Dr Christina Baxter, of EmergencyResponseTIPS.com and Hazard3.com, offers helpful advice for first responders

Keeping you safe!

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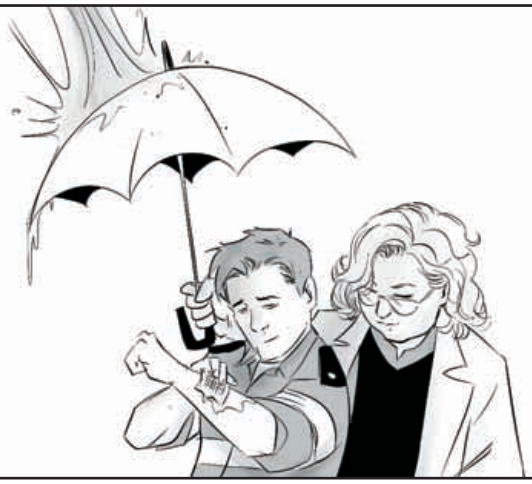
The column is intended to provide operational guidance to the hazmat/CBRNE community on the selection and performance of equipment and tactics. In this issue, we're focusing on decontamination and the use of the Blot-Apply-Remove (BAR) method for hybrid wet/dry decontamination of people, protective equipment and sensitive equipment.

The way in which decontamination is performed for both emergency and technical purposes has evolved greatly in the past four decades. Following the 1985 version of the US Environmental Protection Agency's field standard operating procedures, most hazmat/CBRN teams worldwide developed multi-step processes based on this methodology. In 1990, Levitin et al demonstrated that the removal of clothing also removes 90% of contamination. In 2005, a new generation of absorbent products for hybrid (dry/wet) decontamination appeared (Texas Tech University, FiberTect) as a result of the US Department of Defense's desire to minimise the decontamination logistics footprint and optimise the operational response. Today, large volumes of data on decontamination are readily available in the scientific literature from teams led by Maibach, Chilcott, Gaskin and others.

[Introducing MLog, Cbax's nemesis, spreading bad habits! (Capably played by Queensland Fire's own Mike Logan)]

Studies have demonstrated that large volumes of water are unnecessary and often counterproductive in both toxicology and environmental contexts, and enhanced ventilation is often a suitable decontamination method for volatile chemicals.



Operational considerations

Firstly it is important to identify the chemical and determine if it is interacting with the skin (eg contamination versus exposure). This is often evidenced by irritation, redness, dermatitis-like symptoms, or pain, and is most often associated with liquid or highly concentrated aerosolised corrosive materials. For non-corrosive chemicals, disrobing followed by blotting any residual material is likely to be sufficient. For corrosive chemicals, however, the blotting of residual material must be followed by washing, with soap and water, any skin surfaces in direct contact and then removal of that wash to minimise the spread of contamination and potential interaction with skin, protective clothing or sensitive equipment.

Step 1: Blot

It is important to understand that the initial removal of any residual contaminant, whether from skin or protective clothing, should be performed by blotting with an absorbent material. In this case, blotting is defined as drying a substance using an absorbent material, whereas wiping infers drying by rubbing its surface with a cloth. It is critically important to start by gently blotting any residual material prior to rubbing or wiping, to minimise skin penetration. Blotting should be performed using the most chemically compatible and absorbent material available on scene, whether that be purpose-designed decon wipes, wound dressing, paper towels, or other absorbents and materials.

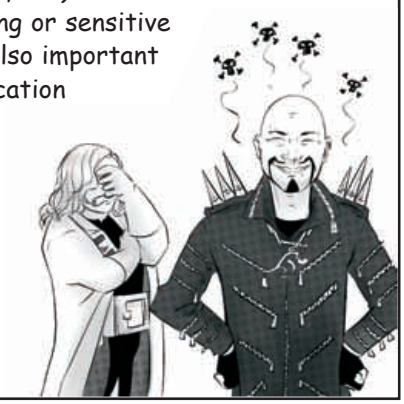
In many situations including non-corrosive liquids, particulates, or gases, blotting residual material may be the only step necessary prior to enhanced ventilation to ensure all potential off gassing has occurred.

Step 2: Apply

For corrosive materials, it is important that washing the affected area of skin or protective clothing with water or soap and water is done for at least 90 seconds. All attempts should be made to keep washing local to the affected areas to minimise the potential for increasing the area of skin damage. For protective clothing, efforts must be made to wash away from any interfaces, including zippers, to minimise the chance of penetration and subsequent contamination of the wearer.

With chemical warfare agents, the application of a substance such as reactive skin decontamination lotion (RSDL) might be required to destroy the material, as washing with water can increase skin penetration.

When applying decontamination or chemical degradation materials (ie peracetic acid, peroxides, bleach, etc) to protective clothing or sensitive equipment, it is also important to minimise application on interfaces, zippers and other high-touch surfaces as they are the most likely areas for cross contamination.



Step 3: Remove

If a decontaminant or chemical degradant is used when decontaminating PPE or sensitive equipment, it is imperative to remove this material prior to exiting the warm zone. Sometimes, this is as simple as rinsing away any residue, but in the case of materials like RSDL, it must be rinsed off as soon as it's safe to do so.

Remember, as you apply your decontamination methodology – always start with disrobing and then focus on blotting any residual materials, apply decontamination solutions where needed, and remove residual decontaminants. The process should always start at the top of the head, then descend to the face, hands, and any other potentially exposed areas. It is also critical to protect the person undertaking the decontamination, and to ensure material does not spread into the clean, cold zone. When decontaminating sensitive equipment, be sure to wipe away from the operator and avoid entry ports. To ensure success, suitable detection methodologies must be employed to monitor the effectiveness of the decontamination process.

Images are courtesy of Phil Buckenham
https://philbuckenhamart.wixsite.com/philbuckenham