

# A Framework for the Assessment of Non-Lethal Weapons

BRIAN RAPPERT

*Department of Sociology, University of Exeter, Exeter EX4 4RJ*

In many government, police and military circles, attention is being given to so-called 'non-lethal' weapons as means of reducing many of the negative effects directly or indirectly associated with the use of force. Despite the purported ability of the adoption of such weaponry to lessen grounds for contention and concern, past experience suggests the need for scepticism regarding the purported benefits. Rather than relying on poorly substantiated claims, comprehensive procedures are needed to ensure the appropriateness of force options. This article outlines some of the institutional structures required for 'carefully evaluating' and 'carefully controlling' non-lethal weapons, with a discussion of the perennial tensions associated with ensuring the relative 'acceptability' of the use of force.

KEYWORDS Injury Less-lethal weapons Non-lethal weapons  
Peacekeeping Policing Use of force

## The Problem(s)

The use of force is a moral, social and medical problem. When members of the police, military, paramilitary organizations, or non-state groups apply force, the question is often asked whether it was effective, necessary and proportional. The deaths, injuries and suffering inflicted through modern conflict are unknowable in their full extent, but there is no doubting the severity of the problem for humanity.

Against concerns about the misery inflicted by modern weaponry, some individuals and organizations are advocating the search for new force options to minimize injuries, particularly in Western police forces and militaries that are said to be preoccupied with reducing casualties. Among the options being advocated are so-called 'non-' or 'less-lethal' weapons: equipment supposed to minimize or at least reduce the severity of injury in comparison to other options. Substantial investments in research and development programmes are being made in many countries with the object of approving new technologies for policing and military operations. Arguments about the pros and cons of non-lethal weapons (NLWs) have been discussed elsewhere (including a past issue of this journal, now available as an expanded book version).<sup>1</sup>

This article, while not wishing to completely dismiss the potential of new force options to help realize more preferable outcomes, seeks a critical engagement with the optimistic claims made about NLWs. The employment of weapons, no matter their name or stated purpose, should not be taken as unproblematic. Though many states and corporations boast about the robustness of their safety-testing procedures and strict implementation programmes, past experience across many countries indicates that such statements should be taken with caution. Although much promise has been attached to such weapons in recent years, arguably their use has not lived up to many expectations. By relating past experiences with such equipment to perennial questions about the wisdom of the use of force, this article outlines elements of a institutional regulatory framework for appraising the appropriateness of the introduction of non-lethal weapons and asks what organizational procedures are prudent to ensure that NLWs are evaluated and controlled appropriately.

Several points of qualification and caution must be given. One danger of a general framework is that it presents possible concerns about the use of force abstracted from the social, historical and political conditions that often give rise to inappropriate practices, conflict and mistrust between security forces and others. This analysis cannot possibly comment on the whole range of issues associated with preventing the improper use of force, for example, what counts as just force, the causes of excessive force, the legality of force, the steps required to restrict the proliferation of weapons, or how best to mobilize public resistance to inappropriate options.<sup>2</sup> It does seek to provide concerned individuals and groups with a resource for actively questioning state, corporate and media claims about the rigour and import of assessments and controls of NLWs. In this respect, the framework outlined is not meant to be exhaustive nor, should its stipulations be met, does it imply that force is necessarily just or appropriate.

A problematic aspect of the framework here is that it makes recommendations across police and military domains. At least in many Western countries, there are important distinctions between the practices and purposes of these agencies. Police forces are generally subject to far stricter public accountability measures and legal standards. Much of today's military focus regarding NLWs relates to so-called 'military operations other than war', such as peacekeeping – said to be more akin to policing than fighting – and where the need to respect the rights and well-being of individuals is deemed vital in official military statements. The introduction of non-lethal weapons is part of ensuring the relative social acceptability of military force and thereby 'winning hearts and minds'. Thus, whatever the differing standards between police and military organizations, there is a common need to ensure that NLWs are introduced through appropriate procedures.

Another problem in addressing the regulation of ‘non-lethal’ weapons is that the very term implies a distinction between different types of weapons: those that cause fatalities and severe injuries and those that (generally) do not. In choosing to adopt the terminology of ‘non-lethal weapons’ and focus on their regulation, the presumption is not being made that any such designated weapons are indeed ‘not lethal’. With regard to the deaths and injuries inflicted, much depends on how weapons are used in practice.<sup>3</sup> Certainly numerous deaths have resulted from weapons labelled non-lethal and they have been employed so as to increase the lethality of ‘conventional’ firearms and explosives.<sup>4</sup> Seeking some distinction between non-lethal and convention weapons on the basis of invariant technical characteristics is therefore fraught with analytical and moral difficulties. The focus on NLWs here is meant to refer to the stated aims of certain weapons – to minimize casualties and provide more appropriate and acceptable force options. To the extent that this is the aim of the adoption of certain weapons called ‘non-lethal’, their development should be subject to procedures to ensure that they will function as advertised.

### Weapons and the Use of Force

While few would maintain that agencies of the state such as the police or military are not justified in making some recourse to coercion in the performance of their duties, just when and what force is legitimate is debatable and often highly contentious. The line between self-defence and aggression is not always clear-cut and appraisals often differ depending on the point of view taken. Although legal standards between militaries and police bodies vary, in general both should only apply force when it is necessary and the response must be proportional to the threat faced. Yet such criteria only go so far in addressing the appropriateness of specific acts. The use of force can require weighing concerns about the safety of security personnel, recipients and bystanders against each other; just how this should be done is likely to be a matter of dispute. Whether applying force early in a conflict (or potential conflict) might reduce injuries or whether it will serve to escalate a situation is often contentious. The low public visibility of much of the activities of police or military agencies and the obvious political sensitivity of the use of force means that there are few systematic analyses or even reliable figures about what force is used and when. Moreover, the agencies of police and military are not always a social good, but are major instruments of internal repression in many countries.

The legitimacy of the use of force is especially contentious when used, not against specific criminals or combatants, but against gatherings related to public order policing or peacekeeping missions.<sup>5</sup> Unlike criminals or combatants who may be placed beyond the moral community, gatherings – however disorderly – can represent citizens with rights expressing genuine and legitimate grievances. Moreover, amongst gatherings there will be a

diverse collection of individuals and groups, so that even if some are acting in ways that justify forceful action, other innocent people are likely to become embroiled.

The wisdom of the utilization of particular weapons as part of the use of force has been a source of continuing unease. Non-lethal weapons are supposed to reduce many such concerns. A representative of the United States Department of Defense has defined NLWs as ‘discriminate weapons that are explicitly designed and employed so as to incapacitate personnel or material, while minimizing fatalities and undesired damage to property and environment’.<sup>6</sup> They are intended for current and future military scenarios, such as the ever-growing role of peacekeeping missions and other quasi-policing activities, but also conventional warfare. For the police, ‘less-lethal weapons’ (a designation supposed to reduce unrealistic injury expectations by the public) are meant to handle continuing threats in routine and public order activities. A common justification for such weapons is that they offer an intermediate stage of response between no force and deadly or serious force.

There are a variety of NLWs available from the arsenals of Western police and military forces and research and development continues apace.<sup>7</sup> Among current options are kinetic projectile munitions such as baton rounds, beanbags and water cannon; chemical incapacitants such as tear gas and hand-held sprays; and electrical equipment such as tasers and adopted batons. Should current research programmes come to fruition, a far broader spectrum of possibilities may soon be a practical option: acoustic weapons that cause internal damage and disorientate; electromagnetic pulse beams designed to knock individuals down; and chemical agents that act as calmatives or malodorants. These old and new weapons will be combined with innovations in delivery systems, such as unmanned aerial vehicles or projectiles that release chemical irritants on impact (Table 1).

The search for non-lethal weapons is not new, although the emphasis placed on them today across organizational and national contexts is perhaps unmatched. Throughout the twentieth century there have been suggestions that particular lines of research development might enable the production of more acceptable force options. Commenting on the prospects of incapacitating irritants such as CS ‘smoke’ and psychochemicals such as lysergic acid diethylamide (LSD) in the 1960s, and echoing office sentiments expressed elsewhere,<sup>9-11</sup> a US army-funded scientist said in 1969:

I and many of my colleagues ... feel that we are opening up a possibility of a kind of warfare that has never been known before and if it really can be accomplished – if we can achieve what we hope to achieve – [it will] really be much more humane than ordinary warfare. I know this word ‘humane’ has been over-used, but it is a fact that we are particularly interested in the so-called incapacitating

TABLE 1  
TYPES OF NON-LETHAL WEAPONS

Category	Type	Description
Kinetic	Impact munitions	Projectiles designed to incapacitate through inflicting energy to the body. Variations include plastic bullets, bean bags and sock rounds
Mechanical	Water canon and sprayers	High-pressured water streams
	Entanglers	Nets and other ensnaring objects delivered by launchers, mines or other systems
Chemical	Barriers	Designed to stop individuals and vehicles
	Incapacitating agents	Irritants and other agents (e.g., CS, CN, CR, OC) that are used as gases and sprays
	Brain receptor chemicals	Meant to induce anxiety, submissiveness or fatigue
	Malodorants	Smells designed to induce particular emotional responses
	Aqueous foams	Creates physical barrier and can be used with chemical irritants
	Superlubricants	Chemicals intended to reduce traction
	Superadhesives	Sticky materials for subduing individuals or denying access to facilities
	Supercorrosives	Chemicals introduced to degrade materials
Electroshock	Electroshock	Devices that deliver electrical shock including projectiles, batons and belts
Acoustic	Infrasound waves	Low frequency sound that allegedly causes disorientation and nausea
Lasers	Vortex ring	Creates low-intensity shock wave
	Tactical lasers	Discriminate and variable intensity lasers that heat and melt materials, including flesh
	Tagging lasers	Meant to indicate the targeting of individuals
Optical munitions	Dazzling lasers	Devices that produce temporary disorientation by overpowering visual senses
	Visible light radiators Strobe lights	Devices that cause flash blinding High-intensity strobes meant to cause vertigo and disorientation
Microwave	Microwave generators	Increases body temperature by heating water near skin
Electromagnetic (other)	Electromagnetic energy generators	For disturbing or damaging communications and information equipment
Biological	Biodegrading agents	Micro-organisms for degrading materials and other functions
	Brain receptor chemicals	Meant to induce anxiety, submissiveness or fatigue
Other	Carbon filaments	Tiny filaments designed to disrupt equipment

Source: Ref.8.

or non-lethal weapon system. And if we do indeed succeed in creating incapacitating systems and are able to substitute incapacitation for death it appears to me that next to stopping war, this would be an important step forward.<sup>12</sup>

Of course, that a certain force option generally inflicts less injury than another is hardly a sufficient justification for its acceptability or humanity and whether non-lethal weapons ought be seen as a substitute for deadly force is also far from clear. A vivid example of this is given by the US army's use of CS gas in Vietnam during the 1960s. Initially, the stated expectation was that the irritant would be employed 'only in those situations involving riot control or situations analogous to riot control'.<sup>13</sup> In such limited circumstances, the gas would provide a humane option because it supposedly meant forgoing the recourse to lethal force. After some such initial deployments, the remit for the gas' use expanded considerably to include the separation of combatants from non-combatants and as, commanders became familiar with the technology, its range of uses expanded considerably.<sup>14</sup> Between 1964 and 1970, nearly 16 million pounds of CS was procured for operations in Vietnam. Among its field uses were forcing Vietnamese out of underground hideouts (perhaps then followed by bombing runs from B-52s<sup>15</sup>), making areas uninhabitable and (as in the First World War with other gases) harassing enemy soldiers in combat. According to US army reports, the possibility of employing CS to separate combatants from non-combatants as initially hoped proved elusive, as civilians typically fled combat areas before fighting began (Ref.4: Appendix 6).

Various civil liberties, human rights and peace organizations, as well as individuals within the police and the military, have criticized particular NLWs, mainly in terms of their potential for abuse, their less-than-harmless effects and their unintentional consequences.<sup>16-18</sup> A key concern in domestic contexts is the possible 'paramilitarization' of police forces through the introduction of NLWs and related tactics. Events such as the 1999 World Trade Organization protests in Seattle illustrate the potential for 'Robo Cop', paramilitary style public order policing with NLWs. The chemical gases used during the protests were said to be associated with serious health outcomes, ill-regulated, targeted on parts of the population that were particularly susceptible to adverse reactions and used against guidelines.<sup>19</sup> Although Seattle was seen by many as a public relations and policing disaster, this did not stop cities hosting subsequent related trade summits from turning to non-lethal equipment as a key part of their policing strategies.<sup>20</sup> There is concern that making conflict less costly through the introduction of less-lethal conflict may make it more likely. The possibility then arises for the escalation of force in the responses and counter-responses of the security forces and others.<sup>21</sup> Still other concerns have been raised that such weapons have been designed to '*appear* rather than actually be safe'.<sup>22</sup>

Against this background of growing debate about the prospects and problems of non-lethal weapons, there has been little in the way of established international standards for their evaluation. Articles 2 and 3 of the 1990 United Nations Basic Principles on the Use of Force and Firearms by Law Enforcement Officials state that:

2. Governments and law enforcement agencies should develop a range of means as broad as possible and equip law enforcement officials with various types of weapons and ammunition that would allow for a differentiated use of force and firearms. These should include the development of non-lethal incapacitating weapons for use in appropriate situations, with a view to increasingly restraining the application of means capable of causing death or injury to persons...
3. The development and deployment of non-lethal incapacitating weapons should be carefully evaluated in order to minimize the risk of endangering uninvolved persons, and the use of such weapons should be carefully controlled.

Yet a detailed consideration of what these principles might mean in practice has not been given much attention. Possible elements of a framework for 'carefully evaluating and controlling' non-lethal weapons are set out below.

### Principles for an Appraisal Framework

Before setting out this assessment framework, I examine some lessons from past experiences with non-lethal weapons in the use of force.

#### *Principle 1: Police and Military Forces should not be left Alone to Police themselves Regarding the Evaluation and Control of Weaponry*

Given the points made above and the potential for multiple and contrasting professional, administrative, legal and public determinations about the acceptability of force, the assessment of NLWs should not be left to security forces. In recent times, it is increasingly becoming unacceptable for any profession to be the sole judge of what constitutes acceptable standards for its practice. Police and military forces face various forms of public and legal scrutiny. Yet, in relation to the evaluation and control of financially minor, tactical forms of weaponry, much of this type of activity is still the province of a limited number of individuals internal to security organizations. What public debate there is about the acceptability of such weapons typically takes place after much of the development work has been conducted and official decisions are well on their way to being taken if not implemented. As such, the possibilities afforded for outside scrutiny are limited. For instance, during the introduction of a particular version of CS spray into policing in England and Wales, it was repeatedly claimed by the United

Kingdom Home Office that this weapon had been tested to a level similar to that required for a pharmaceutical drug. As the extent of testing gradually became known to the public and police forces through investigative work by researchers, journalists and concerned medical professionals, this claim proved immodest at best.<sup>23</sup> Had the extent of the evaluation procedures been known outside government agencies, it would have no doubt been deemed insufficient.

Even when assessment procedures are notionally open to outside scrutiny (often only in response to public criticisms), the terms of this are too often limited. For instance, in response to long-standing concerns about deaths and injuries caused by rubber and plastic bullets in Northern Ireland by members of the British Army and the former Royal Ulster Constabulary, a Steering Group consisting of defence and policing representatives was set up in 2000 to evaluate 'less-lethal' weapons for policing in Northern Ireland and mainland Britain.<sup>24</sup> Although officially hailed as providing 'unprecedented' transparency because interim findings of the research evaluations were published,<sup>25</sup> the information given has been largely limited to summary findings of selective aspects of the research undertaken that provide little scope for independent scrutiny of the substantive conclusions or assessment procedures.<sup>26-28</sup> Any secrecy or limitations placed on information available are undesirable from the standpoint of public accountability and act to forestall efforts to scrutinize and improve the decisions taken.

*Principle 2: Manufacturers' Statements of the Efficacy, Purpose and Safety of a Weapon should not be taken on Faith*

The deficiencies associated with existing regulatory provisions mean that there has been little opportunity for governmental and non-governmental agencies to scrutinize manufacturers' marketing claims. Yet advertising devised to sell products are a poor substitute for independent testing. Reflecting on 25 years of experience with 'mace' incapacitant sprays, two Federal Bureau of Investigation (FBI) officers concluded that it was:

billed as a humane, yet, effective, alternative to police weapons such as the nightstick and the service revolver. While some manufacturers claimed mace reduced assaults on police officers by as much as 50 percent and lowered complaints of police brutality by 80 percent, time and experience proved these claims to be wildly exaggerated.<sup>29</sup>

Problems persist today. Commenting on claims made by both governments and companies, Altmann has argued that safety statements made about many non-lethal weapons have been 'plainly untrue'.<sup>30</sup> Likewise, Doubet argues that the lax regulatory environment has enabled some pepper spray manufacturers in the US to make unsubstantiated and erroneous safety claims about their products.<sup>31</sup> Concern is not limited to those outside security organizations. In 2001 Pennsylvania State University and Los



Angeles Sheriff's Department examined the performance characteristics of numerous kinetic impact projectiles.<sup>32</sup> Summarizing the findings, one of the authors commented:

The good news is that we have a fairly good idea of what works and what doesn't work, the bad news is that there isn't much that works ... Previously, there had been no such comparison data for these types of munitions, but now for the first time we're able to fire a shot across the bow of the industry...<sup>33</sup>

In surveying the range of non-lethal kinetic projectiles, the UK Steering Group mentioned above contended that manufacturers' data was often unreliable.<sup>24</sup>

Many publicly circulated claims about the acceptability of weapons are predicated upon assumptions about how they will be used and the psychological and physical state of those targeted – assumptions that prove unattainable in practice. In addition, although companies often present their equipment as a response to extreme threats, this is not necessarily a good guide to how, in more private settings, instructions are given about their purpose. For instance, while one manufacturer of the electrical taser weapon depicts it as preferable to firearms, batons or other injurious force options, in its police training sessions it instructs users how to employ it against passive resistors and non-complaint individuals who are unlikely to justify severe responses.<sup>34</sup> Thus the 'worst-case' scenarios (that is, the best-case justifiers for NLWs) that are often used to argue for the introduction of new weapons (such as potential terrorist threats or life endangering acts) should not be taken as the proper frame of reference for evaluation and control.

*Principle 3: Uncertainties should be Minimized where Possible and the Responsibility for Addressing them should fall with the Promoters of Non-lethal Weapons*

Much of the promise of non-lethal weapons rests on their supposed relative safety. As suggested above, the data to support such claims has often been sparse or non-existent. Yet, as with many areas of scientific and technical uncertainty, even when some research is commissioned this does not lead to agreement about safety. Three conditions that make assessing novel technologies especially difficult have been identified:<sup>35</sup>

1. Both the new technology and its complex operating environment can be expected to respond in unforeseeable ways, so that the odds of doing things right the first time are minuscule;
2. Misguided policies may carry very high costs, and damage to humans or the environment may be difficult or impossible to reverse fully; and
3. There is a long lag between initiating a new endeavour and finding out about its undesirable features, so problems may accumulate and proliferate for many years before error correction is even attempted.

Forecasting the effects of the technology so as to avoid unwanted consequences is thus desirable in theory, but quite difficult in practice. A number of steps for minimizing the problems associated with any new technologies have been suggested:<sup>36</sup>

1. Protect against the potential hazard by initially placing limits on its use and protecting against severe risks;
2. Proceed cautiously;
3. Test the risks;
4. Reduce major uncertainties; and
5. Learn from experience.

In short, precautions should be taken and policies should be modified on the basis of feedback. In this spirit, those organizations introducing non-lethal weapons should ensure that steps are taken to test risks prior to their deployment and transparent and rigorous procedures exist to monitor the operational use of weapons.

The need for responsible management is often lacking in practice. In the case of the British CS sprays mentioned above, though a variety of organizations including the Home Office, Department of Health, government research laboratories, expertise advisory committees and others contributed to their safety evaluation, none have any formal responsibility for the overall assessment (Ref.8: Ch.8). Here, as elsewhere regarding novel technologies, the dynamics of attributing responsibility are almost completely opposite to those of building up claims about safety.<sup>37</sup> The situation is particularly problematic because claims by organizations regarding the relative safety or dangers with NLWs are based on certain operational presumptions about how the technology should be used, but whether in practice they are used as such is not necessarily factored back into assessing the relevance of safety claims.<sup>38</sup>

The overall state of regulatory controls mean that responsibility for substantiating effects has often fallen on those seeking to prove that particular weapons have unacceptable effects, rather than on those promoting the technologies to substantiate safety claims. Compiled evidence of injury is likely to be equivocal and deficient in many respects because just why the injury resulted and the necessity of force are often disputed. In situations where problems are only likely to emerge after many years, as with chemical irritants, the approach of waiting for casualties to mount up has serious drawbacks.

*Principle 4: Formal Use-of-Force Policies are a Poor Guide to Practice*

The frequent announcements made by police and military organizations during the introduction of non-lethal weapons that formal policies are put in place to ensure the proper use of force should be taken as problematic. Various analyses of the use of force have argued that the formal rules

regarding it are poor relations to the informal practices that characterize use.<sup>39, 40</sup> When things are seen as going wrong with force and severe casualties result, security agencies are of course quick to point to the unrealistic expectations that force could be employed 'by the book' in emotionally charged and stressful confrontational situations.<sup>41</sup> In addition, the nature of human control over technology – whether unfortunate outcomes are caused by accident, mechanical failure, intentional purposes, or inadvertent mishap<sup>42, 43</sup> – is often much disputed in relation to specific situations. Much debate, for instance, has taken place regarding whether deaths caused from kinetic energy weapons are due to the characteristics of these weapons, the volatility of the situations in question, or the intent of users.<sup>44</sup>

This disjunction between policy and practice poses considerable difficulties in attempts to ensure that the use of force is appropriate. At least two types of approaches, often presented as distinct and competing options, can be identified. One is based on deriving, training users in and enforcing ever more precise rules prescribing when force should be resorted to and how. A problem with trying to establish a handbook of 'dos and don'ts' or specific terms of engagement is that in any organizational context rules cannot specify action for all contingencies. Rather, individuals have to interpret rules in relation to particular settings – in other words, discretion in the use of force is unavoidable. While strict military chains of command might seek to minimize the scope for discretion in warfare, such structures are of more limited relevance in 'military operations other than war' where NLWs are presented as having most promise in minimizing casualties. Use of force policy statements, guidelines and legal codes, for instance, often maintain that force should only be used where life is threatened. What counts as a threat and thus what is acceptable force depends on the evaluation of the 'relevant facts' and this cannot simply be determined by referring to a rule. There is no doubt that, in some instances, the severity of a threat might be uncontentious yet, particularly in situations where NLWs might be used, this unanimity should not be assumed. Commenting on public order policing (we might substitute peacekeeping) and echoing sentiments expressed above, Wilson argued that:

public order is nowhere defined and can never be defined unambiguously because what constitutes order is a matter of opinion and convention, not a state of nature ... An additional difficulty, a corollary of the first, is the impossibility of specifying what degree of disorder is intolerable and who is to be held culpable for that degree. A suburban street is quiet and pleasant, a big city street is noisy and (to some) offensive; what degree of noise and offence, and produced by whom, constitutes disorderly conduct?<sup>45</sup>

As what constitutes disorder is a matter of dispute, so too is what force (if any) is justified in dealing with that disorder.

Instead of seeking further rules and specifications, another approach to trying to make force appropriate is to ensure that security personnel are professionally trained and competent to make wise decisions in whatever situations they might face, that is, the exercise of discretion is a central part of determining what force is necessary and appropriate. This approach is exemplified by British use of force policies that are not intended as rules to structure responses, but as aids meant to support and inform individual officers in determining what force is prudent.<sup>46</sup> The obvious disadvantage of this approach is that the lack of binding rules mean that there are a broad band of actions that can be deemed acceptable. Of course, in practice, the use of force is not governed by either rule or discretion-based system, the two are very much intertwined. Yet just how this should be done is a matter of much importance and possible contention; thus we need to recognize the importance of rules but also their limitations.

### Minimum Framework for Assessing Non-Lethal Weapons

Following the principles outlined above, this section sets out something of the elements of a regulatory framework for 'carefully evaluating and controlling' non-lethal weapons. It is only 'something' of what is necessary because such an abstract list cannot attend to the varied local social, political and historical considerations that could or should come to bear on determinations about the appropriateness of the introduction of weaponry. The elements discussed below must be interpreted regarding their specific relevance for particular settings. Moreover, the framework only comments on a narrow range of issues associated with the approval and introduction of new weaponry into police and military forces. A comprehensive framework would need to address varied issues associated with the accountability of police and militaries, the legality of force and the like. Despite such limitations, these recommendations are based on the author's experiences of recurring failings of past and present systems for appraising weapons.

#### *Alternatives to New Force Options should be Pursued First*

Any introduction of non-lethal weapons should be preceded by efforts to find measures other than the adoption of weaponry. Much of the impetus for these weapons today comes from their stated potential to reduce injuries to users and recipients compared to existing force options. Yet the introduction of novel weaponry is not the only way to reduce injuries, nor is its adoption necessarily desirable. For instance, during the 1980s and 1990s South Korean police employed vast amounts of tear gas in quelling student and worker demonstrations.<sup>47</sup> Rather than seeking new and more powerful chemical irritants for public order control, in the late 1990s the police reportedly turned away from aggressive tactics and instead employed unarmed female desk officers operating with non-aggressive tactics for the frontline policing,<sup>48</sup> with a near elimination of the use of tear gas and much

improved police–protester relations. Such examples should be investigated for what lessons they might bring elsewhere. Likewise, various conflict resolution skills offer an alternative way to allocate resources to minimize injuries both to the public and to security personnel.<sup>49</sup> Instead of taking the pursuit of new technologies as the most effective path forward, it should be recognized that often ‘talking is the most effective way of dealing with situations’.<sup>50</sup> An indication of the poverty of thinking today about possible options and the importance attached to new weaponry can be seen from the way in which a whole range of measures, such as the introduction of physical barriers<sup>51,52</sup> or personnel detection systems,<sup>53</sup> are referred to as non-lethal ‘weapons’. Unfortunately, the importance of achieving non-lethality in conflict resolution has become synonymous with the pursuit of non-lethal *weapons*.

In something akin to a doctrine of a ‘just war’, if new weapons are adopted, those introducing them should be able to show that alternative measures have been considered, what threats the weapons are meant to reduce, the likelihood that new weapons will be able to address these and the proportionality of the response. Unfortunately, systematic information about what force is used when, against whom and with what result for bystanders, security personnel and those targeted is widely lacking, even within large police organizations in North America and Western Europe. One police force in the UK however has taken efforts to systematically collect information on force incidents and sought to incorporate such information into training provisions.<sup>54</sup> Rather than just writing new rules or leaving force to the discretion of street officers, senior officers acknowledge their responsibility in knowing where the problem areas are. When such information is compiled, steps can be taken to address the most problematic types of situations – for instance, those in which injuries are most likely to result. If official force policies change or new weapons are introduced, these can be informed by and subsequently evaluated through such systems. In short, the use of force can and should be an evidence-based practice.

### *Weapons should be Subject to Rigorous and Transparent Testing Procedures*

As suggested above, the rigour of past testing regimes for non-lethal weapons has often left much to be desired. Although it would be difficult to specify simple characterizations of what is required by way of testing for varied weapons, following the conclusion of the Himsworth Committee enquiry into the use of tear gas in Northern Ireland, the suggestion has been made that novel weapons ought to be treated as akin to ‘drugs’ for the purpose of their testing. The spirit of this proposal should be followed when the testing regimes for weapons with uncertain or highly contingent effects are considered. As part of this, the *full* testing procedures should be published in the open scientific press *prior* to the approval of any weapons. At least some agencies in certain cases, such as the Dutch police and OC

sprays, have published their reviews in the open scientific press.<sup>55</sup> Any restrictions placed on the information provided should be only be done for compelling reasons that are publicly specified.

The full publication of safety statements will enable future scrutiny about the relevance of initial tests if the practical use of technology changes. For instance, in the UK, electrical tasers are being introduced ostensibly as a substitute for firearms. As such, they are being evaluated at the time of writing as a distance weapon. Summary findings of the tests in this mode have been published by the British government.<sup>25</sup> However, the model being tested can function in a 'touch-stun' mode where the taser is applied directly to the body, but it appears that this mode of use has not been tested for in the British evaluation programme. Determinations about effectiveness, immediacy and the health effects might well be different if the touch-stun mode function had been evaluated. The danger, of course, is that tasers will be deemed 'safe and effective' be taken up by police forces and then be used in the stun-touch mode without sufficient testing.

#### *The Approval of Weaponry should be a Transparent and Accountable Process*

The approval of a non-lethal weapon should be made by a public body that assumes responsibility for the decision taken. This agency must bring together medical and technical tests with operational employment considerations in order to provide a realistic overview of likely practical concerns with future deployments. Transcribed recordings should be made of the approval proceedings, rather than relying on minutes of meetings or no records. The responsible body should be answerable to questions by those outside of security forces and monitor the subsequent use of weapons in order to assess the continuing relevance of the tests and assumptions that informed approval decisions. The members of approval bodies should be a matter of public knowledge and potential conflict of interest should be stated. Membership should extend beyond medical, military or police experts and include those with expertise in others areas, such as human rights, as well as concerned non-governmental organizations. Where relevant, final responsibility for approval should not be taken by those public organizations developing a weapon. In the UK, for instance, the same government agencies developing the latest kinetic baton rounds and launchers at present are the ones evaluating them. At the time of the approval, consideration should be given to the necessity and feasibility of employing de-contaminants or other such measures to alleviate the effects of weapons. The approval of weapons should be made with legally binding safety and quality assurances secured from manufacturers.

#### *Post-approval Monitoring and Feedback is Essential*

Medical and technical assessments, no matter how rigorous, cannot in themselves guarantee the relative acceptable effects of weapons in practice.

Following the suggestion above to treat non-lethal weapons as akin to drugs, surveillance procedures need to be in place to monitor deployments and security forces should adopt their tactics and technology on the basis of systematic evaluations of experience. Various institutional procedures along these lines include:

*The Monitoring of Usage.* What force is used in which situations should be recorded, collated and fed back into training and practices. Immediate injuries to all parties suffered from the use of force should be recorded as part of use of force or incident reporting forms.<sup>56</sup> Where possible, attempts should be made to substantiate claims about the force employed through monitoring mechanisms: chemical irritant sprays can be checked regarding how much chemical was used and some electroshock devices records the time and date of every firing. Video recordings can be made of the use of force in riots or demonstrations.

*Medical Monitoring should err on the Side of Caution:* The extent of injury predicted through testing can underestimate effects. For instance, physicians in southern California identified various deficiencies associated with forecasts and even initial diagnosis of the injuries caused by a certain type of kinetic weapon.<sup>57</sup> The initial erroneous presumptions about the supposed minor health implications of the weapon led to insufficient procedures being implemented, which in turn meant the severity of injuries sustained was only appreciated after unnecessary delay. One of the reasons suggested by the physicians for the injury levels documented was the repeated use of the round under the advised firing distance. Yet if force is justified in such situations, it makes little sense to issue inappropriate equipment to officers. When there is a possible risk exists of long-term or delayed health effects, procedures should be put in place to monitor such injuries. In addition, the terms of reference for any post-adoption reviews of the merits of particular options should be openly debated and the *full* results made public, in contrast, for example, to a recent report from the Washington-based national Institute of Justice.<sup>58</sup>

*Use of Force, Injury, Compensation and Complaint Figures should be Publicly Accessible.* The open availability of accurate information would help substantiate what force is used and when in public discussions. Understandably, withholding or failure to collect the most basic information about force has generated considerable uncertainty and antagonism.<sup>59</sup> The Patten Report into policing in Northern Ireland recommended that the police service should take steps to improve its transparency. The presumption should be that everything should be available for public scrutiny unless it is in the public interest – not the police interest – to hold it back. This suggestion can serve as valuable standard for all aspects of the adoption of (purportedly progressive and appropriately

employed) NLWs by security forces. It is highly unlikely that the provision of such information would resolve disputes about the merits of force, but its availability is a basic requirement in ensuring public accountability.

### *Comprehensive Operational Controls are Needed*

As suggested above, one danger with the introduction of non-lethal weapons is that they are initially justified for particular scenarios and then over time they become deployed in a far wider range of situations. That the purposes of technologies evolve over time is hardly a phenomenon unique to weaponry, nor necessarily inappropriate. Yet when the legitimacy and social acceptability of certain types of force is sought, alterations can have implications not only for determinations of the acceptability of force, but also for the trust held in security organizations. When CS sprays were publicly promoted in the mid-1990s in the UK, they were justified as a last step option in restraining extremely violent individuals short of using a firearm. However, they quickly became justified for a wider range of situations.<sup>60</sup> Elsewhere, the introduction of non-lethal options has not functioned as a substitute for lethal or other force options, but increased the range of situations in which force is used. In relation to the use of OC sprays in one police agency, this 'may not necessarily be an alternative to [physical or deadly] force, but provides officers with options to use more force – perhaps unnecessarily. In other words, if it is there, they will use it.'<sup>61</sup> <closing quote mark?> There is nothing inevitable about the widening of the scope of deployment, but without precautions there is nothing to necessarily prevent it.

Non-lethal weapons should be introduced in such a fashion as to ensure expanded uses are subject to open debate informed by analysis of past use. In the UK, for instance, it is currently being proposed that only the small percentage of armed officers should be able to use electrical tasers. The distinct danger is that such proposals are given to gain public acceptance and then quietly brushed aside. Steps should be taken to prevent this, for instance by requiring official parliamentary or otherwise binding statements of the stated purpose, and the rules and training provisions associated with weapons should be a matter of public knowledge.

By way of illustrating the relatively acceptable effects of particular weapons, some security forces subject their members to 'taster' exposures. These experiences are typically in highly controlled settings and for a fraction of likely 'real life' duration. If a weapon is billed as highly safe and effective, but security forces are not willing to test it on themselves, this should provide grounds for caution. Such exposure tests are not meant to turn police officers or soldiers into guinea pigs, but can convey to users something of the pain likely to be inflicted. As part of professional training that stresses the importance of minimizing the use of force, exposures should (but may not always) be to ensure that weapons are employed appropriately.



A key reference frame in thinking about the acceptability of weapons is what would be said if they were used against politicians or members of security forces. If a weapon is deemed lethal or dangerous against them, it should be treated as such when security forces themselves deploy – I am grateful to Steve Wright for this suggestion.

*All Aspects of the Adoption of Non-lethal Weapons should be Open to Scrutiny by those Outside Security Forces*

Decisions about the introduction and adoption of purportedly more humane weaponry are too important and complex to be left to any single agency, be that the police or military, and active steps should be taken to encourage outside scrutiny to the decisions taken. The limited resources available to many non-governmental groups concerned with the use of force means the public scrutiny will be limited, but the main limits should not derive from the policies of state agencies.

### Conclusion

Much promise has been attached to non-lethal weapons in Western police and military circles. If they are to achieve the potential now given to them by their proponents, they must be and be seen to be evaluated and controlled in a responsible manner. It is inadequate to suggest that 'non-lethal' weapons are preferable to 'conventional' arms because they generally cause less physical injury. This makes possibly inappropriate assumptions about how weaponry is utilized in practice. In contrast, this article has set up some of the components for a regulatory framework, outlining steps to operationalize the call in the UN Basic Principles on the Use of Force and Firearms by Law Enforcement Officials that NLWs should be 'carefully evaluated' and 'carefully controlled'.

A measured examination of what needs to be done regarding the use of force should start with identified problems and a consideration of how they might be minimized, rather than the conclusion that the introduction of new forms of weaponry will in itself alleviate problems with force. More important than the introduction of new NLWs is to strive for non-lethality in conflict, while not equating the search for the latter with the realization of the former. Given the current enthusiasm in and funds for the development of non-lethal weapons, it should be remembered that they do not save lives, though intelligent and professional policing and soldiering can. New force options can be a part of such professional conduct, but not a substitute for it.

## References

1. Lewer N, ed. *The Future of Non-lethal Weapons: Technologies, Operations, Ethics and Law*. London and Portland, OR: Frank Cass, 2002.
2. Martin B, Wright S. Countershock: mobilizing resistance to electroshock weapons. *Med Confl Surviv* 2003; 19: 205–22.
3. Coupland R, Meddings D. Mortality associated with use of weapons in armed conflict, wartime atrocities, and civilian mass shootings. *BMJ* 1999; 319: 407–10.
4. Omega Foundation. *Crowd Control Technologies-Technical Annex*. Report to the Scientific and Technological Options Assessment of the European Parliament. PE 168.394 Luxembourg: European Parliament, 2000.
5. Waddington PAJ. *Policing Citizens: Authority and Rights*. London: University College London Press, 1999.
6. Lamb C. *Non-lethal Weapons Policy: Department of Defense Directive*. Arlington, VA: DOD, 1 Jan. 1995: 1.
7. Fraunhofer Institut Chemische Technologies. *Non-lethal Capabilities Facing Emerging Threats*. 2nd European Symposium on Non-lethal Weapons, Ettlingen, 13–14 May 2003.
8. Rappert B. *Non-lethal Weapons as Legitimizing Forces? Technology, Politics and the Management of Conflict*. London and Portland, OR: Frank Cass, 2003: 51–2.
9. Price, R. *The Chemical Weapons Taboo* (Ithaca, NY: Cornell University Press, 1997).
10. Balmer B. *Britain and Biological Warfare*. Basingstoke: Palgrave, 2001.
11. Jenkins D. *The Final Frontier*. London: Verso, 2002.
12. Reid RW. *Tongues of Conscience*. London: Constable, 1969: 315.
13. Robinson J. Disabling chemical weapons. Presentation to PUGWASH Study Group on Implementation of the CBW Conventions, Den Haag, 27–29 May 1994.
14. Dando M. *A New Form of Warfare*. London: Brassey's, 1996: Ch.5.
15. Shalom S. Bullets, gas, and the bomb: the spread of conventional and unconventional weapons. In: *Imperial Alibis*. Boston, MA: South End Press, 1993. At: <[www.zmag.org/zmag/articles/ShalomWeapons.html](http://www.zmag.org/zmag/articles/ShalomWeapons.html)>.
16. Amnesty International. *Annual Report*. London: AI, 1998.
17. Amnesty International. *Israel/Occupied Territories and the Palestinian Authority: Five Years after the Oslo Agreement*. London: AI, 1998.
18. Hiss J, Hellman F, Kahana T. Rubber and plastic ammunition lethal injuries: the Israeli experience. *Med Sci Law* 1997; 37: 139–44.
19. Allen T. Chemical cops. *In These Times*. Washington, DC, 3 April 2000.
20. Wastell David. Now the trade anarchists target Washington. *Electronic Telegraph*, 9 April 2000. At: <[www.telegraph.co.uk](http://www.telegraph.co.uk)>.
21. Della Porta D, Reiter H, eds. *Policing Protest: The Control of Mass Demonstrations in Western Democracies*. London: University of Minnesota Press, 1998.
22. Wright S. The new technologies of political repression. *Philo Soc Action* 1991; 17: 31–58.
23. Rappert B. Health and safety in policing. *Soc Sci Med* 2003; 56: 1269–78.
24. Steering Group for Patten Report. Recommendations 69 and 70 Relating to Public Order Equipment. *A Research Programme into Alternative Policing Approaches Towards the Management of Conflict – Phase II*. Belfast: Northern Ireland Office, 2001.
25. Steering Group for Patten Report. Recommendations 69 and 70 Relating to Public Order Equipment. *A Research Programme into Alternative Policing*

- Approaches Towards the Management of Conflict – Phase III.* Belfast: Northern Ireland Office, 2002: 1.
26. Amnesty International (United Kingdom). *Submission to the NIO Steering Group on Recommendations 69 and 70 of the Patten Report.* London: AI, 2002.
  27. Committee on the Administration of Justice. *Response to a Research Programme into Alternative Policing Approaches towards the Management of Conflict.* Belfast: CAJ, 2003.
  28. Rappert B. *Submission to the December 2002 Patten Recommendations 69 and 70 Relating to Public Order Equipment Report.* Nottingham: University of Nottingham, 2003: 1–5.
  29. Faulkner S, Danaher L. *Controlling Subjects: Realistic Training vs. Magic Bullets.* At: <[www.fbi.gov/publications/leb/1997/feb974.htm](http://www.fbi.gov/publications/leb/1997/feb974.htm)>.
  30. Altmann J. Non-lethal weapons technologies: the case for independent scientific analysis. *Med Confl Surviv* 2001; 17: 234–47.
  31. Doubet M. *The Medical Implications of OC Spray.* Millstadt, IL: PPCT Management Systems, 1997.
  32. Kenny J, Heal C, Grossman M. *The Attribute-Based Evaluation (ABE) of Less-Than-Lethal, Extended-Range, Impact Munitions.* University Park, PA: Penn State University, 2003. At: <[www.nldt.org/publications.php](http://www.nldt.org/publications.php)>.
  33. Kendig T. Non-lethal weapons testing proves many inaccurate. *Penn State Intercom*, 24 May 2001. At: <[www.psu.edu/ur/archives/intercom\\_2001/May24/weapons.html](http://www.psu.edu/ur/archives/intercom_2001/May24/weapons.html)>.
  34. Rappert B. Shock tactics. *New Sci*; 15 Feb. 2003; 34–7.
  35. Woodhouse E. Is large-scale military R&D defensible theoretically? *Sci Techn Hum Values* 1990; 15: 442–60.
  36. Morone J, Woodhouse E. *Averting Catastrophe.* Berkeley CA: University of California, 1986.
  37. Latour B. *Science in Action.* Cambridge, MA: Harvard University Press, 1987.
  38. Rappert B. Assessing chemical incapacitants. *Int J Police Sci Man* 2002; 4(2): 115–26.
  39. Hunt J. Police accounts of normal force. In: Kappeler V, ed. *The Police and Society.* Prospect Heights, IL: Waveland Press, 2nd edn. 1999.
  40. Bayley D Garofalo J. The management of violence by police patrol officers. *Criminology* 1989; 27: 1–27.
  41. Waddington PAJ. *The Strong Arm of the Law.* Oxford: Clarendon Press, 1991.
  42. Stone D. Causal stories and the formation of policy agendas. *Pol Sci Quart* 1989; 104: 281–300.
  43. Wynne B. Unruly technology. *Soc Studies Sci* 1998; 18 (1): 147–67.
  44. B'Tselem. *Death Foretold.* Jerusalem: B'Tselem, 1998.
  45. Wilson J. *Varieties of Police Behaviour.* Cambridge, MA: Harvard University Press, 1968: 21–2.
  46. Association of Chief Police Officers. *CS Incapacitant Spray: Notes for Guidance on Police Use.* London: ACPO, 1999.
  47. Physicians for Human Rights. *The Use of Tear Gas in the Republic of Korea – A Report by Health Professionals.* Boston, MA: PHR, 1987.
  48. Reitman V. Seoul adopts chemical-free policy on protests. *Los Angeles Times*, 5 March 2000: A4.
  49. Police Ombudsman. *A Study of Complaints Involving the Use of Batons by the Police in Northern Ireland.* Belfast: Office of the Police Ombudsman, 2003.
  50. Acres P. Conflict management portfolio. Presentation to Safer Restraint Conference. London, 17 April 2002.
  51. Eisenreich N, Neutz J, Thiel K. Novel barrier (-systems) as non-lethal weapons. *Non-lethal Capabilities Facing Emerging Threats.* 2nd European Symposium on Non-lethal Weapons, Ettlingen, 13–14 May 2003.

52. National Research Council. *An Assessment of Non-Lethal Weapons Science and Technology*. Washington DC: National Academy Press, 2003.
53. Zierler R. Passive Sensor System. In: *Non-lethal Weapons*. Proceedings of the 1st European Symposium on Non-lethal Weapons. Ettlingen, 25–26 Sept. 2001. Postfach: Institut Chemische Technologies, 2001.
54. Rappert B. The distribution and resolution of the ambiguities of technology, or why bobby can't spray. *Soc Studies Sci* 2001; 31: 557–92.
55. Busker R, van Helden H. Toxicological evaluation of pepper spray as a possible weapon for the Dutch Police force. *Am J Forensic Med Path* 1998; 19: 309–16.
56. Police Complaints Authority. *CS Spray: Increasing Public Safety?* London: PCA, 2000.
57. De Brito D, Challoner K, Ashish S, William M. The injury pattern of a new law-enforcement weapon. *Ann Emerg Med* 2001; 38: 383–90.
58. National Institute of Justice. *The Effectiveness and Safety of Pepper Spray*. Washington DC: NIJ, 2003.
59. Committee on the Administration of Justice. *Plastic Bullets*. Belfast: CAJ, 1998.
60. Trevisick S. *Dispatches: The Truth of CS*. London: Channel 4 and Liberty Publication, 1996.
61. Lumb R, Friday P. Impact of pepper spray availability on police officer use-of-force decisions. *Policing* 1997; 20: 136–48.

(Accepted 11 August 2003)

---

**Brian Rappert** has published numerous articles and books regarding the sociology of technology, scientific and technical professions and public policy. He is the author of *Non-Lethal Weapons as Legitimizing Forces? Technology, Politics and the Management of Conflict* (2003).

*Correspondence:* Department of Sociology, School of Historical, Political and Sociological Studies, University of Exeter, Exeter EX4 4RJ. Email: <B.Rappert@exeter.ac.uk>.

---

---