Minnesota Regional Poison Center Triage Guideline:

Crowd Control Agents

Also known as: “riot control agents” or “tear gas”

Typical Agents:

- Chloroacetophenone(CN), chlorobenzylidene malononitrile(CS), chloropicrin(PS), bromobenzylcyanide(CA), dibenzoxazepine(CR), oleoresin capsicum (OC), Pelargonic Acid Vanillylamide (PAVA)
- Most common agents used: CS “tear gas”, OC “pepper spray”, OC + PAVA projectiles or “pepper balls”
- May be stored and used in liquid, solid, or powder form.

Agent Characteristics:

Agent	Dispersal	Color	Odor	Other features
Chloroacetophenone (CN)	aerosolized or explosive dispersal	white/blue smoke	floral	
Chlorobenzylidene Malononitrile (CS)	aerosolized, smoke or explosive dispersal	white/blue smoke	pepper	mostly smoke/gas
Chloropicrin (PS)	aerosolized liquid	yellow/white	pungent	oily
Dibenzoxazepine (CR)	aerosolized powder or liquid, explosive dispersal	white powder	pepper	largely replaced by OC
Oleoresin Capsicum (OC)	liquid spray, powder projectile, explosive dispersal	orange, can be colorless	odorless	Sticky resin
Pelargonic Acid Vanillylamide (PAVA)	powder, projectile with OC as “pepper ball”	yellow/white powder	pungent	very hydrophobic

Mechanism of action[1]**:**

- Irritation to areas of contact within seconds of exposure.
    - Duration of action minutes to hours depending on dose of exposure and any decontamination that occurs.

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Signs/Symptoms:

- **Eyes:** excessive tearing, burning, blurred vision, redness
- **Nose:** runny nose, burning, swelling
- **Mouth:** burning, irritation, difficulty swallowing, drooling
- **Lungs:** chest tightness, coughing, choking sensation, wheezing, shortness of breath. Fatal asthma attacks have been related to riot control agent exposure.
- **Skin:** burns (especially in hot weather or if liquid on clothing), rash
- **GI:** nausea, vomiting
- **Note:** Long term exposure or large doses can lead to: blindness, glaucoma, respiratory failure, chemical burns to throat and lungs
- **Trauma:** Blunt injuries from projectiles are well described

Decontamination:

- Move the exposed patient to fresh air.
- Remove all clothing and seal in a plastic bag.
- Remove contact lenses
- CS exposure typically improves with ventilation alone and removal of contaminated clothing
- Water is the preferred decontamination solution. Addition of baby shampoo or dish soap can be done but there is not a clear benefit.[2] Cold water provides earlier symptomatic relief than warmer water.[3] Agents can be very persistent and require copious amounts of irrigation. In such cases, room temperature or warm water should be used to avoid hypothermia.
    - Alternative irrigation or topical agents such as Maalox, lidocaine, or milk have NOT been shown to improve symptoms compared with water after OC exposure.[4]
    - DO NOT USE BLEACH.
    - Caution with scrubbing skin as it can worsen dermal injury.
    - Continuous eye irrigation with water ONLY for ophthalmic exposure.
- Clothing may later be safely washed in washer with usual detergent – fill washer then place opening of bag underwater to prevent re-exposure and press clothes into water, remove bag, wash hands with soap and water.
- **Care providers should be careful not to come in direct contact with the substance.**
    - **Wear splash-proof PPE when helping decontaminate patients.**
    - **May require respirator use if high concentrations on patients (PAPR with filter for crowd control agents / charcoal filter or SCBA).**
    - **Use Universal Precautions after decontamination.**

Treatment:

- No specific antidotes for crowd control agents.
- Treatment is typically symptomatic after decontamination has been completed.
- Oxygen, bronchodilators, steroids and/or intubation may be necessary in case of significant respiratory involvement.
- Eye exposures are treated by irrigating eyes with water or NS.
- Burns require standard burn treatment.

For more information contact Minnesota Regional Poison Center at 1-800-222-1222

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Jon B Cole, MD, FACMT, FAACT
Medical Director

Samantha C Lee, PharmD, DABAT
Director, Clinical Toxicologist

References

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