DECON

When WATER Won't Work

Alternative decontamination methods

By John P. Bastin, MHS, PA-C

It's a Saturday afternoon in early December, and the shopping malls are packed with people doing their holiday shopping. Suddenly, 9-1-1 operators begin receiving frantic cell phone calls from shoppers inside the mall reporting that people are having difficulty breathing after a vapor cloud was released in the food court. Mall security guards report that the vapors appear to come from several small canisters resembling aerosol cans. They also report the vapor is leaving an oily residue on anything or anyone it comes into contact with. Other callers report that several people closest to the point of release have collapsed and aren't moving. Law enforcement officers are the first responders on scene, and they keep the people who exit the mall together in groups outside. Some people attempt to leave the parking lot, but the officers block all the exits. Exposure to the fresh air alleviates some symptoms, but many people are still experiencing respiratory problems manifested by coughing, wheezing and shortness of breath. The outside weather temperature is 28° F with a light snow falling. The county's hazmat team arrives, and the incident commander reports that two other hazmat teams from the adjacent county are en route.

Responders quickly erect a decontamination shelter and connect the water supply to the heater. As they make preparations to begin the process, however, decon personnel report that the heater has malfunctioned, and only cold water is being supplied to the tent. In addition, ice is now forming on the heater, further complicating the problem. The crowd grows anxious as delays in beginning decontamination persist. Many contaminated individuals try to leave the scene, and law enforcement officers begin having difficulty controlling the crowd.

Your decon system has failed, and you risk inducing hypothermia if you proceed with decontamination efforts in this environment. What next? How will you proceed with decon? What methods can you use to remove the agent from contaminated individuals?

Decon alternatives

Your agency needs alternatives to decontaminate people when water isn't available, the use of water isn't practical or the numbers of people requiring decon exceed the number that available rescuers can handle using traditional methods.

Rinsing contaminated people with copious amounts of water, either from a decon tent or by a well-directed stream of water from opposing fire hoses, has long been the standard procedure for decontamination. But Murphy's Law will prevail, and your standard decontamination procedures will fail when you least expect it. You also may need to employ alternative decon methods when severe weather conditions exist and/or outside air temperature is below 35° F.

So first response agencies responsible for decon should have established procedures in place for implementing alternative methods that can be deployed quickly if necessary.

Certain populations, such as the very young and the very old, may tolerate alternative decontamination better than conventional decon measures. Trauma patients with such co-existing conditions as extensive burns or shock also may benefit from alternative decon, since exposure to large amounts of water could exacerbate these conditions.

Agencies should ensure, however, that first responders understand that alternative decon is equivalent to gross decontamination at best, so people may be left with some degree of contamination on their bodies. Because of this, people should eventually undergo complete decontamination whenever possible.

Responders using alternatives also should be taught to take precautions to prevent cross-contamination to themselves, their equipment and other decontamination and medical personnel.

To perform alternative decon, responders should use a material or substance that will neutralize or bind to the contaminating agent. Application of this decon substance should be followed by gentle blotting or wiping of the skin to remove the contaminant. Some alternative decon procedures and substances are:

- Spray bottles filled with warm soapy water to spray or mist on the individual, then Chux wipes or other absorbent pads to remove the agent;
- Towels dampened with warm water and soap;
- Commercial chemical decontamination pads or other similar products; or
- Fuller's earth clay dusted on the victim to absorb the agent and then brushed off.

Decontamination triage

First responders should sort contaminated and potentially contaminated people based on their risk of potential exposure to ensure

the best use of available resources. Prioritize decon in this order:

1. People who have some evidence of liquid agent on their skin or clothes and are experiencing potentially serious signs and symptoms, such as shortness of breath and/or chest tightness;
2. People who were close to the point of release and report that they were exposed to an aerosol or vapor;
3. Individuals who were not close to the point of release but have evidence of the agent on their clothes or skin and report symptoms;
4. Victims suffering from conventional wounds, especially open wounds; and
5. Symptomatic but ambulatory victims who were far away from the point of release.

Further sort individuals as either ambulatory or nonambulatory, with those who are nonambulatory and exhibiting signs of exposure receiving the highest priority for decontamination.

Procedures for alternative decontamination

Nonambulatory patients

Reserve nonambulatory decontamination for patients on litters or for those with injuries that prevent them from conducting self-decontamination. Ideally, this form of decontamination should be performed by two rescuers and conducted in a decon tent or some other form of protective shelter to shield the patient from the environment.

Cut away the person's clothing to facilitate decontamination and minimize further exposure. Pulling the patient's clothes off increases the risk of aerosolizing any agent remaining on the clothes or skin, increasing the chances for cross-contamination. Start with the patient's pants, using this sequence:

- Begin cutting at the bottom of the front pants leg and cut up the center of each leg until you have cut up to and through the waistband.
- Cut underpants or briefs at the sides.
- Cut away the socks.
- Begin cutting the sleeves of the shirt at the cuff, moving up the sleeve and cutting through the collar of the shirt.
- Cut up the middle of the front of the shirt; do not unbutton it.
- Repeat that procedure if the patient is wearing an undershirt or bra.
- Roll the material away from the patient and tuck it underneath the patient's body.
- Logroll the patient to remove the cut-away clothing.
- Double-bag contaminated clothing.
- Rinse the scissors in a bleach-and-water solution after each garment.

Once the person's clothes have been cut away, begin to decontaminate that individual by wiping in a systematic fashion, working from the head to the feet. *Important:* Frequently rinse or discard the cloth or other material used to wipe the person as you proceed.

Head

- Blot or wipe the person's hair in a downward fashion to remove any visible agent. Then cover the head to prevent any further contamination to rescuers or hospital staff.
- Wipe the face, beginning in the center and wiping laterally to prevent any residual agent from running into the person's eyes.
- Be sure to wipe the upper and lower eyelids and behind the ears.

Upper extremities

- Wipe from the base of the neck to the tips of the fingers ensuring you cover the entire upper extremity.
- Be sure to wipe the underarms and the web space between the fingers.

Torso

- Start at the base of the neck and wipe from the center laterally to allow any residual agent to drain away from the patient. Continue down the torso to the top of the hips.
- Overlap your strokes with each wipe.
- Logroll the patient on to his or her side to wipe the back, including the cleft between the buttocks.

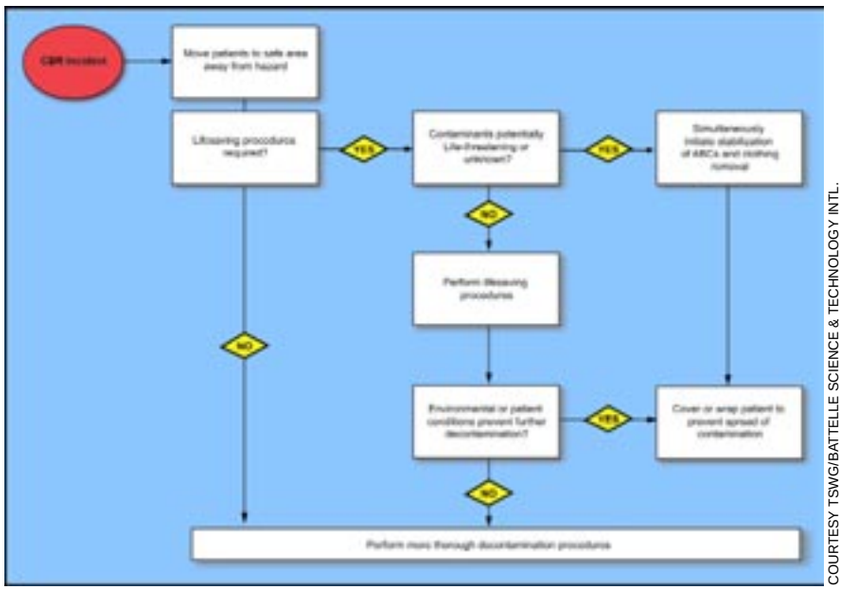
Lower extremities

- Wipe the posterior lower extremities while the patient is on his or her side.
- Rinse the backboard before turning the patient.
- Re-wipe the side of the body the patient was logrolled onto.
- Wipe the front surface of the lower extremities in overlapping strokes, moving laterally.
- Be sure to wipe the patient's groin area.
- Wipe the bottoms of patient's feet.

Ambulatory victims

If they are ambulatory and uninjured or their injuries are minimal, adults can usually perform self-decontamination. Such individuals generally do not require extensive help to facilitate the process, but decon teams may want to assign one to two team members to supervise this self-decontamination.

Decon teams should also provide ambulatory victims with written instructions on how to properly decontaminate themselves. Write



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Decision tree for triaging nonambulatory patients for decon.

these instructions in easy-to-understand lay terms (and perhaps in several languages, depending on the demographics of your service area). Print them on heavy card-stock material, laminate them and store them with your decon supplies.

The procedure for the decontamination of ambulatory individuals is basically the same as for nonambulatory patient decon, except that most ambulatory people will remove their own clothing and perform the decontamination process themselves.

People should be instructed to wipe from their head to their feet, beginning in the middle of the body and wiping laterally. They also should be told to discard wipes frequently to avoid the possibility of cross-contamination.

Decon personnel assigned to supervise must ensure individuals perform a through self-decontamination, including:

- Eyelids and behind the ears;
- Armpits;
- Web spaces of fingers and toes;
- Body crevices and creases;
- Gluteal cleft; and
- Palms of hands and soles of feet.

As people complete self-decontamination, move them into the cold zone and have EMS personnel reevaluate them. Look for any injuries or conditions that may have been overlooked during the initial triage, signs of delayed exposure to the agent or signs of hypothermia.

Ensure EMS personnel know that patients who have been decontaminated by an alternative method may still have some of the contamination agent on their bodies. Since the potential for cross-contamination still exists, EMS providers and other rescuers must continue to take all necessary precautions to protect their own safety.

Summary

As the term implies, alternative methods of decontamination should not be the first choice for decon but should be used as an option when the conventional methods of decontamination fail or are inappropriate for the conditions or for certain individuals. Every response system should develop standard operating procedures for alternative decon procedures, incorporate them into their response plans and train responders in their use. Decontamination teams should have adequate stocks of the supplies necessary for alternative decon readily available and should practice this form of decontamination on a regular basis. HFR

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Resources

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