Office of Justice Programs Resources

Impact Munitions Use: Types, Targets, Effects. NIJ, 10/2004, NCJ 206089

More and more law enforcement agencies are using impact munitions as part of their weapons arsenals. These less-lethal devices give police the means to subdue and arrest potentially dangerous individuals and to disperse unruly crowds with less chance of injury or death to suspects, innocent bystanders, or themselves. Unfortunately, little is known about the circumstances under which impact munitions have been used or the physical effects they have on individuals in the field. This study seeks to fill that knowledge gap. Available on the Government Innovators Network [Here](#)

Performance Characterization Study: Noise Flash Diversionary Devices (NFDDs). NIJ Sponsored, 12/23, NCJ 205642

This report presents results from the testing of eight different less-than-lethal Noise Flash Diversionary Devices. Available on the Government Innovators Network [Here](#)


This report describes the nonlethal weapons and equipment currently used (October 2004) by the Department of Defense (DOD) and the U.S. Coast Guard, as well as less-lethal devices used by a number of local law enforcement agencies and the U.S. Marshals Service. Available on the Government Innovators Network [Here](#)

Impact Munitions Data Base of Use and Effects. NIJ-Sponsored, 2002, NCJ 204433

This study obtained data about the use and effects of impact munitions (rubber bullets, wooden dowels, bean bags, etc.) in order to inform both the policymakers who must decide whether and how to integrate impact munitions into their agencies' use-of-force options and the line officers who might use them in the field. Available on the Government Innovators Network [Here](#)

Deaths in Police Confrontations When Oleoresin Capsicum is Used. NIJ, 2/2004, NCJ 204029

This document discusses fatal incidents in which law enforcement officers use oleoresin capsicum (O.C.) to control a subject. Available on the Government Innovators Network [Here](#)

The Effectiveness and Safety of Pepper Spray. NIJ, 4/2003, NCJ 195739

Though generally assumed to be safe and effective, the consequences of the use of pepper spray, as with any use of force, can never be predicted with certainty. To expand the scope of knowledge on such a complex subject, this Research for Practice examines two unpublished NIJ-funded studies on the use of pepper spray in real-life arrests and compares them with previous studies. While the research does not and cannot prove that pepper spray will never be a contributing factor in the death of a subject resisting arrest, it seems to confirm that pepper spray is a reasonably safe and effective tool for law enforcement officers to use when confronting uncooperative or combative subjects. Available on the Government Innovators Network [Here](#)
Variable Range Less-Than-Lethal Ballistics. NIJ-Sponsored, 1/2003, NCJ 199046

This final report presents the initial Phase I design of a Variable Range Less-Than-Lethal ballistic that would be detonated at close range to a suspect in order to achieve disorientation and/or incapacitation. Available on the Government Innovators Network Here

Pepper Spray's Effects on a Suspect's Ability to Breathe. NIJ, 12/2001, NCJ 188069

Oleoresin capsicum (OC), or pepper spray, has gained wide acceptance in law enforcement as a swift and effective way to subdue violent and dangerous suspects in the field with relatively little force. However, it has been argued that OC spray, when used in combination with physical restraints, can lead to significant respiratory compromise, including asphyxiation and death. This Brief discusses the effect of OC on respiration, particularly when combined with positional restraint. Available on the Government Innovators Network Here


This report presents a visual effects assessment of the green laser-baton illuminator. Available on the Government Innovators Network Here


This federally funded study assessed the effects to humans of the Sticky Shocker device used by law enforcement in subduing an individual. Available on the Government Innovators Network Here


This report describes a 2-year study to collect and analyze data on injuries to police officers and suspects in North Carolina resulting from police use of oleoresin capsicum (OC) spray. Information for the study was obtained from the Charlotte-Mecklenburg Police Department, the Winston Salem Police Department, and the North Carolina State Highway Patrol. The analysis focused on injuries to police officers and use of excessive force complaints against the police. Study findings showed the issuance of OC spray was associated with a decline in the number of injured patrol officers per month and a decline in the monthly counts of suspects injured by the use of force by the Charlotte-Mecklenburg Police Department. Further, a decline in excessive use of force complaints lodged against patrol officers was associated with the implementation of OC spray. While OC spray could have implicated in changing counts of injured police officers and suspects at other study sites, available data did not provide sufficient evidence to make those claims. Available on the Government Innovators Network Here

Evaluation of Pepper Spray discusses the implementation process and field test results of a project to evaluate the effectiveness of pepper spray in police confrontations with humans and animals. A research team analyzed Baltimore County Police Department policies, implementation training, and use of pepper spray. Key issues include: whether OC spray can effectively incapacitate humans -- including those who are intoxicated, drugged, or mentally disturbed -- in confrontations with police and whether OC spray can reduce the number of assaults against police attempting to subdue or arrest hostile/aggressive subjects. The research showed that OC spray successfully incapacitated humans in 156 out of 174 (90 percent) confrontations. Available on the Government Innovators Network Here

Other Resources

M26 Taser: Year One Implementation, SPD Special Report, Seattle Police Department, 05/2002, NCJ 201842

This document focuses on the Seattle (Washington) Police Department's progress in implementing the Less Lethal Options Program, particularly the M26 Taser. The M26 Taser is laser-sited and uses cartridges attached to the end of the barrel that send 26 watts of electricity at over 50,000 volts over the copper wires with the effect of overriding a target's motor and sensory systems. Without the cartridge, the M26 Taser can function as a contact stun device. The M26 Taser has not been found to be harmful to persons with pacemakers or having other unusual health conditions. It is intended to provide officers with a force option to help in overcoming a subject's combative intent, physical resistance, and/or assaultive behavior; in disabling or subduing persons bent on harming themselves or others; or in providing self-defense. The department's field experience with the device in the first year of implementation shows that Tasers were used in a wide variety of incidents, involving mentally ill/suicidal subjects and traffic-related incidents. Sixty-three taser subjects were impaired, often severely, by alcohol, drugs, or a mental illness or delusion. A quarter of the taser subjects were armed, most often with knives. Taser subjects were most often males between the ages of 21 and 40. About half were Caucasian and another 42 percent were African-American. Tasers were used in the dart projectile mode about 60 percent of the time; in the stun mode, 27 percent of the time; and both modes were used 12 percent of the time. Verified taser contact was obtained in 86 percent of the incidents. In 85 percent of all of the incidents and in 92 percent of the incidents where contact was verified, the taser was credited with controlling the subject or bringing the situation to a resolution. Both officers and subjects reported low rates of injury during taser incidents when compared with the other use of force situations. No injuries were directly attributable to the taser device. Available on the Government Innovators Network Here


Discussing United Kingdom police officers' need for less lethal weapon technologies, this report reviews and evaluates commercially available weapon possibilities. After discussing the need for less lethal weaponry for the business of policing in crowds and other scenarios, the author of this report discusses the phases of review and assessment
of various less lethal weapons options. Discussing the various alternative technologies as impact or kinetic energy devices, long-range chemical delivery devices, water cannons, electronic devices, and distraction/disorientation devices, this report details each of the specific weapons being manufactured within these categories. A series of charts, graphs, and photographs describing the weapons and the results of impact testing for each potential police weapon is followed by evaluation criteria documenting the effectiveness of each weapon in policing. Health and safety issues are addressed along with operational issues within each category. After presenting the various weapons for evaluation as new police equipment, the author concludes that further testing of all of the described devices will continue to assess their potential use in policing. This report also includes a glossary of terms and suggestions for further research. Available on the Government Innovators Network Here

Capsicum Spray: The Record to Date, Parliament of Australia, 2002, NCJ 194630

This article discusses the use of capsicum spray by police as a tool for subduing citizens exhibiting violent or destructive behaviors. The physical effects of the spray are relayed and information is offered concerning the use of capsicum spray in Australia. The author begins this article by recounting the fact that in December 2001, a 33-year-old man died in police custody in Brisbane after being subdued by police using capsicum spray. A heart attack is the suspected cause of death. This case highlights the fact that there is controversy surrounding the use of capsicum spray. The author notes that a number of human rights organizations, including Amnesty International, have questioned the use of the spray by police. Furthermore, police use of capsicum spray has been rejected in the United Kingdom because of its possible carcinogenic properties. The physical effects of capsicum spray include intense burning, swelling, blistering, inability to breathe or speak, respiratory arrest, and acute hypertension. However, proponents of the spray point out that its benefits outweigh its potential dangers. They suggest that use of the spray results in fewer and less serious injuries to police and citizens. Also, its deterrent effects mean that violent behavior is minimized during potentially dangerous situations. The article goes on to recount the use of capsicum spray by police in Australia. The findings of a 1999 report of the use of the spray in Queensland demonstrate that the spray was found to be effective in subduing violent offenders. No deaths, injuries, or other medical problems were reported as a result of the use of capsicum spray. However, the report did not find support for the notion that use of the spray by police served as a deterrent to violence directed at police. The concluding comments by the author give support to the police use of capsicum spray as an additional tool in subduing dangerous offenders without the use of lethal force. Available on the Government Innovators Network Here


The Queensland Police Service (Australia) recently conducted a trial issue of defensive spray to operational police in two police regions; this report describes the implementation and evaluation of the trial and offers recommendations for the future use of defensive spray. The issuing of defensive spray -- specifically oleoresin capsicum (OC) spray -- to police was a recommendation of the Queensland Police Service Project Lighthouse report (1996) and follows similar moves by interstate police services. OC spray is intended to give police an additional tool for use in resolving threatening, dangerous incidents. A joint Queensland Police Service-Criminal Justice Commission Steering Committee was appointed in October 1997 to implement the trial; evaluate the trial, including the OC spray product; and make recommendations as to the future use of OC by the Queensland Police Service. The Steering Committee set the following criteria by which to judge the results of the trial: the spray's effectiveness; whether the spray was
used appropriately; the number of injuries/deaths caused or avoided by use of the spray;
and the impact on complaints against police. During the trial there were 35 incidents that
involved OC spray, all but one occurring during the second 6-month phase of the trial.
Seven of the incidents involved attacking dogs. In the 28 incidents involving human
attackers, there were 37 deployments (discharges) of OC by an officer against a subject
and 3 recorded uses in which the spray was presented to the subject but not discharged.
The overall conclusion of the Steering Committee was that the aims of the trial were
generally met. There were no serious problems with the use of OC spray during the trial,
and there were strong indications that OC spray would prove a useful addition to the
current range of incident resolution options available to Queensland police officers. Four
recommendations are offered for the implementation of police use of OC spray. 25
references and appended trial evaluation forms and data tables

NCJ Number: 201684
What's Good for Them, Is Good for Us: Outside Influences on the Adoption of Incapacitant
Sprays by the British Police, International Journal of Police Science & Management,
Volume 5 Issue 2, Summer 2003, Pages 98 to 111. John W. Buttle.

This article reviews the history of and the rationale for the adoption of incapacitant sprays
(mace and pepper sprays) in the United States and in England and Wales, reviews the
research on the health and operational implications of using such sprays on humans, and
questions the assumptions underlying the adoption of incapacitant sprays for policing
purposes; the implications of adopting other nonlethal weapons for use in policing are
also considered.

NCJ Number: 197763
Constructions of Legitimate Force: The Case of CS Sprays, British Journal of Criminology,

This paper examines conditions under which assessments are made regarding the
legitimacy of using chemical incapacitants such as CS (c-chlorobenzylidene
malononitrile), other sprays, and various non- or sub-lethal weapons.

NCJ Number: 196304
Assessing Chemical Incapacitant Sprays, International Journal of Police Science and

A 1996 Baltimore (Maryland) study, aimed at determining how effectively pepper sprays
incapacitated, indicated that sprays incapacitated individuals in only 70 percent of cases,
though it eased arrest 85 percent of the time. A study done in the Buffalo (New York)
Police Department between 1994 and 1997 focused on the use of incapacitants, their
effectiveness and injury potential, and their possible abuses. Evidence regarding use
showed that more and more officers were being trained with the sprays. Results showed
that the spray immobilized subjects in 67 percent of cases and compared favorably with
options such as the baton or flashlights. The possibility of abuse was explored by an
examination of complaints made against officers from citizens. Chemical force accounted
for 56 percent of the types of force noted on complaint forms.

NCJ Number: 195249
Effect of Oleoresin Capsicum "Pepper" Spray Inhalation on Respiratory Function, Journal
; Gary M. Vilke ; Jack Clausen ; Richard F. Clark ; Paul Schmidt ; Thomas Snowden ; Tom
Neuman.

This research performed a randomized, cross-over controlled trial to assess the effect of
Oleoresin capsicum (OC) spray inhalation on respiratory function by itself and combined
with restraint. A total of 35 subjects were exposed to OC or placebo spray, followed by 10 minutes of sitting or prone maximal restraint position (PMRP). Spirometry, oximetry, and end-tidal CO2 levels were collected at baseline and throughout the 10 minutes. Data were compared between groups and with predefined normal values. While in the sitting position, OC did not result in any significant changes in mean percent predicted forced vital capacity (%predFEV), percent predicted forced expiratory volume in 1 s (%predFEV1), oxygen, or CO2 levels. In the PMRP, mean %predFVC and %predFEV1 fell 14.4 and 16.5 percent for placebo and 16.2 and 19.1 percent for OC, but were not significantly different by exposure. There was no evidence of hypoxemia or hypercapnia in either group. OC exposure did not result in abnormal spirometry, hypoxemia, or hypoventilation when compared to the placebo in either sitting or PMRP.

Websites

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Comprehensive Bibliography