

# Use of Force Policies and Training Recommendations: Based on the Medical Implications of Oleoresin Capsicum

*by Darrell Ross, Ph.D. and Bruce K. Siddle*

## *Introduction*

It has long been recognized by law enforcement personnel that a void exists in the range of authorized types of less-than-lethal force equipment that are available to them to control a resisting individual in an arrest situation. Beyond empty-hand control techniques, historically officers have utilized an impact weapon and/or their firearm as a response measure to varying levels of subject resistance. In violent situations, officers may be obliged to choose an unnecessarily strong option for lack of an alternative force measure. The use of force presents at least three potential problems for both the police and members of society. First, officers may have to respond to a situation with more force than is necessary, due to a lack of additional force options available to them. Secondly, officers and their departments have been the subject of a growing trend of civil litigation for allegations of excessive force and police brutality which frequently has placed the agency and the community in a financial hardship as a result of many multi-million awards that have been assessed against police departments, or for cases settled out of court. Thirdly, police and community relationships have been strained as a result of the continued debate over appropriate force measures or equipment the police should be allowed to use. Clearly a balance must be maintained that provides effective and safe law enforcement while at the same time minimizes the risk to life.

Based on the need to provide law enforcement officers with alternatives to lethal force, three separate meetings have been convened over the years (1972, 1986 and 1992) by the U.S. Department of Justice with federal, state and local law enforcement agencies, Department of Defense representatives, scientists, and academicians. The purpose of these meetings has primarily been to explore the possibility of developing technology for less-than-lethal force devices. As a result of these meetings many research proposals have been funded to study various types of less-than-lethal force equipment presently being utilized in the field and to examine several new technologies that might be

developed for use in law enforcement. Additional research is still ongoing in the field.

Of particular interest to law enforcement officers has been the introduction of Oleoresin Capsicum (OC; pepper spray) as a less-than-lethal force option for officers to consider when faced with a resisting individual. Products using spicy oils in sprays to incapacitate an individual or an animal have been used in the United States since about 1977 (Salem, et al, 1993; DuBay, 1995). Since the late 1980's, OC has grown in its use by police, mainly due to its popularized efficacy in temporarily incapacitating subjects, with minimal risk of injury to the officer or suspect. Although a majority of manufacturers and several law enforcement professional groups or associations have supported the widespread use of the product in law enforcement, other professional police training groups and the American Civil Liberties Union (ACLU) of Southern California (1993) have challenged the effectiveness and are supporting a more conservative use of OC. Manufacturers of OC have asserted that OC is safe, non-toxic, and a low risk product which does not cause permanent or long term health problems or death to subjects or officers.

The rise in the frequency of the application of OC by police has also been paralleled by the increase in the number of deaths or injuries following its use (Steffee, et al., 1995; NIJ, 1996). Due to the increase in the applications of OC in numerous force situations the National Institute of Justice has been tracking the number of deaths which have occurred when OC was used. Since 1993, NIJ has reported 60 in-custody deaths following OC exposure by police. One of these deaths was listed as asphyxia due to bronchospasm precipitated by pepper spray, as reported by the medical examiner (Flannagan, 1993). The state of California has witnessed 26 deaths where OC was used and in one third of these cases civil litigation has resulted against the police agency. In two cases, settlements have been paid out (ACLU, 1995). Other states such as Michigan and North Carolina have witnessed OC related litigation as well.

As the number of deaths continue, questions over the medical implications of using OC increase. Currently a cloud of controversy hovers over the long-term health risks that are potentially associated with OC usage. Both short-term and long-term medical research by manufacturers is non-existent and recent discovered medical literature research reveals the existence of health care risks to limited and/or longer exposure to OC (Salem, et al., 1993; Stopford, 1996). The research also indicates that OC products may be connected to a variety of health hazards, if officer training is not monitored and designed correctly.

### *Purpose of the Report*

There is little controversy over whether the usage of OC products have proven to be a positive subject control tool. Since its introduction as a less-than-lethal force option, it has been used thousands of times successfully to de-escalate varying levels of resistance, and is directly responsible for decreasing the incidents of serious injuries to officers and subjects (Gauvin, 1995, Farenholtz, 1993; NII, 1995). But with any subject control technique, there are inherent risks which require further strict scrutiny and analysis, and also dictate a level of common sense and responsibility.

The purpose of this report is to reveal a large body of evidence which documents the serious negative medical implications of OC exposure. The research indicates that usage of OC products possess several health risks to humans which could result in serious injury or death to some members of the population. It is not our intent to suggest or recommend the use of OC products should be discontinued. We strongly support the use of OC products as an intermediate tool. Rather, our intent is to provide an overview of the documented medical research for police officers, administrators and trainers of the potential short and long-term health risks associated with the utilization of OC products. The primary focus being to provide an awareness of the hazards and then to recommend prudence in the development of officer training and use of less-than-lethal force policies. This report is a summary of a larger research analysis conducted relative to the medical implications of OC products being finalized by Mike Doubet (State of Minnesota Wildlife officer), for PPCT Management Systems Inc. Doubet was awarded a grant by PPCT in 1995 to research the existing medical and other relevant literature concerning OC.

### *Research Methodology*

The method used for this research primarily involved content analysis. A medline search produced over 150

medical studies relative to OC research and form the basis of this report. Additional studies conducted by police, incident reports of OC usage in the field, other research reports, and analysis of several autopsy reports of deaths of subjects where OC was used was also examined. Moreover, several focus interviews with medical examiners, medical researchers, manufacturers of various OC products and law enforcement personnel were conducted. The analysis continues to be ongoing, but comprised well over a year to compile and review the research.

Research data was analyzed with the intent of determining the following research questions:

1. What if any specific health risks are associated with the usage of OC products.
2. What medical studies exist which document the medical implications of OC exposure?
3. Is there a segment of the population more vulnerable to the health risks associated with OC exposure?
4. What medical research has various manufacturers conducted which document the acceptable usage of their products?

### *Brief Medical Review*

Manufacturer's of OC products were contacted and were requested to complete a questionnaire relative to their medical research on their respective products. None of the 16 manufacturers responded to the questionnaire, nor submitted any medical documentation regarding their product. The majority of the manufacturers have relied on a study conducted by the Federal Bureau of Investigation (FBI) (Weaver and Jett, 1989) and the assumption that oleoresin capsaicins are a by-product of ground chili peppers.

On the surface, most police administrators and trainers would accept the FBI study without further research. Historically, when the FBI produces a report based on testing and research, there is need to question the validity of their findings. However, the FBI's study on OC products now appears to be invalid. On February 12, 1996, the CNN U.S. News and Associated Press reported the following:

"FBI agent, Thomas Ward admitted in Federal Court in Miami Monday, that he received more than \$57,000 over a two year period from the maker of Cap-Stun. Ward wrote an update of his research on the product while training FBI

personnel at the FBI Academy. Based on his research and testing, the FBI purchased Cap-Stun for use by all agents."

This report clearly raises questions of validity of the FBI study on the safety of OC products. Of equal importance, hundreds of agencies have purchased OC products on the basis of the FBI study and have relied on this study as defense in the event of litigation. The implications of this discredited study are yet to be fully appreciated.

The safety of OC products as a natural by-product of chili peppers is also observed as controversial. Medical research examined reveals known hazards associated with OC products. Salem et al. (1993) conducted a review of the medical literature for the Department of Defense. In their report they discovered numerous medical studies which indicate that OC may cause:

"mutagenic effects, carcinogenic effects, sensitization, cardiovascular toxicity, pulmonary toxicity, neurotoxicity and human fatalities," The report also indicates that OC may induce mucous fibrosis in the oral cavity and play a role in the development of esophageal cancer."

A second medical report (Stopford, 1996) links capsaicin to gastric cancers, loss of vision, brain and nerve damage chronic airway diseases, as well as pulmonary edema and respiratory arrest in asthmatics. Stopford's report is based on the use of capsaicin in the chili pepper industry and a synopsis of correctional officers who required medical attention after being exposed to OC during inservice training. The following highlights selected findings of the report:

**Cancer:** In human populations who use peppers routinely in their diet, there is an increased incidence of gastric cancer, with risks as high as 5 fold greater than in individuals not using peppers in their diets.

**Laryngospasm and Respiratory Arrest:** Asthmatics are more sensitive to the bronchoconstriction effects of capsaicin than normal with up to a 40% decrease in air flow. In addition to the precipitation of an acute asthmatic attack, OC spray may increase the risk of respiratory arrest. Respiratory arrest was reported in two asthmatics and one individual with chronic bronchitis after OC spray exposure during an arrest and in another individual who was sprayed repeatedly at the time he had a respiratory tract infection. This effect may be secondary to laryngospasm. Direct contact of vocal cords to capsaicinoids associated with laryngospasm lasting up to 45 seconds. Laryngospasm and respiratory arrest occurred after intentional OC spray inhalation by a child.

**Pulmonary Edema:** Pulmonary edema occurred after intentional OC exposure in a child, Pulmonary edema was also noted in an asthmatic who had respiratory difficulty and a respiratory arrest after being sprayed with OC during an arrest. Risk of pulmonary edema increases with prior infection with parainfluenza virus or mycoplasma infection.

**Hyperactive Crisis:** Acute elevation of blood pressure, such as seen with capsaicin inhalation, may cause headaches and are associated with an increased risk of stroke and heart attacks.

**Eye Damage:** In humans, OC spray is associated with severe twitching of the eyes, stinging, lacrimation and spasmodic closing of the lids. A 1 % capsaicin application to the cornea results in neurogenic inflammation and loss of reaction to chemical and mechanical stimuli for at least one week. The loss of the superficial sensation of the cornea and the blink reflex can result in corneal abrasions with contact lens and abrasions if foreign bodies get into the eye.

Finally, two separate reports of children being accidentally sprayed with OC is troubling. As reported by the California EPA office: "an infant was accidentally sprayed in the face with 5% spray on October 6, 1994. Immediate gasping and nosebleed was followed within 2 minutes by apnea and cyanosis. Mouth to mouth respiration was initiated immediately, he was intubated to support respiration upon arrival at the hospital about 20 minutes later. Anemia, hyperkalemia, and hematuria developed over the next 24 hours. Mechanical respiration was required for the next several days, as well as antibiotics for a throat infection and bilateral thoracostomy for pulmonary air leaks. A heart-lung machine was needed at day 4, which was continued for about 6 days till his lungs healed enough to support respiration." The infant did survive and was released from the hospital approximately 14 days later, Winograd (1977) reported that an 11 year old boy who deeply inhaled OC spray coughed for 1 hour then was asymptomatic until 4 hours after exposure, when nonfatal pulmonary and laryngeal edema with stridor and respiratory arrest supervened.

These medical reports are troubling and pose significant considerations to law enforcement. The research questions posed in this study have been more than answered in the positive, as the medical research indicates a consistent pattern where OC products may be hazardous to individuals with respiratory conditions or vascula disease. Of equal concern is the long term effects of OC exposure to the eyes, particular the potential risk of cornea damage. Both Salem's and Stopford's research reveal that the

majority of OC products contain carcinogenic and mutagenic effects, and "may" play a role in the development of certain types of cancers. This issue alone could become an administrative nightmare in future years relative to both civil litigation and workmen's compensation claims.

## *Implications*

### USE OF FORCE POLICY RECOMMENDATIONS

All control techniques and products in law enforcement have inherent risks. It is well known that any technique or tool may have a lethal potential to a relatively small percentage for the population. However, the research on the short term effects of OC clearly indicate that OC could be fatal to individuals with cardiac or respiratory conditions. The research and interviews with a majority of the police personnel in this study revealed that their department does not have a clear policy statement or guidelines for utilizing OC. Based on the findings of this report, administrators are encouraged to review their use of force policies and develop a section on the proper and authorized usage of OC for their department. A force continuum should be developed which is the heart of the policy and which will also serve as guidance for officers when considering to use OC. Policy should be written in accordance with state laws and in accordance with established U.S. Supreme Court decisions concerning the use of force. In light of the medical implications, OC should be considered an intermediate weapon level of control. Clear assessment of the arrest situation variables based on the reasonable perception of the officer should assist in deciding whether to expose a subject to OC. Procedures should be developed which articulate under what circumstances OC may be used, decontamination measures, responding to possible medical complications, monitoring of the subject, transportation procedures, and appropriate incident report components. Administrators are encouraged to development a tracking system which documents the official uses of OC products, including but not limited to health effects determined from medical examinations immediately following the incident should such treatment be required. It is also recommended that administrators request all medical safety studies from their OC manufacturers. The "best defense" ultimately will come from the manufacturers research.

## *Training Recommendations*

Of equal importance is the direct health hazard to criminal justice personnel who receive training in OC and/or who exposed to OC in a field application. Line officers have the right to expect their equipment will operate within minimal

accepted safety levels. Although reasonable judgement requires officers to accept a level of responsibility in the handling of their equipment, officers should not be subjected to products which have questionable hazards.

While OC spray is a valuable tool for criminal justice personnel in controlling resistive subjects, the risks of possible injuries to officers does not warrant full exposure to officers. Medical research implications and both federal OSHA in two states (Florida and Michigan) occupational safety administrations recommend the following when conducting training with line personnel:

1. Inform employees of all the hazards of all of the chemicals that are present in the OC product the agency is using.
2. Conduct medical screening of all employees, including trainers, to help detect pre-existing medical conditions that might preclude the use of OC spray. This screening should be approved by a physician.
3. Provide adequate eye (goggles) and face protection (face shield) for individuals when exposing them to the actual spraying process.
4. Have designated medical personnel and equipment at the training site to render first aid and medical assistance. Medical personnel should be an LPN, RN or an MD.

All training should comply with both state and federal OSHA standards and trainers are encouraged to research the applicable standard in their state. It is strongly recommended that officers do not fully be exposed to OC without eye and face protection. Indirect exposure is suggested by spraying OC into a trash can and having the officer experience the effects of OC through residual fog. A second method of indirect exposure is to have officers spray OC into a cloth and wipe the cloth around the cheeks to avoid direct contact into the visual and respiratory systems.

Both of these procedures minimize the officers' exposure to a potential health hazard, and unnecessary risk of workman's compensation or disability claims, If officers who are wearing protective eye and face equipment are exposed to OC through a direct spray, they should be closely monitored by the trainer. Ensure to decontaminate all officers after spraying. If medical symptoms persist after the normal recovery period, the officer should be

transported to the nearest medical facility for appropriate medical attention.

## Conclusion

This medical review has clearly illustrated three critical concerns regarding the medical implications of using OC. First, the medical literature is replete with studies which document the associated potential health risks associated with OC exposure. Of concern is the potential risks to the eyes, the respiratory and circulatory system to a variety of subjects in the population. Secondly, administrators must revise their use of force policies and provide guidance to their officers when the use of OC is appropriate. Based on the medical research presented in this report, a conservative placement of OC as an intermediate weapon on a force continuum is recommended. Moreover, reliance on one tool or product is highly discouraged. No tool or technique is 100 percent effective. Therefore, it is also recommended that administrators continue to provide ongoing training to line personnel and supervisors in empty-hand control techniques and the impact weapon in order to respond to varying resistive situations. Proficiency in these methods is vital to officer safety. Finally, trainers must use reasonable training approaches when training line personnel in how to correctly use OC. Officers should not be exposed to a direct spray of OC without protective equipment and trainers should, as with all training, strive to create and maintain the safest training atmosphere possible for all student.

Trainers are encouraged to obtain OSHA standards and additional research in this area which will enhance their training delivery. A proactive approach and reasonable forethought to considerations mentioned in this report will assist in providing the best training possible for line officers as well as provide for reasonable responses to use of force situations in the field.

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