REPORT 10 OF THE BOARD OF TRUSTEES (June 2021)
Protester Protections
(Resolution 409-NOV-20)
(Reference Committee D)

EXECUTIVE SUMMARY

Background: The right of people to peaceably assemble is protected by the First Amendment to the Constitution. However, this right is not without limitation, as jurisdictions have a duty to maintain public order and safety and may regulate the time, place, and manner of protests. The use of force by law enforcement officers may be necessary and is permitted in certain circumstances. However, law enforcement officers should use only the amount of force necessary to mitigate an incident, make an arrest, or protect themselves or others from harm. Crowd control tactics used by law enforcement at some anti-racism protests have been called a public health threat, with excessive use of force raising health and human rights concerns as well as undermining freedom of peaceful assembly. Concerns have specifically been raised regarding law enforcement's use of crowd-control weapons (CCWs) or less-lethal weapons (LLWs), including kinetic impact projectiles (KIPs) and chemical irritants against protesters resulting in preventable injury, disability, and death.

Discussion: Population-level data on protest-related injuries from LLW, including chemical irritants and KIPs, are not readily available. Limited studies have attempted to identify these injuries through emergency department encounters captured through the injury surveillance systems as well as through injuries reported through traditional and social media. A systematic review of the literature on deaths, injuries, and permanent disability from KIPs from January 1990 to June 2017 identified injury data on 1,984 people. Over the 27-year period, 53 people (3 percent) died because of their injuries. Penetrative injuries caused 56 percent of the deaths, while blunt injuries caused 23 percent, head and neck trauma accounted for nearly 50 percent of deaths, and chest and abdominal trauma accounted for 27 percent. A systematic review found that among 9,261 injuries from chemical irritants, 8.7 percent were severe, two were lethal, and 58 caused permanent disabilities. Studies have identified chronic bronchitis, compromised lung function, and acute lung injury as consequences of chemical irritant exposure.

Conclusion: The right of assembly plays a fundamental role in public participation in democracy, holding governments accountable, expressing the will of the people, and in amplifying the voices of people who are marginalized. The morbidity and mortality data available on the use of rubber bullets, including rubber or plastic-coated metal bullets and those with composites of metal and plastic, suggests that their use by law enforcement for the purposes of crowd control and management should be prohibited in the United States. There is some data available to suggest that the use of LLWs decreases the likelihood of suspect injury, which is why a complete ban of all KIPs and chemical irritants is not recommended at this time. While it is important to recognize that there may be a role for the use of LLWs by law enforcement, standards for their use should be clear. If KIPs and chemical irritants are going to be used, law enforcement agencies should have specific guidelines, rigorous training, and an accountability system, including the collection and reporting of data on injuries. Appropriate de-escalation techniques should be used to minimize the risk of violence when feasible. Where force is necessary to achieve a legitimate law enforcement objective, precautionary steps should be taken to minimize, the risk of injury or death.

REPORT OF THE BOARD OF TRUSTEES

B of T Report 10-JUN-21

Subject:	Protester Protections (Resolution 409-NOV-20)
Presented by:	Russ Kridel, MD, Chair
Referred to:	Reference Committee D

At the November 2020 Special Meeting of the House of Delegates Resolution 409, introduced by the Medical Student Section, was referred for study. This resolution asked that our American Medical Association (AMA):

(1) advocate to ban the use of chemical irritants and kinetic impact projectiles for crowd-control in the United States (Directive to Take Action); and
(2) encourage relevant stakeholders including but not limited to manufacturers and government agencies to develop, test, and use crowd-control techniques which pose no risk of physical harm. (Directive to Take Action)

BACKGROUND

In 2020, protests and demonstrations increased in the United States following the outrage and grief over the killing of George Floyd, Breonna Taylor and other victims of law enforcement-related violence and racism across the country. While an analysis of more than 7,750 demonstrations across the country from May 26, 2020 through August 22, 2020 found that more than 93 percent of Black Lives Matter protests have been peaceful, a small number of protests involved demonstrators engaging in violence.[1] Crowd control tactics used by law enforcement at some anti-racism protests have been called a public health threat, with excessive use of force raising health and human rights concerns as well as undermining freedom of peaceful assembly.[2,3] Concerns have specifically been raised regarding law enforcement's use of crowd-control weapons (CCWs) or less-lethal weapons (LLWs) against protesters resulting in preventable injury, disability, and death.[3]

The right of people to peaceably assemble is protected by the First Amendment to the Constitution. However, this right is not without limitation, as jurisdictions have a duty to maintain public order and safety and may regulate the time, place, and manner of protests. The use of force by law enforcement officers may be necessary and is permitted in certain circumstances. However, law enforcement officers should use only the amount of force necessary to mitigate an incident, make an arrest, or protect themselves or others from harm.[4]

The American Medical Association has previously studied the issue of law enforcement-related violence. This report will be narrowly focused on the issue of the use of chemical irritants and kinetic impact projectiles for crowd-control in the United States.

DEFINITIONS

Definitions are critically important to this issue. For the purposes of this report, key terms are defined as follows:

Crowd control is defined as techniques used to address civil disturbances (breach of the peace or an assembly where there is a threat of violence, destruction of property, or other unlawful acts), to include a show of force, crowd containment, dispersal equipment and tactics, and preparations for multiple arrests.[5]

Crowd management is defined as techniques used to manage lawful assemblies (demonstrations, marches, or protests) before, during, and after the event for the purpose of maintaining lawful status through event planning, pre-event contact with event organizers, issuance of permits when applicable, information gathering, personnel training, and other means.[5]

Demonstrations are defined as the lawful assembly of persons organized primarily to engage in free speech activity. These may be scheduled events that allow for law enforcement planning. However, lawful demonstrations can devolve into civil disturbances that necessitate enforcement actions.[5]

Kinetic impact projectiles (KIPs), commonly called rubber or plastic bullets, are defined as projectiles designed and intended to deliver non-penetrating impact energy. KIPs are designed to incapacitate individuals by inflicting pain or sublethal injury.[3] Some KIPs target an individual with a single projectile, while others target a group by scattering multiple projectiles. There are numerous types of KIPs available, including "rubber bullets," which are spherical or cylindrical projectiles and can be made of hard rubber, plastic, or polyvinylchloride. The term "rubber bullets" is also often used to describe KIPs made of a composite of plastic and metal fragments as well as metal bullets surrounded by a coating of plastic or rubber.

Chemical irritants, also referred to as riot control agents, are chemical compounds that temporarily make people unable to function by causing irritation to the eyes, mouth, throat, lungs, and skin.[6] Several different chemical compounds are used as chemical irritants, including oleoresin capsicum ("pepper spray"), hexachloroethane ("smoke grenade"), the "tear gases" chloroacetophenone, chlorobenzylidenemalononitrile (CS), chloropicrin, bromobenzylcyanide, dibenzoxazepine, as well as combinations of various agents. Chemical irritants come in many forms (liquids, solids, fine powders), thus many formulations and dispersion technologies are used. Most are released into the air as fine droplets or particles using propellants, solvents, or explosives.

EXISTING AMA POLICY

Existing AMA policy does not address the use of chemical irritants or kinetic impact projectiles for crowd control. Policy H-515.955, "Research the Effects of Physical or Verbal Violence Between Law Enforcement Officers and Public Citizens on Public Health Outcomes," encourages the study of the public health effects of physical or verbal violence between law enforcement officers and the public, particularly within ethnic and racial minority communities; encourages the Centers for Disease Control and Prevention as well as state and local public health agencies to research the nature and public health implications of violence involving law enforcement; supports requiring the reporting of legal intervention deaths and law enforcement officer homicides to public health agencies; and encourages appropriate stakeholders, to define "serious injuries" for the purpose of systematically collecting data on law enforcement-related non-fatal injuries among civilians and officers.

Tasers, or Conducted Electrical Devices (CEDs) are another LLW often used by law enforcement. The AMA has existing policy on CEDs, which recommends that law enforcement departments and agencies should have in place specific guidelines, rigorous training, and an accountability system for their use that is modeled after available national guidelines. CEDs are outside of the scope of this report.

DISCUSSION

Population-level data on protest-related injuries from LLW, including chemical irritants and KIPs, are not readily available. There are limited regulations on the development of KIPs and manufacturers are not required to keep records on injuries from their products. Generally, there is no requirement for law enforcement to collect data on injuries from LLWs and if the data is collected, it may not be publicly available. Limited studies have attempted to identify these injuries through emergency department encounters captured through the injury surveillance systems as well as through injuries reported through traditional and social media. While research has shown that people of color face a higher likelihood of being killed by police than do White men and women[7], morbidity and mortality specific to LLWs and their use in crowd control by race and ethnicity is unclear. Though it has been observed that crowds comprised largely of people of color have faced a more aggressive, more militarized approach.[8]

Law enforcement agencies oppose some restrictions on LLWs, saying the weapons are a critical tool to control uncooperative people that stops short of deadly force. Limiting access to LLWs could increase morbidity and mortality, requiring law enforcement officials to choose a more deadly form of force. There is some data available to suggest that the use of LLW decreases the likelihood of suspect injury.[9,10] For example, the use of pepper spray decreased the likelihood of suspect injury by 65 percent.[11] However, most of this research is focused on CEDs and pepper spray and is not specific to KIPs or crowd control.

Injury, Disability, and Death from Kinetic Impact Projectiles (KIPs)

A systematic review of the literature on deaths, injuries, and permanent disability from KIPs from January 1990 to June 2017 identified injury data on 1,984 people.[3] Over the 27-year period, 53 people (3 percent) died because of their injuries. Penetrative injuries caused 56 percent of the deaths, while blunt injuries caused 23 percent, head and neck trauma accounted for nearly 50 percent of deaths, and chest and abdominal trauma accounted for 27 percent.[3] Three hundred people (15 percent of survivors) suffered permanent disability. Many injuries were secondary to vision loss and abdominal injuries resulting in splenectomies or colostomies. Amputation of a limb occurred in two individuals.[3] Of the 2,135 injuries in the 1,931 people who survived, 71 percent were severe, with injuries to the skin and extremities being the most frequent.[3] Almost all (91.5 percent n=732) head and neck, ocular, nervous, cardiovascular, pulmonary and thoracic, abdominal and urogenital injuries were severe.[3]

Anatomical site of impact, firing distance, and timely access to medical care were correlated with injury severity and risk of disability. Morbidity and mortality from KIPs often occurs as a result of shots to vital organs at close range including the head, neck, chest and abdomen.[3] Although the data are limited, rubber-coated metal bullets and those with composites of metal and plastic appear to be more lethal than plastic or rubber alone.[3] Though there is some evidence that "newer 'attenuated energy projectiles' (with a hollow plastic tip that collapses on impact or a soft sponged tip) may mitigate some injuries from ricochet or deep penetrative injury."[3]

Several studies have examined ocular injuries caused by KIPs and have found that the use of KIPs increase the incidence of debilitating ocular trauma.[12] For example, a study investigating cases of ocular trauma from KIPs during the civil unrest in Chile between October 18 and November 30, 2019 identified. KIPs as the suspected cause in 182 cases (70.5 percent).[13] Thirty-three cases had total blindness and 90 cases (49.5 percent) had severe visual impairment or were blind at first examination. Around 20 percent of the cases caused by KIPs had open-globe trauma.[13] Compared to other causes of ocular trauma, KIPs were related to a more severe loss of visual acuity and a higher frequency of open-globe injuries.[13]

Effects of Chemical Irritant Exposure

Chemical irritants such as tear gas and pepper spray are banned from use in warfare under the United Nations Chemical Weapons Convention (CWC). However, the CWC and local regulations stipulate that certain chemical agents may be used for riot control when officers give people adequate warning before releasing the agents and people have a reasonable route to escape any gas.[14] Chemical irritants used in crowd control have historically been considered by law enforcement to be safe and to cause only transient pain and lacrimation. However, in a recent publication, the National Institute of Justice notes that the deployment of pepper spray should be constrained and discusses the negative effects of pepper spray use.[15] Attempts have been made to catalogue the chemical irritants used by law enforcement but have been unsuccessful because of the number and variability of agencies and policies.[16]

Mixed reports exist regarding the effects of chemical irritants on people who are exposed. Some reports note that without medical attention, the effects of pepper spray and tear gas wane within several minutes; that significant adverse clinical effects, life-threatening conditions, and long-term effects are rare; and that death caused by chemical irritant exposure is unlikely.[15,17,18] However, numerous newer reports indicate that the use of these chemicals may cause serious injuries, have a significant potential for misuse, and cause unnecessary morbidity and mortality.[19–21] A systematic review found that among 9,261 injuries from chemical irritants, 8.7 percent were severe, two were lethal, and 58 caused permanent disabilities.[22–24] Studies have identified chronic bronchitis, compromised lung function, and acute lung injury as consequences of chemical irritant exposure.[22–24]

The International Association of Chiefs of Police (IACP)

The IACP, the world's largest professional association for police leaders with more than 31,000 members in over 165 countries, has established guidelines for managing crowds, protecting individual rights, and preserving the peace during demonstrations and civil disturbances. It is the policy of the IACP to "protect individual rights related to assembly and free speech; effectively manage crowds to prevent loss of life, injury, or property damage; and minimize disruption to persons who are not involved."[5]

ICAP's guidance provides that impact projectiles shall not be fired indiscriminately into crowds.[5] Non-direct (skip-fired) projectiles and munitions may be used in civil disturbances where life is in immediate jeopardy or the need to use the devices outweighs the potential risks involved.[5] Direct-fired KIPs may be used during civil disturbances against individuals engaged in conduct that poses an immediate threat of death or serious injury.[5] A verbal warning should be given prior to the use of KIPs when reasonably possible.

IACP provides that aerosol restraint spray, or oleoresin capsicum (OC), may be used against individuals engaged in unlawful conduct or actively resisting arrest, or as necessary in a defensive

capacity when appropriate.[5] OC spray shall not be used indiscriminately against groups of people where bystanders would be affected, or against passively resistant individuals.[5] High-volume OC delivery systems may be used in civil disturbances against groups of people engaged in unlawful acts or endangering public safety and security when approved by the incident commander.[5] Whenever reasonably possible, a verbal warning should be issued prior to the use of these systems.

CS (2-chlorobenzalmalononitrile) chemical agents are primarily offensive weapons to be used with the utmost caution. ICAP notes that CS may be deployed defensively to prevent injury when lesser force options are not available or would be ineffective.[5] These chemical agents are to deployed at the direction of the incident commander only when avenues of egress are available to the crowd. When reasonably possible, their use shall be announced to the crowd in advance. ICAP notes that CN (phenacyl chloride) shall not be used in any instance.[5]

The IACP has indicated that they plan to review their recommended policies on pepper spray and LLWs, including KIPs, as well as other aspects of crowd control. However, while the IACP makes recommendations, law enforcement agencies set their own policies.

United Nations

In 2019, the United Nations issued guidance on *Less Lethal Weapons in Law Enforcement*.[25] The guidance notes that law enforcement officials may only use force when strictly necessary and to the extent required for the performance of their duty. However, its acknowledged that law enforcement officials have the immense responsibility of determining, often in a matter of seconds and under hazardous conditions, whether force is necessary and, if so, how much is proportional to the threat they face with the possible cost of error being the loss of life.[25]

The guidance stresses the need for countries to supply law enforcement officials with effective, less-lethal means, and to train them in their lawful use.[25] The deployment of LLWs needs to be carefully evaluated to minimize the risk of endangering uninvolved persons and their use should be carefully controlled. The guidance recognizes that improper use of LLWs can cause serious injury or death.[25] Even LLWs "must be employed only when they are subject to strict requirements of necessity and proportionality, in situations in which other less harmful measures have proven to be or are clearly ineffective to address the threat."[25]

The guidance also makes it clear that LLWs have an important role in law enforcement. They may be used either in situations where some degree of force is necessary but where the use of firearms would be unlawful, or as a less dangerous alternative to firearms, to reduce the risk of injury to the public.[25] Where law enforcement officials are only equipped with a baton and a firearm, the risks to themselves and to the public may be heightened.[25]

State Legislation

At least seven cities and a few states have enacted or proposed limits on the use of KIPs and chemical irritants, though some efforts have stalled across the United States in the face of opposition from police agencies and other critics.[26,27]

The District of Columbia City Council enacted legislation, which provides that chemical irritants and less-lethal projectiles shall not be used to disperse a First Amendment assembly.[28] Legislation enacted in Colorado provides that in response to a protest or demonstration, a law enforcement agency shall not discharge KIPs and all other non- or less-lethal projectiles in a manner that targets the head, pelvis, or back; discharge kinetic impact projectiles indiscriminately into a crowd; or use

chemical agents or irritants, including pepper spray and tear gas, prior to issuing an order to disperse in a sufficient manner to ensure the order is heard and repeated if necessary, followed by sufficient time and space to allow compliance with the order.[29] In Massachusetts, a 2020 law provides that a law enforcement officer shall not discharge or order the discharge of tear gas or any other chemical weapon, or rubber pellets from a propulsion device or release to control or influence a person's behavior unless de-escalation tactics have been attempted and failed or are not feasible and the measures used are necessary to prevent imminent harm and the foreseeable harm inflected by the tear gas or other chemical weapon, rubber pellets is proportionate to the threat of imminent harm.[30] Oregon enacted legislation providing that a law enforcement agency may not use tear gas for the purpose of crowd control except in circumstances constituting a riot. Furthermore, before using tear gas in a riot, law enforcement shall: announce the agency's intent to use tear gas; allow sufficient time for individuals to evacuate the area; and announce for a second time, immediately before using the tear gas, the agency's intent to use tear gas.[31] Virginia enacted a bill prohibiting the use of KIPs unless necessary to protect a law enforcement officer or another person from bodily injury. The bill directs the Department of Criminal Justice Services to establish training standards for law enforcement on the use of KIPs and tear gas.

Federation of Medicine Statements and Positions

In June 2020, the American Thoracic Society called for "a moratorium on the use of tear gas and other chemical agents deployed by law enforcement against protestor participating in demonstrations, including current campaigns sparked by the death of George Floyd."[32] Citing significant short- and long-term respiratory health injury and likeliness of propagating the spread of viral illnesses including COVID-19, the potential to endanger innocent bystanders and the media, and concerns to medical personnel when treating protestors since the agents can contaminate clothing and medical equipment[32]. ATS also cited inadequate training, monitoring, and accountability in use of these weapons contribute to misuse and risk of injury. If used at all, tear gas should be a last resort.[32]

Also in June 2020, the American Academy of Ophthalmology (AAO) called on "domestic law enforcement officials to immediately end the use of rubber bullets to control or disperse crowds of protestors."[33] The statement noted that Americans have the right to speak and congregate publicly and should be able to exercise that right without the fear of blindness; people should not have to choose between their vision and their voice.[33] The following Federation members signed on to the AAO statement: American Academy of Allergy, Asthma and Immunology; American Academy of Family Physicians; American College of Surgeons; American Geriatrics Society; American Society of Nephrology; Council of Medical Specialty Societies; and the Society of Interventional Radiology.

CONCLUSION

The right of assembly plays a fundamental role in public participation in democracy, holding governments accountable, expressing the will of the people, and in amplifying the voices of people who are marginalized. For years, activists and civil libertarians worldwide have urged police to ban LLWs from use for crowd control.[34] Physicians and other health care personnel have witnessed first-hand the morbidity and mortality of LLWs. There have been calls for the development of national standards and training programs for years, but there has been little progress. At this time, based on the morbidity and mortality data available, the use of rubber bullets, including rubber or plastic-coated metal bullets and those with composites of metal and plastic, by law enforcement for the purposes of crowd control and management should be prohibited in the United States.

Law enforcement agencies oppose some restrictions on LLWs, saying the weapons are a critical tool to control uncooperative people that stops short of deadly force. Limiting access to LLWs could increase morbidity and mortality, requiring law enforcement officials to choose a more deadly form of force. There is some data available to suggest that the use of LLWs decreases the likelihood of suspect injury, which is why a complete ban of all KIPs and chemical irritants is not recommended at this time.[9,10] However, the AMA strongly encourages prioritizing the development and testing of crowd-control techniques which pose a more limited risk of physical harm.

While it is important to recognize that there may be a role for the use of LLWs by law enforcement, standards for their use should be clear. KIPs and chemical irritants can result in injury, disability and death, and they should not be used against crowds that pose no immediate threat. If KIPs and chemical irritants are going to be used, law enforcement agencies should have specific guidelines, rigorous training, and an accountability system, including the collection and reporting of data on injuries. Appropriate de-escalation techniques should be used to minimize the risk of violence when feasible. Where force is necessary to achieve a legitimate law enforcement objective, precautionary steps should be taken to minimize, the risk of injury or death. Considerations should include the proximity of non-violent individuals and bystanders; for KIPs safe shooting distance and avoidance of vital organs (head, neck, chest, and abdomen), and for all LLWs, the issuance of a warning followed by sufficient time for compliance with the order prior to discharge.

RECOMMENDATIONS

The Board of Trustees recommends that the following be adopted in lieu of Resolution 409, November 2020 Special Meeting, and the remainder of this report be filed.

Less-Lethal Weapons and Crowd Control

Our American Medical Association (1) supports prohibiting the use of rubber bullets, including rubber or plastic-coated metal bullets and those with composites of metal and plastic, by law enforcement for the purposes of crowd control and management in the United States; (2) supports prohibiting the use of chemical irritants and kinetic impact projectiles to control peaceful crowds that do not pose an immediate threat; (3) recommends that law enforcement agencies have in place specific guidelines, rigorous training, and an accountability system, including the collection and reporting of data on injuries, for the use of kinetic impact projectiles and chemical irritants; (4) encourages guidelines on the use of kinetic impact projectiles and chemical irritants to include considerations such as the proximity of non-violent individuals and bystanders; for kinetic impact projectiles, a safe shooting distance and avoidance of vital organs (head, neck, chest, and abdomen), and for all less-lethal weapons, the issuance of a warning followed by sufficient time for compliance with the order prior to discharge; (5) recommends that law enforcement personnel use appropriate de-escalation techniques to minimize the risk of violence in crowd control and provide transparency about less-lethal weapons in use and the criteria for their use; and (6) encourages relevant stakeholders including, but not limited to manufacturers and government agencies to develop and test crowd-control techniques which pose a more limited risk of physical harm. (New HOD Policy)

Fiscal Note: Minimal – less than $1,000

REFERENCES

1. Demonstrations & Political Violence in America: New Data for Summer 2020 | ACLED. Published September 3, 2020. Accessed March 5, 2021. https://acleddata.com/2020/09/03/demonstrations-political-violence-in-america-new-data-for-summer-2020/
2. Gaffney AW, McCormick D, Woolhandler S, Himmelstein DU. US law enforcement crowd control tactics at anti-racism protests: a public health threat. *Lancet Lond Engl*. 2020;396(10243):21. doi:10.1016/S0140-6736(20)31421-5
3. Haar RJ, Iacopino V, Ranadive N, Dandu M, Weiser SD. Death, injury and disability from kinetic impact projectiles in crowd-control settings: a systematic review. *BMJ Open*. 2017;7(12):e018154. doi:10.1136/bmjopen-2017-018154
4. Overview of Police Use of Force. National Institute of Justice. Accessed March 8, 2021. https://nij.ojp.gov/topics/articles/overview-police-use-force
5. IACP Law Enforcement Policy Center CROWD MANAGEMENT Model Policy April 2019.
6. CDC | Fact Sheet: Facts About Riot Control Agents. Published May 16, 2019. Accessed March 8, 2021. https://emergency.cdc.gov/agent/riotcontrol/factsheet.asp
7. Edwards F, Lee H, Esposito M. Risk of being killed by police use of force in the United States by age, race–ethnicity, and sex. *Proc Natl Acad Sci*. 2019;116(34):16793-16798. doi:10.1073/pnas.1821204116
8. Protests In White And Black, And The Different Response Of Law Enforcement. NPR.org. Accessed March 15, 2021. https://www.npr.org/2021/01/07/954568499/protests-in-white-and-black-and-the-different-response-of-law-enforcement
9. MacDonald JM, Kaminski RJ, Smith MR. The effect of less-lethal weapons on injuries in police use-of-force events. *Am J Public Health*. 2009;99(12):2268-2274. doi:10.2105/AJPH.2009.159616
10. Police Use of Force: The Impact of Less-Lethal Weapons and Tactics. National Institute of Justice. Accessed March 15, 2021. https://nij.ojp.gov/topics/articles/police-use-force-impact-less-lethal-weapons-and-tactics
11. Police Use of Force: The Impact of Less-Lethal Weapons and Tactics. National Institute of Justice. Accessed March 15, 2021. https://nij.ojp.gov/topics/articles/police-use-force-impact-less-lethal-weapons-and-tactics
12. Bloom WR, Bloom TD. Epidemiology of Eye Injuries Caused by Personal Protection Devices and Kinetic Impact Projectile Weapons. *JAMA Ophthalmol*. 2020;138(12):1318. doi:10.1001/jamaophthalmol.2020.4434
13. Rodríguez Á, Peña S, Cavieres I, et al. Ocular trauma by kinetic impact projectiles during civil unrest in Chile. *Eye Lond Engl*. Published online August 24, 2020. doi:10.1038/s41433-020-01146-w
14. Chemical Weapons Convention. OPCW. Accessed March 7, 2021. https://www.opcw.org/chemical-weapons-convention
15. Kearney T, Hiatt P, Birdsall E, Smollin C. Pepper spray injury severity: ten-year case experience of a poison control system. *Prehospital Emerg Care Off J Natl Assoc EMS Physicians Natl Assoc State EMS Dir*. 2014;18(3):381-386. doi:10.3109/10903127.2014.891063
16. Police and tear gas: what do we really know about the chemicals being unleashed on protestors in America? Abe Doroshow ’21. Accessed March 7, 2021. https://www.haverford.edu/kinsc-undergraduate-science-research-symposium/news/use-tear-gas-and-other-chemical-munitions
17. Yeung MF, Tang WYM. Clinicopathological effects of pepper (oleoresin capsicum) spray. *Hong Kong Med J Xianggang Yi Xue Za Zhi*. 2015;21(6):542-552. doi:10.12809/hkmj154691

18. Tidwell RD, Wills BK. Tear Gas and Pepper Spray Toxicity. In: *StatPearls*. StatPearls Publishing; 2021. Accessed March 7, 2021. http://www.ncbi.nlm.nih.gov/books/NBK544263/
19. Haar RJ, Iacopino V, Ranadive N, Weiser SD, Dandu M. Health impacts of chemical irritants used for crowd control: a systematic review of the injuries and deaths caused by tear gas and pepper spray. *BMC Public Health*. 2017;17. doi:10.1186/s12889-017-4814-6
20. Kim YJ, Payal AR, Daly MK. Effects of tear gases on the eye. *Surv Ophthalmol*. 2016;61(4):434-442. doi:10.1016/j.survophthal.2016.01.002
21. Ballantyne B. Medical management of the traumatic consequences of civil unrest incidents: causation, clinical approaches, needs and advanced planning criteria. *Toxicol Rev*. 2006;25(3):155-197. doi:10.2165/00139709-200625030-00003
22. Hout JJ, White DW, Artino AR, Knapik JJ. O-chlorobenzylidene malononitrile (CS riot control agent) associated acute respiratory illnesses in a U.S. Army Basic Combat Training cohort. *Mil Med*. 2014;179(7):793-798. doi:10.7205/MILMED-D-13-00514
23. Rothenberg C, Achanta S, Svendsen ER, Jordt S. Tear gas: an epidemiological and mechanistic reassessment. *Ann N Y Acad Sci*. 2016;1378(1):96-107. doi:10.1111/nyas.13141
24. Arbak P, Başer İ, Kumbasar ÖO, Ülger F, Kılıçaslan Z, Evyapan F. Long Term Effects of Tear Gases on Respiratory System: Analysis of 93 Cases. *Sci World J*. 2014;2014. doi:10.1155/2014/963638
25. Vereinte Nationen, Hochkommissariat für Menschenrechte. *Guidance on Less-Lethal Weapons in Law Enforcement*.; 2020.
26. Reforms Introduced to Protect the Freedom of Assembly. ICNL. Published June 19, 2020. Accessed March 5, 2021. https://www.icnl.org/post/analysis/reforms-introduced-to-protect-the-freedom-of-assembly
27. Tear Gas Bans: A Policing Change Not Gaining Traction. Accessed March 5, 2021. https://pew.org/3fjZwzq
28. DC Legislation Information Management System. Accessed March 7, 2021. https://lims.dccouncil.us/Legislation/B23-0825
29. Enhance Law Enforcement Integrity | Colorado General Assembly. Accessed March 7, 2021. http://leg.colorado.gov/bills/sb20-217
30. Bill S.2963. Accessed March 7, 2021. https://malegislature.gov/Bills/191/S2963
31. HB4208 2020 1st Special Session - Oregon Legislative Information System. Accessed March 7, 2021. https://olis.oregonlegislature.gov/liz/2020S1/Measures/Overview/HB4208
32. Tear Gas Use During COVID-19 Pandemic Irresponsible; Moratorium Needed, Says American Thoracic Society. Accessed March 7, 2021. https://www.thoracic.org/about/newsroom/press-releases/journal/2020/tear-gas-use-during-covid-19-pandemic-irresponsible-moratorium-needed,-says-american-thoracic-society.php
33. Statement on Rubber Bullets for Crowd Dispersion. American Academy of Ophthalmology. Published June 4, 2020. Accessed March 7, 2021. https://www.aao.org/newsroom/news-releases/detail/statement-on-rubber-bullets-crowd-dispersion
34. TODAY DS USA TODAY, Dennis Wagner, USA TODAY, Jay Hancock, Kevin McCoy, USA. Less-Lethal Weapons Blind, Maim and Kill. Victims Say Enough Is Enough. Kaiser Health News. Published July 24, 2020. Accessed March 8, 2021. https://khn.org/news/less-lethal-weapons-blind-maim-and-kill-victims-say-enough-is-enough/