Better communication can enhance US chemical exposure incident response, new evaluation says

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First responders to major chemical exposure incidents in the United States can improve treatment protocols for at-risk casualties with better communication strategies, according to new analysis in *Annals of Emergency Medicine*.

The evaluation, Operation DOWNPOUR, was funded by the U.S. Department of Health and Human Services (HHS) Biomedical Advanced Research and Development Authority (BARDA), part of the HHS Office of the Assistant Secretary for Preparedness and Response (ASPR).

The authors note that existing processes are nearly 100 percent effective. But, enhancing communication processes would better serve people with chronic illnesses, disabilities or language barriers. And, for the first time, experts endorsed revised guidelines that call for immediate disrobing to ensure optimal decontamination.

"Should a large-scale chemical exposure occur, clear communication from first responders can save lives. Making sure everyone can hear you, understand you, and is physically able to follow safety procedures will speed the decontamination process and limit toxic exposure, especially for children, the elderly and the most vulnerable victims," said Robert P. Chilcott, Ph.D., professor at the University of Hertfordshire (UK) and lead study author. "First responder staffing levels and resources may

need to be re-evaluated in order to avoid casualties and ensure safe and effective rapid response."

Hearing and communicating instructions in an emergency can be difficult, according to feedback from first responders and participants that is included in the analysis. Concerns were raised that first responder staffing levels would need to increase, and resources would need to be allocated, so that victims deemed "at-risk" (unable for any reason to comply with verbal instruction) were able to follow the time-sensitive decontamination instructions as directed.

The evaluation supports the introduction of an immediate "disrobe and dry" decontamination stage while victims wait for further treatment. The analysis notes that the most effective decontamination methods start by disrobing then include a triple combination of dry, ladder pipe and technical decontamination. "This should be adopted as the standard approach," Dr. Chilcott said.

The initial "dry decontamination" involves rapidly wiping down the victim with any absorbent material (toilet paper, paper towels, diapers, or materials typically carried on an ambulance, such as wound dressings) and does not rely on specialist resources. Dry decontamination enables first responders to reassure victims, start providing instructions and offer situational information.

Next, "ladder pipe decontamination," involves positioning victims of chemical exposure in a corridor between two parallel fire engines then spraying them with water from a hose strapped to an overhead ladder. This procedure was occasionally performed on fully-clothed individuals. Now, the guidelines have been updated to emphasize the need for disrobing prior to any form of wet decontamination. A third step, "technical decontamination," involves specialist units, privacy, warm water and waste containment.

Adding disrobe and dry procedures before ladder pipe decontamination enables more effective time management, the authors note. While setting up the ladder pipe system, first responders should not miss the critical window of opportunity to remove toxic chemicals from hair or skin.

Disrobing may limit the likelihood of a panicking victim fleeing the scene of the incident and prevents contamination on clothes from spreading to skin, the authors write in "Evaluation of US Federal Guidelines (Primary Response Incident Scene Management: 'PRISM') for Mass Decontamination of Casualties During the Initial Operational Response to a Chemical Incident."

The evaluation looked at the clinical and operational efficacy of the recently revised PRISM (Primary Response Incident Scene Management) response, the United States federal guidance for first responders to mass chemical exposure incidents. The simulation took place in August 2017 and included more than 80 volunteers who were exposed to a chemical warfare agent simulant (methyl salicylate, curcumin and baby oil mixture). Fire department and emergency medical service personnel in Rhode Island participated alongside representatives from the Federal Emergency Management Agency (FEMA).

"If a chemical attack or catastrophic accident occurs on American soil, first responders would be relied on to act as quickly and effectively as possible in order to save lives." Dr. Chilcott said. "The revised PRISM guidance should double first responders' efficiency. And, the introduction of the disrobe and dry decontamination stage should further improve clinical outcomes for victims."

More information: Robert P. Chilcott et al, Evaluation of US Federal Guidelines (Primary Response Incident Scene Management [PRISM]) for Mass Decontamination of Casualties During the Initial Operational

Response to a Chemical Incident, *Annals of Emergency Medicine* (2018). DOI: 10.1016/j.annemergmed.2018.06.042