other confrontational encounters?
4. Would use-of-force complaints on police officers be reduced in arrest and other confrontational encounters?
5. How effective is OC in human and animal encounters?

Development of the Measurement Instruments

Measurement of the effectiveness of OC spray is critically dependent on the data received from the field. Data collection instruments were developed to obtain information from the field on each OC spraying incident. A form was constructed as the initial collection instrument to be completed by each officer who used OC. The form included both open-ended and forced-choice questions relating to the following: weather conditions, suspects, OC application, injury, decontamination and animals. The form would be completed along with the departmental incident report as soon as practical after the conclusion of the event.

A second measurement instrument, an unstructured follow-up interview, was developed to validate all information collected by the data form. This interview was conducted by the on-site observer with each officer after the data collection form was received. The unstructured interviews addressed the same issues as the data collection form, allowing, however, the officers to add any comments, suggestions or observations.

Prior to their use in BCPD, the data collection sheet and the unstructured follow-up interview were pilot-tested in the Anne Arundel County, Maryland, Police Department (AAPD). Pilot testing indicated that the measurement instruments were suitable for the needs of the project and were generally user-friendly. Following the pilot test, the form was printed in quantity for

distribution throughout all BCPD precincts and operations sections. Upon completion of the data collection forms and unstructured interviews, incident reports were requested and subsequently mated with the other measurement instruments. These reports further verified the data validity. This methodological triangulation provided the research team with official (the incident report), structured (the data collection form) and unstructured (the unstructured follow-up interview) sources, thus preventing reliance on one sole information source.

Data Collection

Data collection for both the impact and process evaluations began in mid-July 1993 with a site visit to the BCPD. Prior to the research team's arrival, the department had undertaken a considerable study of the type of OC product (fog delivery system spray versus stream, manufacturer and desired strength of OC) it wanted to provide its officers. The data were provided by BCPD's Crime Analysis Unit and Internal Affairs Section. Monthly *Maryland Law Enforcement Officers Killed or Assaulted* data sheets were also utilized. The time periods for which data were collected were:

- Pre-OC 1: July 1, 1990 to March 31, 1991
- Pre-OC 2: July 1, 1991 to March 31, 1992
- Pre-OC 3: July 1, 1992 to March 31, 1993

— **Introduction of OC - July 1993** —

- Post-OC 4*: July 1, 1993 to March 31, 1994

* *Comparison data were gathered for the post period (July 1993 to March 1994).*

While the information provided by Crime Analysis and Internal Affairs was important, each incident of spray was additionally "tracked" through the use of a spray data collection form that was developed by the research staff. As mentioned, each officer using his/her spray in a confrontational encounter with either a human or animal was required to complete the form.

IV. FINDINGS: OUTCOME EVALUATION

The types of encounters in which Baltimore County officers generally used OC were routine disorder complaints that beat police officers often handle. These types of complaints generally involved aggressive, excitable behavior on behalf of both the complainant and victim. Moreover, they tended to escalate quickly, resulting in confrontational outcomes.

Findings indicated that 39 percent of the incidents occurred inside (e.g., house, car) while the other 62 percent occurred outside. Weather conditions did not seem to affect an officer's decision to use OC or OC's effect on suspects. Of the human sprays, 84 percent were males and 16 percent were females. Generally, individuals who were intoxicated (drugs or alcohol),

belligerent and/or combative were sprayed with OC. The preponderance of incidents involved physical threats by the suspect to the police officer. Very few incidents involved use of firearms or knives.

Data indicated that almost all officers applied OC to the face as they had been instructed in training. However, the officers did not spray from a distance of four to six feet as instructed. Many of the sprays in this sample (144 of 194) were done at a distance of three feet or less. There were 102 incidents where OC was sprayed at a distance of two feet or less. Consequently, the OC may not have been maximally effective on the suspects.

OC was effective in the majority of incidents in our data. Most incidents (143) only required the use of one spray to incapacitate a subject. There were, however, four incidents where officers used full cans of OC in attempts to control suspects. There is no indication in our data that spraying more is better, if the subject is given a "good" spray the first time. Lastly, if suspects were properly sprayed, they became sufficiently incapacitated to be arrested in 90 percent of all cases.

Findings: The Five Principle Questions

Question 1:

Will assaults on officers be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

Three years of prior "assault" data (pre-OC data) were collected, to be compared to the time period after which OC was adopted by the department (post-OC data). The pre-OC data were examined to identify any possible trends regarding assaults. Overall, these data showed that officer assaults were decreasing prior to OC use. Similarly, the post-OC data indicated that assaults continued to decline. Most importantly, the total number of officers assaulted in the post-OC data period was substantially lower than any of the pre-OC data periods. (Note: While it is likely that the introduction of OC spray accounts for these declining trends, this can only be considered a preliminary finding, since the pre and post data for this study are not strictly comparable in all cases.)

Question 2:

Will injuries to police officers be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

Data from the spray collection form showed that few officers were injured when they used OC to control a confrontational encounter. Of the 194 total (human or animal) spray incidents, only

21 officers (11 percent) reported receiving any injuries. Most of the injuries officers received were minor and did not result in any work time lost. While data from the pre-OC use period was not comparable and did not permit a complete pre-post analysis, the relatively low level of officers injured in the post-OC period suggests that OC use has the potential to lessen officer injuries.

Question 3:

Will injuries to suspects be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

The number of injuries to suspects was very similar to the number of injuries to officers: very few suspect injuries occurred during the post-OC project period. Of the 174 spray incidents, only 14 suspects (eight percent) received any injuries. Although staff were unable to collect comparable pre-OC suspect injury data, post-OC data indicate that all suspect injuries were minor, not requiring hospital treatment.

Given that staff were not able to gather the pre-OC comparison data, other methods were employed to examine how suspect injuries might be affected by OC. Specifically, it was hypothesized that if suspects were injured, complaints of force would be filed more often. However, the data indicated that such complaints were decreasing. Consequently, it is likely that OC had an equally positive effect on reducing the number of suspect injuries.

Question 4:

Will use-of-force complaints on police officers be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

Data suggest that despite an increase in calls for service and fewer patrol officers working their beats, use-of-force complaints substantially declined. A 53 percent decrease in complaints occurred between the first pre-OC period and the post-OC period. Likewise, a similar reduction of 40 percent occurred between the second pre-OC period and the post-OC period. Since no other major policy changes regarding use of force took place during pre and post data correction, it is likely that pepper spray did account for the decline in complaints.

Interviews with Internal Affairs officers further substantiate this finding. They note that OC, unlike impact weapons, does not have lasting effects or leave identifiable marks on suspects, and as such lessens the probability of brutality or excessive force complaints being lodged. Also, individuals who were sprayed received aftercare from the officers who sprayed them. Officers were instructed to assist those they sprayed. This too may have lessened the need to complain.

Question 5:

How effective is OC in human and animal confrontational encounters?

OC proved to be very effective for the Baltimore County Police Department. Overall the effectiveness of OC on humans in confrontational encounters was 90 percent. A total of 156 individuals of 174 in the study were incapacitated enough to be "effectively" arrested. If the animal sprays are included with this total, OC is found to have a 91 percent effectiveness level.[1]

Generally, if a suspect was properly sprayed (a one to three-second burst from a distance of four to six feet), he/she became submissive and/or complied with the instructions of the officer. The data showed that 117 individuals (65 percent) were classified as submissive by the officers after the OC had been applied. There were 26 individuals (15 percent) that were listed as complying with the officer's instructions after application. The difference between the terms submissive and complying seems substantively subtle[2] and therefore it might be more appropriate to collapse the two categories into one category. When that is done, 143 individuals (82 percent) of the 174 humans were affected enough to comply with officer instructions. There were 29 individuals (16 percent) that struggled and did not follow officer instructions. Only seven individuals (four percent) were not affected after OC was applied.

Data analysis also uncovered 18 subjects (nine percent) who were not incapacitated in the opinion of the officer. This suggests that a suspect's behavior at encounter may determine how well OC works or does not work. In seven of the 18 incidents, officers reported that OC had "no effect." In those conditions where individuals exhibited drugged behavior or seemed to have mental problems, spraying with OC to control that subject's behavior had no effect.

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[1]All Twenty animal sprays were reported 100 percent effective at deterring an attacking or threatening dog. There were no reported failures when the animals (dogs) were sprayed.

[2]The terms submissive and complied were terms used by the officers completing the data collection form. In many respects the difference between the two seems slight and it would be easy to collapse the two categories into one. This brings into the question the meaning of submissive and complied. There may well be wide differences in the use of the terms depending on the individual officer's understanding and expectation of what OC is to do to a suspect. Some officers might believe that the purpose of OC is to totally incapacitate a subject with no resistance (individual was submissive), therefore the product worked. If the OC did not do this, the product was reported to have no effect, despite the fact the OC made the person easier to arrest. Other officers might believe that the product worked well even though the individual offered a struggle. This discussion is offered as a possible word of caution for interpreting this information.

those conditions where individuals exhibited drugged behavior or seemed to have mental problems, spraying with OC to control that subject's behavior had no effect.

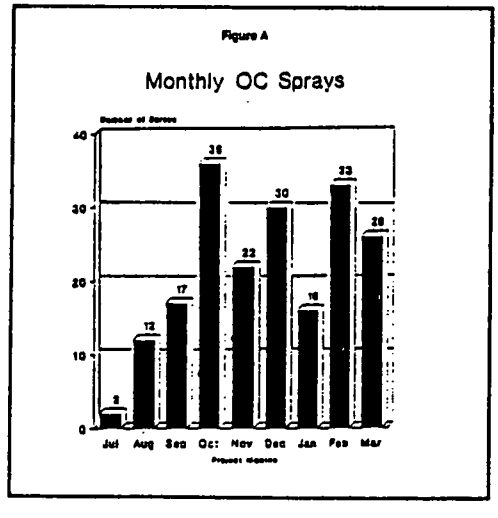
From these data, there is indication that individuals who are heavily intoxicated, drugged and/or mentally ill are in such a state that OC will have little or no effect and may make the individual more difficult to control.[3] Additionally, these types of encounters may cause the officer to be cross-contaminated if the incident escalates to a physical confrontation. Training officers may want to stress to patrol officers the importance of assessing the effect of the spray in such an encounter and be prepared to move to another force alternative to control the subject.

Animal Control

Examination of the effectiveness of OC to incapacitate dogs revealed success. Interest in how successful OC is in animal encounters was high because previous to the implementation of the OC project, BCPD had experienced a number of incidents where officers were forced to shoot dogs.

During the OC field study, there were 20 incidents in which dogs were sprayed with OC. Officers used their spray when the dog posed a threat. The data showed that officers sprayed the dogs at distances greater than those from which they sprayed humans. Officers sprayed the majority of dogs at a distance of three to eight feet, whereas officers sprayed humans at a distance of one to three feet. The difference in application distances may account for the differences in the effectiveness levels for dogs and humans. OC was effective almost 100 percent of the time in all dog encounters (one officer was bitten but required no medical treatment).

The majority of the dogs sprayed were medium to large in size. Ten of the dogs sprayed were between 25 and 50 pounds, and six were greater than 50 pounds. Attacking and aggressive animals were affected by the OC spray.



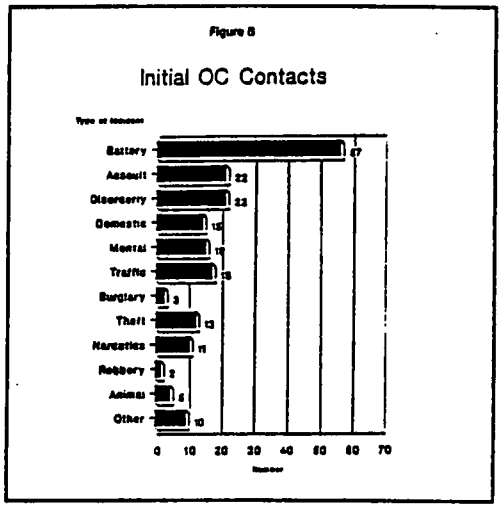
Summary of Outcome Findings

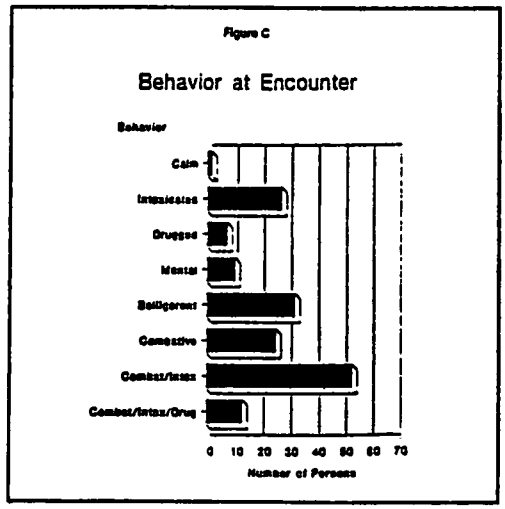
In the nine-month period OC spray was adopted and in use by the BCPD, the spray was used 194 times on either humans or dogs (see Figure A). The arrest/intervention incidents necessitating the use of spray were, in the majority, battery, assault, disorderly conduct, domestic, mental and traffic-related (see Figure B). Most incidents occurred outdoors (62 percent) with the remaining incidents either indoors or in vehicles. Most of the

[3] This is not unlike the findings presented in an earlier study on OC and in-custody deaths. See Appendix B for a copy of the study. However, due to the low numbers in this category, more research is required to obtain definitive answers to how intoxication, drug use and/or mental illness affects a person's reaction to OC spray.

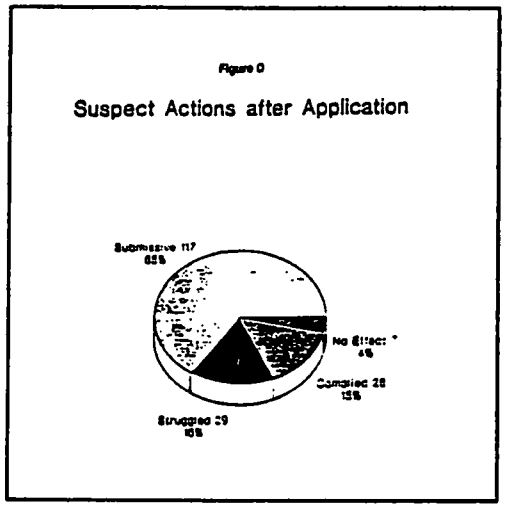
humans sprayed were males (84 percent) of either medium or large frame size.

The sprayed humans at the time of encounter were predominantly intoxicated, belligerent or combative with a large number both combative and intoxicated. (See Figure C.) The force or threat used by the sprayed individuals toward the officers was largely physical (79 percent) versus with any type of weapon.



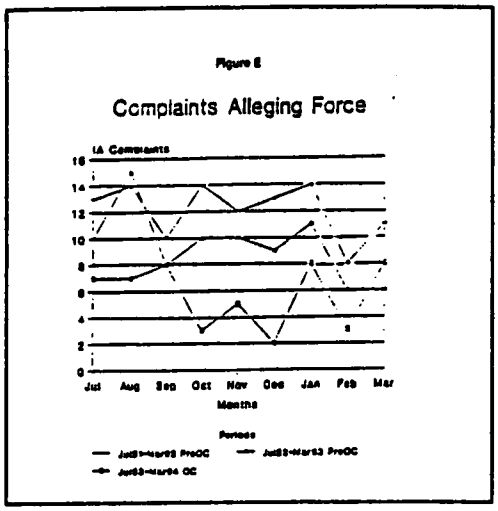


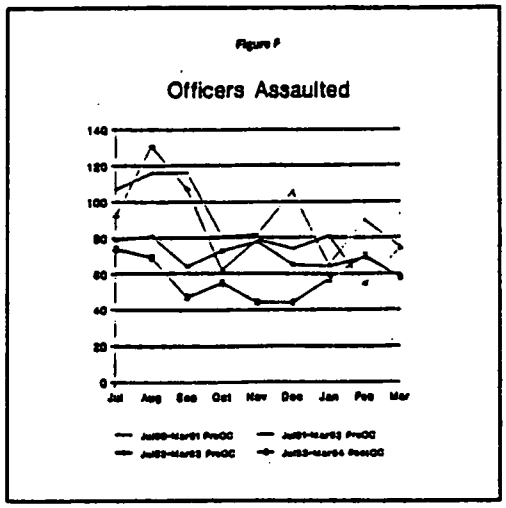
IACP, Legal Offices Section (See Appendix J.) In most cases (91 percent), the spray was administered to the face of the individual, typically (74 percent) from a distance of one to three feet. Twenty-one officers and 14 suspects were injured in the 194 applications.



In the vast majority of cases of OC use, officers reported that the individual sprayed was effectively controlled: 65 percent were "submissive" and another15 percent were "compliant" (see Figure D).
Overall, officers reported that in 90 percent of incidents the individual was sufficiently incapacitated to permit arrest or other officer actions. In the 18 cases where OC spray was not effective, some combination alcohol/drug use and combative behavior appeared to prompt or even permit individual resistance to OC spray.

Looking at comparative data from pre-OC spray periods in 1992 and 1993, the total number of complaints by citizens alleging force were lower during the OC spray use period (see Figure E). Similarly, the total number of officers assaulted was lower during the OC spray period than in the two non-OC spray periods (see Figure F). While only a preliminary investigation of OC effectiveness and impact, this comparative data certainly imply that OC has the potential to reduce the number of officers assaulted and the number of force complaints lodged against the department.





V. FINDINGS: PROCESS EVALUATION

BCPD Training Issues

The need to train approximately 1,400 officers in a three-hour block of instruction, not affect assignments or manpower, without necessitating payment of overtime, required a phase-in approach to OC training in BCPD. BCPD addressed their OC training needs by conducting the three-hour block as an addition to officer in-service firearms training. Firearms in-service with OC training began on July 12, 1993 and continued through December 31, 1993. During this time, 1,345 officers were trained in the use of OC and issued OC canisters.

Decontamination

OC decontamination was another significant concern addressed by the BCPD entities. Decontamination of OC spray and assurance to the suspect of the temporary nature of its effects are two very important requirements an officer must deal with after a subject has been sprayed and is no longer combative.

Standard Operating Procedures

The BCPD committee charged with examining the feasibility of the department adopting OC drafted a Standard Operating Procedure (SOP). The document was developed following consultation with BCPD's legal counsel, training officers, Internal Affairs, and command and staff officers. Additional directives were added following instructor training and writing of the lesson plan.

The SOP requires that all members of BCPD whose normal duties include making arrests or supervising arrest situations carry OC spray. Uniformed members of the department carry the device on their gun belt in an issued holster, while non-uniformed officers carry pen-sized containers.

containers.

Use-of-Force Issues

The BCPD, like most other police departments, adheres to the use-of-force continuum and its range of response, beginning with the mere presence of an officer and escalating to the use of deadly force. BCPD places the use of OC spray above verbal commands on the force continuum. Officers who find that verbal commands are ineffective or inappropriate, or who find that physical confrontation is necessary and/or anticipated, are justified in employing OC as a means of control and restraint. BCPD emphasizes that OC is not a substitute for a firearm. If when faced with an armed individual the officer deems deadly force necessary, then the firearm is the correct weapon.

Reporting the Use of OC as a Use of Force

Departmental reporting of OC spray was another significant issue of concern for personnel, including the executive corp, patrol officers and the FOP. BCPD policy states that a use-of-force report must be completed if the subject complains or goes to the hospital for treatment. If neither of these situations occur, then a use-of-force report is not required.

Discussion among BCPD officials occurred prior to the adoption of OC about the possibility of having each use of OC a reportable use of force. However, since any other LTL use of force did not require a report unless a complaint was made or hospital treatment was required, it was concluded that treating OC differently could inappropriately hinder its use.

During the time of data collection (July 21, 1993 to March 31, 1994) and over the span of 194 sprayings, five complaints of brutality and one use-of-force case were received by BCPD. These complaints centered on the officer and his/her purportedly inappropriate behavior. The complaints did not address the spray itself. At the time of this report, BCPD has not had any complaints or suits filed that relate to the issue of OC spray itself.

Police Use of Deadly Force in Defense of an OC Spray Attack

During the study, patrol officers voiced significant concern about whether they would be allowed to use deadly force if attacked with OC spray. The Legal Officers Section of the IACP holds that an officer may use deadly force to protect himself from the use or threatened use of OC spray when the officer reasonably believes that deadly force will be used against him if he becomes incapacitated. Incapacitation includes situations in which officers may be unable to adequately defend themselves due to the effect of chemical sprays.

In determining whether an officer's use of deadly force was reasonable, the following factors may be considered:

- The nature of the crime committed by the person or persons confronting the officer.
- The nature of the verbal or physical threats on the part of the person confronting the officer.
- The relative strength and fighting skills of the officer and his opponent.
- The number of officers versus the number of potential assailants.
- The nature of weapons in the possession of or available to the assailant.
- The ability to avoid the potential effect of the OC spray.
- The alternative means of defending against the use or effect of the OC spray.
- The availability of assistance from other nearby officers.

Source: IACP Legal Officer Section

When a criminal attacks an officer with OC spray, he does so with the intent to harm the officer, escape or both. It is common knowledge that a high percentage of officers who are incapacitated or have had their guns taken away from them are later shot with their own weapons. It would be unconscionable to ask an officer to take a chance that the OC spray attacker is merely going to walk away after incapacitating the officer.[4]

[4] IACP, Legal Officres Section (See Appendix J.)

INTRODUCTION

Violent encounters between police officers and individuals resisting arrest have historically been a source of injury to officers and subjects. These violent encounters have often resulted in complaints on the level of force used by the police.

Concern for these issues along with increased civil liability and court-imposed limitations on the use of deadly force have necessitated the search for safe and effective less-than-lethal (LTL) force alternatives. One alternative that has gained popularity is Oleoresin Capsicum (OC) spray, or as it is commonly called, pepper spray. OC is a naturally occurring substance found in cayenne peppers that, when used in a spray, is reported to be both safe and effective. The agent is relatively inexpensive and, according to anecdotal evidence, reduces injuries, civil litigation and excessive force complaints.

Despite extensive field application in virtually hundreds of police departments, few evaluative studies of OC have been conducted. Although anecdotal information has been reported and some police departments have analyzed their use of OC for effectiveness, as well as injury and complaint reduction (Onnen, 1993), no formal field evaluation has been completed. To address this issue, the National Institute of Justice (NIJ) awarded a grant to the International Association of Chiefs of Police (IACP) to evaluate the effectiveness of pepper spray. The Baltimore County, Maryland, Police Department (BCPD) was selected as the site for this implementation/evaluation project. Key elements of the study include pre- and post-introduction assessments of assaults on officers, subject injuries and the number of use-of-force complaints. Implementation/process issues, including product selection, training and operational considerations were also examined.

Grant monies were allocated to purchase the pepper spray product for BCPD, to hire a grant manager, and secure the services of a researcher and on-site observer. The BCPD independently selected a pepper spray product through the normal procurement process as required by Baltimore County regulation. BODYGUARD OC spray in a three-ounce canister with a five percent concentration level and a fogger delivery system producing a full-cone pattern of spray was selected for patrol use. A pen-like canister, consisting of the same concentration level and delivery system, was selected for plain-clothes officers. The BCPD trained their officers in the use of the OC spray, required officers to complete a form detailing its use in subsequent incidents and allowed access to key departmental personnel and necessary information by the IACP research staff.

OC training and issuance began in conjunction with the start of BCPD's semi-annual in-service firearm training on July 12, 1993. Concomitantly, a news release was issued by BCPD informing the public of OC adoption (See Appendix A). Training and issuance continued and was subsequently completed on December 31, 1993.

I. LITERATURE REVIEW

Various forms of chemical agents have been used in war as offensive weapons for centuries. In 428 B.C., the Spanish used wood soaked in sulfur and pitch, which, once ignited, generated choking fumes. According to historians, this was the origin of what eventually became known as "weeping gas" or "tear gas." In 673 A.D., "Greek Fire," comprised of sulphur, quicklime, pitch, resin and petroleum, was used in battle to produce suffocating vapors. The United States first used chemical agents, specifically "Greek Fire" and sulphur-soaked wood, during the Civil War (Jones, 1976).

After World War I where tear gas was used extensively, officials expressed an interest in extending the use of chemicals into the realm of law enforcement. It was hypothesized that these agents could effectively control criminals and riotous crowds as effectively as they controlled enemies during warfare.

Chloroacetophenone (CN)

The French used chloroacetophenone (CN) during the late 1920s to break up riots. Relative to the nightstick and the respective harm that this weapon could cause, CN was considered a humane method of crowd control. The effectiveness of the product encouraged law enforcement agencies from around the world to adopt CN as a supplement to standard issue equipment (Jones, 1976).

This organic compound, in its purest form, is a white crystalline solid resembling salt or sugar. It is available in many forms (e.g., mist, vapor or dust), and must be projected into the air to disperse the lacrimating (tear-producing) material. For use as a liquid aerosol, CN must be mixed with alcohol or ether. CN is a tearing agent that causes the eyes to water profusely and the respiratory passages to become irritated. Breathing thus becomes shallow and difficult. Other physical symptoms include tightness in the chest, stinging sensations on the skin and nausea. Psychological effects of fear and panic may also occur (Jones, 1976).

As an irritant that relies on pain compliance, CN is most effective on those individuals who are lucid and have a normal pain threshold. Those who are intoxicated, extremely agitated and/or mentally ill are generally less affected by the agent because of their greater tolerance for pain (Jones, 1976).

Studies have also indicated that relatively darker-skinned individuals are less susceptible to the effects of CN. Those who have lighter skin, particularly blondes with freckles, are much more sensitive to the burning effects of the agent (Jones, 1976).

Although humans are susceptible to agent effects, animals suffer little, if any, from the symptoms induced by CN. The agent cannot easily penetrate animal fur. In addition, their tear ducts are underdeveloped, therefore, the agent does not produce the profuse tearing that occurs in humans. However, even though the skin and eyes are not highly affected, animals do tend

to suffer from temporary respiratory distress.

Finally, it has been concluded that the level of CN effectiveness is temperature dependent. CN relies on the evaporation process for effectiveness, and the evaporation depends significantly on weather/temperature conditions. Cold weather hinders the effects because slow evaporation occurs under these conditions. Consequently, agent effects may not occur until subjects are placed in warmer areas. Extremely hot and/or humid weather will intensify the effects on the skin since the agent adheres to areas that are moist with perspiration. The agent is useful in any temperature over 50° F (Oleoresin Capsicum Chemical Agent Study, 1991), but is most effective when utilized in temperatures of 72° F and above (Jones, 1976).

CN presents an additional problem of decontamination. The microscopic particles can remain airborne for some time after being discharged. Dissipation time is dependent upon the amount of agent dispensed, air current, temperature and humidity. When used outdoors, no decontamination procedure is required. However, when used in enclosed areas, decontamination procedure requires thorough ventilation and cleansing of contaminated objects.

First aid treatment is relatively simple. The affected individual should be removed from the contaminated area. Upon contact with fresh air, subjects will begin to experience immediate relief. The initial recovery period can range from five to ten minutes. To expedite the process, eyes can be flushed with water, boric acid, or a two percent solution of sodium bicarbonate (Jones, 1976).

CN must be removed from the skin as soon as possible. The longer the chemical lingers on the skin, the more damage the agent will render. Water can be used with non-oil based soap to wash the exposed skin. Soda ash or caustic soda are also proven decontamination agents (Logman, 1993). A change of clothing is also suggested.

Finally, CN cross-contamination between subjects and police officers is common. Officers note that they are often contaminated by the agent when arresting and transporting sprayed subjects. This cross-contamination is purportedly responsible for officers' reluctance to use this agent.

Even though serious injury can be minimized by decontamination, CN does potentially present dangers. To date, four deaths have been attributed to the use of CN (Special Summary Report on the Toxicology of CN, CS and DM). Each incident involved police intervention with a subject in an enclosed area. Pathological exams concluded that the cause of death in all cases was attributed to air passage and lung damage (Logman, 1993). Animal testing similarly indicated that mortality is attributable to lung damage (Special Summary Report on the Toxicology of CN, CS and DM).

Opinions regarding the carcinogenic potential of CN vary. Scientists have reported no link between tear gas and cancer. According to Dr. Robert F. Dyer (Jones, 1976), Director of the District of Columbia Police and Firemen's Clinic, an association may be possible, but rare. Cancers in a certain occupational group could be merely coincidental (Jones, 1976). An officer

or chemical agent instructor would have to be exposed to a significant amount of CN over an extensive period of time to suffer any risk to his/her health (Jones, 1976).

Although cancer is unlikely, other damaging skin conditions can develop: dermatitis (inflammation of the skin), erythema (redness caused by congestion of small capillaries), edema (swelling) and necrosis (hemorrhage and death of cells) (Logman, 1993).

Although the risk of severe damage to the skin is minimal, CN can cause chemical burns. As mentioned earlier, the agent has a more concentrated effect on those areas of the skin that are prone to heavier perspiration, such as the armpits, elbows, knees and buttocks. These areas can develop a condition similar to a bad sunburn that can last several days. The sooner the skin is cleansed, the less the risk of injury.

Finally, permanent eye damage can occur if a significant amount of CN, in the form of dust, is expelled at close range into a subject's eyes (Jones, 1976). Although the likelihood of such damage is improbable, caution should be exercised when using the product. Any subject who is the direct target of CN should be sprayed in the upper torso, not directly in the face.

Ochlorobenzylidene-Malononitrile (CS)

The U.S. Army and the National Guard continued to use CN as a riot control agent until 1960, when it was replaced with ochlorobenzylidene-malononitrile (CS). Officials held that CS was considerably less toxic and more effective than CN (Jones, 1976). Following military protocols, American law enforcement agencies subsequently adopted CS in 1965.

In pure form, CS is a white, crystalline substance similar to talcum powder that can be discharged in either smoke, liquid or dust form. Like CN, it is classified as a solid, not a gas, since it requires a carrying agent to disperse it into the desired target area.

CS is a lacrimating irritant that immediately affects the mucous membranes producing tears, runny noses, and persistent coughing and/or sneezing. Additional symptoms include respiratory distress accompanied by tightness in the chest, a burning sensation on the skin, and nausea or vomiting. In addition to physical effects, CS also causes intense fear, panic and cognitive disorientation.

According to military and law enforcement personnel, CS is a preferred alternative to CN (Selected Military Reports on CS Riot Control Agent) as it produces immediate effects and is less toxic. Minimal tolerance can be developed for CS, and it is virtually impossible to endure the effects for more than two minutes. To date, there have been no successful defenses for either CN or CS, other than the use of a gas mask (Jones, 1976).

Subject incapacitation generally occurs within the first few seconds after dispensing the agent. Although the reaction time for nonviolent individuals occurs immediately (within three to ten seconds), the reaction time increases when CS is used on individuals who possess a higher level

of pain resistance. Those who are drug and/or alcohol intoxicated, mentally disturbed or extremely agitated will either experience an increased reaction time or experience no effects at all. However, if the agent does take effect, increased control of the subject can be maintained by a police officer.

As with CN, CS is also more effective on those areas of the skin that are moist (Compton, 1987). The mixture of the vapors with human sweat results in burning or stinging sensations. It has also been determined that fair-skinned individuals, who are more susceptible to sunburn, experience more intensified effects from the product (Selected Military Reports on CS Riot Control Agent).

CS, like CN, is virtually ineffective on animals. The absence of fully developed tear ducts and the presence of fur tend to hinder the full effects of CS. Generally, animals experience only minor respiratory distress (Jones, 1976).

Unlike CN, CS is considered to be effective over a wide temperature range and is considered more persistent, especially in humid climates where the effects are accentuated causing the odor and irritation to linger. Concentration amounts depend on wind conditions, and rain or snow tend to flush the agent from the air (Compton, 1987).

The microparticulate nature of CS results in agent persistency and thus can make decontamination problematic, especially in enclosed or confined spaces. If CS is used in an enclosed space, the decontamination process can be accelerated by providing proper air circulation (i.e., opening doors and windows) and using exhaust fans. Heating the area will aid in vaporizing the agent, and vacuuming will also remove the particles. In extreme cases, an area may need to remain unoccupied for days.

If CS is used outdoors, the decontaminating procedure is relatively simple, requiring little, if any, attention other than perhaps hosing down the affected area with water. Although no extensive procedures are required for individuals, the importance must not be underestimated. The initial recovery period for CS can range from five to ten minutes. First aid is similar to that used with CN. Individuals should be exposed to fresh air while facing the wind, and their eyes should be flushed with water. To minimize any serious skin injury, a cool shower and a fresh change of clothes is recommended. It should be noted that a hot shower will open the pores, resulting in increased irritation to the exposed areas of the skin. A solution of five percent sodium bisulfide can be used in situations where a heavy concentration of CS was involved (Jones, 1976).

Serious injury to an individual is improbable if CS is used properly. Extensive toxicological testing using several thousand volunteers, inclusive of both military and civilians, was conducted in England, the United States, Germany, France and Vietnam (Jones, 1976). None of the subjects, who were of different ages and of various ethnic backgrounds, developed any significant complications or serious side effects. These findings were consistent for healthy individuals and for those who had pre-existing health conditions. In spite of the potency of CS,

it was determined to be a safe, less toxic and more effective alternative to CN (Special Summary Report on the Toxicology of CN, CS and DM).

Thorough animal testing was also conducted to determine toxicity levels (Jones, 1976). Although no animals died during their exposure to CS, some died several days later. Autopsy results indicated that the CS obstructed the air passages, resulting in the poor transfer of oxygen to the bloodstream (Special Summary Report on the Toxicology of CN, CS and DM). To date, however, there have been no recorded human deaths related to the use of CS (Special Summary Report on the Toxicology of CN, CS and DM). Experimental results (Jones, 1976) indicate that the lethality threshold for humans is at least 2,600 times greater than the amount delivered to the animals. Even if CS was used indoors in a confined area, it would be highly unlikely that any individual would ever be exposed to such a concentrated amount in one incident.

As with CN, it has also been implied that CS is a cancer-producing agent. To date, there has been no conclusive evidence to support this claim (Jones, 1976). However, individuals exposed to CS will suffer from a certain degree of respiratory distress. The amount of discomfort can be even more apparent from the effects of CS than from CN. An individual may experience significant difficulty in breathing. This symptom, combined with a sense of panic and disorientation, can result in hyperventilation. Reassurance that the effects of CS are only temporary will often prevent this phenomena from occurring.

Subjects suffering from asthma, epilepsy or fainting spells may be more prone to experience an attack at the time of CS exposure (Jones, 1976). In addition, individuals with hypertension (high blood pressure) may be more susceptible to a stroke (Jones, 1976). However, there have been no reports of anyone collapsing from CS (Jones, 1976). It appears that these reactions are attributable to the stress generated by an arrest/police encounter.

It has been suggested that if an individual is exposed to an excessive amount of CS in a confined area, lung damage or chronic bronchitis could develop (Jones, 1976). Although it is a potential risk, the possibility of permanent damage to the lungs is highly remote (Jones, 1976).

Similar to CN, CS can also cause dermatitis or eczema (an inflammatory skin disease) if the skin is continuously exposed over an extensive period of time (Selected Military Reports on CS Riot Control Agent). An excessive concentration of CS could cause blistering, but if properly treated, will not likely lead to scarring.

Finally, it should be noted that CS is much less capable of causing serious permanent eye damage than CN. However, the force of any product expelled from a projectile-type mechanism could cause damage if used at close range.

Oleoresin Capsicum (OC)

CN and CS are still used by many law enforcement agencies, especially for tactical use in crowd control situations. However, some law enforcement officials are troubled with the risks,

cross-contamination and the decontamination problems that these chemical agents pose. Increases in violent police encounters coupled with court-imposed limitations on the use of force have resulted in an almost universal demand for an alternative. Increased civil liability and injury-related costs have further necessitated the development of a viable option. Another less-than-lethal alternative that has recently gained popularity and acceptance is Oleoresin Capsicum (OC), also referred to as pepper spray.

Pepper spray has been used for centuries to ward off adversaries. The Chinese utilized "stink pots" composed of red pepper, which, when burned with oil, created a blinding and suffocating smoke (Jones, 1976). The Japanese also temporarily blinded their opponents by throwing rice-paper bags filled with ground pepper in their faces (Jones, 1976).

Although OC has been available since the mid-1970s, it has become widely used only within the past few years. This increased acceptance is, in part, attributable to a study conducted by the FBI Firearms Training Unit (FTU) and the U.S. Chemical Research and Development Center (CRDEC). This two-year study involving animal and human subjects assessed the safety of OC. Research findings revealed no long-term health risks associated with the use of OC. Specifically, the FBI reported that no ill effects or adverse reactions were experienced by the 899 participating subjects (Weaver and Jett, 1989). The CRDEC further reported that neither mutagenic nor carcinogenic effects were found in laboratory animals exposed to OC via gastrointestinal doses, subcutaneous injections, droplets to the eyes and skin patch tests (Weaver and Jett, 1989). Since then, hundreds of law enforcement agencies have adopted OC as a reliable LTL alternative.

Unlike the synthetic chemicals CN and CS, OC is a naturally occurring substance derived from the cayenne pepper plant. An organic oily resin, OC is currently used for pharmacologic (e.g., as a topical analgesic) and food spicing purposes.

OC is considered an inflammatory agent, unlike the traditional chemical irritants (i.e., CN and CS). Upon contact with OC, the mucous membranes of the eyes, nose and throat become inflamed and swell. The symptomatic swelling produces involuntary eye closure, nasal and sinus drainage, gagging, coughing and shortness of breath. A burning sensation occurs on any exposed skin areas and, depending on the complexion of the individual, some temporary redness may appear. Additional symptoms include nausea, loss of coordination and upper body motor skills, disorientation and fear.

Because OC is an inflammatory agent, it is purportedly more effective than CN and CS on violent, intoxicated/drugged and mentally ill individuals. However, there are reported instances in which pepper spray was less than effective on highly intoxicated and on combative subjects (Granfield, Onnen and Petty, 1994). However, in these reported incidents, OC did cause the eyes to shut, causing temporary blindness, thus, enabling law enforcement personnel to acquire heightened control (Granfield, Onnen and Petty, 1994).

Involuntary eye closing and automatic irritation of the respiratory tract explain why OC is so

effective on animals. As mentioned earlier, animals possess underdeveloped tear ducts that consequently negate the effects of CN and CS. However, OC affects animals in the same manner as humans, swelling the eyes and restricting respiration. Anecdotal evidence suggests that OC has been very effective in many situations where police officers and postal workers have been unexpectedly confronted with threatening or attacking animals (Oleoresin Capsicum Chemical Agent Study, 1991). Unlike its counterparts CN and CS, OC is effective over a wide range of temperatures and has been used successfully in both warm and cold climates.

No special decontamination protocols are required for OC because it is biodegradable and, unlike chemical irritants, it will not persist in clothing or affected areas. Sprayed subjects should be exposed to fresh air as soon as possible to expedite relief. Any eyeglasses or contact lenses should be removed, and the eyes and skin flushed with cool water. Oily soaps or creams should be avoided, as they will clog pores and intensify agent effects. Although the immediate effects are short-term, the full recovery period can range from 30 to 45 minutes.

OC will not persist in clothing or fabrics unless it is mixed with CN or CS. Fresh air is generally all that is required to remove any OC particles. If desired, exposed garments can be washed without contaminating any other clothing. Police officers can prevent cross-contamination by waiting, if possible, until the spray has "settled" before coming into physical contact with the subject.

In an enclosed area, doors and windows should be opened to accelerate the dissipation of the OC. Large exhaust fans are generally unnecessary since the agent does not linger for any significant amount of time.

As earlier mentioned, results from the two-year study collaboratively conducted by the FBI and the CRDEC concluded that OC was non-toxic and not associated with any long-term health risks (Weaver and Jett, 1989). Regarding OC use on persons with pre-existing respiratory conditions, Fuller, Dixon and Barnes (1985) found no significant difference in either the magnitude or duration of bronchoconstriction between normal, smoking or asthmatic subjects. Occupational Health Services, Inc., a private research facility contracted by the Kansas City, Missouri, Police Department, reports that the use of OC on persons with respiratory problems could, in rare instances, cause death (Bowers, 1991). However, they further state that such an occurrence is statistically improbable.

Examination of in-custody deaths that occurred subsequent to OC use has excluded the agent as a contributory factor (Granfield, Onnen and Petty, 1994). To date, OC has not caused any deaths, even among persons with pre-existing conditions (Granfield, Onnen and Petty 1994). The individuals died from a variety of other causes including positional asphyxia, excited/cocaine delirium, drug and/or alcohol overdose and neuroleptic malignant syndrome. (See Appendix B for an extensive discussion of this issue.)

Finally, OC use will not result in dermatitis, skin depigmentation or burns. The burning sensation experienced by sprayed subjects is harmless, resulting from the naturally occurring

pepper oil. These symptoms will remain constant regardless of spray concentration and frequency of exposure.

Although statistically possible, the probability of serious eye damage from OC spray is quite improbable. Manufacturers suggest that OC should be sprayed in the face and upper torso of the subject to realize the desired optimal effects; however, there is always the possibility of injury from the force of the propellent agent when expelled at close range.

Currently, OC spray does not fit into a category or classification that would place it under the jurisdiction of any federal regulatory agency. Its unusual status is attributable to the fact that it is a naturally occurring substance and that it is used on people. Interestingly, if OC was marketed or advertised as a product for use on dogs, or as was done for some time, marketed as a bear repellent, then the Environmental Protection Agency (EPA) would have regulatory authority because OC would have to be classified as a pesticide. Similarly, the U.S. Consumer Product Safety Commission (CPSC) has no regulatory authority as this agency does not regulate weapons used on people. Furthermore, the Food and Drug Administration (FDA) has no authority because the agent is not used as either a drug or a food product.

Many people within the OC industry, law enforcement and the public would like to see OC spray come under the jurisdiction of a regulatory agency, so issues of product standards and safety could be more extensively examined. Currently, the only comprehensive laboratory testing has been undertaken at facilities contracted by OC manufacturers. Extensive clinical studies employing human subjects are needed; however, until such studies are conducted, information will be solely derived from experience in the field. Data collection and evaluation activities began simultaneous to actual spray use by officers.

II. THE RESEARCH SETTING

Baltimore County, Maryland, site of the Pepper Spray Project, has a population of approximately 695,000 people and covers an area of 612 square miles. The county covers urban, suburban and rural areas. The county is a separate jurisdiction from Baltimore City and provides a full range of public services, including police protection. The county has 281,553 housing units with a median home value of $99,900 and a median household income of $38,837. The county is home to 18,392 companies employing 302,184 workers; 462 of these companies employ 100 workers or more.

Demographically, the county population consists of:

- 22.0 percent under 18 years of age
- 14.0 percent 65 years of age or over
- 85.0 percent white
- 12.0 percent black
- 3.0 percent other
- 5.5 percent who earn below the poverty level
- 78.4 percent high school graduates or higher
- 25.0 percent with a bachelor's degree or higher.

The Baltimore County Police Department has sole responsibility for delivery of police services to Baltimore County. There are no incorporated cities or towns, and the police have county-wide jurisdiction. The mission statement of the department follows:

> **Working in partnership with the entire community and basing our work on fundamental values, we are totally committed to enhancing the quality of life in Baltimore County by protecting life and property, preventing crime, enforcing the law, reducing fear and preserving the peace through sufficient and effective police services.**

The department is a nationally accredited agency and follows the community policing model. The department has an authorized strength of nearly 1,500 officers, 80 percent of whom are assigned to the Field Operations Bureau. These officers responded to 442,436 calls for service in 1993, which included 44,074 Part I offenses. Police service is generally provided through the Patrol Bureaus' nine precincts (see Appendix C). In a typical day, these patrol officers will:

- Respond to over 1,000 calls for service
- Drive 38,788 miles
- Handle the reporting and investigation of 222 crimes (one every 12 minutes)
- Arrest 79 persons
- Issue 353 moving citations
- Have three of their members assaulted.

BCPD Interest in a Force Alternative

As a result of a strong commitment by the chief and the executive corps for experimentation and research into police functions and technology, and more importantly, a significant concern for officer and public safety, an examination of less-than-lethal alternative weapons was initiated. In January 1992, a committee was assembled to conduct this examination. The committee consisted of seven members representing: the Patrol Division, Technical Support, Services Division, Training Division, Tactical Unit and Safety Unit.

Once convened, an early concern of the committee was a need for an alternative to shooting dogs who attacked officers. Upon contacting several local police departments and other departments nationwide, BCPD found that many departments were using OC for subduing dogs. Moreover, departments noted that the agent was highly effective as a alternative weapon on the use-of-force continuum including incidents involving human suspects.

The committee gathered this information from police departments and agent vendors and analyzed concerns relative to legal and medical issues, product selection, training requirements, funding ability and safety. Following their investigation, the committee decided that OC was a viable option worth adopting. They held that OC spray was a safe and effective alternative that, relative to existing forms of force, could result in a lowered incidence of officer and citizen injury. Moreover, it was suggested that civil liability suits and citizen complaints would diminish as OC use would not result in any overt visual effects like those associated with many officer and subject struggles.

III. PROJECT METHODOLOGY

Evaluation of BCPD's adoption of OC was designed to examine two major components. The first component evaluated how the program was actually conceived and the process of OC adoption and implementation. The second component examined the impact that OC use had on assaults on police, brutality/use-of-force complaints, and on the effectiveness of subduing uncooperative subjects. All too frequently, analyses of the relationship between the introduction of a new item or technology and the outcomes (effect) of that item or technology do not exist. Such assessments, however, are critical to understanding WHAT does and does not work, and WHY it does and does not work. Without these two pieces of information, there can be no transfer of knowledge about new technologies or programs. Additionally, properly executed process evaluations allow officials to decide more confidently and precisely what specific program components and concepts they want to use in the future, how to go about implementing those components and concepts, and what effects they can anticipate. This was the case in this study.

Process Evaluation

In order to examine OC project development, officers and command staff members were identified who were critically involved with the project. These officers included individuals from the Executive Corp, Internal Affairs, Range/Training Division, Planning and Research, OC Coordinating Committee and Union Officials. Throughout the entire project, beginning with its inception, constant communication was maintained with these individuals. Formal and informal meetings were continually held by BCPD during which specific OC-related issues were addressed. Research staff attended these meetings and collected information on the process of OC adoption and implementation. The issues addressed during the process evaluation included:

- selection of pepper spray product line
- development of written use policy
- development of training program and materials
- implementation of documentation for post-use reporting
- identification of required follow-up (in-service) training needs.

Outcome Methodology

The second part of the research design was concerned with assessing the impact of OC spray in confrontational encounters between police officers and citizens as well as police officers and animals (dogs). It was hypothesized that providing OC to police officers would lessen assaults, injuries and complaints on police officers as well as lessen injuries to suspects in arrest/confrontational encounters. Additionally, if OC was found to be an effective agent, it would be adopted as a viable alternative to the traditional use-of-force methods.

Five principle questions were developed to guide the assessment of the effectiveness of OC in confrontational encounters:

1. Would assaults on officers be reduced in arrest and other confrontational encounters?

2. Would injuries to police officers be reduced in arrest and other confrontational encounters?

3. Would injuries to suspects be reduced in arrest and other confrontational encounters?

4. Would use-of-force complaints on police officers be reduced in arrest and other confrontational encounters?

5. How effective is OC in human and animal encounters?

The data analysis used in the OC evaluation consists of an integration and examination of qualitative and quantitative data through a multi-method/multi-trait technique. The objective in this study was to acquire a comprehensive understanding of OC adoption and use in the Baltimore County Police Department.

Development of the Measurement Instruments

Data collection instruments were developed to obtain information from the field on each OC spray incident. The initial collection instrument was constructed as a form to be completed by each officer who used OC. The form included open and forced-choice questions relating to the following: weather conditions, suspects, OC application, injury, decontamination and animals. The form would be completed along with the incident report as soon as practical after the conclusion of the event.

When developing the data collection sheet, researchers sought to keep it simple, limit it to one side of one page, require as little writing as possible, make it as easy as possible to code for computer entry and make it as comprehensive as possible. For guidance, OC use forms being used by Fairfax County, Virginia, Police Department, the New York State Police and the Drug Enforcement Administration were utilized. By blending information from these forms with the needs of BCPD and with the requirements of the project, a data collection sheet that met the desired goals was developed. (See Appendix D for copy of data collection sheet.)

To validate information collected by the data form, a second measurement instrument, an unstructured follow-up interview, was developed. This interview was conducted by the on-site observer with each officer after acquisition of the data collection form. The unstructured interviews addressed the same issues as the data collection form, allowing however, for the officers to add any comments or personal suggestions/observations. (See Appendix E for copy of interview.)

Prior to its use in BCPD, the data collection sheet and unstructured follow-up interview were pilot tested in the Anne Arundel County, Maryland, Police Department (AAPD). AAPD was

already using OC spray; however, they were not utilizing any type of data collection sheet. Although AAPD serves a smaller, more rural area than the BCPD, it was concluded that the departmental and demographic similarities were sufficient to pilot-test the use of the form and the follow-up interview.

To introduce the form and interview to AAPD officers, a video was made describing each, as well as the process of the pilot project. The video was then presented at roll calls. The AAPD chief also sent his officers a directive requiring them to complete the form and the interview when OC was used.

The AAPD pilot test, which lasted three weeks, resulted in only three sprayings; however, during this time, the researchers concluded that the measurement instruments were suitable for the needs of the project and were generally user-friendly. Following the pilot test, the form was printed and distributed throughout all BCPD precincts and operations sections to ensure that the forms were readily accessible to all officers.

BCPD patrol officers and the FOP raised the concern that copies of the data collection form would be made and sent to Internal Affairs (IA) as a record of OC sprayings and involved officers. The issue was resolved when the department agreed not to make any copies of the form other than when issues were found that related to training. The form, which was an IACP form, not an official BCPD form, would be sent to the IACP on-site observer without any information being made available to IA; however, the form was reviewed and signed by respective shift lieutenants and precinct commanders.

Upon completion of the data collection forms and unstructured interviews, incident reports were requested and subsequently paired with the other measurement instruments. These reports further verified the data. This methodological triangulation provided the research team with official (the incident report), structured (the data collection form) and unstructured (the follow-up interview) sources, thus preventing reliance on one sole informational source to collect the data.

After considerable discussion, it was decided that much of the additional information used to measure the impact of OC would come from either the Crime Analysis Unit or the Internal Affairs Section. The BCPD Crime Analysis Unit routinely collects a significant amount of departmental information for a number of internal reports and projects. The staff of the unit was not only very helpful, but was able to provide much of the raw data needed to examine the impact of OC regarding the number of assaults on police officers. Initially, it was believed that the assault-on-officer data could be obtained from incident reports completed by officers. While this information was reliable, it was determined that a more accurate picture of assaults on officers could be obtained by using the *Maryland Law Enforcement Officers Killed or Assaulted* data. These data were not only more detailed in format, but are a state requirement that must be accurately submitted monthly to the Maryland State Police, Central Records Division, to be compiled by the Federal Bureau of Investigation.

Crime Analysis staff provided copies of the monthly *Maryland Law Enforcement Officers Killed*

or Assaulted data sheets for each of the three years prior to the introduction of OC in July 1993. The time periods were:

- Pre-OC 1: July 1, 1990 to March 31, 1991
- Pre-OC 2: July 1, 1991 to March 31, 1992
- Pre-OC 3: July 1, 1992 to March 31, 1993

— Introduction of OC - July 1993 —

- Post-OC 4: July 1, 1993 to March 31, 1994

Data gathered for the post-period (July 1993 to March 1994) was then used for comparative data with the three pre-OC data sets.

Selection of the nine-month period (July to March) as the project examination and data collection interval was determined for the most part by the length of time remaining in the project funding period. Initially, the project was funded for a period of one year, but due to temporal constraints related to the phased-in OC training program, the project needed an extension to lengthen the data collection time period. A full twelve-month period would have allowed for the capture of seasonal variation in the patterns of arrest and in police/citizen encounters. However, given the OC training constraints of the project and the amount of time required to complete the final reports, a nine-month data collection period was employed.

One of the principle objectives of this study was to determine the effect of OC in reducing the number of use-of-force complaints the BCPD receives each year. One of the promoted advantages of using OC is that it allows officers the opportunity to control suspects while minimizing the use of physical force. Consequently, it was hoped that departmental use-of-force complaints would decrease with the proper use of OC by officers.

BCPD policy requires that all use-of-force complaints be sent to Internal Affairs (IA) for investigative action. Complaints are chronologically logged by IA for the particular calendar year. The research staff contacted IA for the number of complaints received for improper use of force. IA was most cooperative in providing the data that were needed for the project time periods. Monthly data on the number and types of complaints (use of force or brutality[6]) were chronicled against officers for each of the examination years. All the information provided by Internal Affairs was done so without compromising the confidentiality or identity of any officer in any way, for any case reported.

While the information provided by Crime Analysis and Internal Affairs was useful, each

[6]The terms "use-of-force" and "brutality" are defined by BCPD in departmental policy. Essentially, all complaints alleging unnecessary, excessive or brutal force and all use-of-force incident reports are to be recorded and reviewed by the IA section.

spraying incident was also "tracked" with the data collection form previously mentioned. Each officer using his/her spray in a confrontational encounter with either a human or animal was required to complete the form. Initially, research team members designed a very detailed instrument,[7] but aspirations were modified when they realized that officers might perceive such questions as intrusive.

The data collection form was designed to acquire information as to how effective OC was in confrontational encounters and how officers felt about using the OC spray. Additionally, there was interest in capturing information on suspect and officer injuries. The data collection instrument did ask whether either an officer or suspect was injured in the application of OC spray.

Data collection for both the impact and process evaluations began in mid-July 1993 with a site visit to the Baltimore County Police Department. Department officials met with IACP staff to establish protocols regarding the collection of data. Prior to the research team's arrival, the department had undertaken considerable study of the type of OC product (fog spray versus stream, manufacturer and desired strength of OC) it wanted to provide its officers. In light of this activity, the IACP research team had only to introduce its members, establish its data collection protocols and begin data collection.

Data Limitations

There are always limitations to the collection of data in any research endeavor. One of the difficulties encountered at the outset of the project was the fact that the timetable for the project would not allow for a full 12 months of data collection. It was initially believed that a full year of data would be collected to account for seasonal differences that affect crime and encounters with police officers. However, as was discussed above, only nine months were available for data collection.

Another limitation of this study involved the difficulty of using a self-report form (the OC Data Collection Form) to capture information. There are methodological concerns about the use of a self-report form to collect data. Specifically, it is often difficult to know whether or not the information is accurate. Despite stringent efforts to ensure that the forms were accurately completed for each spray of OC, the staff cannot be certain that this was done. However, to verify the information, each officer was contacted by our on-site staff member and interviewed about the particular spray incident. Consequently, it is held that the data are reasonably accurate. All data collection forms were matched with an official report which was written

[7]Initially, the research team had hopes of collecting information on officer workmen's compensation claims and developing dollar costs to injuries. Also, there was hope of determining the loss of wages and duty time as a result of officer injuries for both the pre- and post-periods. Unfortunately, this information was not available from either departmental or county risk managers in a form that was easily retrievable. Research team members spoke with these individuals and found that much of this information would have to be acquired by a hand search of claim files, and then it was not assured that it would be useful for our purposes.

regarding the use of the spray.

The second major issue in using a self-report process to collect research data regards the concern of not completing a spray data collection sheet at the time an incident happens. Our best efforts were to ensure that all sprays were recorded so that the data reflected the actual number of sprays.

In summary, given that there are limitations with any study, the research design selected for this study made every attempt to account for and minimize project weaknesses. Despite the limitations, staff believe thse data to be as accurarte as possible, thus supporting the findings and policy recommendations that are presented in this report.

IV. FINDINGS: OUTCOME EVALUATION

The information presented below is organized in the following fashion. First, a series of figures is presented with a discussion of the research findings. This information is an overview, designed to give the reader an idea of the types of incidents and situations in which OC was used and what influence it had in controlling various situations.

The second part of the outcome analysis is an examination of the effectiveness of OC spray in confrontational encounters. Specifically, this discussion examines five questions that staff believed central to a police department's adoption of OC spray as a force alternative. Lastly, a summary is presented of the outcome evaluation findings.

Overview Analysis

During the nine months of data collection, Baltimore County officers were involved in a total of 194 recorded spray incidents. These incidents included both human and animal confrontational encounters.

Monthly OC Sprays. Figure 1 shows the number of spray incidents per month for the project period. The gradual increase in the number of sprays per month up to September 1993 is attributed to the phased-in OC training officers received as they completed their firearms in-service training. The department's OC implementation plan called for officers to become trained in the use of OC spray as they were scheduled for in-service training. By December 31, 1993, a total of 1,345 officers completed OC training. This represents the total number of officers trained and issued OC spray.

The gradual introduction of OC spray slowly increased the probability of more suspects being exposed to OC as more officers became qualified in its use. Also, gradually increasing the number of officers carrying OC allowed officers to hear about how the product worked and to form opinions regarding its usefulness. This gradual increase also prevented the initial "over-usage" of OC due to the introduction of and subsequent curiosity toward a new technology. Figure 1 shows that by the time all 1,345 officers had OC spray available to use, the department averaged 25 sprays per month.

Initial OC Contacts. Figure 2 displays the types of initial contacts officers encountered when they used OC spray. The range of incidents officers responded to in the data collection period was so varied that it had to be consolidated to allow for graphic representation. Figure 2 shows the types and frequency of incidents officers were involved in when they decided to use OC spray. These incidents are essentially high-volume, ordinary disorder complaints that are routinely handled by beat police officers. But they are also the types of complaints where police officers are very likely to encounter aggressive, excitable behavior from both those individuals that called the police to do something, and those individuals that the police were called to manage. The largest number of initial contact incidents included battery, assault, disorderly conduct, domestic violence, mental disturbance and traffic incidents.

Figure 1

Monthly OC Sprays

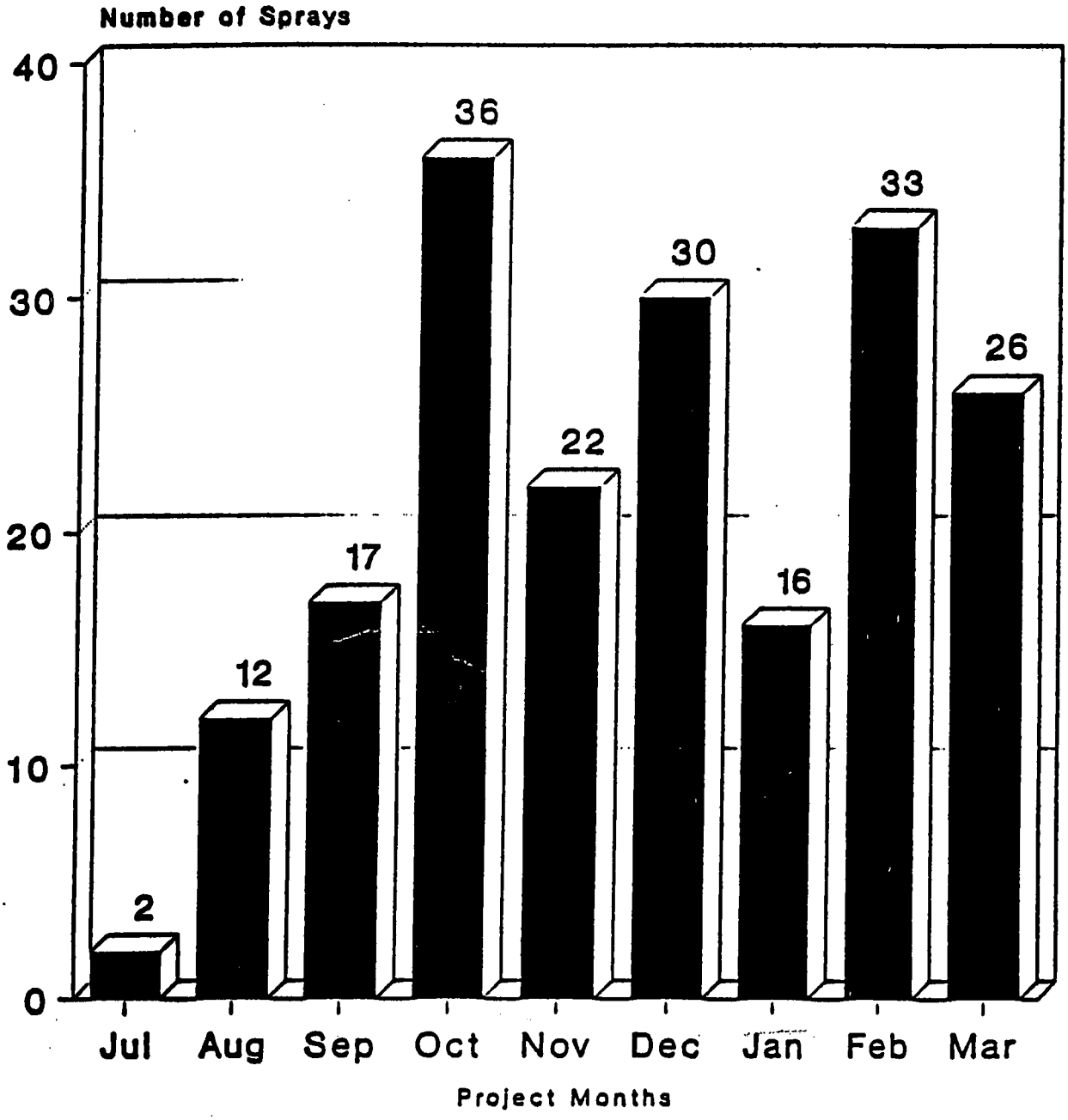
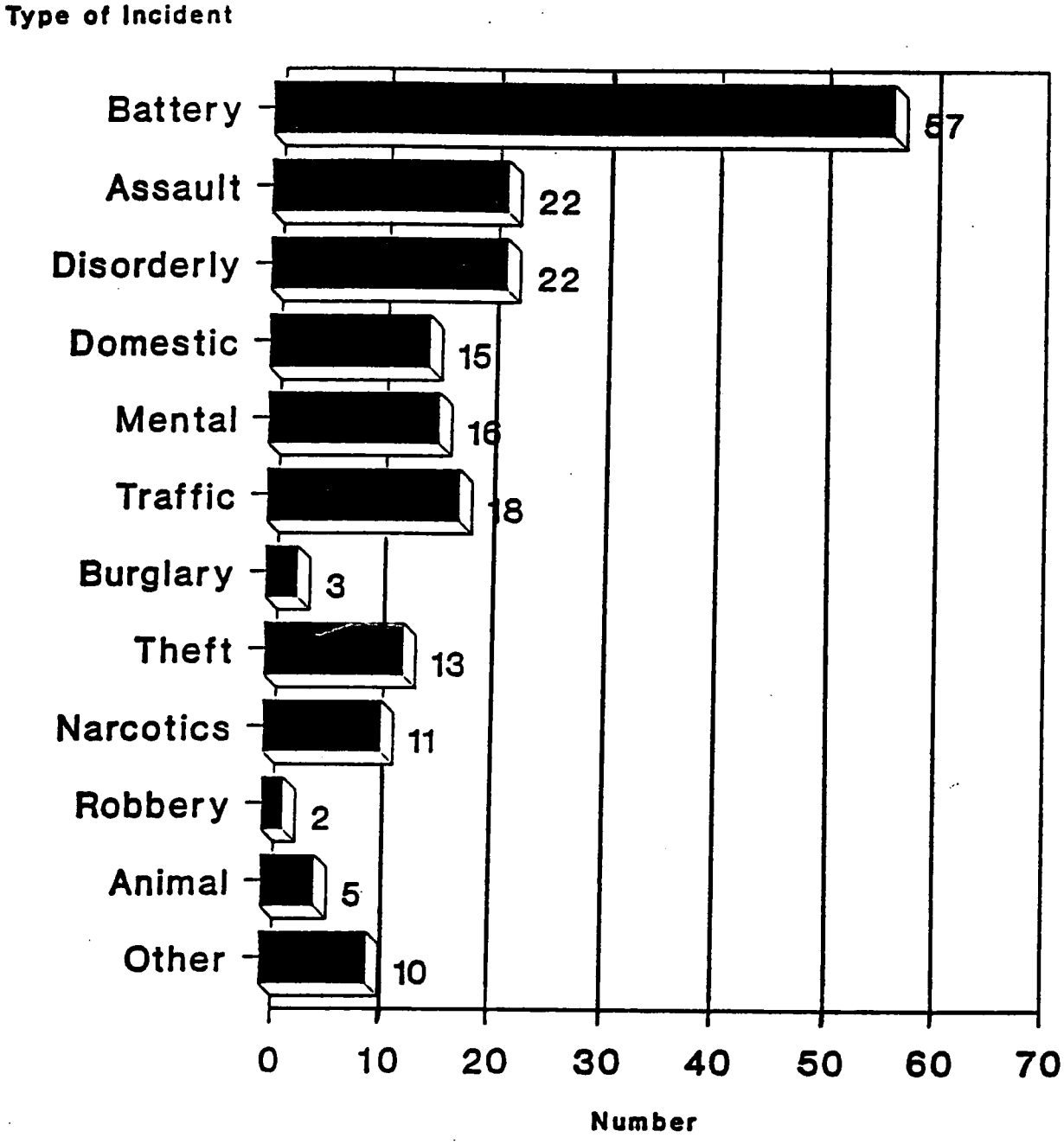


Figure 2

Initial OC Contacts



OC Use/Location. Most of the OC sprays took place outdoors as shown by Figure 3. Of the 194 OC spray incidents, 120 incidents (62 percent) of the OC sprays took place outdoors, while 69 incidents (36 percent) took place indoors. Only five incidents (three percent) took place in vehicles.

Most of the incidents took place in locations where there is little concern with contamination or the decontamination of the spray location. To our knowledge, there were no complaints made to the department about any locations requiring special decontamination procedures to clean the location beyond the use of a fan as was the case in one indoor location.

Weather Conditions. Figure 4 indicates that OC spray was applied under a variety of weather conditions. Two clarifications of this table are helpful. First, officers indicated "dark" as a weather condition, most likely reporting that visibility was lessened due to any number of reasons, and not referring to "nightfall" or nighttime." These have been included in the "other" category in Figure 4. Also the large percentage of "other" (48 percent) is presumably large because officers most likely included indoor and vehicular applications (39 percent of total applications) in this other category.

Suspect Gender. Figure 5 shows that males were sprayed most often in the 194 spray incidents. Of that number, 174 incidents were sprays of humans and the remaining 20 were sprays of animals (all dogs); eighty-four percent of human sprays were sprays of males, and the remaining sprays (16 percent) were of females.

Suspect Frame Size. For the most part, individuals sprayed with OC were either medium or large-framed (Figure 6). Fifty-one percent (98) of the suspects were of medium build, and 32 percent (62) were of large build. Only seven percent (13) were considered small by officers completing the data collection forms. Regarding the missing data in the figure, one data sheet did not report the suspect's size and the remaining missing data reflect usage on animals (dogs).

Reasons/Use of Spray

The previous section established general information about OC spray such as how many sprays occurred during the project, initial reasons, contacts, locations, suspect gender, and the weather conditions. The following section examines the encounters and reasons for the use of OC spray. Specifically examined are the behavior of the suspect at the time of the encounter, the threat of force and agent effectiveness. The analysis begins with an examination of suspect behavior at the time of the encounter.

Behavior at Encounter. Figure 7 displays the range of suspect behaviors at the time the police officers arrived on the scene. A majority of the suspects in the spray sample were either belligerent, combative and/or intoxicated (drugs/alcohol or both). These behavioral conditions are those which often lead to physical confrontations, as indicated in Figure 8.

Figure 3

OC Use / Location

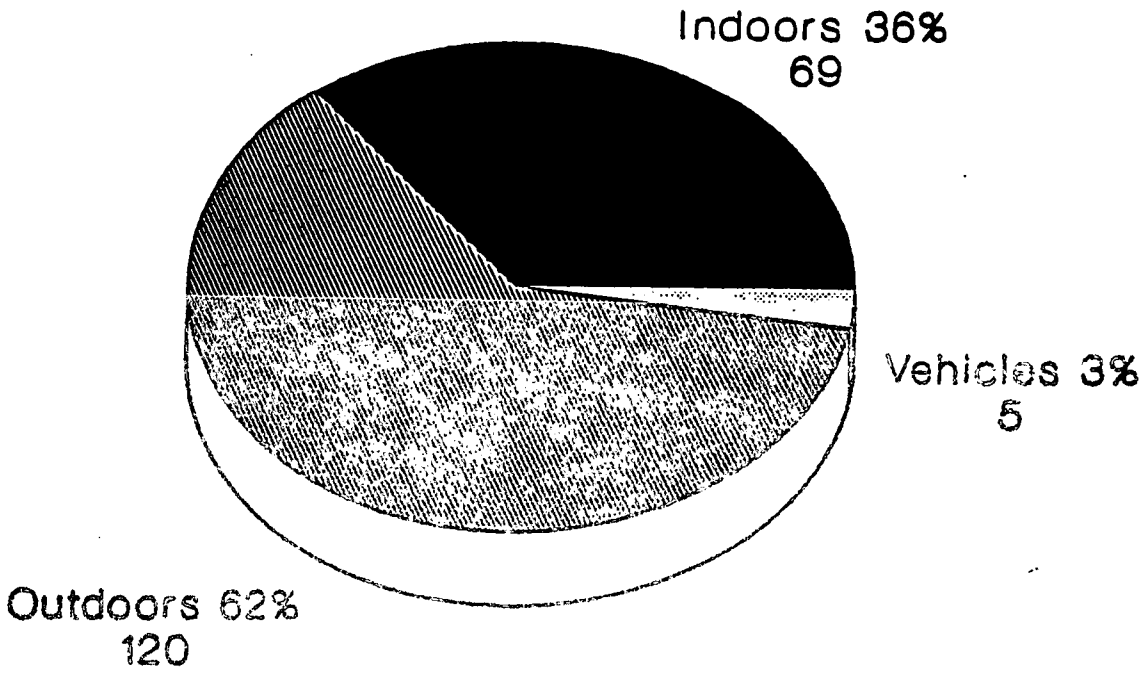


Figure 4

Weather Conditions

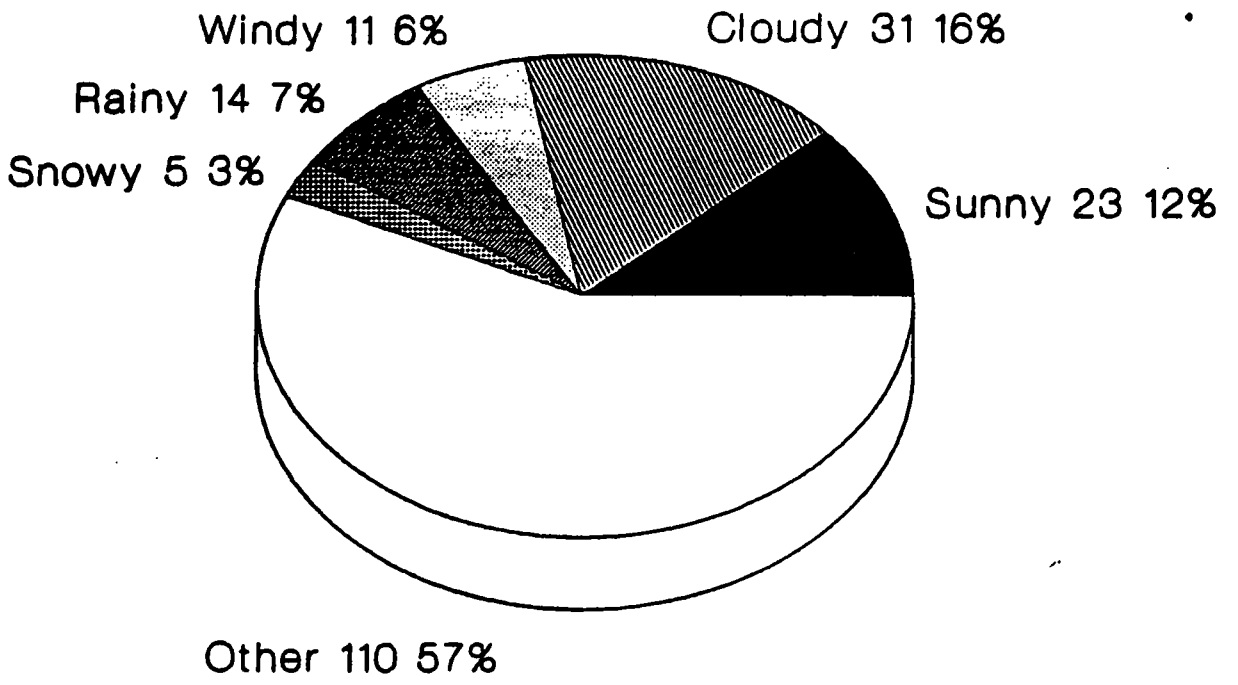


Figure 5

Suspect Sex

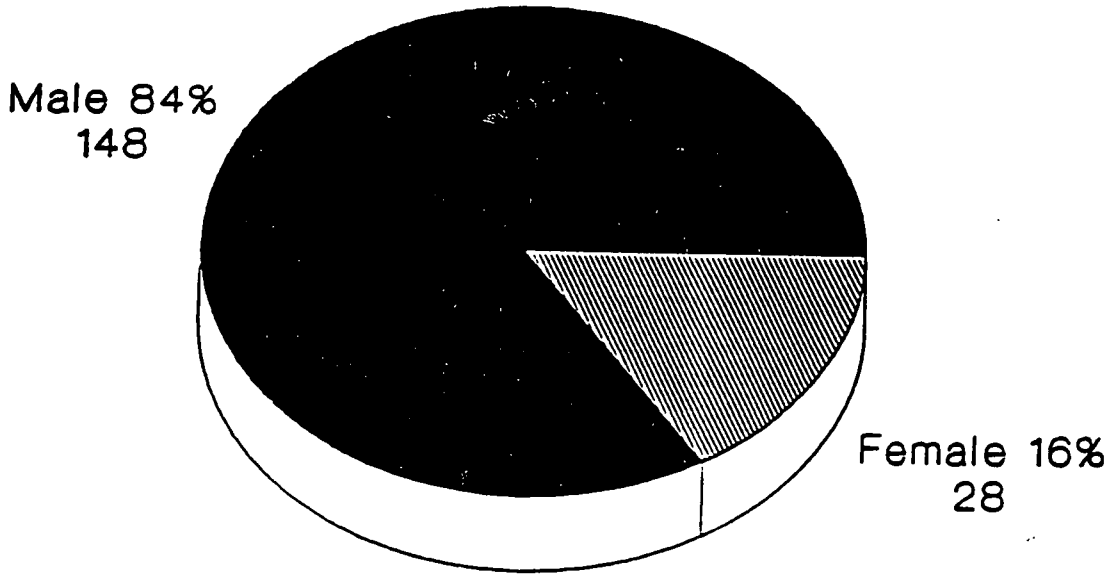


Figure 6

Suspect Frame Size

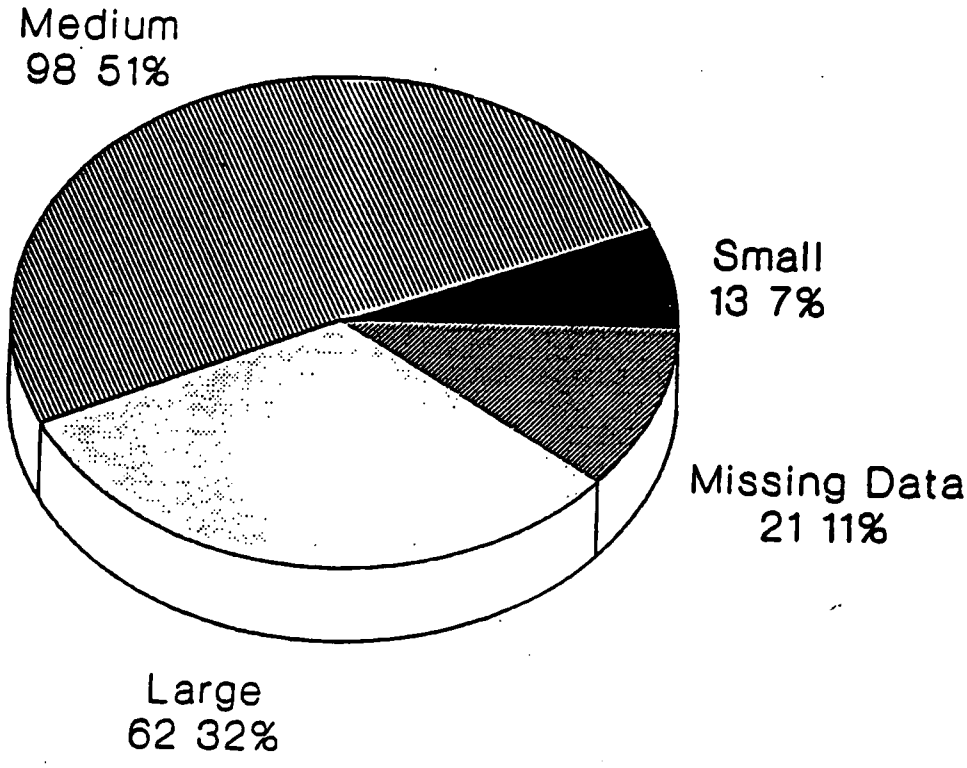


Figure 7

Behavior at Encounter

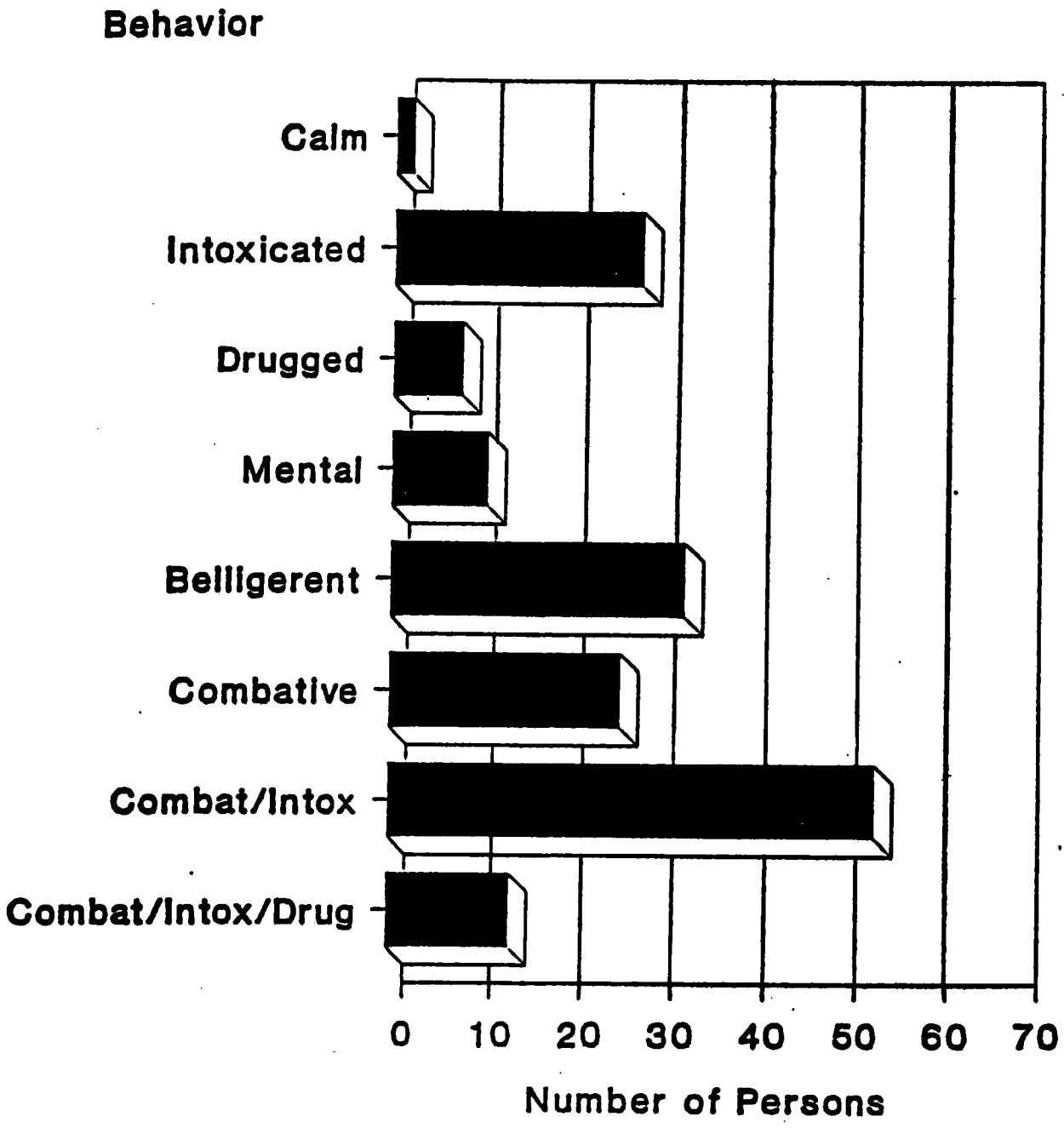
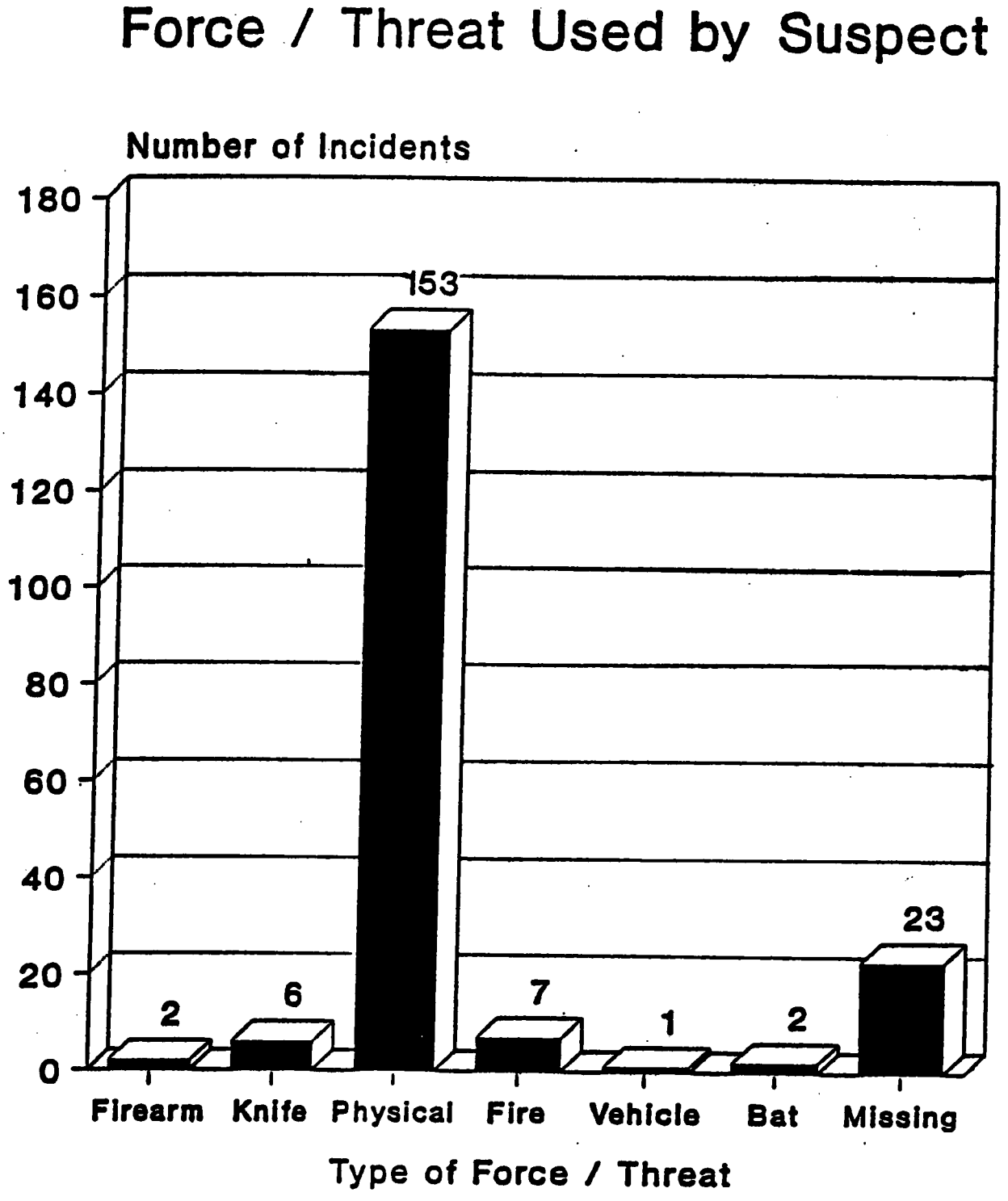


Figure 8


Force / Threat Used by Suspect
Number of Incidents
180
160
140
120
100
80
60
40
20
0
153
23
2
6
7
1
2
Firearm
Knife
Physical
Fire
Vehicle
Bat
Missing
Type of Force / Threat

Physical Force/Threat. Physical force was the most prominent form of force used against police officers (See Figure 8). Officers used OC as the means of controlling the situation instead of allowing an incident to escalate to a threat level above physical force or the additional or continued use of force by the suspect. There were very few force incidents where OC was used that involved threats of firearms or knives.

OC Application. Figure 9 shows that officers responded to the threat/force by applying the majority (177) of the OC sprays to the face of the suspects. Officers were instructed in the OC training that the most effective part of the human body to hit with OC spray is the facial area. This figure demonstrates that officers reportedly followed the instructions given in training.

Distance OC Sprayed/Number of Sprays Per Incident. Figure 10 shows the distance from which OC was sprayed in the 194 encounters. This table represents all the sprays, human and animal, taken during the study. The usefulness of this combined chart is that it shows many of the sprays (144) were at distances of three feet or less. There were 51 humans and four dogs sprayed at one foot or less; 46 humans and one dog were sprayed at one to two feet and 39 humans and three dogs sprayed at distances between two to three feet.

Officers were instructed during training that the best distances for spraying were between four and six feet and that the short bursts should be one to three seconds in duration. This distance and time allows the OC to become atomized and maximally effective. What these data show, however, is that a number of officers use OC at distances too close to be maximally effective. There were 102 incidents where OC was sprayed at a distance under two feet.[3] It is suggested that the distance sprayed may have had some effect on how well OC worked at incapacitating suspects/animals.

The number of sprays per incident does not seem to influence agent effectiveness. Figure 11 shows, that in most incidents (143), only one spray was used to incapacitate the suspect. What staff do not know from the data is whether any spray was a long burst or a short burst. Nevertheless, the data indicate that only one spray was used in most (143) encounters.

Finally, in Figure 11, eight sprays were selected as a value to indicate when a full can of OC was used in an encounter. There were four incidents where this happened, and in each of these incidents the product failed. While it is clear from the data that OC was very effective in most instances, there were a limited number of encounters where the product failed. It appears that whole cans were used out of desperation, thinking that if one spray was good then a whole lot was better. However, there is no statistical indication that a "more is better" philosophy is more effective than a single spray placed directly in the face.

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[3]Later in this report the effectiveness of OC on animals (dogs) is discussed. That discussion reveals that most of the animals (15 of 20 dogs) were sprayed at a distance greater than three feet.

Figure 9

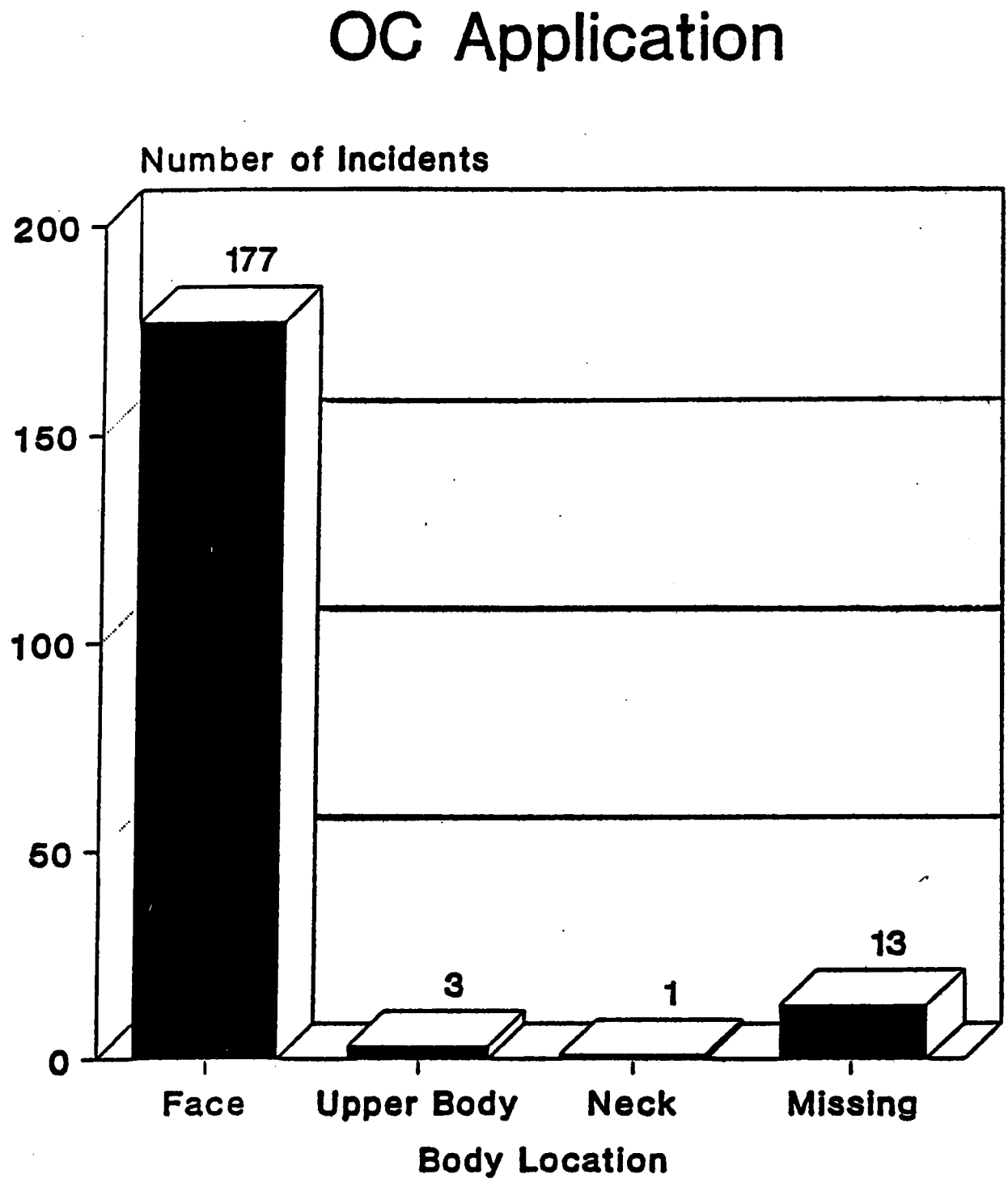

OC Application
Number of Incidents
200
150
100
50
0
177
3
1
13
Face
Upper Body
Neck
Missing
Body Location

Figure 10

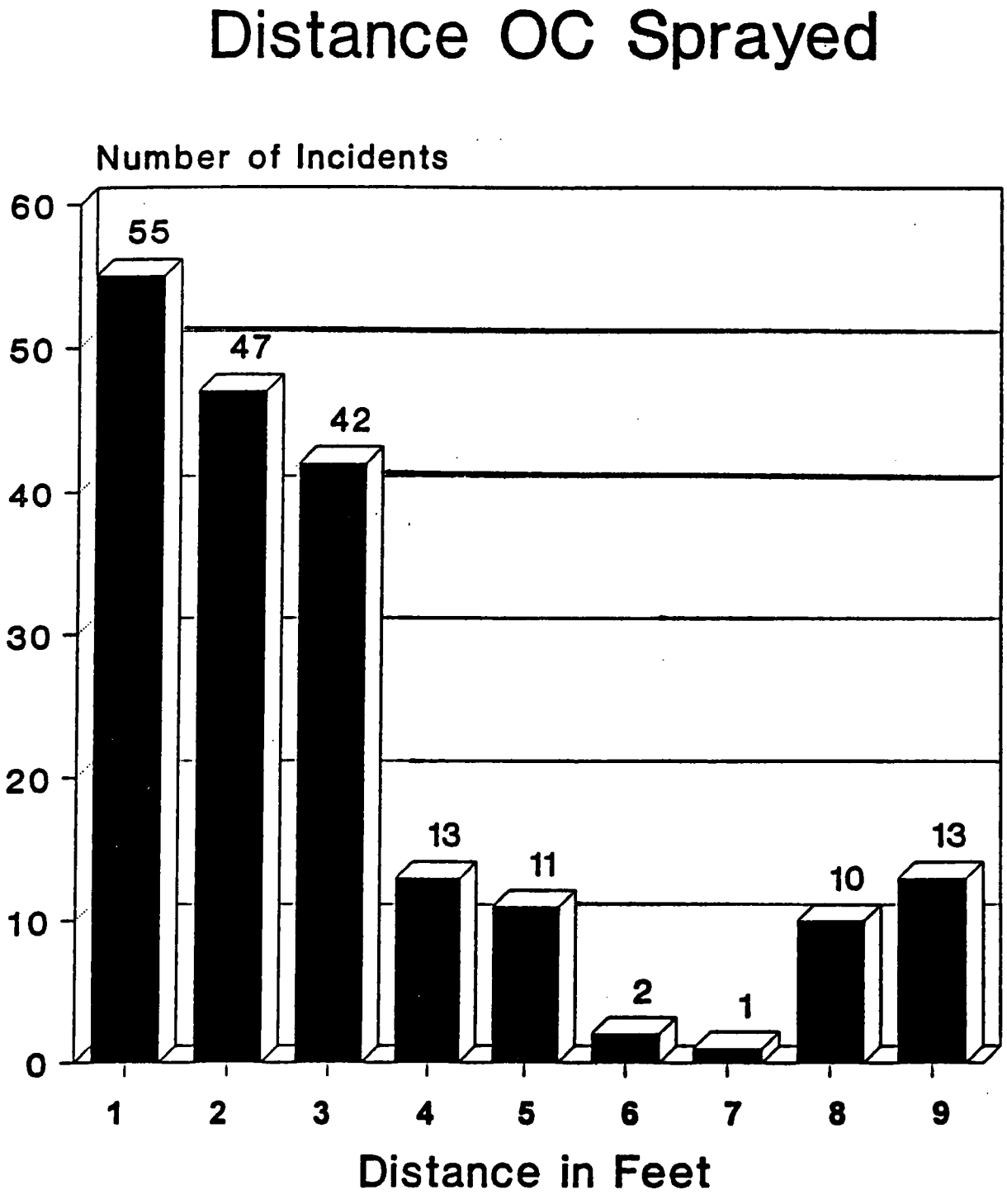
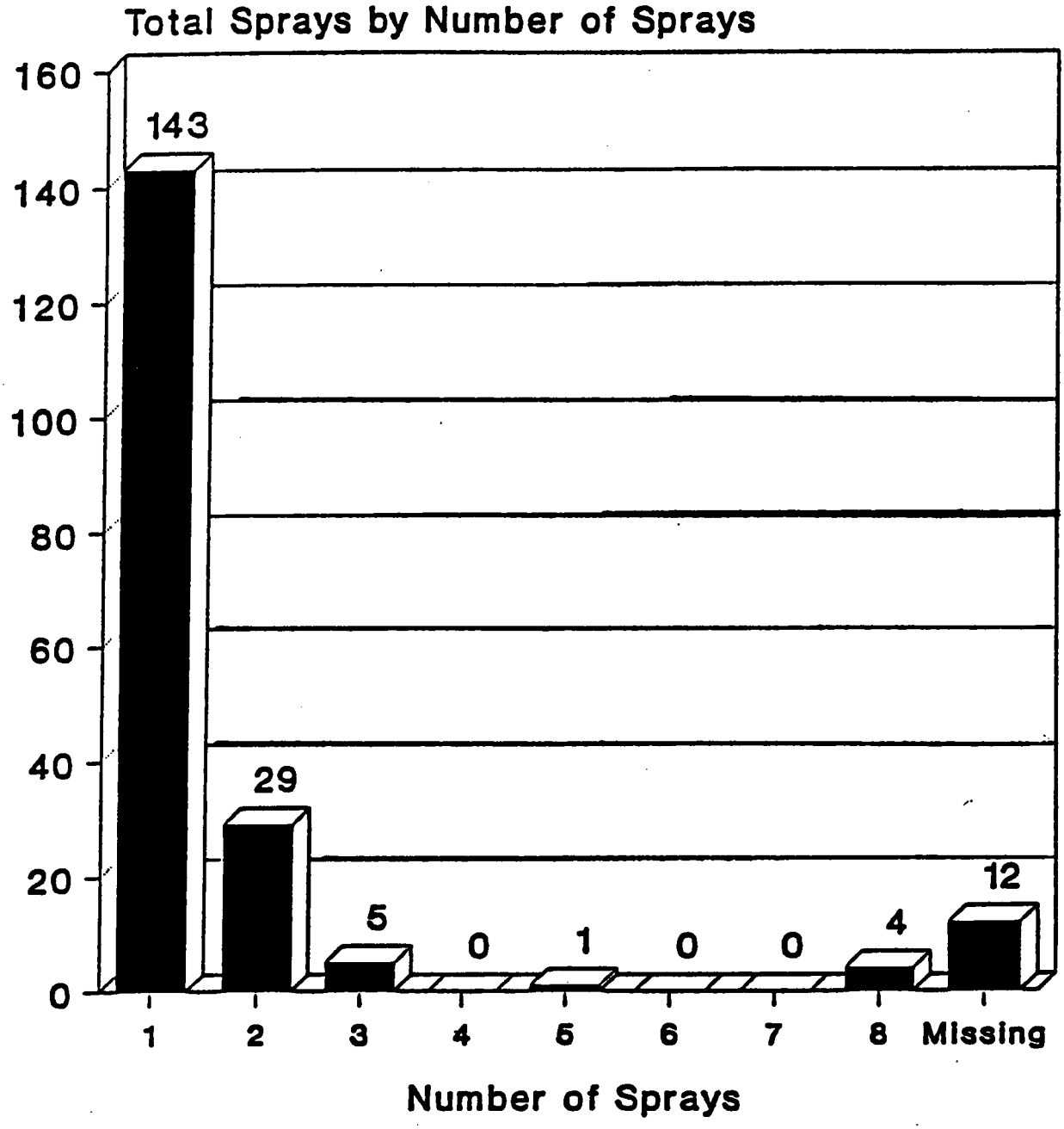

Distance OC Sprayed
Number of Incidents
60
50
40
30
20
10
0
55
47
42
13
11
2
1
10
13
1
2
3
4
5
6
7
8
9
Distance in Feet

Figure 11

Number of Sprays per Incident



Suspect Actions after Application. Generally, if a suspect had been properly sprayed, he/she was either submissive or complied with the instructions of the officer. Figure 12 shows that 117 individuals (65 percent) were classified as submissive by the officers after the OC had been applied. There were 26 individuals (15 percent) that were listed as complying with the officer's instructions after application. The difference between the terms submissive and complying seems subtle,[4] and thus it may be appropriate to collapse the two categories into one category. When that is done, 143 individuals (80 percent) of the 174 humans were affected enough to comply with an officer's instructions. There were 29 individuals (16 percent) who struggled and did not easily follow officers instructions. Only seven individuals (four percent) were not affected after OC was applied.

The data offered in Figure 12 show that OC was generally useful to police officers in the range of confrontational encounters they faced. (See Figure 2, Initial OC Contacts, for the range of confrontations officers encountered.)

Figure 13 shows OC to be effective at incapacitating (versus causing "compliance" or "submission") human subjects 90 percent of the time. Out of the 174 humans sprayed in the study, a total of 156 were incapacitated enough to be arrested. If the animal sprays are included with this total, OC is found to have a 91 percent effectiveness level.[5] This is certainly an acceptable level of effectiveness even though 18 subjects (nine percent) were not incapacitated in the encounter according to individual officers.

A secondary analysis was conducted on these 18 cases. Using SPSS PC+, the 18 cases were isolated to determine if there were any characteristics that might indicate why the OC did not incapacitate the suspects.

Table 1 displays the types and frequency of initial offenses that officers confronted with the 18 suspects. Overall, there appears to be nothing particularly different about the types of offenses in which OC proved less than effective. Similarly, the spraying location was evenly distributed – eight incidents (44.4 percent) took place indoors and ten incidents (55.6 percent) took place outdoors. Consequently, it was determined that the use of the spray did not seem to be a factor. Examination of weather data proved similarly insignificant. Lastly, the suspect's frame data were also evenly distributed between nine medium and nine large suspects.

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[4]The terms submissive and complied were terms used by the officers completing the data collection form. In many respects, the difference between the two seems slight, and it would be easy to collapse the two categories into one. This brings into question the meaning of submissive and complied. There may be wide differences in the use of these terms depending on the individual officer's understanding and expectation of what OC is to do to a suspect. Some officers might believe that the purpose of OC is to totally incapacitate a subject resulting in no resistance. Other officers might believe that the product worked well even though the individual offered a struggle. This discussion is offered as a possible caution for interpreting this information.

[5]Though it is not shown in Figure 13, all 20 animal sprays were reported 100 percent effective at deterring an attacking or threatening dog. There were no reported failures when the animals (dogs) were sprayed.

Figure 12

Suspect Actions after Application

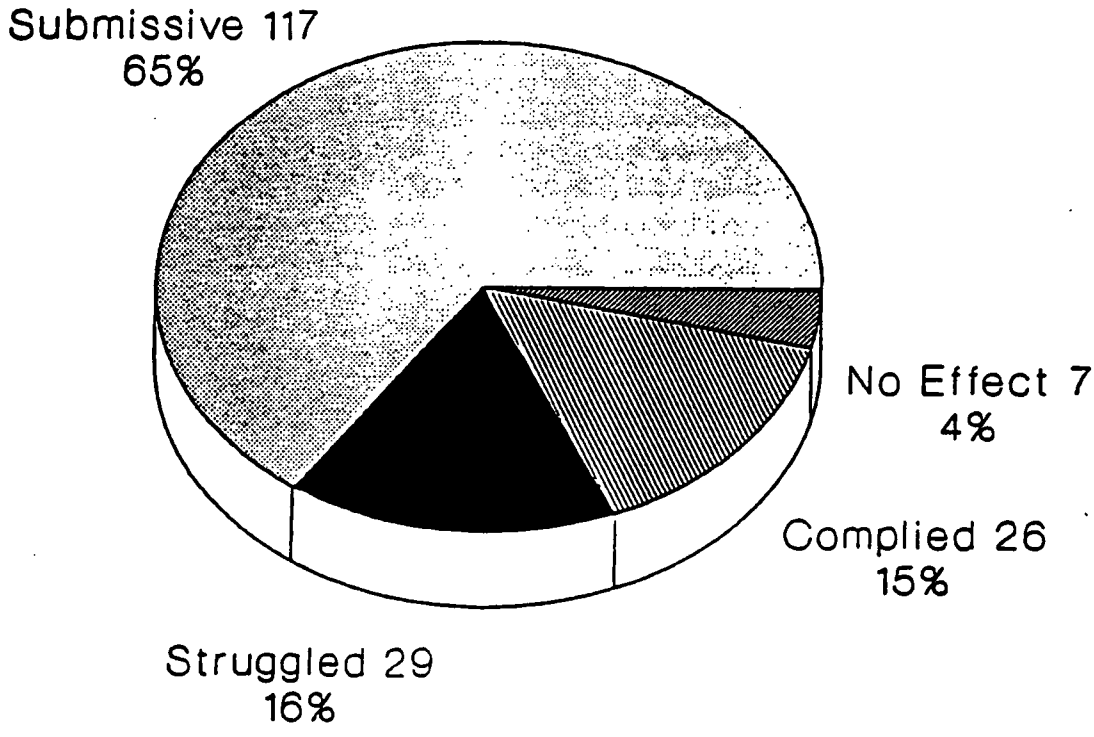
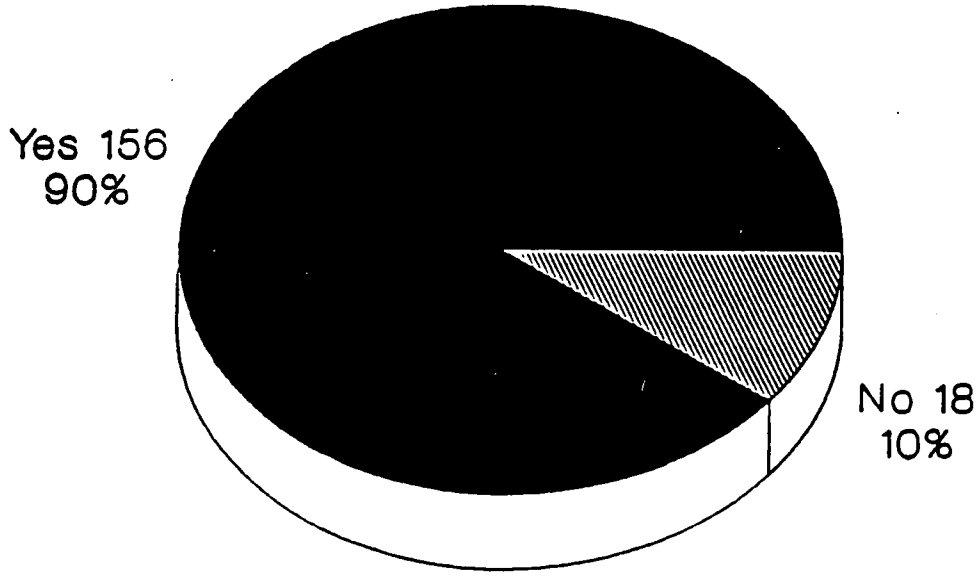


Figure 13

Suspect Incapacitation



As noted earlier in this report, the types of incidents recorded by Baltimore County police officers in this study were incidents that are essentially ordinary disorder complaints routinely handled by beat officers. They are also the types of complaints where police officers are very likely to encounter aggressive, excited behavior.

Table 1
Cases Where Pepper Spray Was Not Effective:
Offenses at Initial Contact

Initial Offense	Frequency	Percent
Battery	6	33.3
Simple Assault	3	16.7
Narcotics	1	5.6
Arson	1	5.6
Burglary	1	5.6
Traffic Arrest	3	16.7
Mental Suspect	2	11.1
Theft	1	5.6
Total	18	100.0

The data in Table 2 suggest that intoxicants (drugs or alcohol) and behavioral combativeness are involved in most of the 18 incidents. In cases where OC was ineffective, the suspects were medium to large-framed individuals who were combative and/or intoxicated at the time they encountered the police. The combination of physical and behavioral variables may give an individual the ability to resist the effects of OC.

Table 2
Cases Where Pepper Spray Was Not Effective:
Suspect Behavior at Encounter

Suspect Behavior	Frequency	Percent
Intoxicated	3	16.7
Drugged	2	11.1
Mentally Ill	1	5.6
Belligerent	2	11.1
Combative	3	16.7
Combative/Intoxicated	6	33.3
Combative/Intoxicated/Drugs	1	5.6
Total	18	100.1

Table 3 presents a cross-tabulation analysis of the variables Suspects Actions after Application of OC by Suspect Behavior at Encounter.

Table 3
Cases Where Pepper Spray Was Not Effective:
Actions After Application by Behavior at Encounter

Suspect Actions	Intoxicated	Drugs	Mental Ill	Belliger	Combative	Combat/ Intoxicated	Combat/ Intox/Drugs
Struggled	33.3% (1)			100% (2)	33.3% (1)	83.3% (5)	
Submissive					33.3% (1)		100% (1)
No Effect	66.7% (2)	100% (2)	100% (1)		33.3% (1)	16.7% (1)	

Though the number of incidents (18) for this analysis is small, thus warranting caution in interpretation, Table 3 suggests that a suspect's behavior at the encounter may determine how well OC works or does not work. In seven of the 18 incidents, officers reported that OC had no effect. In those conditions where individuals exhibited drugged behavior or seemed to have mental problems, being sprayed with OC had no effect. Similarly, two of three subjects identified as intoxicated were reported to not be affected by the OC spray. Examination of the individual drug incidents revealed that both cases involved subjects who had taken PCP. OC spray, according to the officer's report, did not have any effect on either individual. Likewise, OC had no effect on the individual that was mentally disturbed. For the other four cases where OC did not have any effect, it appears that other, unidentified factors may have been responsible for OC ineffectiveness.

In summary, OC was effective 90 percent of the time, but ineffective in ten percent of the incidents. Training staff need to remind officers that such incidents will happen from time to time.[6] From this limited data, there is indication that individuals who are heavily intoxicated, drugged and/or mentally ill are in such a state that OC will have little or no effect and may indeed become more difficult to control.[7] Additionally, such physical encounters may cause the officer to become contaminated. Training officers may want to stress the importance of

[6]The idea that OC can be "oversold" is something to consider in the training process. Officers generally will have little or no understanding of what OC does to incapacitate a suspect until they use it. OC should be thought of as an aid in arresting a troubling suspect. Most of the time it incapacitates an individual completely. However, there are times it only partially incapacitates the subject to where he/she cannot see, even though he/she continues to struggle.

[7]This is similar to the findings presented in an earlier study, Pepper Spray and In-Custody Death. See Appendix B for a copy of this study.

assessing the effect of the spray in such encounters and being prepared to move to another force alternative to control the subject.

Officer/Suspect Injuries. Data from the spray collection forms showed that officer and suspect injuries were minimal when OC spray was used in confrontational encounters. Figure 14 shows that in the 194 spray incidents, only 21 officers (11 percent) and 14 suspects (seven percent) received any injuries.

Comparable officer and suspect injury information for the three years prior to the introduction of OC was not available. Although Baltimore County officials wanted to provide the information, a tedious and time-consuming hand-search of all claims of officer and suspect injuries would have been necessary and then, the information was of questionable reliability.

All the injuries received by officers and suspects during confrontations in the post-OC period were very minor. Information obtained during interviews with officers and information gathered on the spray data collection form indicates that injuries to officers and suspects were reduced during the period of study.

Figure 15 presents pre- and post-OC spray use data on citizen complaints alleging police use of force. Three separate nine-month periods in 1992, 1993 and 1994 are presented. The top two lines on the graph represent complaints prior to the implementation of OC spray by the department. The lower line presents data after OC spray use came on-line. As officer use and experience with OC progressed, the number of complaints dipped quickly, remaining below each pre-OC time frame level until March 1994. Overall, citizen complaints after OC spray was implemented dropped substantially, totalling 51 for the OC period versus 109 for the first pre-OC period and 85 for the second pre-OC period. (See Figure 16.)

Figures 17 and 18 compare officers assaulted over four different time frames (three nine-month periods prior to OC spray use and one post-OC spray use period). As with citizen complaints about use of force, the monthly and total number of officers assaulted was lower, and on a month-to-month basis often substantially lower than periods where other sprays were used.

Decontamination. Figure 19 shows the number of times and the predominant method used by officers to decontaminate the OC recipient. Seventy-five percent (N=145) of the time decontamination procedures were used by officers to relieve the discomfort of the suspect. Twenty-two percent (N=43) of the time, no decontamination was needed or requested by the subject. There were no reported incidents where suspects went to the hospital for decontamination.

Figure 14

Officer / Suspect Injuries

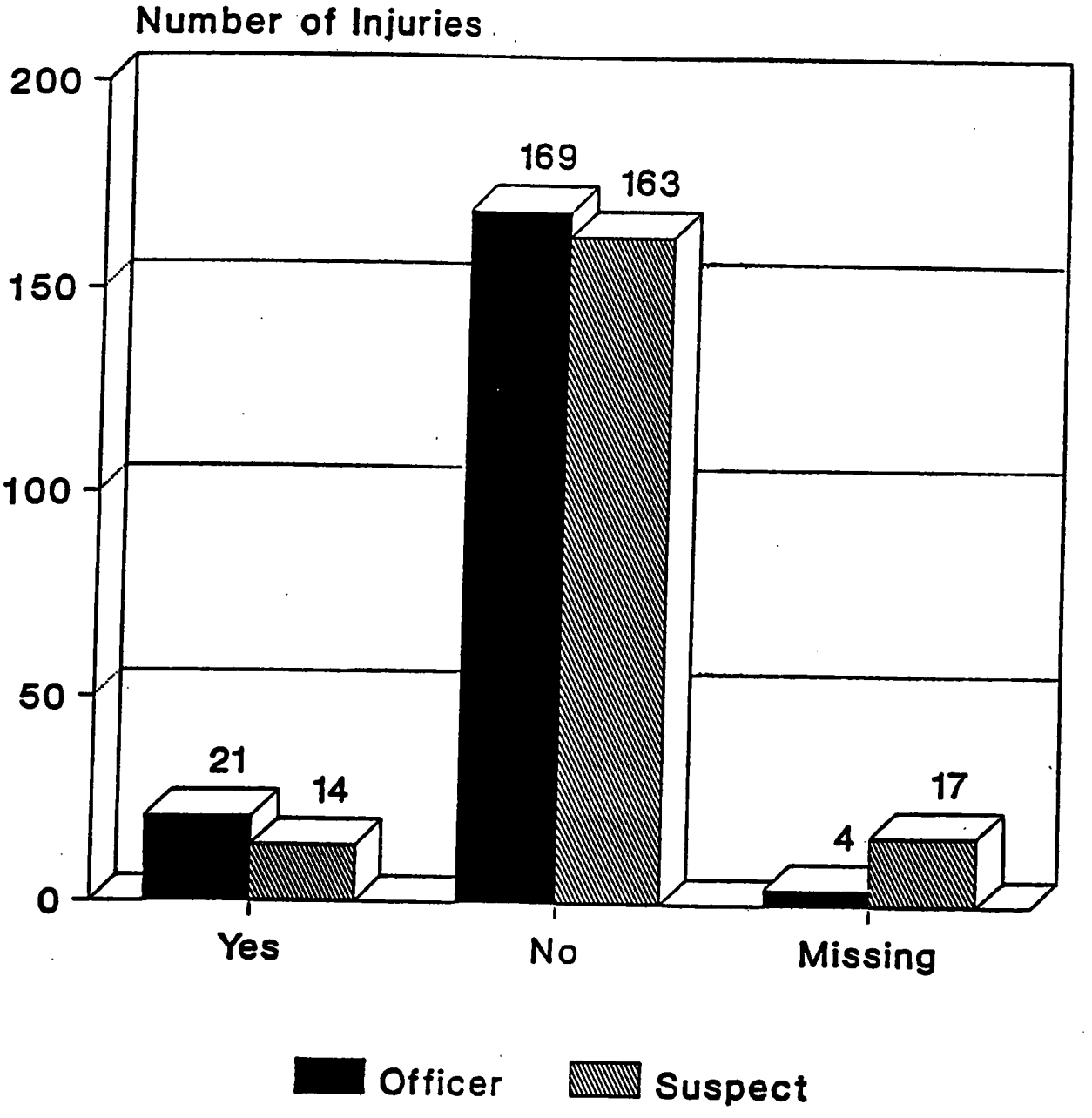


Figure 15

Complaints Alleging Force

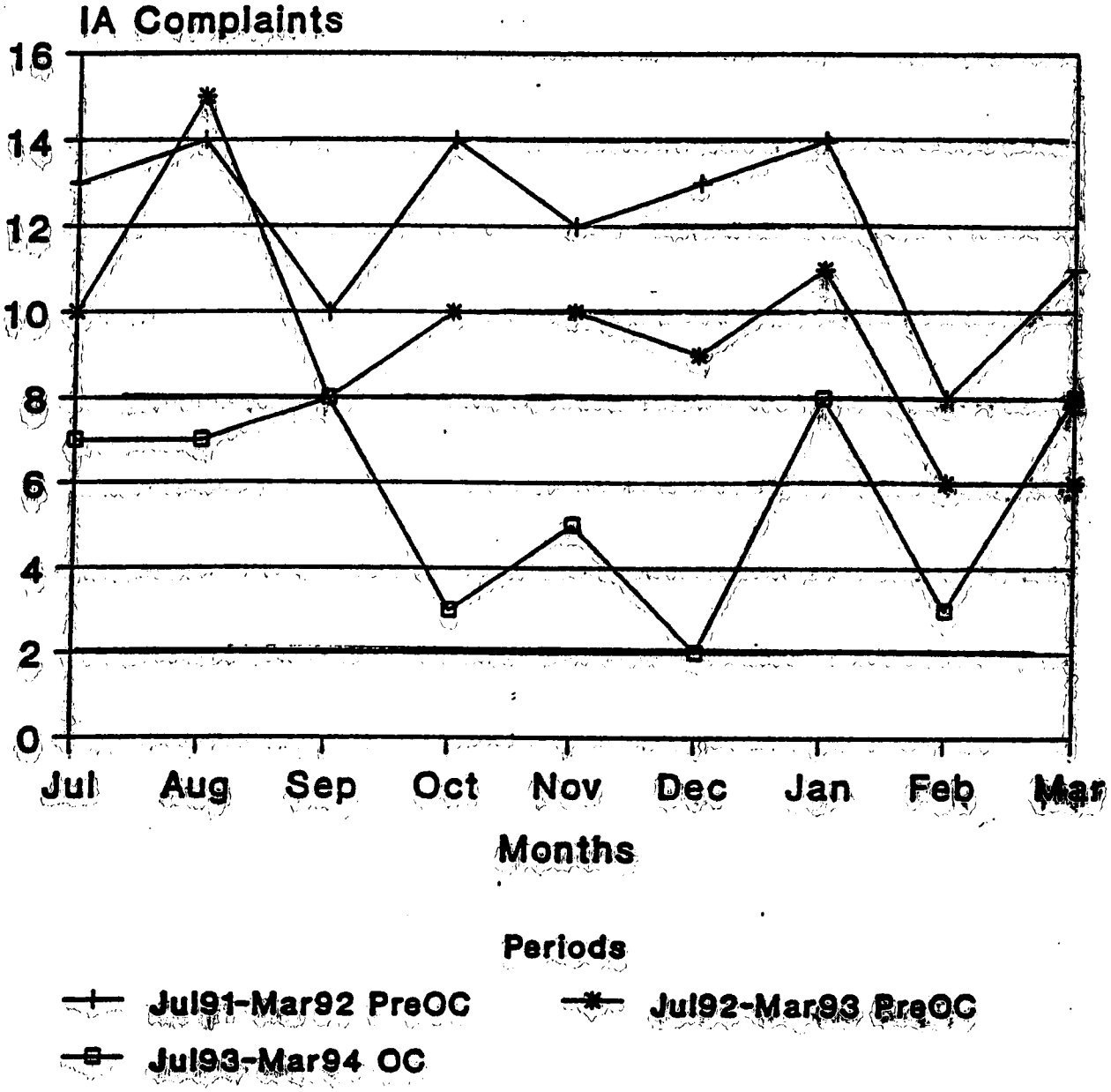
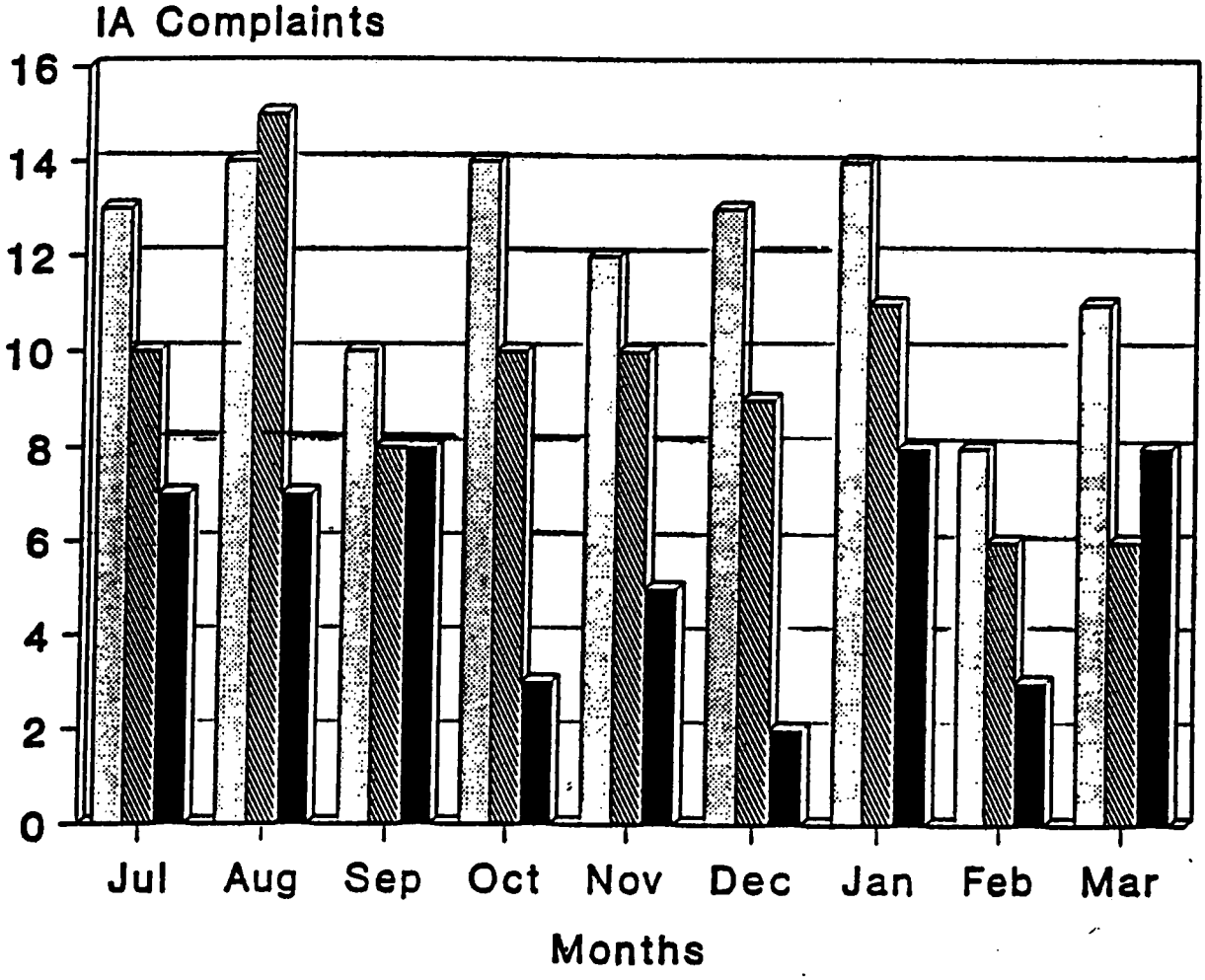


Figure 16

Complaints Alleging Force



TOTALS

Jul91-Mar92 PreOC	109	Jul92-Mar93 PreOC	85
Jul93-Mar94 OC	51		

Figure 17

Officers Assaulted

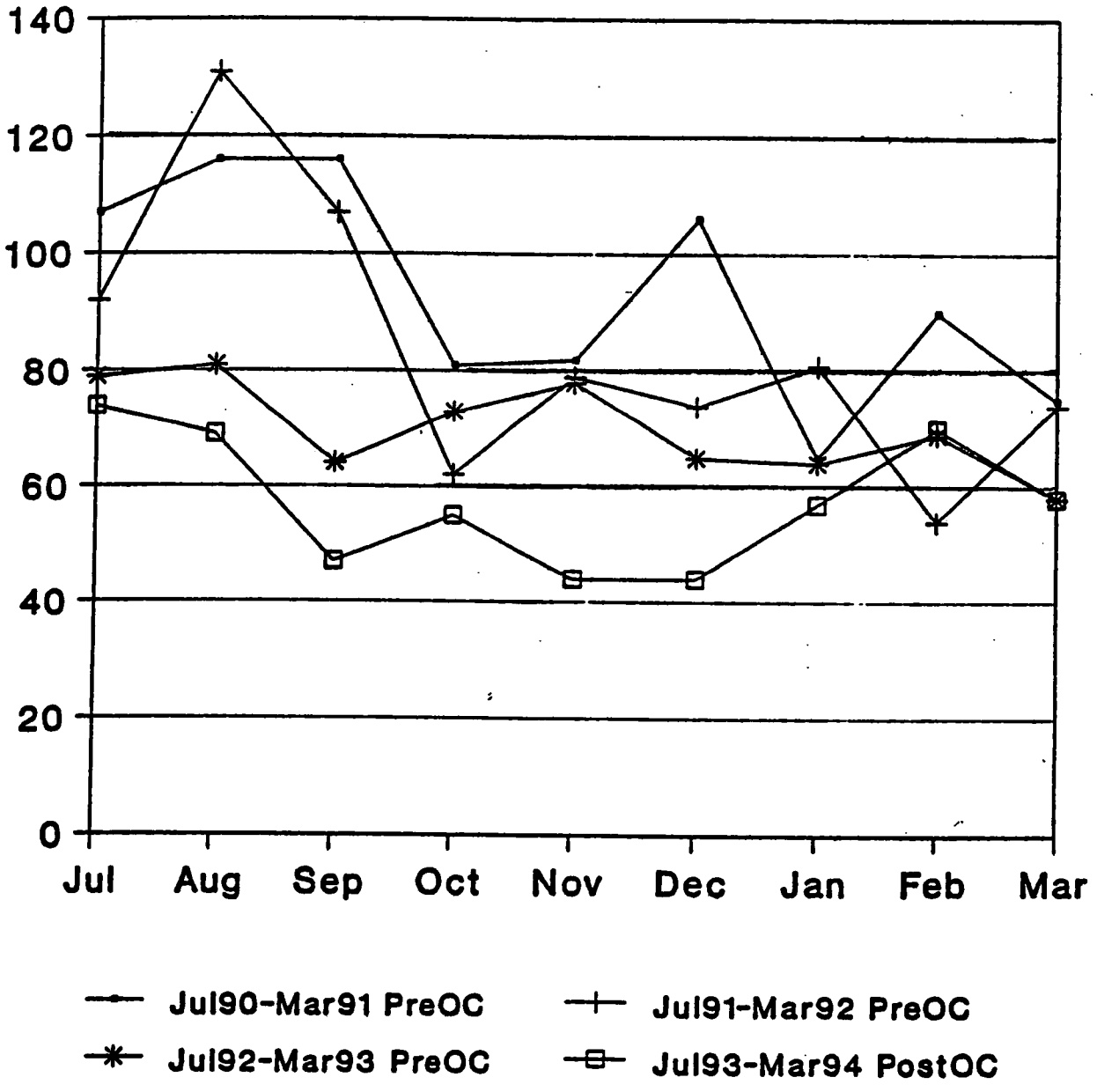


Figure 18

Officers Assaulted

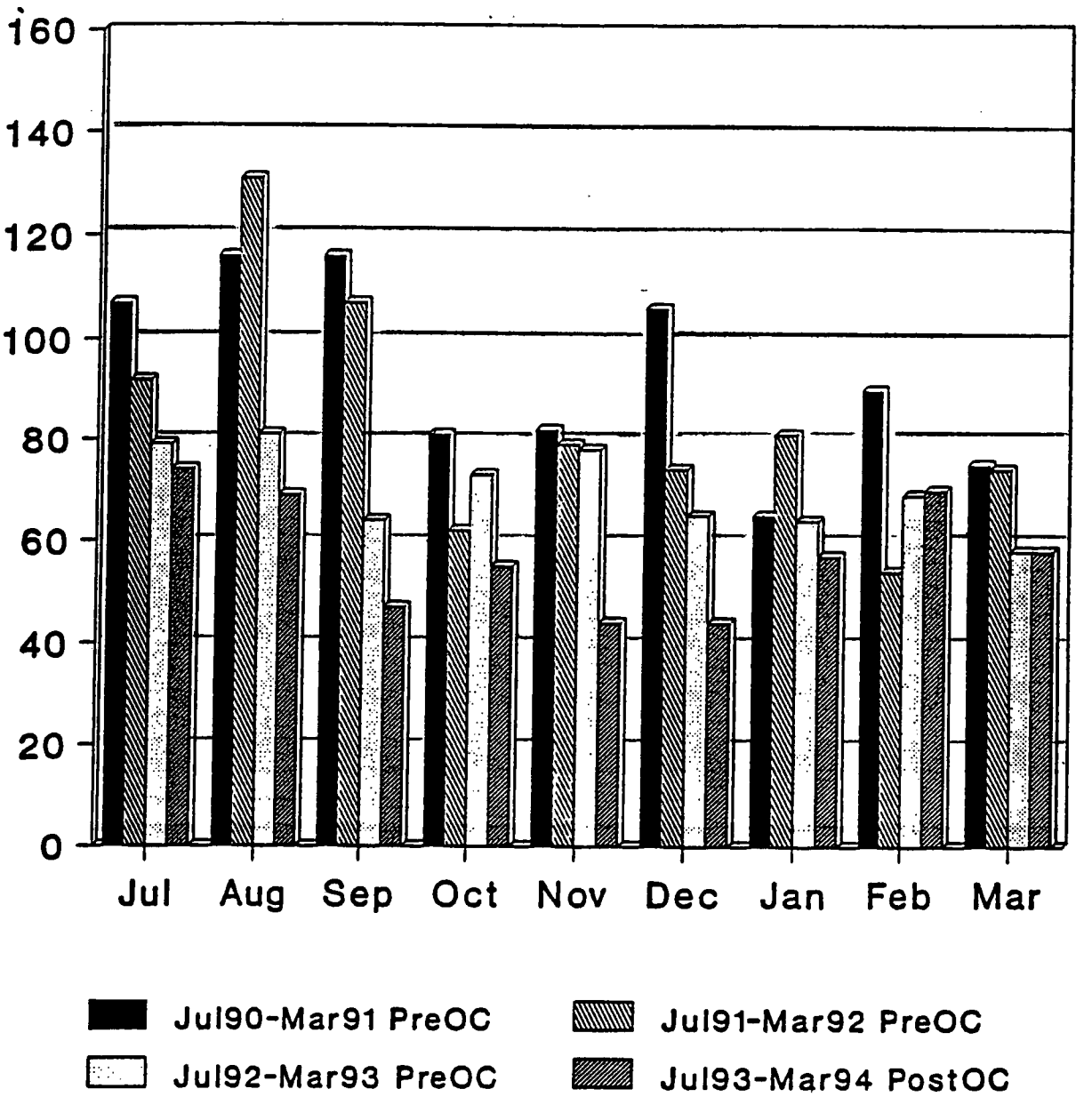
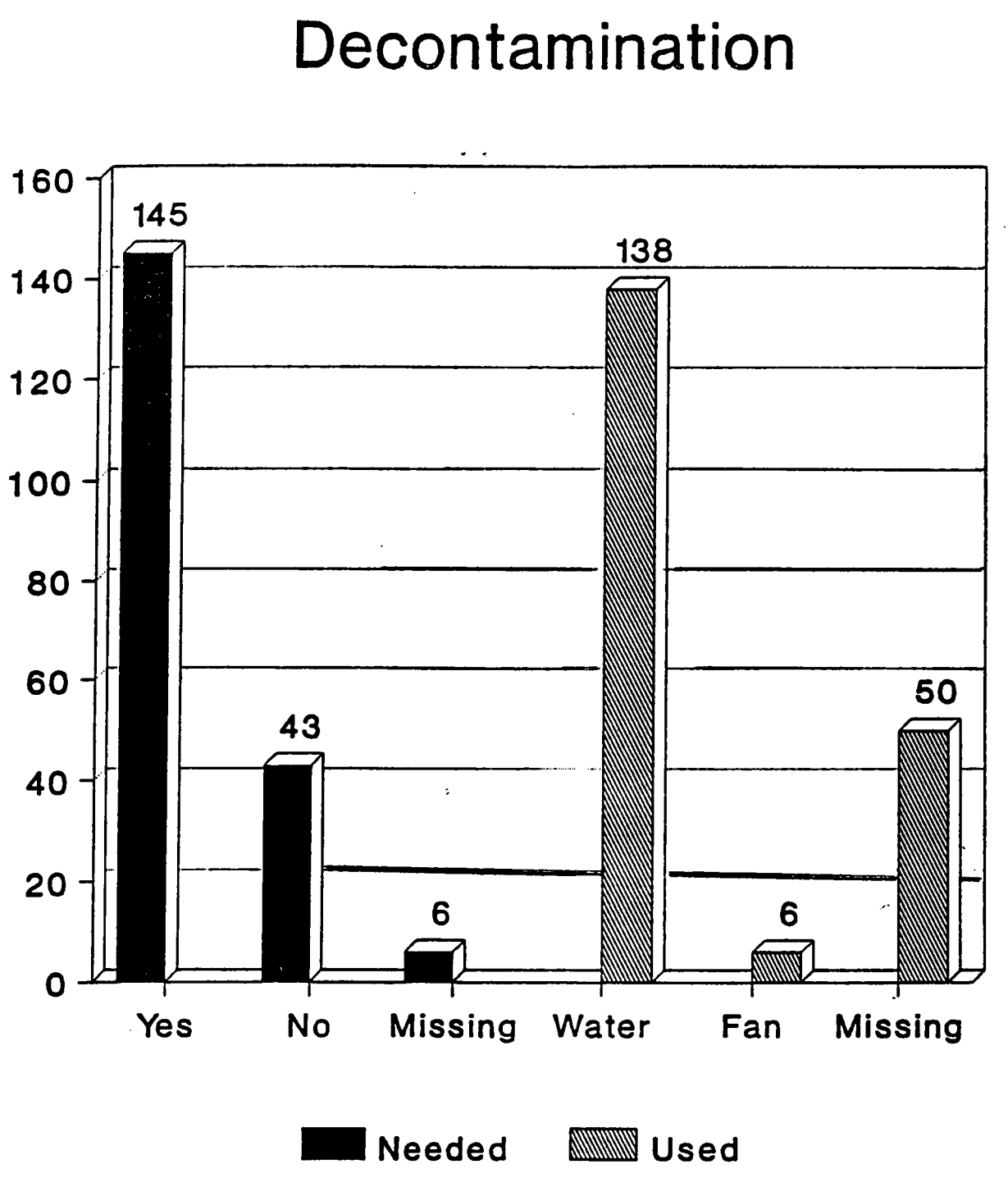


Figure 19


Decontamination
160
140
120
100
80
60
40
20
0
145
43
6
138
6
50
Yes
No
Missing
Water
Fan
Missing
Needed
Used

The most predominant method of decontamination was the use of water. Generally officers provided this to a suspect after they transported the suspect to the district precinct. There were times that suspects received water at the scene, but it was more likely that the suspect was allowed use of a water hose at the precinct. On a few occasions, fans were used to accelerate the decontamination process.

Application of OC on Animals

This examination of the effectiveness of OC included a measure of the agents' success in incapacitating dogs. Departmental interest in how effective OC is in animal encounters was significant, both because BCPD had been experiencing anumber of incidents where officers were forced to shoot dogs and because previous use of CS or CN had not been effective.

During the OC field study, 20 of the 194 incidents collected consisted of animal (dog) encounters. Officers used their spray when the dog exhibited aggressive behavior of some form. Figure 20 shows that the dogs were either attacking the officer or threatening to attack when sprayed.

Figure 21 shows that officers sprayed the dogs from distances greater than those from which they sprayed humans. (See Figure 10 for a comparison.) Officers sprayed the majority of the dogs at a distance of three to eight feet, in contrast to the distance that officers sprayed humans (one to three feet). This difference in distance may well account for the difference in the effectiveness of OC on dogs and humans. In the dog encounters, the OC was effective almost 100 percent of the time. One officer was bitten, however, he required no medical treatment.

The majority of dogs sprayed were medium to large in size. Ten of the dogs sprayed weighed between 25 and 50 pounds, and six weighed more than 50 pounds (See Figure 22). The fact that some were attacking and aggressive did not affect the successful outcome of the OC spray.

Summary of Outcome Data

When this study was commissioned, much of the information and knowledge available to practitioners about OC was anecdotal. Few police departments had conducted assessments of OC products, and even fewer had conducted detailed, systematic studies. While many of the verbal anecdotes about how well OC worked were correct, no systematic, comprehensive evidence was available about how well OC worked in an operational environment.

This outcome evaluation was guided by five fundamental questions. Presumably, if answers could be developed regarding the five fundamental questions, substantial information would be presented to practitioners regarding the utility and effectiveness of OC spray.

Figure 20

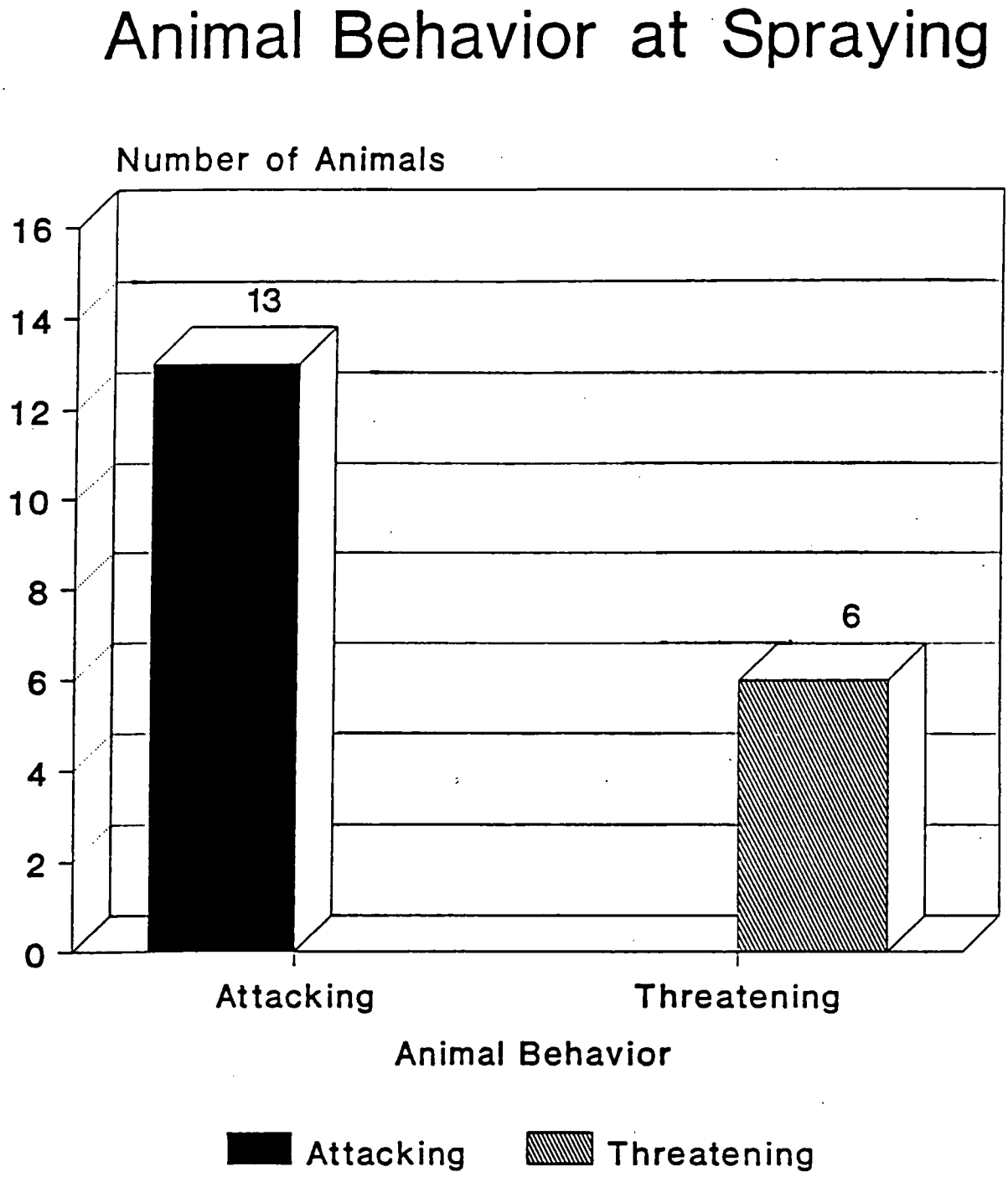

Animal Behavior at Spraying
Number of Animals
16
14
12
10
8
6
4
2
0
13
6
Attacking
Threatening
Animal Behavior
Attacking
Threatening

Figure 21

Animal Distance Sprayed

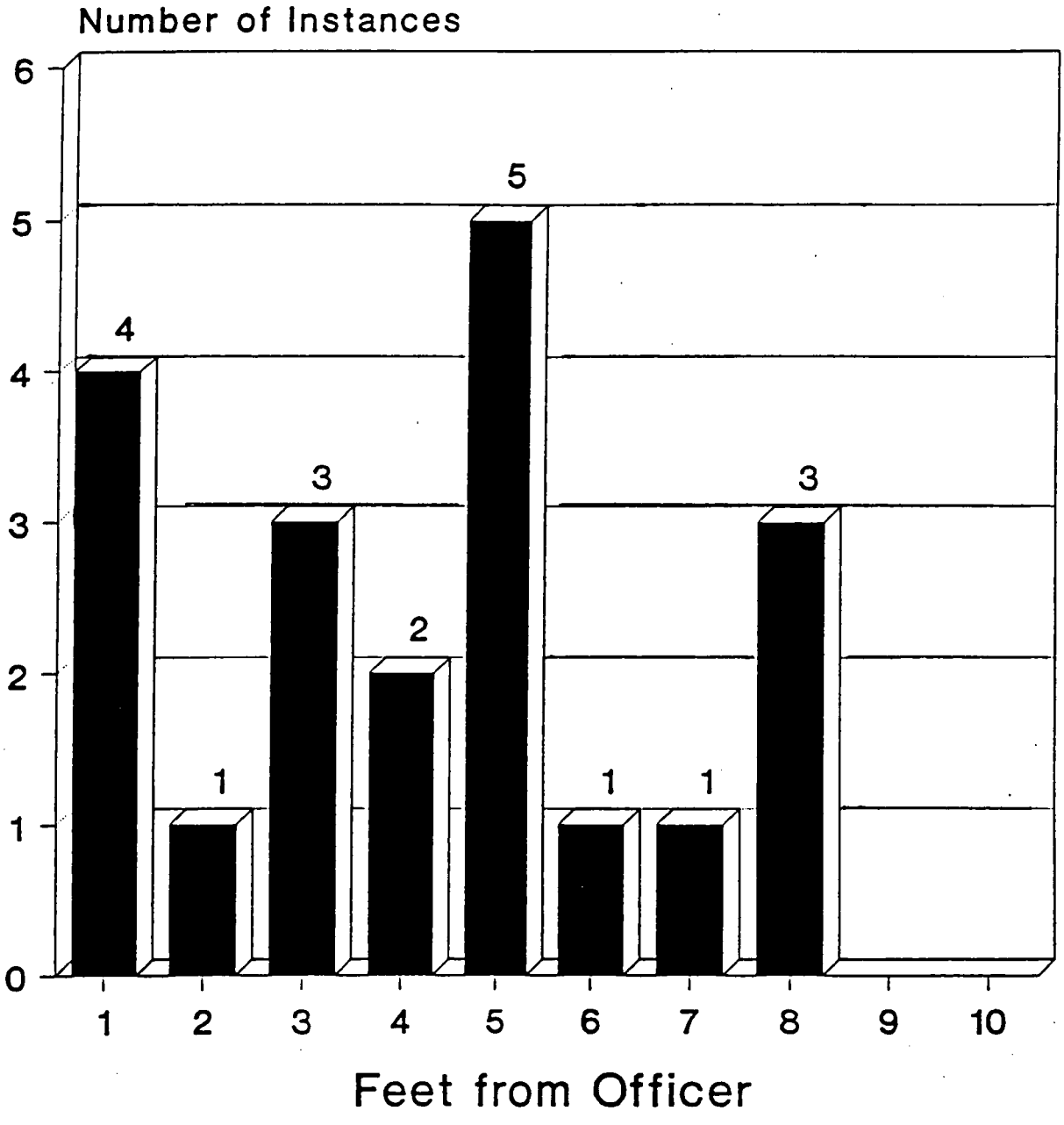
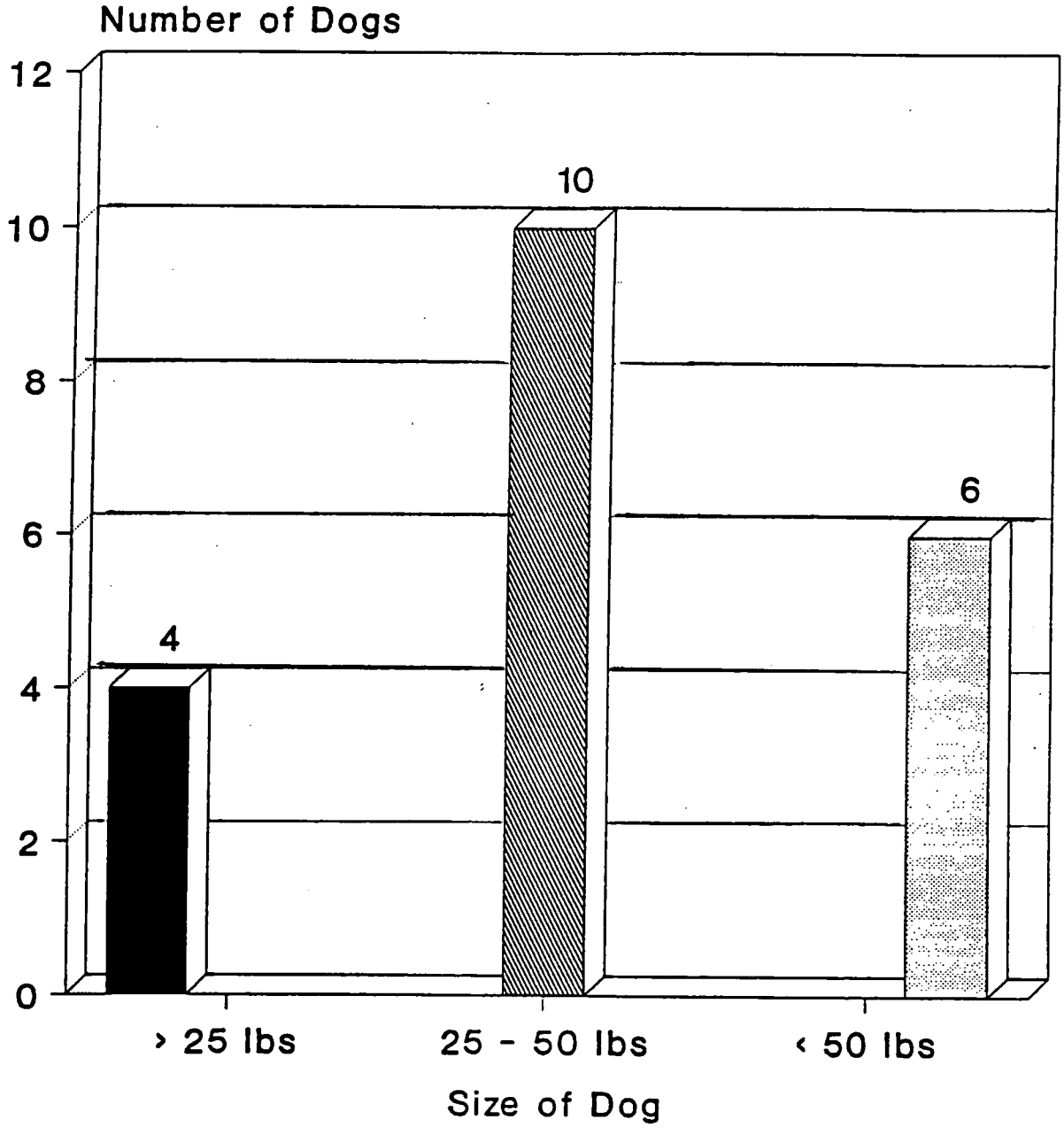


Figure 22

Animal Size



Findings Regarding the Five Principle Questions

Question 1:

Will assaults on officers be reduced in confrontational encounters as a result of the use of OC spray?

Three years of prior "assault" data (pre-OC data) were collected to be compared to the time period after which OC was adopted by the department (post-OC data). The pre-OC data were examined to identify any possible trends regarding assaults. Overall, these data showed that officer assaults were decreasing prior to OC use. Similarly, the post-OC data indicated that assaults continued to decline. Most importantly, the total number of officers assaulted in the post-OC data period was substantially lower than any of the pre-OC data periods.

Question 2:

Will injuries to police officers be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

Data from the spray collection form showed that very few officers were injured when they used OC to control a confrontational encounter. Of the 194 total (human or animal) spray incidents, only 21 officers (11 percent) received any injuries. Most of the injuries that officers received were minor and did not result in any work time lost. While data from the pre-OC use period was not comparable and did not permit a complete pre-post analysis, the low levels of officers injured in the post-OC period suggests that OC use has the potential to lessen officer injuries.

Question 3:

Will injuries to suspects be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

The number of injuries to suspects was very similar to the number of injuries to officers. Few suspects were injured during the time of the project period. Figure 14 (page 38) shows that in the 194 spray incidents, only 14 suspects (seven percent) received any injuries. The injuries suspects received were very minor. While it was not possible to compare pre- and post-OC use trends, it appears that use of OC had a positive effect on reducing the number of suspect

injuries.

Question 4:

Will use-of-force complaints on police officers be reduced in arrest and other confrontational encounters as a result of the use of OC spray?

An examination of force complaints was conducted by comparing the total number of use-of-force and brutality complaints filed with BCPD for pre- and post-OC time periods. Data were obtained from the BCPD Internal Affairs Unit. Due to data collection and computerization changes that occurred in Internal Affairs, only two pre-OC time periods were valid for project comparison. During the time periods examined, there were no definitional or operational changes in use of force. Moreover, discipline policy and training protocols were similarly consistent.

During the post-OC time period, the population served by the BCPD experienced an increase. In addition, during this time period, the BCPD had a six percent increase in calls for service, while concomitantly experiencing a significant decrease in the patrol force (between 30 to 35 fewer officers per month). Consequently officers experienced increased contact with the citizenry. While it is unknown what, if any, effect the increased contact may have had on force complaints, it is plausible that there was an increase in the probability of complaints. Based on these staffing level decreases and population increases, it may be that the reduction in citizen complaints presented here is a conservative estimate and that controlling for population and staffing levels would result in an even more substantial decrease in citizen complaint levels.

The data for the first pre-OC period indicate that there were a total of 109 complaints for the period. Eighty-five (85) complaints were registered during the second pre-OC period. The post-OC period data show that there were 51 complaints filed during this time (see Figure 16). Examination of these figures indicates that a 53 percent decrease in complaints occured between the first pre-OC period and the post-OC period. A 40 percent decrease similarly occurred between the second pre-OC period and the post-OC period.

Discussion with members of the Internal Affairs Unit further suggests that OC use had resulted in a reduction of use-of-force complaints. They contend that the use of other LTL weapons, such as the baton and physical restraints, often resulted in suspect injury and tangible proof of police force, and therefore, complaints. OC, however, does not cause injury and leaves no lasting physical marks, thus resulting in a lessened probability of complaints being lodged.

Question 5:

How effective is OC in human and animal confrontational encounters?

The effectiveness of OC spray use in the Baltimore County Police Department was substantial. Overall, the effectiveness of OC on humans in confrontational encounters was 90 percent (N=156). It was not effective on humans ten percent of the time. Effectiveness was substantially reduced when subjects were highly intoxicated and/or combative.

Generally, if a suspect had been properly sprayed, he/she was either submissive or complied with the instructions of the officer. Figure 12 indicates that 117 individuals (65 percent) were classified as submissive by the officers after the OC had been applied. There were 26 individuals (15 percent) that were listed as complying with the officer's instructions after application.

The difference between the terms submissive and complied seem subtle and therefore it might be more appropriate to collapse the two categories into one category. When that is done, 143 individuals (80 percent) of the 174 humans were affected enough to comply with an officer's instructions. There were 29 individuals (16 percent) that struggled and did not easily follow the officer's instructions. Only seven individuals (four percent) were not affected after OC was applied.

The data offered in Figure 12 show that OC was generally useful to police officers in the various confrontational situations they encountered. (See Figure 2, Initial OC Contacts, for the range of confrontations officers encountered.) The usefulness of OC at incapacitating suspects to affect arrest can be seen in Figure 13. Figure 13 shows OC to be effective at incapacitating human subjects 90 percent of the time. Out of the 174 individuals in this study, 156 individuals were incapacitated enough to be effectively arrested. If the animal sprays are included with this total, OC is found to have a 91 percent effectiveness level.[8]

[8]Though it is not shown in Figure 13, all twenty animal sprays were reported 100 percent effective at deterring an attacking or threatening dog. There were no reported failures when the animals (dogs) were sprayed.

V. FINDINGS: PROCESS EVALUATION

Training Issues

The decision by a department to adopt OC mandates the consideration of training issues that are vital in ensuring the effective use of the spray, as well as minimizing liability for its use.

The first consideration in the development of BCPD's departmental OC training program was to address the recommendations of the spray manufacturer and reconcile these recommendations with the needs of the department in terms of projected use. Each manufacturer provides or recommends specific training for a department's instructors. Additionally, manufacturers provide guidelines for the use of their product and a material data sheet listing product content. Each manufacturer's product differs somewhat in the content of the spray, so trainers must be well aware of the various peculiarities of their selected product, as well as an overall understanding of OC itself.

BCPD instructors received their training from Personal Protection Consultants (PPC), a private training concern familiar with and recommended by BODYGUARD, BCPD's product. The classes covered all aspects of OC training, including each participant being sprayed. PPC's training program was approved by the Maryland Police Training Commission, which was a requirement for BCPD trainers to be certified to teach their officers.

Following PPC training, BCPD instructors developed a lesson plan to use in training their officers. This lesson plan was based on PPC training and specific issues relating to BCPD policy, procedure and environment. This training program, documented by a lesson plan, was followed consistently for each class of officers taught. The three-hour training program consisted mostly of classroom lecture and included a short video segment showing the trainers being sprayed and dramatizing the use of OC in defense of a knife-wielding subject. The final part of the training program involved each member of the class practicing stance, giving an OC spray warning and spraying an inert canister. BCPD did not spray classes of officers with OC, but wanted the inert canisters sprayed to give officers the opportunity to become familiar with the action necessary to spray the canister.

The BCPD lesson plan (see Appendix G) included the following:

- Value statement
- Training objective
- Introduction
- History of OC
- Description of OC and its effects
- Description of particular OC product selected
- Placement on the use-of-force continuum

- Use and deployment of OC
- Decontamination and securing of sprayed subjects
- Officer safety issues.

Trainers sought feedback from the field as officers used the OC spray and completed the data collection form to ensure that training was current and reflective of street officer needs. Information gathered from the field was introduced in two ways: for officers not yet trained, the new information was incorporated into subsequent training classes; for trained officers, the information was introduced via training bulletins (see Appendix H). The following were issues suggested from officer feedback:

- Need to emphasize that the most effective distance for their spray was four to six feet and that any spraying under two feet greatly reduced agent effectiveness. (The volume of the spray is discharged past the subject).

- Always be ready to go to another force option if the spray doesn't work with the first or second try; don't just keep on spraying hoping that the more you spray the more chance the agent will work.

- Emphasize immediate and compassionate decontamination procedures. Technically, once a subject has been sprayed, the subject is the officer's sole responsibility. Consequently, the sooner the subject is decontaminated, the sooner the officer is freed from subject responsibility.

- Never use OC as punishment.

The trainers felt they had a training program that worked well for their department. The three-hour time block was considered appropriate, providing enough time to adequately cover all relevant issues. Currently, a 15-minute update on OC issues is being considered as part of the Fall firearms in-service training.

A training issue that has generated substantial controversy nationally is the "mandatory spray policy" used by some departments. This policy holds that all officers trained in and authorized to use OC must be sprayed during OC training. BCPD resolved the issue in favor of not spraying officers. Many agencies require officers to be sprayed as part of their training, while many other agencies do not require any spraying or only require officers to take a whiff of the spray or dab the spray on their faces.

Proponents of the mandatory spray policy contend that the policy is critical to a comprehensive OC training program. Spraying officers during training gives them an experiential understanding of and familiarity with OC's effects. By virtue of OC exposure, officer confidence in the product should be enhanced. Empathy for the subject may be increased and consequently, decontamination procedures will be appropriately and expeditiously handled. More importantly, police officers might be at a significant advantage if ever sprayed during a confrontation since they would be personally familiar with OC effects. Such familiarity will enable the sprayed officer to work through the effects. An incident that highlights this issue took place in Howard County, Maryland, when a police officer was sprayed by a shoplifting suspect who was attempting to wrestle away the officer's gun. Despite being sprayed, the officer was able to defend himself and shoot the subject. Finally, some argue that the mandatory spray policy may prove useful during litigation since officers can testify from personal experience that the spray effects are neither painful nor excessive.

Officers in some agencies object to being sprayed as a part of OC qualification. Many see it as an unnecessary action that serves only to put them in great discomfort. Officers argue that "we don't need to get shot to know what a bullet does; so why do we have to be sprayed to know what OC does?"

Agencies with labor organizations often experience unified support against the mandatory spraying of officers. Some departments have had lawsuits filed against them by officers and subsequently obtained rulings that prevent the spraying of officers. In the state of Utah, an officer's complaint to the state OSHA and their subsequent evaluation of the mandatory spraying of officers in training led to a department's being cited for unsafe working conditions caused by the mandatory spray policy. Currently, the issue is scheduled for a hearing before an administrative law judge for adjudication. In the interim, agencies in Utah are refraining from spraying officers as part of their OC training.

In New Jersey, a pregnant state trooper was told by her doctor not to be sprayed, as it might be unsafe for the fetus. As a result, other female troopers have also become concerned.

In conclusion, agencies across the county seem to be fairly well split on the "mandatory spray policy." Pending litigation may resolve the status of this issue.

BCPD Training

The need to train approximately 1,400 officers in a three-hour block of instruction, not affect assignments or manpower, without necessitating payment of overtime, required a phase-in approach to OC training in BCPD. Many agencies find that they can implement their OC training program over a short time frame by mass training of officers. However, this was not a viable option in BCPD, given the number of officers to be trained and the time constraints of the project period.

BCPD addressed their OC training needs by conducting the three-hour block as an addition to officer in-service firearms training. In-service firearms with OC training began on July 12, 1993

requires that all members of BCPD whose normal duties include making arrests or supervising arrest situations carry OC spray. Uniformed members of the department carry the device on their gun belt in an issued holster, while non-uniformed officers carry pen-sized containers. Other members of the department may carry OC at their discretion.

The SOP encompasses when OC may be used, as well as how to use the spray to ensure proper deployment. The effects of the spray and a thorough discussion of the decontamination process are given. Emphasis is placed on the need for officers to constantly monitor all sprayed subjects. The SOP refers to the IACP/NIJ study and requires all officers to complete the data collection form following any use of OC spray. A reminder that it is illegal to transport OC spray via commercial airlines is also included.

The SOP is complete with directives and important requirements for OC spray use. The SOP does not duplicate the lesson plan, but borrows from it the important details necessary to establish a framework of control and effective use, while appropriately affording officers discretion in OC use. (See Appendix I for SOP.)

Use-of-Force Issues

Another issue addressed by OC project personnel was placement of OC on the use-of-force-continuum. The BCPD, like most other police departments, adheres to the use-of-force continuum and its range of response, beginning with the mere presence of an officer and escalating upward to the use of deadly force. Since use-of-force is a particularly sensitive area of law enforcement, every effort is made to provide officers with the most recent training and tools to enable them to perform their duties, and at the same time minimize the danger of injury to both themselves and the citizenry.

BCPD places the use of OC spray above verbal commands on the force continuum. Officers who find that verbal commands are ineffective or inappropriate, or if it appears that physical confrontation is necessary and/or anticipated, are justified in employing OC as a control and means of restraint.

Examples given by BCPD of when OC use would be acceptable include:

- when the officer could reasonably use deadly force;
- when the officer could reasonably use an impact weapon as a striking tool and not merely as a restraint device;
- when the officer is confronted by a suspect/assailant with an edged weapon;

Appendix E:
Unstructured Follow-Up Interview

Unstructured Follow-up Interview Questions

1) On _____ you were involved in a(n) _____ incident. Do you recall the incident?

2) Do you recall what you were doing prior to receiving this call for service?

3) In the incident report, you listed the contact as _____. Is this correct? Have you been to this location or had contact with the subject prior to this call?

4) When you arrived at the scene of the incident, can you recall what you did up to the point of the OC spraying? Generally explain what happened. Were there others around (i.e. non-police)? What was the behavioral condition of the suspect?

5) At what point did you decide to spray and why? Explain what happened? Was there force used against the officer? Did the suspect pose a threat of any kind, physical or otherwise?

6) When you sprayed the suspect with OC, what happened? Where did the spray hit the suspect? Did the suspect do anything to offer a defense against the spray?

7) What was the effect of the spray? How long did it take for the spray to work? What was the reaction of the suspect? Was the suspect incapacitated enough to ease arrest?

8) Regarding decontamination, what was done? Did the suspect want decontamination? What was the suspects reaction after decontamination?

9) If used on an animal, how effective was the OC?

10) Have you use OC prior to this encounter?

11) What is your opinion/reaction to OC? Do you have confidence in OC as an alternative to other forms of force that police officers might use?

12) Any additional comments or questions that can be added to this interview that have not been asked?

Appendix F:
List of Officer's Comments

COMMENTS BY OFFICERS REGARDING THE USE OF OC

The following comments were extracted from the OC data collection sheets completed by the involved officer(s) or from the follow-up interviews that were conducted.

- Wish we would have had it awhile ago.
- I think it's great ... great alternative for initial use of force.
- The spray is one of the best items we have been issued.
- I like it and prefer it to other forms of LTL.
- Good faith in product.
- Definitely better than using a nightstick.
- Love it.
- Great stuff.
- Best thing department has done since I've been on the force.
- Good stuff, I wouldn't want to sprayed with it.
- The word is out (on the street) ... all people have to do is hear the velcro and they comply pretty quickly. (This officer has actually pulled his OC from his holster at least ten times but has actually only sprayed once.)
- One subject actually said to the officer, "next time just beat me instead."
- I feel that PCP subjects are actually running more from the spray than from the officer.
- Some subjects actually apologize after being sprayed.

Appendix G:
BCPD Lesson Plan

BALTIMORE COUNTY POLICE DEPARTMENT

LESSON PLAN

COURSE:	Use of Force
TOPIC:	Oleoresin Capsicum (OC) Spray
METHOD:	Lecture/Demonstration/Video Tape
FACILITY:	Appropriate classroom
INSTRUCTIONAL AIDS:	Video Player/Overhead Projector/ Overheads/Inert Canisters of OC/ Live Canisters of OC
REFERENCES:	Michael A. Brave and John G. Peters,Jr., Personal Protection Consultants - Training Manual
TIME:	3.0 Hours
PREPARED BY:	Officer Jeffrey A. Munchel #2183 Recruit Training Unit

VALUE STATEMENT:

As members of this police department, we aspire to professionalism in all aspects of our operation. We are committed to fair and impartial enforcement of the law.

Use of Force being a particularly sensitive area of law enforcement, the department will make every effort to provide officers with the most recent training and tools to enable them to perform their duties and at the same time minimize the danger of injury to both the officer and the citizen.

REVISED 5/10/93

TRAINING OBJECTIVES

At the conclusion of this training officers will be able to properly utilize OC Spray by having an understanding of the following:

1. Where OC can be utilized on the Use of Force Ladder.

2. The effectiveness of OC, its make-up, characteristics and advantages.

3. OC Sprays psychological and physiological effects on subjects.

4. Use of OC in reference to proper stance, grip and spraying technique.

5. Verbal skills necessary prior, during and after the use of OC on an individual.

6. Decontamination procedures for individuals and areas (including building and vehicle interiors)

7. First-aid procedures to be administered to exposed subjects.

8. Officer safety and officer exposure procedures.

9. Procedures for reporting use of OC on subjects or animals.

BALTIMORE COUNTY POLICE DEPARTMENT
Education and Training Division

LESSON PLAN

Course: Use of Force
Topic: Oleoresin Capsicum (OC) Aerosol Spray
Page: 1

NOTES:

INTRODUCTION

Over the years many officers and suspects have been injured in physical confrontations with each other. The use of physical force by an officer, after a subject has refused to submit to verbal commands, often escalates a situation and causes more problems than the original call for service.

After review and evaluation of the circumstances of these types of situations, it would appear that if officers were given another option on the Ladder of Force there would be less injuries and less law suits. A new product, only 2000 years old, was examined for possible use by law enforcement officers as an additional non-lethal force option - this product is Oleoresin Capsicum or more commonly known as OC.

The use of O.C. SPRAY will be classified as a use of force and will be governed by all applicable policy.

OC has taken a long time to be accepted by agencies for several reasons:

1- officers had used other chemical agents that were unreliable and counter-productive.

2- officers had limited knowledge of the various chemical compounds that made up these chemical agents and mistakenly lumped all chemical agents into one category.

3- there was no formalized training standards on the use of chemical agents and officers had no idea of when, where and how to properly use the chemicals.

4- in most cases, the officers employing these chemical weapons lost confidence in the products and therefore stopped carrying them.

NOTES:

HISTORY

Chemical weapons go back some 2000 years. The Chinese use to place ground pepper in rice paper and throw it into the face of their opponent.

The F.B.I. conducted a study, in 1990, on OC and concluded that it is different from CN, CS and Mace. OC(a derivative of cayenne peppers) is an inflammatory agent and not an irritant, it cause immediate involuntary closing of the eyes and impairs breathing.

Since 1976 there have been no reported cases of permanent injuries or death as a result of exposure to OC, and OC has proven to be effective on subjects under the influence of alcohol/drugs, emotionally disturbed persons, and other subjects who have reduced sensitivity to pain. In addition OC has proven itself against domestic and wild animals.

HOW AND WHY IT WORKS

OC is a non-lethal aerosol weapon which incapacitates with no lasting after effects. OC will immobilize an attacking human or animal for up to 45 minutes. It is bio-degradable and does not decompose.

INFLAMMATORY AGENT

- produces rapid physiological and psychological reactions

- effects > eyes - respiratory system - skin - lips - face

1. immediate swelling of mucous membranes
2. involuntary closing of eyes
3. uncontrollable coughing
4. gagging
5. gasping for breath

6. sensation of intense burning of skin and mucous membranes of nose and mouth

7. emotional anxiety

THE EFFECTS OF OC WILL CAUSE A LOSS OF COORDINATION, INTENDED THOUGHT PROCESSES, UPPER BODY CONTROL, THUS INCAPACITATING AND RENDERING FULL COMPLIANCE.

Generally the subject experiencing OC exposure will:

1. be immediately rendered helpless through temporary blindness,
2. drop whatever might be in his/her hands,
3. bend forward at the waist, and
4. immediately cover the face with the hands.

O.C. exposure is generally instantaneous and effective against:

1. drug abusers,
2. emotionally disturbed persons
3. intoxicated persons
4. enraged persons who have reduced sensitivity to pain
5. domestic and wild animals

BODYGUARD OC SPRAY

The department has chosen a 3 ounce canister of BODYGUARD OC spray, 5% concentration level.

FOGGER DELIVERY SYSTEM - delivers a full cone pattern rather than a solid stream.

The pattern is completely filled with microscopic droplets producing a wider area of contamination and less chance of the subject continuing their attack. Precision aiming is not necessary with this type of delivery system.

Special Note: a cone pattern can be effected by wind conditions

PROPELLANT - the propellant in BODYGUARD is a mixture of *Dymel* a new DuPont Product.

You Should Know: it is not alcohol based and therefore is non-flammable

it is not a carcinogenic, as freon is(which is banned by the E.P.A.)

DEPLOYMENT OF OC

A. THREAT RECOGNITION - Ladder of Force Considerations

NOTE: OC agents are considered an alternate use of force option and are not intended to replace a firearm.

OC is considered a low level control and restraint technique. There are four elements which must be present to justify the use of force:

ABILITY: Does the violator possess the ability to resist you or a third party, or cause you or a third party bodily harm?

OPPORTUNITY: Does the violator have the opportunity to resist you or a third party, or to cause you or a third party bodily harm?

JEOPARDY: Has the violator placed you or a third party in jeopardy? Jeopardy can be defined as a hazard, danger, or peril.

PRECLUSION: Have you reasonably exhausted all of your options at that time and at that place?

The Use of Force Continuum and its range of response begins with the mere presence of an officer and escalates up to the use of deadly force. The use of OC spray falls into the Ladder of Force at a level just above verbal commands.

If verbal commands are ineffective or inappropriate, or it appears that physical confrontation is necessary, the officer may be justified in employing OC as a control and restraint means.

Selected examples of acceptable OC use include:

(1) where the officer could reasonably use deadly force;

(2) where the officer could reasonably use an impact weapon as a striking tool and not merely as a restraint device;

(3) where the officer is confronted by a suspect/assailant with an edged weapon; and [Note: Officers should understand that if a suspect with an edged weapon is attacking the officer or others, and the officer reasonably believes that he/she or another is in imminent danger of death or serious bodily harm, the officer should use a firearm rather than OC. OC may be the more appropriate tool when the officer is in a stand off with a suspect armed with an edged weapon and the suspect is not moving toward the officer, but rather the suspect is refusing to drop the weapon.]

(4) where an officer reasonably believes that he/she will become engaged in a fight with a suspect. e.g., If a suspect is moving toward the officer and the officer reasonably perceives, based upon the suspect's demeanor and/or words, that the suspect is going to engage the officer in a fight.

(5) OC may be used to effect the removal of a person or persons who voluntarily lock themselves into a vehicle and refuse to exit when lawfully commanded to do so by an officer. Officers should assure that the suspect is not able to put the vehicle into motion by safely blocking in the vehicle.

(6) OC may be released into an enclosed area (such as a house or other building) to effect the removal of known or unknown persons who refuse to voluntarily exit or when a forced exit is necessary.

(7) Officers may spray a combative restrained or handcuffed prisoner only when other available means of control have been exhausted or would clearly be ineffective.

(8) Officer shall not engage in horseplay with OC or any other departmentally issued device/ substance/ equipment.

(9) Officers shall not intentionally or knowingly create a situation whereby a person sprayed by OC who is temporarily blinded would or could walk into the path of oncoming traffic or walk off an elevated area, e.g. roof, bridge, etc. causing unreasonable injury.

(10) The use of OC shall be consistent with the guidelines for the Department's Use of Force Policies and the manufacturer's specific guidelines for use.

These are reasonable responses for the officer based on the fact that OC spray causes no permanent injury to the suspect and provides a high level of subject control.

OC is not a substitute for a firearm. If you find yourself faced with an armed individual and you deem that deadly force is necessary, your firearm is the correct tool. There may be occasions where your first weapon of choice is your firearm, but once drawn and the elements of time, distance and

cover are on your side you may choose to draw your OC spray and spray the subject. Generally speaking this would apply to circumstances where the subject is armed with a weapon other than a firearm. These are judgment calls that can only be made by the officer present on the scene.

B. TACTICAL USE AND DEPLOYMENT OF OC

Uniformed personnel are to wear the OC spray canister on the gun-belt, on what is referred to as the weak side or opposite side as their firearm. The OC canister is to be drawn and fired with the weak hand. This will allow the officer to keep the strong hand (weapon hand) free in the event that the use of the firearm becomes necessary.

Once drawn from the holder, the safety tab is broken by depressing the Spray Actuator with either the thumb or index finger fully until you hear the tabs snap.

At this time you can continue to depress the actuator and fire the OC, or stand at the ready and issue additional verbal commands to the suspect.

When OC spray is used against a subject or animal it should be:

1- Sprayed directly into the face

2- Spray an initial one(1) second burst

3- Maintain Reactionary Gap and evaluate

4- Spray a second one(1) second burst, if needed

Note: considerations when using OC

* Wind direction
* Innocent bystanders
* Other officers
* Your location

Tactics of Use

STANCE

- strong leg back (interview or fighting stance)
- canister held at arms length, weak handed
- strong hand may be used to support weak hand

GRIP

- depress Spray Actuator with thumb or index finger

TARGET

- facial area

Spraying Methods

VERTICAL SPRAY

- one on one, subject moving towards you with head down to avoid being sprayed
- raise and lower arm at target while spraying

HORIZONTAL SPRAY

- multiple subjects or lateral movement by subject
- move arm side to side, no greater than shoulders width, while spraying

CIRCULAR SPRAY

- escaping attack or multiple assailants
- move arm in a circular motion, putting up a fog of OC - which attackers would have to pass through in order to advance on you

Once OC spray has been employed, several factors that existed during OC use will determine how quickly officers can move in to take control of a prisoner.

Each situation will differ based on:

- whether used indoors or outdoors
- wind conditions
- amount of OC used

Generally, a brief period of time must be allowed to permit the OC to settle on the subject and for the airborne OC to dissipate prior to moving in and taking physical control of the prisoner. Verbal commands or directions should be given to the subject during this short waiting period. (this will be covered in the Treatment/ Decontamination segment of this lesson)

NOTES:

CAUTION: OC will have the same effect on officers as it has on suspects!

* Do not enter into the airborne OC

* If other officers are in the area, a warning of "SPRAY" is to be yelled prior to OC spraying

  - officers should immediately disengage and clear the spray area

* If an officer is contaminated by OC, he/she must be treated immediately. The contaminated officer will be incapacitated and vulnerable.

  - officers may have to totally disengage from the scene in order to treat the effected officer, before approaching the suspect again

OC AFTER EFFECTS AND DECONTAMINATION

NOTE:
- Effects of OC are generally immediate and temporary
- Effects will usually dissipate within 45 minutes
- Spraying OC directly into the face of a subject will not cause permanent damage to an individuals eyes or respiratory system
- In over 15 years of field experience, there has not been a substantiated instance of adverse reaction to the spray by any subject
- F.B.I. Chemist have stated that there should not be any long-term health risks associated with the use of OC as a chemical agent

SECURING OF ARRESTEE

- Once sprayed the subject is to be verbally ordered to a prone handcuffing position
- Assure the subject that they will be treated and that what they are experiencing is temporary
  - have them breath normal and relax
- Wait approximately 15 seconds for the OC to settle prior to approaching the subject
- Handcuff the subject using caution - OC is not failsafe

NOTE: GOAL ORIENTED SUBJECTS can still attack an officer even after being sprayed with OC.

REMEMBER to maintain a safe distance, do not get caught flat-footed

- Remove the subject from the spray area and into fresh air
  - if there is a wind, face the subject into it
  - a fan may also be used to aerate the face and eyes
- Direct the subject not to rub his/her eyes
  - rubbing will cause the cayenne pepper to be grind into the area and will prolong the effects, along with intensifying the effect

- If practical flush the eyes with cool water before transporting
    - a garden hose or kitchen sprayer works well
- If it is not possible to flush the eyes at the scene, offer to flush the eyes and face when you arrive at the station
    - transporting the subject to a precinct station with a shower available in the lock-up area may be necessary for decontamination
- The subject should be instructed to breath normally through the nose
    - if irritation persist and the handcuffs can be removed safely, have the subject blow his/her nose to assist with removal of particles
- Lotions, salves and creams are not to be used on the effected areas, the use of these products will trap the resin against the skin
    - A non-oil based soap will help remove the resin
- Once this is done pat dry with a cloth towel DO NOT RUB
- Seek medical attention if symptoms persist beyond 45 minutes and the subject complains of an injury
- Once a subject is sprayed with OC and submits to the officer's authority, the officer must provide comfort and reassurance to the subject that the effects are temporary

NOTES:

AREA AND VEHICLE DECONTAMINATION

- OC is biodegradable, no special equipment or washing process is necessary
- Ventilate by opening doors and/or windows
- Buildings, rooms, vehicles can be decontaminated in approximately one (1) hour
- Resin can be removed from effected seats or areas by simply washing with soap and water

OFFICER SAFETY

Officers must be particularly careful not to be a victim of OC spray. The incapacitating nature of OC would put an officer in a position of imminent danger.

Even though OC spray is not lethal in of itself... the effects of being sprayed would render an officer unable to defend themself and therefore vulnerable to being relieved of their firearm.

When an Officer is Confronted by a Person Holding Oleoresin Capsicum: when an officer is confronted by an attacker/suspect/assailant holding, wielding, or threatening the officer with an OC aerosol the officer shall make reasonable efforts to minimize the amount of self-defense force applied. The officer shall consider the following (as allowed by duration and circumstances of the incident):

1) The officer understands that if the subject is successful in spraying the officer with OC he/she will be at the mercy of the person, person's companions, or others for an extended [up to forty-five (45) minutes] period of time. It is foreseeable and reasonable to believe that during this time the officer may be disarmed, killed, or seriously injured by the person, person's companions, or others.

2) If the officer can reasonably retreat safely to a distance outside the foreseeable range of the OC - a minimum of twenty-five (25) feet - the officer should do so, provided that his/her retreat does not create substantial additional risk or harm/ injury to others.

3) The officer should consider the following incident factors (among others - as known to the officer) based upon the totality of the circumstances:

a) the OC attacker's age, sex, known history, etc.;

b) the number of OC attackers, or companions of the OC attacker, present and known to the officer;

c) the perceived demeanor of the attacker(s) and other hostile third parties; [What can the officer reasonably believe from the attacker's, or third parties' behavior, words, actions, history, etc.?]

d) the makeup of the officer's surroundings; [Is the officer in an area of relative safety or is the officer in a potentially violent/ destructive environment?] and

e) whether the officer has other officers present who could reasonably and safely protect him/her if incapacitated by OC exposure.

4) If an officer, confronted by a suspect (or suspects/companions) threatening the officer with OC, cannot reasonably and safely retreat from the scene, or if there are not sufficient backup/ support officers present to reasonably and safely protect the officer from attack/injury after OC exposure, the officer may use reasonable force up to and including deadly force against the OC attacker.

The use of deadly force in this situation will rest soley with the officer. The officer's decision must be in compliance with the use of firearms policy in the Department's Rules and

LESSON PLAN

Course: Use of Force
Topic: Oleorasin Capsicum (OC) Aerosol Spray
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NOTES:

While use of deadly force is an extreme circumstance, and escape may be the better option, you must be prepared.

OFFICERS ARE KILLED BECAUSE THEY...

* Failed to have a plan and practice it
* Failed to use proper tactics
* Failed to properly assess and anticipate danger

I.A.C.P./N.I.J. STUDY

A study on the use of O.C. Spray by the Baltimore County Police is being conducted by the International Association of Chiefs of Police and the National Institute of Justice. This project will require all officers to complete a data collection form when the O.C. Spray is used. The form will be forwarded to the Crime Prevention/Community Policing Bureau Planning Unit upon completion.

This form is to be completed:

1) when O.C. is used
2) when O.C. is pulled from holster and the subject submits based on the threat of use by the officer
3) on all accidental discharges

The I.A.C.P./N.I.J. Study will require that the officer be interviewed by the research consultant, Ms. Jami Onnen, shortly after the incident. The procedure will be for the officer to fill out the appropriate forms and then they will be contacted by Ms. Onnen and an interview will be arranged to fit the officer's schedule.

The study is being conducted in conjunction with our adoption of O.C. Spray, but is independent of all use of force investigations by this department. The study by I.A.C.P./N.I.J. of the Baltimore County Police Department's utilization of O.C. Spray will be published and serve as a national standard of a complete and comprehensive report on Law Enforcement's adoption of O.C. Spray as a non-lethal use of force alternative.

Appendix H:
Training Bulletin

the informer

Baltimore County Police

Training Bulletin

#93- 15

December, 1993

O.C. SPRAY UPDATE #1

At this point in time, almost all of the Agency's personnel have been trained in the use of O.C. Spray. The vast majority of our O.C. Spray uses have clearly been within Departmental guidelines. As the use of this product continues to increase by members of this Department, three issues should be re-enforced.

USE OF FORCE

Officers should routinely attempt to use verbal commands before escalating to the use of O.C. Spray. Where situations allow, a suspect should be warned about its impending use. We realize that this is not practical in *every* situation, but this practice is generally viewed as the *normal* escalation to the use of O.C. Spray.

The use of O.C. Spray can be considered **excessive force** or an **unnecessary use of force**. For example, in a situation where the officer faces no real difficulty in handcuffing a suspect, or in a situation where the suspect is under control or expresses a desire to cooperate, spraying a suspect may constitute excessive force or unnecessary force. Please use the product wisely!

And remember, O.C. Spray cannot ever be used to punish a prisoner!

DECONTAMINATION

In cases where O.C. Spray is inhaled by a suspect (or a police officer), breathing will inevitably become restricted. Given this condition, several decontamination steps should always be followed.

- Provide for and allow proper ventilation!
- Allow access to water...plenty of water! A water hose works best. Affording access to an abundance of water will serve to de-escalate the situation. Likewise, refusing water to one who has been sprayed will only serve to agitate an individual.

(continued)

Appendix I:
Standard Operating Procedure (SOP)

BALTIMORE COUNTY POLICE DEPARTMENT
Standard Operating Procedure

ISSUING COMMAND: Crime Prevention Community Policing Bureau	S.O.P. # 93-6
ISSUE DATE: July 1,1993	EFFECTIVE DATE: July 6, 1993
REVISION DATE:	REVISION #
SUBJECT: Pepper Aerosol Restraint Spray	
SUB-TOPIC:	
REFERENCES: C.A.L.E.A. 1.3.7 , 1.3.13	

BACKGROUND

The Department continues to make every effort to provide officers with the most effective equipment to carry out their mission.

A device used by many law enforcement agencies nationwide has been obtained by this Department - Oleoresin Capsicum (OC) Pepper Aerosol Restraint Spray (ARS). ARS will offer our personnel a less than lethal means to defend themselves from human or animal attack. The spray is an organic non-enduring substance containing common cayenne pepper. Oleoresin Capsicum is classified as a temporary inflammatory agent, not an irritant, such as tear gas.

PURPOSE

To familiarize officers with the use of pepper ARS and establish procedures concerning its use.

VALUES STATEMENT

As members of this police department, we aspire to professionalism in all aspects of our operation. The professional manner in which our officers carry out their duties should not waiver in spite of being subjected to unusual circumstances and conditions. The Department will make every effort to supply officers with the necessary equipment to carry out their duties and minimize the danger of injury to officer and citizen.

PROCEDURE

1. Any member of the Department whose normal duties include making arrests or supervising arrest situations, shall be required to carry the departmentally issued ARS while on duty. Uniformed members shall carry the device on the gun belt in the issued holster, while non-uniformed officers will carry the pen-size container. Other members may carry the device at their discretion.

2. No member shall carry ARS without first completing a training program administered by departmental instructors, and exhibit competence in the safe and proper handling, care, and use of the issued ARS.

3. The aerosol restraint spray may be used by officers in any arrest situation when:

A. The aggressor has failed to comply with the officer's instructions.
B. After having been advised of its impending use (when practical).
C. The officer is about to utilize hands-on tactics to defend himself against active hostile resistance or after aggressive resistance to arrest is anticipated or occurring.
D. ARS maybe deployed at anytime upon confronting aggressive approaching animals.

4. ARS is employed in the following manner:

A. When practical, create a safe distance two to ten feet away from the aggressor.

B. The ARS mist should be directed at the face, eyes, nose and mouth of the aggressor. Normally, a single, one to three second mist will be sufficient to control the aggressor.

C. The officer should make every attempt to be up-wind of the aggressor and not enter the sprayed mist area.

5. The effects of the ARS will take place one to three seconds after first exposure. Since ARS affects the mucous membrane, the subject may experience any of these physical symptoms:

* temporary blindness
* difficulty breathing
* burning sensation in the throat
* nausea
* lung pain
* impaired thought process

Since the effectiveness of the spray varies among individuals, the aggressor should be cuffed immediately.

6. If practical, the arrestee shall be transported in the precinct paddy wagon. The paddy wagons will be equipped with spray water bottles and clean paper towels.

7. Air and water are the only treatment necessary to overcome the effects of the ARS. If practical, the arrestee should be offered a container of water and towel immediately upon being placed in the paddy wagon. If in the opinion of the arresting or transporting officers, this cannot be safely done, the arrestee is to be immediately transported to the precinct.

8. Officers should verbally assure the prisoner of the temporary nature of their discomfort, encouraging them to relax. Normally, the effects of the pepper spray will begin to subside after five minutes. If at any point after exposure, the arrestee displays a reaction not consistent with the expected reaction to ARS, medical assistance is to be summonsed immediately.

9. The arrestee should be permitted unlimited access to water upon return to the precinct. Utilization of the cellblock shower is recommended. The effects of the pepper spray should cease 30-45 minutes after exposure but can last for several hours.

10. Immediately after the use of the ARS, the officer shall notify his squad supervisor. Routine medical screening shall be conducted upon arrival at the precinct. Continuous monitoring of the prisoner will be required until the effects of the ARS subside.

11. The use of force report procedure will be initiated whenever the utilization of ARS requires medical treatment for the individual.

12. A study on the use of ARS by Baltimore County Police is being conducted by the International Association of Chiefs of Police and the National Institute of Justice. This project will require all officers to complete a data collection form when the ARS is used. The form will be forwarded to the Crime Prevention/Community Policing Bureau Planning Unit upon completion.

13. Officers will offer assistance to any innocent bystanders who should feel the effects of the ARS. A intra-department correspondence will be initiated detailing an accidental exposure to the ARS.

14. Replacement of the ARS shall occur at any point where the unit is less than half full. This can be determined by weighing the canister. Scales will be made available at duty stations. Additionally, issued ARS units shall be weighed semiannually at the range during qualification.

Special Note: It is illegal to transport an ARS pepper spray via commercial airline.

Major Donald Hamerman A/Col.

Deputy Chief Michael D. Gambrill
Bureau Chief
Crime Prevention/Community Policing Bureau

MDG:mc

Appendix J:
Legal Officer Section (LOS) Opinion

Opinion of IACP's Legal Officers Section

Police Use of Deadly Force in Defense of OC Spray Attack

Q) Should officers be allowed to use deadly force when attacked with OC spray?

A) An officer may use deadly force to protect himself from the use or threatened use of OC spray when the officer reasonably believes that deadly force will be used against him if he becomes incapacitated. Incapacitation includes situations in which officers may be unable to adequately defend themselves due to the effect of chemical sprays.

In judging the reasonableness of an officer's use of deadly force, the fact finder must allow the officer broad latitude and judge the officer's actions from the perspective of the particular officer's perceived threat and the necessity to "make a split-second judgment in circumstances that may have been tense, uncertain, and rapidly evolving." Graham v. Connor, 490 U.S. 386 (1989).

In determining whether an officer's use of deadly force was reasonable, the following factors may be considered:

1) The nature of the crime committed by the person or persons confronting the officer.

2) The nature of the verbal or physical threats on the part of the person confronting the officer.

3) The relative strength and fighting skills of the officer and his opponent.

4) The number of officers versus the number of potential assailants.

5) The nature of weapons in the possession of or available to the assailant.

6) The ability to avoid the potential effect of the OC spray.

7) The alternative means of defending against the use or effect of the OC spray.

8) The availability of assistance from others, especially nearby officers.

Appendix K:
Sample Cases

SAMPLE CASES

- BCPD officers were called to a scene involving a distraught subject who was attempting to commit suicide by hanging himself with a bed sheet. When the officers arrived, he was already suspended from a tree. One officer attempted to ease the stress and weight on the subject's neck by grabbing his feet, but the subject continued to kick uncontrollably. He was administered a mild dose of pepper spray in the face and subsequently became limp allowing the officers to remove the noose from his neck. As a result of the officers' speedy response and use of the pepper spray, the subject did not suffer from any visible injuries.

- An undercover officer was following a subject who was involved in a narcotics violation. The officer called for a backup who subsequently stopped the vehicle. The occupants were ordered out of the car. The driver complied, but the passenger resisted and proceeded to ingest an undetermined amount of drugs. The undercover officer attempted to grab the subject and, with the help of the other two officers, tried to extract him from the vehicle. He was warned several times that he would be sprayed with OC, but still refused to comply. When he was sprayed, he immediately became limp and was easily removed from the vehicle "like a bag of jello." The neighbors and spectators who witnessed the incident described the OC as "pretty neat stuff." Unlike other situations where spectators may observe more forceful tactics being applied, such as the use of a nightstick, the OC appeared to gain better acceptance as a more humane alternative force option.

- A BCPD officer responded to a call concerning an elderly woman who was found unconscious in her bathroom. Emergency medical personnel were summoned but the victim's dog would not allow them, or the officer, to attend to her. After several attempts of luring him away, he was administered a mild dose of OC under a blanket. The blanket was then wrapped around him, and he was removed from the scene without harm. This enabled the medics to administer the necessary medical treatment to the woman.

- After being arrested, a subject was transported to the precinct for a narcotics violation and placed in a temporary holding area. While cuffed to a retaining bar mounted to the wall, he became extremely agitated and shattered a mirror with his head. He then took his free hand and grabbed a huge jagged piece of glass and began to swing it at the officers. He was then sprayed with OC and immediately dropped the glass. One of the officers involved, who felt his life was threatened, was convinced that if he did not have the OC, he would have shot the subject.

- In a previous incident last year, three unusually large brothers had a confrontation with BCPD officers at a local bar. The officers attempted to arrest one of the brothers and a struggle took place. The subject attempted to grab the officer's gun, at which time the officer, fearing for his life, shot the subject, who then subsequently died. Recently, officers were engaged in another confrontation with the two remaining brothers. Another struggle took place, and in this incident, the officer utilized his OC to subdue the subjects who complied after being sprayed. They were arrested without further incident.

Q) Should departments develop separate use of deadly force policies regarding officer's defense of OC spray?

A) No. Legal and policy standards that generally apply to an officer's use of deadly force should apply to OC spray situations. An officer's reasonable fear for his safety is the essential question. The same deadly use-of-force policy should apply whether he is being attacked by an individual with a gun, knife, bat, pipe or OC spray.

Q) If OC spray is placed below, or just above, open-hand contact on the use-of-force continuum, because the spray does not cause serious injury or lasting harm, then how can deadly force be justified in defense of such a non-injurious weapon?

A) An officer uses OC spray to control a threatening, violent or resisting individual in a manner which is intended to cause as little physical harm as possible.

When a criminal attacks an officer with OC spray, it is with the intent to harm the officer, escape or both. It is common knowledge that a high percentage of officers who are incapacitated, or have had their guns taken away from them, are later shot with their own weapons. It would be unconscionable to ask an officer to take a chance that the OC spray attacker is merely going to walk away after incapacitating the officer.

Therefore, it is illogical and unreasonable to compare an officer's use of OC spray and an assailant's use of a chemical spray against an armed officer.

- when an officer reasonably believes that he/she will become engaged in a fight with a suspect;

- spraying a combative restrained or handcuffed prisoner only when other available means of control have been exhausted or would clearly be ineffective.

The uses cited by BCPD are reasonable responses for officers based on the fact that OC spray causes no permanent injury to the subject and provides a high level of subject control. BCPD emphasizes that OC is not a substitute for a firearm. If when faced with an armed individual, an officer deems that deadly force is necessary, then the firearm is the correct tool.

Reporting the Use of OC as a Use of Force

Departmental reporting of OC spray was another significant issue of concern for personnel, including the executive corp, patrol officers and the FOP. BCPD policy states that a use-of-force report must be completed based on two elements of the result of force -- if the subject complains or if the subject goes to the hospital for treatment. If neither of these situations occur, then a use-of-force report is not required.

Discussion among BCPD officials occurred prior to the adoption of OC about the possibility of having each use of OC a reportable use of force. However, since no other LTL use of force required a report (unless a complaint was made or hospital treatment was necessary), it was concluded that by treating OC differently, its use could be inappropriately hindered. Should this occur, then a valid measure of the use of OC would be suspect because officers might be reluctant to use the product.

The reluctance would not necessarily stem from the need for the report, but from a policy in BCPD that requires the "flagging" of an officer after three uses of force. This flagging, which identifies officers who use force and may subject them to counseling, is an extremely controversial issue among the officers. If the mere use of OC required a use-of-force report, a different criteria than other uses of LTL force, then OC use would likely be affected.

During the time of the data collection (July 21, 1993 to March 31, 1994) and over the span of 194 sprayings, five complaints of brutality and one case of use of force were received by BCPD. The use-of-force incident occurred when a breaking and entering suspect became aggressive with an officer and was sprayed with OC. The subject requested hospital treatment and thus triggered the use-of-force report.

A synopsis of the five brutality complaints follows:

In determining whether an officer's use of deadly force was reasonable, the following factors may be considered:

- The nature of the crime committed by the person or persons confronting the officer.
- The nature of the verbal or physical threats on the part of the person confronting the officer.
- The relative strength and fighting skills of the officer and his opponent.
- The number of officers versus the number of potential assailants.
- The nature of weapons in the possession of or available to the assailant.
- The ability to avoid the potential effect of the OC spray.
- The alternative means of defending against the use or effect of the OC spray.
- The availability of assistance from others, especially nearby officers.

Source: IACP, Legal Officers Section

When a criminal attacks an officer with OC spray, he/she intends to harm the officer, escape or both. It is common knowledge that a high percentage of officers who are incapacitated or have had their guns taken away from them are later shot with their own weapons. It would be unconscionable to ask an officer to take a chance that the OC spray attacker is merely going to walk away after incapacitating the officer. Therefore, it is illogical and unreasonable to compare an officer's use of OC spray and an assailant's use of a chemical spray against an armed officer. (See Appendix J for complete opinion.)[9]

[9] IACP Legal Officer Section Opinion

Weaver, Wayne and Monty B. Jett. Oleoresin Capsicum Training and Use. Firearms Training Unit. FBI Academy. Quantico, VA: 1989.

APPENDICES

A. News Release and Article

B. Executive Brief: "Pepper Spray and In-Custody Death"

C. BCPD Precinct Boundaries

D. Data Collection Sheet

E. Unstructured Follow-Up Interview

F. List of Officer's Comments

G. BCPD Lesson Plan

H. Training Bulletin

I. Standard Operating Procedure (SOP)

J. Legal Officer Section (LOS) Opinion

K. Sample Cases

Appendix A:
News Release and Article

NEWS FROM
BALTIMORE COUNTY POLICE DEPARTMENT

OFFICE OF PUBLIC INFORMATION
400 KENILWORTH DRIVE
TOWSON, MARYLAND 21204
TIP: (410) 887-2210
FAX: (410) 887-4958

July 26, 1993
FOR RELEASE:
IMMEDIATELY

Baltimore County Police have begun training all officers in the use of pepper spray as a non-lethal means of subduing violent people.

Pepper spray is an aerosol containing common cayenne pepper. It is being carried by many police departments nationwide. In tests, pepper spray has proven safer and more effective than chemical spray or tear gas. County police expect that the use of pepper spray will reduce the number of officers injured in assaults.

The effects of pepper spray, all of which are temporary may include blindness, breathing difficulties, and a burning sensation in the throat. Normally, these symptoms begin to disappear five minutes after exposure and cease after 45 minutes.

All officers will undergo the specialized training before they are allowed to carry pepper spray, police said. The spray is issued to each officer upon successful completion of the training. Issuance of the spray began last week. The training is expected to be completed by the end of the current year.

The county is purchasing the pepper spray with a grant provided by the National Institute of Justice. NIJ will evaluate the department's use of pepper spray and its effectiveness in order to assist other law enforcement agencies considering its use.

# # #

BALTIMORE COUNTY

Pepper spray ready for frisky suspects

By Glenn Small
Staff Writer

Take red hot cayenne pepper — a lot of it — condense it into an oily liquid that clings to human skin, and put that liquid into a small canister that can spray a fine stream about 10 feet.

It's not a recipe for a new sauce, but rather "pepper spray," a Mace-like spray that can disable someone for as long as 25 minutes. It is the newest tool in the Baltimore County police force's arsenal.

"You wouldn't want this on your taco," said Col. Leonard J. Supenski, head of the department's technical services bureau. "It's a natural organic compound in a super-concentrated format."

Baltimore County has begun training and equipping about 1,400 patrol officers and detectives with pepper spray, considered a nonlethal means of disabling a violent suspect.

Colonel Supenski said studies have shown pepper spray to be effective, yet not as harmful as other chemical sprays.

"This is a move to give officers another tool," Colonel Supenski said. It could be used rather than a police club or handgun.

Someone sprayed with it would experience temporary blindness, breathing difficulties and burning in the throat.

County police officers began receiving the pepper spray last week. The entire force should be equipped by the end of the year. The $25,000 cost is being paid by a grant from the National Institute of Justice.

The NIJ will study the use of pepper spray in Baltimore County to decide whether to recommend it to other law enforcement agencies.

In Maryland, Baltimore City and Howard County police use pepper spray. State police are considering it.

The technical name for pepper spray is oleoresin of capsicum, or OC for short. In researching the spray, county police said they found agencies that use it had a decrease in the number of assaults and injuries to police officers, said E. Jay Miller, county police spokesman.

"This will stop people on drugs or PCP," he said. "Bullets won't stop them sometimes. But this will knock them down."

Appendix B:
Executive Brief:
"Pepper Spray and In-Custody Death:

International Association of Chiefs of Police
515 N. Washington St., Alexandria, VA ☐ 703/836-6767

Executive Brief

March 1994

Pepper Spray and In-Custody Deaths

By John Granfield, Jami Onnen and Charles S. Petty, M.D.

Introduction

Responding to the need for a less-than-lethal alternative, police departments throughout the country have adopted Oleoresin Capsicum (OC) or pepper spray as a force option. OC is a naturally occurring inflammatory agent found in cayenne peppers. OC causes almost immediate swelling and burning of the eyes and breathing passages. When the agent is inhaled, the respiratory tract is inflamed, and breathing is restricted. Effects do not support high levels of physical activity such as fighting with the police.

Anecdotal reports of agent effectiveness are favorable: significant reductions in officer/arrestee injuries and in use-of-force complaints have been reported. Moreover, studies indicate that the risk of injury or death is statistically improbable (for discussion of this, see Onnen, 1993). However, cases have recently been reported where deaths have occurred subsequent to OC use. These deaths have created some concern among those in the law enforcement community, as well as among others, with regard to OC's possible role. As a result, some agencies contemplating product adoption are reluctant to begin use, while agencies using the product are seeking information affirming product safety and effectiveness.

To address this concern, the National Institute of Justice (NIJ) asked the International Association of Chiefs of Police (IACP) to collect data on in-custody death incidents where pepper spray had been used in the arrest procedure and to assess from this aggregated data whether there is a possibility that OC could be a factor in these deaths. This report will cover information resulting from the examination of these specific incidents.

Reported Incidents

An incident involving a sudden death while in police custody is not a distinct category of information reported by local, state or federal law enforcement agencies. Therefore, in order to collect some representative data on the incidents where death followed the use of OC spray, four sources of information were used: news media services, California POST, the American Civil Liberties Union of Southern California and networking among IACP members.

A total of 30 incidents were found between August of 1990 and December of 1993 in which the death of a subject occurred following a spraying with OC. The earliest incident in this study occurred on August 27, 1990; except for one incident in 1991 and two in 1992, the remaining 26 took place in 1993. Although there is no way of knowing all the incidents that have taken place, it is logical to conclude that most occurrences would be fairly recent since the substantial growth in OC use has been over the last two years. With knowledge of 30 occurrences from 13 states, information was obtained to review the cause of death and to determine

Science and Technology is a publication of the International Association of Chiefs of Police under a grant from the National Institute of Justice, U.S. Department of Justice, and is published to promote the utilization of the most technologically advanced equipment available to the law enforcement profession.

commonalities among the cases. To investigate these cases, the following procedure was used:

1. A review of the incident reports of the law enforcement agency involved.
2. A review of the medical-legal investigative office (coroner or medical examiner) records, including investigation reports and autopsy reports, together with toxicologic information and conclusions as to the cause of death.
3. A comparison of all cases where complete details existed to determine what patterns were present in the nature of the confrontations.

Information from the 30 cases revealed the following:

Age:	*Range: 24-53 years*
	20s 7
	30s 14
	40s 8
	50s 1
Gender:	Male 30
	Female 0
Race:	White 12
	Black 13
	Hispanic 5
Behavior:	Violent/Bizarre 30
Struggle:	Yes 28
	No 0
	Unknown 2
Effectiveness of OC:	Effective 4
	Ineffective 18
	Partially Effective 7
	Unknown 1
Restraint Techniques:	Hog-tying 5
	Handcuffs 6
	Cuff/Leg Restraint 15
	Strapped to Stretcher 4
Drug/Alcohol Involved:	Yes 23
	No 5
	Unknown 2
Significant Disease Present:	Yes 12
	No 18
	Unknown 0

The 30 cases, all involving male decedents, share several commonalities. All subjects behaved in a combative and/or bizarre manner and struggled with the police. Drugs and/or alcohol were involved in most cases. In the majority of cases, OC spray was either ineffective or less than totally effective. Generally, restraint techniques were employed subsequent to spraying, and with one exception, all deaths occurred either immediately or soon after the confrontation.

Sufficient information was obtained in 22 of the 30 cases to allow for a thorough review of the incident so a reasonable conclusion as to the cause of death could be determined. Specifically, an autopsy and the police report were necessary so an entire incident could be reviewed to ensure that all causal and/or contributory factors to the death were examined. The reviews' results indicate that OC was not the cause of death in any of the cases.

In the one case where OC was listed in the autopsy report as a factor in the death, the review did not substantiate that opinion. Our review concluded that, in these cases, OC was not a factor in any of the deaths and that something else caused the subject to die. More specifically, it was concluded that in 18 of the 22 cases, positional asphyxia was the cause of death, with drugs and/or disease also being contributing factors. In the remaining four cases, three involved a drug (cocaine)-related death, and one involved a drug (cocaine)/disease-related death.

The circumstances leading to positional asphyxia in many cases were probably initiated by handcuffing subjects (behind the back) and having them on their stomachs or in a position that allowed them to end up on their stomachs. In some cases, ankle restraints were concomitantly employed with hog-tying and/or pressure on the back by an officer. Subjects were also often transported in a prone position, and a number of them were markedly overweight with "big bellies."

In such a prone, secured position, it is very difficult for any individual to breathe. In most instances, drugs (including alcohol), disease and obesity made the subject even more vulnerable to being denied proper breathing.

In conclusion, in none of the 22 cases was OC considered to be a cause of, or a contributor to, the deaths. Rather, the cause of death in the majority of cases was determined to be positional asphyxia, aggravated by drugs, disease and/or obesity.

Custody-Related Deaths

Although OC was not implicated as a lethal factor in the reported deaths, further discussion of sudden death in custody is warranted because of the potential for certain individuals to die in police custody. While subsequent evaluation of civil and criminal liability is often incumbent on the courts, an extensive investigation by the individuals charged with determining the cause of death is also required (Mittleman and Davis, 1991). To reasonably establish the cause of death, a broad range of factors must be considered:

- Nature of the confrontation
- Weapon(s), if any, employed by officers
- Amount and duration of physical combat
- System or type of restraint employed
- Transportation of the subject
  - —Destination
  - —Duration
  - —Mode of transport (police car, EMS vehicle)
  - —Position of subject during transport
- Emergency room observations and actions
- Postmortem examination (autopsy) of subject
  - —Nature of injuries
  - —Diseases present
  - —Drugs present
  - —Other physical factors

While custody deaths are rare, they tend to share common elements which occur in a basic sequence. Subjects will often display bizarre or frenzied behavior. Almost always, the subjects are intoxicated by drugs and/or alcohol. Usually, subjects will engage in a violent struggle with the police, requiring the officers to employ some type of restraint technique. During or immediately after the struggle, the subject becomes unresponsive, goes into cardiopulmonary arrest and does not respond to resuscitation.

Experts postulate that often the mechanism of sudden custody death is an abnormal heart rhythm produced by one or more of the following: the arrhythmogenic potential of catecholamines released during the struggle, certain drugs (e.g. cocaine, amphetamines) and alcohol. All of these substances work directly on the heart and can produce fatal arrhythmias (DiMaio and DiMaio, 1989). In addition, certain restraint techniques (i.e., hog-tying and prone positioning) combined with intoxicants and catecholamines can contribute to death (DiMaio and DiMaio, 1989; O'Halloran and Lewman, 1993).

Determination of cause of death is often problematic regardless of the causative conclusions rendered. Attesting to the perils of investigating and certifying custody death, Luke and Reay contend that "there is no more slippery slope than death in custody" (1992, 98). Such deaths often follow violent struggles with police and create the potential for significant legal and departmental ramifications. Witnesses may misinterpret such events as police brutality. Family members, the news media and concerned citizens' groups may become involved and demand further case investigation and even outside case intervention. The potential complications are exacerbated by the fact that often little pathological evidence is demonstrated at the autopsy (Luke and Reay, 1992; DiMaio and DiMaio, 1989; Reay et al., 1992). When negative findings are reported, accusations of conspiracy or incompetence may be directed at the medical examiner's/coroner's office. Involved police officers may be similarly accused and subsequently required to further justify their actions.

Moreover, due to the lack of or difficulty in interpreting pathological evidence, the cause of death may be misattributed to police action (see Mittleman and Davis, 1991, for an excellent discussion of this possibility). Wetli (1991, 3) cautions that "sole reliance upon anatomical findings for the determination of the cause and manner of death is fraught with error" as "death certification must rely upon physical evidence and witness testimony." Hirsch and Adams (1993, 140) similarly warn that "the pathologist who focuses solely on anatomic causes of death is doomed to fail . . . equally important are the evaluations of the history, circumstances surrounding death, and the fatal environment."

Based on these considerations, law enforcement personnel must be aware of and familiar with deaths in custody. The benefits of such understanding are twofold: police may potentially avert death by recognizing symptomatology and thus rendering/obtaining assistance; or if a fatality does occur, police will be familiar with the problems associated with custody death investigation and certification.

General Conditions

Research suggests that four conditions may account for the majority of custody-related deaths: positional asphyxia, cocaine intoxication, excited delirium and neuroleptic malignant syndrome. Each condition is subsequently discussed, so law enforcement personnel will have a basic familiarity with some of the various presentations of these general types of custody deaths.

Positional Asphyxia. Positional asphyxia occurs when body position interferes with respiration, resulting in asphyxia (Reay et al., 1992). Positional asphyxial deaths tend to occur in a similar manner: maximally restrained subjects, unless seated upright in police vehicles, may become quiet and inactive after several minutes of transport. Respiratory difficulty is exhibited, and subjects subsequently stop breathing.

Certain factors can render individuals more susceptible to sudden death due to positional asphyxia. Such predisposing factors include drug/alcohol intoxication (Bell et al., 1992); excited delirium (O'Halloran and Lewman, 1993); and violent muscular activity. Acute alcohol intoxication is a major risk factor because respiratory drive is reduced, and subjects do not realize they are suffocating. Excited delirium combined with certain restraints (e.g., hog-tying) can also increase the susceptibility to sudden death by placing catecholamine stress on the heart. Subjects who have engaged in violent activities are rendered more vulnerable to subsequent respiratory muscle fatigue. Such fatigue may prove fatal to a restrained subject whose movement is restricted.

Experts (Reay et al., 1992; O'Halloran and Lewman, 1993) contend that maximal, prone restraint techniques can have sudden lethal consequences. This potential is increased in intoxicated, delirious and/or violent individuals. Law enforcement personnel should employ alternative restraint methods (e.g. upright, seated positioning) whenever feasible. In situations where prone restraints are necessary, subjects should be closely and continuously monitored.

Cocaine Abuse and Toxicity. Cocaine is an agent that stimulates both the central nervous and the cardiovascular systems. Pharmacologically, cocaine constricts blood vessels, elevates heart rate, raises blood pressure and increases body temperature. Such effects have produced lethal anatomic catastrophes in individuals without underlying preexisting anatomic disease(s). Mittleman and Wetli (1991) note that the medical literature clearly documents cocaine-induced vasoconstriction, vasospasm and hypertension that has culminated in spontaneous intracranial hemorrhage and infarcts of the cerebrum (i.e. strokes), kidney and intestinal tract. Cocaine may also be the cause of death in cardiovascular incidents where there is no anatomic abnormality (Mittleman and Wetli, 1987). Likewise, these effects can substantially compromise an already diseased heart or vascular system, and potentially culminate in fatalities (Mittleman and Wetli, 1987).

Of further concern is the fact that there is not an individual minimal lethal dose since fatalities have been associated with a wide range of concentrations including very low concentrations (Mittleman and Wetli, 1987). For example, the sudden

occurrence of seizures and death has been documented in recreational users who chronically use even small amounts of cocaine (Fishbein and Pease, in press). Apparently, this phenomenon is the result of a kindling effect, a reverse tolerance whereby the sensitivity of the brain to cocaine is increased, and the brain's seizure threshold is lowered. Fishbein and Pease (in press) note that such potentially lethal seizures may occur any time.

Alcohol substantially increases the risk of sudden death when combined with cocaine. Researchers (Escobedo et al., 1991) suggest that the cardiotoxic effects of alcohol potentiates the cardiotoxic effects of cocaine, thus increasing the risk of overdose death. Wetli (1993) indicates that the risk of sudden death is increased 18-fold when cocaine is used in combination with alcohol. This may be due to the production of cocaethylene, a result of this combination.

Mittleman and Wetli (1987) note that recreational cocaine use may be lethal via its pharmacologic effects. They argue that the role of cocaine in precipitating a hypertensive or cardiovascular crisis must seriously be considered when investigating sudden death in a population where cocaine abuse is prevalent. Police should be aware of the potential lethality of cocaine use.

Cocaine-Induced Excited Delirium. Excited delirium is an acute mental disorder characterized by impaired thinking, disorientation, visual hallucinations and illusions (Wetli and Fishbain, 1985). Behavior is consistent, purposeless and often violent. Significantly increased body temperature (hyperthermia) is part of the syndrome (O'Halloran and Lewman, 1993). Excited delirium may be part of the spectrum of manic-depressive psychosis, chronic schizophrenia and/or acute drug intoxication (cocaine, PCP and amphetamines).

The most serious psychiatric consequence of cocaine abuse is cocaine-induced excited delirium (cocaine psychosis), which may be associated with sudden death (Wetli and Fishbain, 1985). Although most individuals will respond to treatment, cocaine-induced excited delirium is usually regarded as a potentially lethal medical emergency. Wetli (1992) notes that hyperthermia is a negative prognostic factor frequently associated with sudden, unexpected cocaine-induced delirium deaths.

Cocaine-induced excited delirium fatalities tend to occur in a stereotypic manner, with subjects exhibiting similar behaviors. Generally, symptoms begin with an acute onset of intense paranoia, immediately followed by violent and/or bizarre behavior. Such behaviors include displaying violence toward inanimate objects (particularly glass), running, screaming and stripping off clothing (Wetli, 1992). Subjects appear psychotic, exhibit great strength and appear to have a significantly diminished sense of pain. Police must necessarily restrain such individuals, and a violent struggle generally ensues; however, force used by police often has minimal effects. Sudden death occurs either during or immediately after the struggle. Wetli (1992) explains that the mechanism of death is uncertain, and autopsy findings are generally nonspecific, revealing only injuries sustained from the struggle with the police.

Police officers should be aware of the potential for sudden unexpected death resulting from cocaine-induced excited delirium. Police should be able to immediately recognize attendant symptoms, including any one or combination of the following:

- bizarre and/or aggressive behavior
- shouting
- paranoia
- panic
- violence toward others
- unexpected physical strength
- sudden tranquility

Subjects exhibiting any of these symptoms should be promptly transported to a nearby medical facility. Close and constant monitoring during transit is warranted.

Neuroleptic Malignant Syndrome. Neuroleptic malignant syndrome (NMS) is another recognized cause of sudden, unexpected death. This syndrome presents characteristics in a manner very similar to excited delirium (Reay et al., 1992). Neuroleptic malignant syndrome generally occurs in psychiatric patients who are taking antipsychotic medication (i.e., neuroleptics). Physical exhaustion, dehydration and organic brain disease are additional predisposing factors. Symptoms include hyperthermia, fluctuating levels of consciousness and hypotonicity (i.e. limpness) of skeletal muscles.

NMS may also occur in individuals who are not being treated with such medication. This specific form is often diagnosed as acute exhaustive mania. The condition is poorly understood and may be related to a cardiac event due to psychological stress (Reay et al., 1992). Hirsch and Adams (in Spitz, 1993) contend that the common lay term "scared to death" is literally true: psychological stress can induce fatal cardiac arrhythmias. However, autopsy findings are generally negative, seldom revealing a pathological cause of death (Reay et al., 1992).

Anyone exhibiting symptoms of NMS or acute exhaustive mania should be taken immediately to a medical facility for evaluation. Optimally, this transport should involve two officers, thus allowing for the close and constant monitoring of the subject in custody.

Conclusion

Sudden death in custody is neither a new phenomenon nor attributable to the use of OC spray. Rather, sudden custody death can occur at any time for a variety of reasons. Any law enforcement agency may experience a sudden custody death, regardless of OC involvement. Consequently, officer awareness and recognition of risk indicators are necessary to ensure subject safety and minimize the risk of sudden custody death. These indicators generally include:

- bizarre/violent activity
- obesity—especially "big bellies"
- drug and/or alcohol involvement
- apparent ineffectiveness of spray

Diligent observation and constant monitoring of subjects displaying any one or a combination of the indicators are procedurally warranted. Furthermore, the use of maximal, prone restraint techniques should be avoided. If prone positioning is required, subjects should be closely and continuously monitored. By implementing such procedural protocols, the potential for custody deaths may be lessened.

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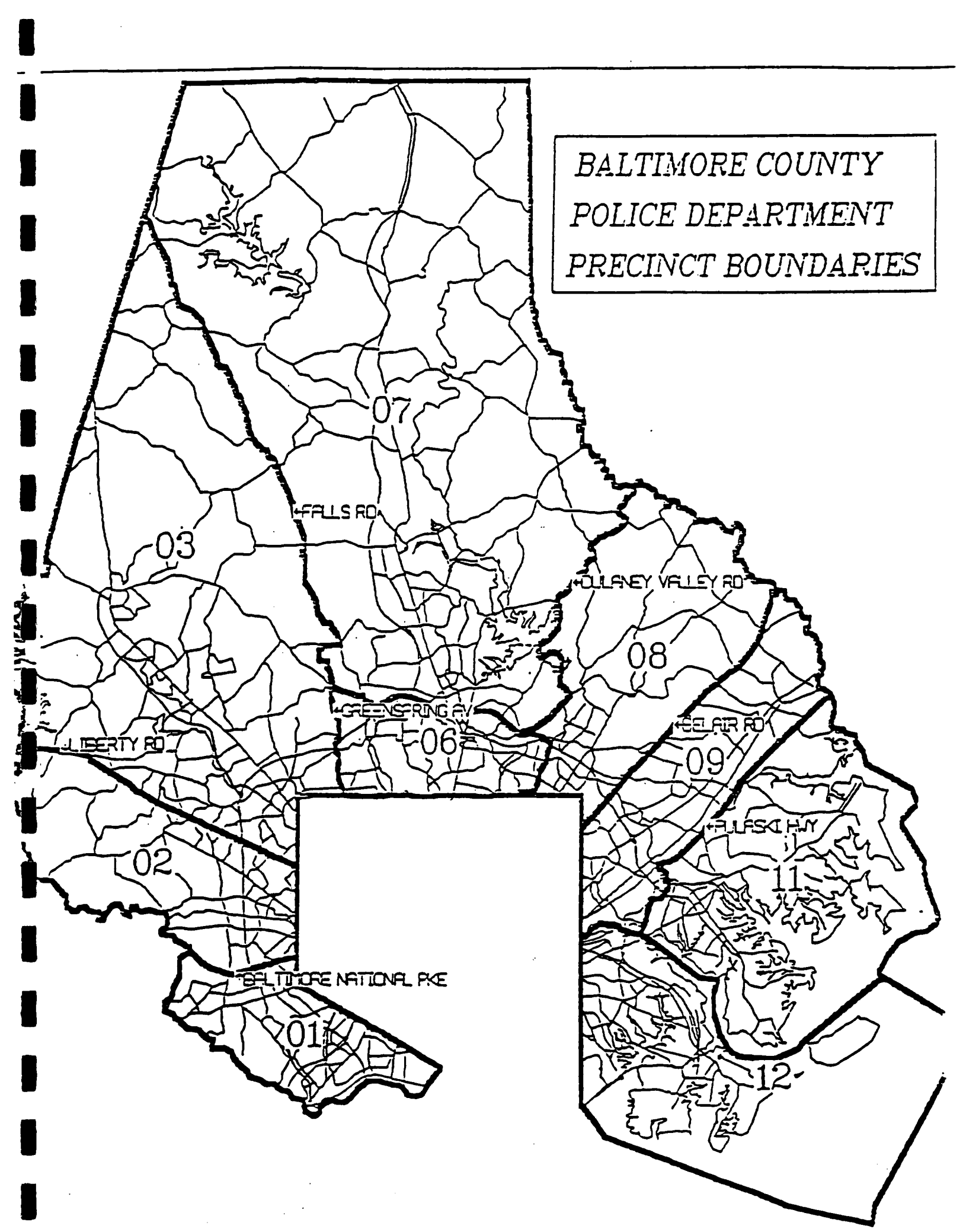
Reporting In-Custody Deaths

The National Institute of Justice-funded Technology Assessment Program is dedicated to continuing this effort to identify, as early as possible, patterns of adverse responses to any less-than-lethal product that may suggest procedural changes to enhance safety or suggest any warnings that might be necessary to protect the public and law enforcement personnel. The program requests that all law enforcement agencies experiencing a death following the use of OC spray or any other less-than-lethal technology contact the Technology Assessment Program Information Center (TAPIC) at 1-800-248-2742. The information given will be used for the continuing study of the utility and viability of less-than-lethal weapons and will only be released in the aggregate without reference to specific cases.

Technology Assessment Program Information Center
1600 Research Blvd. ○ Rockville, MD 20850 ○ 800-248-2742

Appendix C:
BCPD Precinct Boundaries


BALTIMORE COUNTY
POLICE DEPARTMENT
PRECINCT BOUNDARIES
07
FALLS RD
03
OLNEY VALLEY RD
08
GREENSPRING AV
06
LIBERTY RD
09
EDGEMERE RD
02
PULASKI HWY
11
BALTIMORE NATIONAL PKE
01
12

Appendix D:
Data Collection Sheet

IACP/Baltimore County
Oleoresin Capsicum Data Collection Sheet

C.C.# _____ Date _____ Time _____

Name _____ Precinct/Function _____

NATURE OF INITIAL CONTACT

BCPD Situation Found Code _____

USE

☐ Indoors ☐ Outdoors ☐ In Vehicle

WEATHER CONDITIONS IF OUTDOORS

☐ Sunny ☐ Cloudy ☐ Windy ☐ Rainy ☐ Snowy ☐ Other _____

SUSPECT INFORMATION

Name _____ DOB _____

Race _____ Sex _____ Height _____ Weight _____

Body Frame: ☐ Small ☐ Medium ☐ Large

SUSPECT BEHAVIORAL CONDITION AT ENCOUNTER

☐ Calm/Passive ☐ Intoxicated ☐ Drugged ☐ Mentally Ill ☐ Belligerent

☐ Other (describe) _____

FORCE OR THREAT OF FORCE AGAINST OFFICER

☐ Firearm ☐ Knife ☐ Physical Force ☐ Other (specify) _____

OC INFORMATION

Application point on body _____

Distance sprayed _____ Number of sprays _____

Describe actions of suspect after application. _____

_____

Was suspect incapacitated enough to ease arrest? (explain) _____

_____

INJURY

Officer: ☐ Yes ☐ No Suspect: ☐ Yes ☐ No

If yes, describe injury. _____

First Aid Administered: ☐ Yes ☐ No

If yes, describe. _____

DECONTAMINATION NEEDED

☐ Yes ☐ No

If yes, describe. _____

ANIMAL USE

Animal Type _____ Distance Sprayed _____

Animal Behavior: ☐ Attacking ☐ Threatening

Animal Size: ☐ Less than 25 lbs. ☐ 25-50 lbs. ☐ 50 lbs. plus

ADDITIONAL COMMENTS _____

_____

(Continue additional comments on reverse side if necessary.)

_____ _____