

Less Lethal Weapons: An Effectiveness Analysis

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A Senior Thesis submitted in partial fulfillment
of the requirements for graduation
in the Honors Program
Liberty University
Spring 2016

Acceptance of Senior Honors Thesis

This Senior Honors Thesis is accepted in partial fulfillment of the requirements for graduation from the Honors Program of Liberty University.

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Abstract

Less-lethal weapons have been effective at saving lives by providing police an option for defense or apprehension that does not involve a firearm. However, not all less-lethal weapons are created equal, and careful planning with a solid base of research must be done to insure that officers are prepared for every circumstance. The purpose of this study is to analyze the current information about less-lethal weapons and create a comprehensive breakdown of their strengths and weaknesses. This will include current statistics on the most common less-lethal weapons, as well as insight from scholarly sources. The strengths and weaknesses of a less-lethal weapon can be analyzed with the categories of lethality, or how often the weapon kills or seriously injures, and how often it is effective at ending an altercation. Each weapon will be examined in light of these categories, as well as any other merits or demerits that may arise. In addition, this study showcases how police can be trained, emphasizing either citizen safety or officer safety, and offers suggestions to implement in the future. Ideally this study can be used as a tool for law enforcement agencies and officers to be better equipped for their profession.

Less Lethal Weapons: An Effectiveness Analysis

The development and implementation of less-lethal weapons has been an immense benefit for American law enforcement. Giving police officers an option for self-defense that reduces the likelihood of death or serious injury has saved many lives throughout the country. However, Mesloh, Henych, and Wolf (2008) mention that not all less-lethal weapons are equally effective in every circumstance. OC sprays with an alcohol base can light on fire, and sunglasses or eye protection can negate any desired effects (Oleoresin Capsicum, 1994). Electroshock weapons could provoke heart conditions, which may lead to death (Jaslow, 2012). And nothing looks quite as bad as video footage of a police officer hitting someone with a baton, even if it is justified (Scoville, 2009). Since less-lethal weapons each have different strengths and weaknesses, it is important for every department to have a carefully selected and up-to-date inventory for their officers that will be as useful and effective as possible in any circumstance.

Patrol Officer Everyday Carry

The majority of American police and sheriff departments provide a standard set of equipment to all of their patrol officers. This set of equipment varies from department to department, depending on the specific challenges and opportunities the area provides (Kadner, 2015; Peralta, 2015; UTPD Policy A-13, 2010). Universally, that set of equipment includes some type of less lethal weapon or weapons. This study will look at these less lethal weapons and determine their effectiveness based on what they purport to do, namely not kill or maim but still deter and detain. The most commonly provided less lethal weapons for patrol officers are batons, conducted electrical weapons, and OC

spray.

The Baton

Batons are very simple, yet effective less lethal weapons. According to Mesloh, Henych & Wolf (2008), batons come in three varieties: traditional straight, side-handled, and expandable. The straight baton is a long cylindrical shape and is traditionally made of wood or plastic. The side-handled baton, or PR-24, has a handle a couple of inches from one end and looks similar to the martial arts weapon known as a *tonfa*. The expandable baton, or ASP, is usually made from steel and comes in a couple of different sizes.

Baton history. Batons are the oldest less lethal weapon still used by police today. While hard objects have been used to bludgeon people for thousands of years, batons were first introduced to law enforcement in 1829 in London (Peak, 1990). The design of the baton remained relatively unchanged until the 1970s when the side-handle style of baton was introduced which offered the ability to add mechanical advantage and leverage to take down techniques (Mesloh, Henych, & Wolf, 2008, p. 27). It was improved again in the 1980s with the invention of the expandable baton. According to Mesloh, Henych & Wolf (2008), “High visibility nightsticks and side-handled batons seem to have gone out of style and have been replaced with smaller, collapsible straight batons which have a more positive public perception and are easier to carry” (p. 27). Even though most law enforcement departments use the expandable batons, some still prefer traditional baton types.

Baton styles. Each style of baton has advantages and disadvantages. The straight baton is more intimidating to potential assailants, quicker to draw, and hits harder.

However, it is also intimidating to normal citizens, slower to strike, and bulky. The side-handled baton, or PR-24, has the same advantages and disadvantages as the straight baton, but more tactical potential, especially in regards to defense. However, more training is necessary to fully utilize that tactical potential, and it does not hit quite as hard as the straight baton. Alpert & Dunham (2000) state, "If the PR-24 is to be retained, officers need regular retraining and practice in how to use it effectively" (p. 74). One small town in California has given their officers a police version of nun-chucks as a baton variant. The officers intend to use the nun-chucks mainly as a controlling device, while still maintaining the ability to use them as a striking weapon (Peralta, 2014). Since this is a fairly new development in less-lethal police weapons, not much data exists regarding police using nun-chucks other than the fact that they have an advantage when it comes to controlling a suspect or perpetrator. Finally, the expandable baton is lightweight, and inconspicuous. However, it takes an extra motion to expand, and there is a small possibility that the baton will collapse during use. Gervais, Baudin, Cruikshank, & Dahlstedt's 1997 study (as cited in Mesloh, Henych, & Wolf, 2008, p. 27-28) postulates that the success of the expandable baton was partly due to the fact that it was so much easier and lighter to carry than the straight baton. Gervais, Baudin, Cruikshank, & Dahlstedt (1998) state, "In light of their intended use, no single factor can conclusively dictate a baton's superiority over another with respect to the inherent risks to an officer or an assailant" (p. 17). There are too many factors to determine which style of baton is best, so departments should consider their options and the advantages and disadvantages of each.

Baton effectiveness. This study will use two criteria for determining how

effective a less lethal weapon is: how often it seriously injures or kills, and how often the use of a less lethal weapon is sufficient to deter an offender. To understand how batons are supposed to be used, Jenkinson, Neeson, & Bleetman (2006) mention how baton training works:

Officers are trained to aim for primary target areas ('green areas'), medically assessed as carrying a relatively low probability of permanent injury. For a higher-level threat, secondary target areas ('yellow areas') may be struck: this is more likely to disable a subject but carries a greater risk of fractures or dislocations. Final targets ('red areas') are to be used only as a last resort to avoid a serious or deadly threat and are considered to carry a high probability of causing serious bodily harm or death to the subject. (p. 232)

On the diagram, red areas were the head, neck, and solar plexus. Yellow areas were the torso, groin, and joints such as knees and elbows. Green areas were everywhere else, shins, forearms, hips, etc.

Baton lethality. As can be seen in Table 1, the use of a PR-24 baton resulted in moderate or major bodily injuries 64% of the time (Alpert & Dunham, 2000). In addition, they have this to say concerning baton use:

Interestingly, a suspect was more likely to suffer injury if struck with a fist than if struck with a PR-24 police baton. This may be due to the training that police receive in how to use the baton in a manner that minimizes the risk of injury. In any event, the chances of a suspect being injured during a use of force incident were greatest when the officer used his hands, arms, feet, or legs during the encounter. (2000, p. 68)

The Alpert & Dunham study accompanied the above quotation with Table 1 regarding Metro-Dade police. Using the PR-24 reduces the likelihood of a suspect's injury, especially when the officer would otherwise use his or her fists.

Baton deterrence. Mesloh, Henych & Wolf did a study using statistics from two Florida agencies: the Orange County Sheriff's Office and Orlando Police Department. In that five-year study, 71 instances of officers using an impact weapon, or baton, during the first iteration were recorded. Of that 71, 32 ended the altercation, while 39 required more force. That means the baton was effective about 45% of the time. For the second iteration, batons were used 80 times and ended the event about 51% of the time (2008). While the baton has been an essential part of any law enforcement officer's tool kit, these studies seem to indicate that it may not be very effective.

Table 1: *Type of Force and Chance of Injury*

Type of Force	Chance of Injury
Hands/Arms	65%
Fist	81%
Foot/Leg	67%
PR-24	64%
Handgun	45%

Baton training. Alpert & Dunham (2000) mention that while the PR-24 has a higher tactical advantage, it is not being utilized. In Dade County, every reported instance of the PR-24 being used involved a strike, even though the PR-24 has much better capabilities as far as controlling and trapping subjects. This can be used to assume that the PR-24 is not being used in the most effective manner. If a department does not

have regular re-training, they should phase out the PR-24 with a straight or expandable baton, as the side-handled baton is more difficult to stay proficient with without regular training.

Conducted Electrical Weapons

Conducted electrical weapons, commonly known as CEWs, CEDs, or Tasers, are electronic weaponry that affects both the sensory and motor systems: “CEDs such as Tasers produce 50,000 volts of electricity. The electricity stuns and temporarily disables people by causing involuntary muscle contractions” (Alpert et al., 2011, p. 2). Tasers fire two prongs and are only effective if both prongs hit the target or if used to make direct contact.

Conducted electrical weapon history. “TASER International was formed in 1993 and has been the forerunner in design and manufacture of electronic weaponry” (Jenkinson, Neeson, & Bleetman, 2006). At first CEWs relied entirely on pain compliance, and did not affect the motor system. This meant that especially aggravated subjects or those in an altered state of mind could overcome the effects. In 1999 the Advanced TASER M26 was released, which improved on the earlier designs by affecting the motor system as well as the sensory system. During their trials TASER International reported that, “Common effects were: falling to the ground; screaming; involuntary muscle contractions and subjects freezing on the spot (Jenkinson, Neeson, & Bleetman, 2006, p. 231). The M26 and its 2003 upgrade the X26, have been widely successful and are being used by many law enforcement departments today.

Conducted electrical weapon effectiveness. Naturally, the effectiveness of CEWs is dependent on whether or not both darts hit the target. The darts can reach a

range of 25 feet; however, studies indicate that placement of probes beyond 15 feet is exceptionally difficult, thus reducing the effective range (Mesloh, Henych, Houglund, & Thompson, 2005). Mesloh et al. (2005) continue by mentioning that out of 50 sampled cases where the TASER was not effective, 38% were due to the fact that the operator missed the target. Mesloh, Henych & Wolf's (2008) study on less lethal weapons includes some very comprehensive information on CEW effectiveness. Table 2 gives the various reasons why CEWs have failed over a five-year period (p. 64).

Conducted electrical weapon lethality. The barbs from CEWs can do permanent damage if they hit a subject in the eyes or other sensitive areas. Alpert et al. (2011) mentions the danger of people falling over after being hit by a CEW:

Some people have experienced serious head injuries or bone breaks from the falls, and at least six deaths have occurred because of head injuries suffered during falls following CED exposure. More than 200 Americans have died after being shocked by Tasers. Some were normal, healthy adults; others were chemically dependent or had heart disease or mental illness. (p. 2)

Drugs that affect the heart appear to lead to individuals being more susceptible to death from a CEW, although that is not the only cause. Repeated exposure could bring about problems. Alpert et al. (2011) state that during animal trials, "longer exposures led to ventricular fibrillation-induced death in three pigs. ... A preliminary review of deaths following CED exposure found that many are associated with continuous or repeated shocks" (p. 4). The Stanford Criminal Justice Center (2005) mentions three deaths related to excessive TASER use and drug use. Out of the three, one subject was shocked seventeen times, another eleven times, and the last six times. Officers should be trained

to switch to a different tactic if the one they are using is not effective, especially after multiple attempts. Because repeated shocks increase the likelihood of death, officers should be wary when using CEWs, but still realize that repeated shocks are sometimes necessary.

Table 2: *Effectiveness of TASERS at Subsequent Iterations*

	Iteration 1	Iteration 2	Iteration 3
Missed	209	26	5
Baggy clothes	73	18	1
Probe came loose	13	2	0
Wire broke	54	17	5
Suspect grabbed	3	3	0
Malfunction	37	10	2
Cartridge fell off	8	5	1
Ineffective	452	176	36
Effective	1264	548	221
Total	2113	805	271

Alpert et al. (2011) continue:

The seeming safety margins of CED use on normal healthy adults may not be applicable to small children, those with diseased hearts, the elderly, those who are pregnant and other at-risk people. The use of CEDs against these populations (when recognized) should be avoided, but may be necessary if conditions exclude other reasonable choices. (p. 4)

Not using a TASER on a pregnant woman or small child unless there is no other option is common sense that many officers should realize, but it still needs to be included in TASER training.

Payne-James, Sheridan, & Smith (2010) mention that common medical consequences due to the use of TASERS include “barb injuries, localized discharge burns, and injury from falls or from intense muscle contraction” (p. 609). Even though these injuries are relatively minor, they are also quite common and have the potential to be serious. In addition, most agencies do not allow CED use when the target is near a flammable substance (Alpert et al., 2011). While the medical concerns of CEWs seem very high, Alpert et al. (2011) mentions that, “Many law enforcement agencies noted that injury rates for officers and suspects declined after they introduced CEDs (p.3). Alpert et al. continues, “In Miami-Dade, the odds of a suspect being injured were almost 90 percent lower when a CED was used than when it was not” (2011, p.14). Smith et al. (2010) mention, “Across 12 agencies and more than 24,000 use of force cases, the odds of a suspect being injured decreased by almost 60 percent when a CED was used” (p. 127). TASERS are less lethal weapons that have a very small chance to do a lot of harm, but most of the time the effects wear off as soon as the current does.

Conducted electrical weapon deterrence. In Mesloh, Henych & Wolf’s (2008) five-year study with the Orange County Sheriff’s Office and Orlando Police Department they counted 2113 events in which a CEW was deployed in the first iteration. The CEW is clearly the weapon of choice for these departments as it makes almost half of all use of force events, the total being 4303. Out of those 2113, 69% of events were ended, while 31% of uses were ineffective. Mesloh, Henych, & Wolf (2008) clarify the study by

stating that, “coding of ‘ineffective’ in a single application does not necessarily mean that in the context of the complete encounter, TASER was ineffective rather only that a single use did not gain immediate suspect compliance (p. 54). In other words, each squeeze of the trigger constitutes a different iteration.

For the second iteration, Mesloh, Henych, & Wolf (2008) report that a TASER was used 806 times, and successfully ended the event 66.5% of the time. TASER International’s training strategy teaches that multiple applications may be required for a subject to comply, so it is understandable that officers might be quick to activate the TASER a second time.

Conducted electrical weapon drive stun. Modern CEWs are designed to have additional versatility beyond the two-pronged shot. CEWs have the ability to *drive stun*, which is possible after the cartridge is removed and the CEW is held directly to the target. Mesloh et al. has information on this method’s advantages and disadvantages. Since the drive stun is not automatic, and does not puncture the skin, an officer has the option to apply the TASER for less than the usual five seconds if the subject becomes instantly compliant. The drive stun can be effectively used in crowded areas where firing the prongs would have a high likelihood of hitting a non-combatant (2008). Naturally, the drive stun requires an officer to get within arms reach of a subject before it can be deployed, meaning he or she comes a lot closer to danger. This is usually not an issue because drive stuns have typically been used for compliance with subjects who are already on the ground or as a defense after firing the barbs. Since the primary capacity of the TASER is the pronged attack, the drive stun should be considered secondary, not the most important aspect of the weapon but still essential to be taught and learned. Table 3,

taken from Mesloh et al. (2008, p. 65), shows the effectiveness of both modes of TASER fire. With each use of the TASER, drive stun or probe, the rate of effectiveness goes up. This is consistent with typical officers' training that teaches multiple applications are often necessary for a subject to comply. Mesloh et al. (2008) continue, "Despite negative media coverage touting abuse, multiple TASER deployments (delivered by probes or drive stun) may be necessary to obtain the effectiveness that agencies are seeking" (p. 65).

Table 3: *TASER Probe Deployments vs. Drive Stuns*

	Probe		Drive Stun	
	Deployments	%	Deployments	%
Iteration 1	1151	59.4	113	64.2
Iteration 2	365	67.7	108	67.9
Iteration 3	131	80.4	56	83.6

Conducted electrical weapon training. According to Mesloh et al. (2008), police officers that are issued a TASER are required to complete training on how to properly use it. Such training typically includes how to examine and test the weapon, what areas of the body to target, how to use it safely, and how to remove the darts should it be necessary. TASER training also emphasizes the point that officers should continue to apply shocks until the subject completely stops resisting. Officers should also be trained to avoid using a CEW if the subject is in a position where a fall could be fatal or cause permanent injury, such as at the top of stairs or an elevated surface.

OC Spray

Oleoresin capsicum, OC, or pepper spray, is a less lethal weapon that irritates and

inflames the eyes, skin, and respiratory system. The American Civil Liberties Union of Massachusetts (2007) states that pepper spray is typically applied with a handheld canister that discharges a liquid, foam or spray. If inhaled, OC spray will swell the mucus membranes along the respiratory tract and temporarily restrict breathing to gasping or shallow breaths. In addition, it will often swell the eyes shut, incapacitating most opponents. Mesloh et al. (2008) mentions that the Scoville Heat Rating is often used to determine the strength of a spray. Most pepper sprays have a rating around 5.3 million, while a bell pepper has a rating of zero and the habanera pepper a rating of 300,000.

OC spray history. CN and CS gas were used before the invention of modern pepper spray. Research done by Vilke & Chan show that CN was first used during World War I, and was utilized as the main tear gas by both the military and law enforcement up until the 1950s. Exposure can result in coughing, gagging, vomiting, skin irritation, and tearing. CS is the chemical agent that eventually replaced CN and was first created in 1928. However, CS is rather insoluble which makes decontamination difficult. That and the fact that CS is flammable created a potential hazard for anyone who used it (Vilke & Chan, 2007). These issues led to the eventual decline of CS and the invention and implementation of OC.

OC spray was created out of the necessity for a CN and CS replacement that worked quicker and was not as dangerous. Alpert et al. (2011) states, “Law enforcement agencies rapidly adopted pepper spray in the late 1980s and early 1990s as an alternative to traditional chemical agents such as tear gas” (p. 3).

OC spray effectiveness. Early studies done by Nowicki (1993) indicate that OC

spray is effective more than 90% of the time. There is an unfortunate possibility that the spray will cross-contaminate and hit another officer or bystander. In addition, there have been a “growing number of reports that suspects were able to fight through the burning pain” (Mesloh et al. 2008, p. 30).

OC spray lethality. The American Civil Liberties Union of Massachusetts (2007) mentions that a study discovered that, “exposure to pepper spray, when combined with pre-existing respiratory difficulties and asthma, can lead to fatalities. It is also possible that exposure to pepper spray, combined with positional restraints such as the ‘hogtie,’ could pose additional risk of asphyxia” (p. 3). Bowling, Gaines, & Petty (2003) examined sixty-six cases where OC spray was used prior to the death of a suspect and determined that the vast majority of these deaths were due to drug use, disease, asphyxiation, or any combination of the three. The elderly and people with breathing problems such as asthma are also at a greater risk when exposed to OC spray. Quoting the NYPD Patrol Guide (2007), the ACLU mentions, “if possible, officers should avoid using pepper spray on people in frail health, young children, women believed to be pregnant, and people with respiratory conditions” (p. 19). It is often not apparent if someone has a respiratory condition or bad health, but if an officer can make that distinction, then he or she should use a different method of less lethal force. Looking at the multiagency models, the use of OC spray reduced the probability of a suspect’s injury by 70% (Smith et al. 2010).

OC spray deterrence. According to Mesloh et al. (2008), chemical agents, or OC spray, is effective at ending a situation 64% of the time in the first iteration. In the second iteration, it is 72% effective. While the second result seems disproportionately

high, it is possible that OC sprayed during the first iteration did not take immediate effect, and the higher effectiveness is due to a delayed reaction. *The Effectiveness and Safety of Pepper Spray* (2003) states, “the effectiveness rate reported by officers was significantly reduced when subjects exposed to pepper spray appeared to be on drugs.” Certain drugs might numb the mind and body so the user would not be as susceptible to the effects of pepper spray. Since those under the influence of illegal narcotics often have contact with the police, this weakness certainly needs to be considered. Mesloh et. al. (2008) mention that during their study, 32.3% of offenders were under the influence of either drugs, alcohol, or both. According to Kaminski, Edwards, and Johnson (1999), OC spray eased the arrest 85.3% of the time, and incapacitated the subject during 70.7% of uses.

OC spray training. Alpert & Dunham state that more training is required in how to use chemical agents effectively. Their research notes that in Oregon pepper spray was used in only 15 out of 547 use of force encounters, and only in 4 out of 803 encounters by the Metro-Dade police. At the time of their study, the Metro-Dade police did not issue pepper spray to their officer, which probably accounts for the exceptionally low numbers (2000). These rates do not apply across the board to all police departments and pepper spray use has improved over the years as can be seen in Table 4 (Mesloh, Henych, & Wolf, 2008).

Overview

The study of less lethal weapons can be a very complicated process, and often includes independent variables to be considered. Mesloh, Henych, & Wolf (2008) mentions the following regarding their three iteration based study:

On a cursory review, it would seem that the level of force used in this iteration was in all cases successful. However, this is overly simplistic as it does not take into account the prior levels of force used and their cumulative effect on gaining compliance from the suspects. A suspect who has been “TASERed” and sprayed with chemical agents and then wrestles with an officer may have become exhausted tired, disoriented and at that point either chooses to become compliant or is simply overpowered. (p. 62)

It is important to remember cumulative force when looking at data that includes more than the first iteration. Table 4 shows how using force multiple times can alter the effectiveness of said force (Mesloh et. al., 2008).

Table 4: *Success Rates by Weapon and by Iteration*

	Iteration 1	Iteration 2	Iteration 3
Chemical agent	329 (64%)	211 (72%)	108
TASER	1460 (69%)	536 (67%)	270
Compliance hold	64 (16%)	81 (63%)	35
Takedown	215 (41%)	166 (62%)	64
Empty hand strike	26 (28%)	63 (61%)	47
Impact weapon	32 (45%)	41 (51%)	43
Pepperball	4 (57%)	2 (67%)	0
12 gauge beanbag	2 (29%)	1 (50%)	2
K9	209 (69%)	74 (71%)	32

Out of the three less lethal weapons looked at in this study, the TASER was initially the most effective (69%) according to Table 4. Next is the chemical agent (64%)

and finally the impact weapon (45%). However, in the second iteration, the chemical agent (72%) pulls ahead of the TASER (67%), which is followed by the impact weapon (51%). In the two iterations, the chemical agent had the biggest improvement (8%), which is perhaps due to nature of OC spray and how it can get worse over time. The TASER was actually less effective (-2%) during the second iteration. Impact weapons remain around 50% effectiveness range during both iterations, which could be used in an argument for retiring the baton.

Table 5, created by Mesloh et al. (2008) shows what type of force officers are likely to use as a first resort in a very general sense. As set forth in Table 5, by far the most used type of force was the TASER, with 2113 instances of use. The other types of force important to this study are chemical agents (511 instances) and impact weapons (71 instances). With the data in Table 5 it could be argued that the TASER is essential to modern law enforcement. In addition, out of the three the TASER was the most efficient (69.1%) followed by chemical agents (64.4%) and impact weapons (45.1%). Table 6, created by Mesloh et al., shows an overview of a study done with data from 2001 to 2003 from the Orange County Sheriff's Office (2005, p. 74). Table 6 shows a very different picture than Table 5, although it could easily be due to the small sample base. The TASER is still the most used less lethal weapon (282 uses), followed by chemical agents (77) and impact weapons (9). While the high success rates for TASERs and chemical agents can be supported by the data in Table 5, the high effectiveness rate of impact weapons contradicts it. Considering that the effectiveness rate of impact weapons in Table 6 is double that of Table 5 it is safe to assume that the low sample number skewed the results or that the officers were better trained in the use of their impact weapon.

Table 5: *Officer Use of Force in First Iteration*

Type of Force		Event Continued	Event Ended
No Force	Count % within Officer's Force Used	143 99.3%	1 .7%
Gentle Hold	Count % within Officer's Force Used	36 90%	4 10%
Handcuff	Count % within Officer's Force Used	38 52.1%	35 47.9%
Chemical Agents	Count % within Officer's Force Used	182 35.6%	329 64.4%
TASER	Count % within Officer's Force Used	653 30.9%	1460 69.1%
Compliance Hold	Count % within Officer's Force Used	333 83.9%	64 16.1%
Takedown	Count % within Officer's Force Used	307 58.8%	215 41.2%
Empty Hand Strike	Count % within Officer's Force Used	68 72.3%	26 27.7%
Impact Weapon	Count % within Officer's Force Used	39 54.9%	32 45.1%

Officers in predominately urban areas are going to have very different needs than those in rural areas when selecting equipment. Therefore, it is important to review the data and become as knowledgeable as possible before making an important decision.

Training Emphasis

As important as it is to choose the right weapon for the job, the man behind the weapon is often just as crucial. Police departments should select the best possible training for their officers based on different sources. Officers should also receive training on situations that have proven to be a common issue in the past.

Table 6: *OCSO 2001-2003*

Type of Weapon Used	Immediately Effective	Delayed Effectiveness	Not Effective	Total
Taser	191 (67.7%)	27 (9.6%)	64 (22.7%)	282 (100%)
Chemical Agent	64 (83.1%)	4 (5.2%)	9 (11.7%)	77 (100%)
Impact Weapon	8 (88.9%)	0 (0%)	1 (11.1%)	9 (100%)
Defensive Tactics	13 (54.2%)	4 (16.7%)	7 (29.1%)	24 (100%)
Bean Bag	1 (100%)	0 (0%)	0 (0%)	1 (100%)
Total	277 (70.5%)	35 (8.9%)	81 (20.6%)	393 (100%)

Citizen safety based training. The goal of many police and sheriff departments is to protect and serve their community, even when members of that community need force brought against them. Law enforcement departments should strive to attain the standards that have been set forth by the American Civil Liberties Union of Massachusetts (2007). They recommend that the agency or a third party should administer any training related to less lethal weapons, as opposed to the manufacturer, because the manufacturer might have a bias. The Stanford Criminal Justice Center (2005) also mentions that police departments should not rely solely on training materials

supplied by the weapon manufacturer. They state that TASER International's training materials downplay the risks of TASER use and misrepresent studies done on the health effects of TASER use. The American Civil Liberties Union of Massachusetts (2007) continues by stating that officers should also receive training on which people might be more susceptible to serious injury if they are on the receiving end of less lethal force, namely pregnant women, children, the elderly, or those with certain medical conditions. That portion of the training should emphasize de-escalating force in regards to that part of the population. Officers should also take retraining courses every two years or so in order to make sure they still have the knowledge they need to carry less lethal weapons. For CEWs and OC spray, officers should know how it feels to be on the receiving end of each before they are allowed to use it. In addition, officers should have training on how to administer medical aid to a subject who has been pepper sprayed or hit with a TASER, and should be instructed to call for Emergency Medical Service should it be required.

The mentally ill. Law enforcement agencies have often dealt with the mentally ill, not always with the best possible results. Woolverton (2016) mentions that the 4th Circuit of Appeals recently decided on new parameters for police officer TASER use. The court stated that police officers are not allowed to use a TASER unless the person is creating an immediate safety risk. This decision was caused by the death of Ronald H. Armstrong, a man with bipolar disorder and paranoid schizophrenia. Police were supposed to involuntarily commit Armstrong to the hospital; however, when Armstrong grabbed onto a pole and would not let go the present officers used a drive stun. Over the next two minutes Armstrong was shocked five times with little effect. It took five people to pull Armstrong off the pole, pin, and handcuff him. Armstrong died a few minutes

later. The lesson from this incident is clear; police officers should be trained to deal with mentally ill people without use of force unless necessary. In addition, police departments should consider investing in a team trained specifically to deal with the mentally ill.

While not all mentally ill people have trouble with the law, a significant portion of inmates have had a mental illness. According to Dorfman & Walker (2007) an estimated 60% of inmates have personally had a mental health problem during their lifetime. With such a large percentage of inmates experiencing mental illness, police departments would be remiss if they did not provide adequate training to their officers. While it may take a psychologist weeks to determine which mental illness a subject has, simply being able to identify the fact that a person has a mental illness could help officers better resolve a situation. Recognizing the symptoms of excited delirium, paranoid schizophrenia, or bipolar disorder could change how an officer would respond to a situation. Often, the same few mentally ill people are responsible for the majority of calls related to a mentally ill individual. Reuland, Schwarzfeld, and Draper (2009) mention that in Lexington, twenty percent of calls for service within one year involving a mentally ill person took place in seventeen locations, each of which required at least three visits from the police that year. They also mention that the Los Angeles Police Department reported sixty-five mentally ill people who had at least five contacts with police during an eight-month period, totaling to 536 calls for service. In a situation such as this it would be wise to have a few officers become familiar with these mentally ill people. This would create a level of trust between the individual and the police. Also, if an officer is familiar with the person they are dealing with and their specific disorders, the officer will be less likely to take something out of context or act rashly. Creating a team specifically

trained to deal with the mentally ill would maximize this effect. Reuland et al. (2009) mentions that there are two types of specialized response program:

The first type trains sworn officers to provide crisis intervention services and act as liaisons to the formal mental health system; the Crisis Intervention Team (CIT) model, pioneered in Memphis (Tenn.), fits into this category. The second type partners mental health professionals with law enforcement at the scene to provide consultation on mental health-related issues and assist individuals in accessing treatments and supports; this strategy is commonly referred to as the co-responder model. (p. 9)

These programs create a connection between law enforcement and mental health personnel that can help people from both professions do their jobs more effectively. Both types of program would be useful, but training law enforcement to better handle mental health issues would be more practical because mental health professionals may not arrive on scene in time. Utilizing these programs could greatly improve the public perception of the police while reducing injuries and deaths from improperly handled situations.

Officer safety based training. In addition to protecting others, police officers must be wary to protect themselves. Mesloh et al. (2008) mentions an interesting phenomenon researchers refer to as a force deficit:

That is, in examining the cumulative force after three iterations, it appears as though the officers are consistently using less force than may be justifiable or necessary to subdue the suspect and end the confrontation. Thus, the use of decisive force early on in active suspect officer confrontations appears to be the

solution in ending conflict quickly and thereby statistically reduce the likelihood of additional injuries. (p. 89)

While many officers would be hesitant to use an extra level of force that might not seem necessary, studies show that using that extra level reduces the chance of injury for both the officer and the subject. Naturally the officer needs to use discretion to decide when a situation requires that extra force. Even though it might mean leaving a citizen in an uncomfortable state, using reasonable decisive force early on could prevent permanent injuries.

Empty hand training. Alpert & Dunham (2000) also call for an increase in empty hand training. They postulate that since both officer and suspect injury is so high from situations in which weaponless tactics were used, police officers need more training on how to protect themselves, and how to safely subdue another when less lethal weapons are not available or practical. Bernard Lau (2001) mentions it is important to note that self-defense is different from the defensive tactics taught in police academies. Self-defense is entirely focused on protecting the one individual using it, while defensive tactics are also concerned with protecting others and apprehending an assailant. While less lethal weapons are becoming more prevalent among law enforcement, a police officer should be rounded and well versed in as much material that is available in order to protect himself and others. Ultimately, police training needs to find a balance between emphasizing the safety of both the officer and the citizens around him, while hopefully achieving both.

Conclusion

Less lethal weapons have become a necessity for law enforcement. One needs only look at the number of people involved in altercations when less lethal weapons were used to understand how drastic a difference it would be if deadly force was the only option. In fact, it would be acceptable to say that departments who do not issue less lethal weapons to their officers are negligent in protecting their citizens. These less lethal weapons that have become crucial to law enforcement, the baton, CEW, and OC spray, all have varying effectiveness at ending altercations safely.

In most of the referenced studies, the CEW has been the most effective at ending altercations quickly and without injury. Many departments offer a TASER course, but do not require officers to complete it before they graduate the academy. But since it has been proven to be effective if the officer has been properly trained, every department should have a TASER course as a part of the academy. The Force Options Research Group (2000) mentions that there are five reasons the M26 TASER is recommended. The first is that the TASER is similar to a service weapon, so police officers should be fairly comfortable with it and learn to use it quickly. The second is that the M26 can be deployed up to 21 feet, which is an improvement from previous models. Third, it instantly subjects a target without causing injury or permanent side effects. Fourth, the M26 documents each time it is used, which helps departments keep accurate records and promotes transparency. Last, the initial cost and the ongoing cost are both moderate. However, batons and OC spray are still valuable assets to any police department, and no officer should rely on one option to keep him or her safe. Phillip Bulman (2011) mentions, "If injury reduction is the primary goal, however, agencies that deploy pepper

spray and CEDs are clearly at an advantage. Both weapons prevent or minimize the physical struggles that are likely to injure officers and suspects alike.” While TASERs and pepper spray are more expensive than a baton or empty hands, they have become the new standard for less lethal force. The verdict is clear about less lethal weapons, specifically CEWs and OC spray; the effectiveness and improved safety are undoubtedly worth it.

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