Training security operatives to recognize the perils posed by contaminants from weapons of mass exposure – Part II

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In a 2007 article in this journal, the authors detailed how to protect staff, patients and visitors from becoming contaminated after attacks by weapons of mass destruction (WMDs), or weapons of mass exposure. Given security's central role in keeping hospitals free from contamination, here they update the advice for today's world. They review the contaminants of concern, addressing the basics of effective training for security officers, how to handle the flow of vehicles and people, when to institute lockdowns, and how to don and remove personal protective equipment (PPEs).

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The first article we published in this journal, in 2007--"Training Security Officers to Recognize the Perils of Weapons of Mass Destruction and Pandemic Flu Contaminates" (Vol. 23, No.2. pp. 1-9)--discussed the ABCs of diagnosing that an exposure event has occurred, spotting exposed persons, and donning of contaminant-controlling attire at exposure events. The article spelled out how the establishment of a WMD training program enables the hospital Security Department to help contain WMD exposures before they adversely impact the intuitional setting. Since then, terrorism incidents have captured the news after occurring at school shootings, churches and synagogues, outdoor concerts, marathons, and other special events worldwide.

Suffice to say that it is extremely important that hospital security departments remain well-equipped and ever ready to assist all who come for first aid. According to an August 14, 2018 website posting by the U.S. Department of Homeland Security (DHS), The United States faces a rising danger from terrorists and rouge states seeking to use weapons of mass destruction. DHS goes on to define weapons of mass destruction as nuclear, radiological, chemical, biological, or other devices intended to harm many people.

Today, a terrorist's choice of weapons includes trucks, cars, knives and guns--not items recognized previously at mass causality incidents. In the past, the weapons of choice included biological, chemical and radiological instruments. The good news is that potential weapons created from biological, chemical and radiological sources are often difficult to obtain, owing to diligence in securing these types of substances. Notwithstanding, we should always be well prepared for all possible eventualities. It is security's job to protect the hospital, staff, patients and visitors. To adequately do this job, hospital security staff must be well versed in and trained to recognize the perils involved in fighting this seemingly never-ending war on terrorism. Here is what those responsible for hospital security need to know today.

THE ABCS OF EFFECTIVE WMD TRAINING

First, there is a general assumption that, if an exposure event occurs, hospitals will be notified before victims begin knocking on the door seeking medical services. Often, though, this is only an assumption--not all emergencies are reported beforehand. Frequently, victims show-up at hospitals before official notification is made to the hospital. As such, it is critical that policies be created and reviewed periodically that speak to properly identifying exposed persons before they contaminate the hospital and staff with unwanted substances.

Once it is apparent that an exposure incident has occurred, notification is the most important sequence of events in the management chain. Given that security is always considered the frontline gatekeeper for security and safety issues, they should al-

ways be immediately notified. For many hospitals, security is the central point in the implementation of a mass notification scheme. Notification to the rest of the hospital is paramount to the successful implementation of the hospital's disaster plan. Notification should be quick and efficient, allowing security to get the word out, answer calls from inquiring staff and implement its own plan of action. If an incident is suspected or published, security should be ready to immediately put its disaster plan in motion. Irrespective of the particular plan, any effective plan must incorporate a process that effectively locks down the facility promptly and efficiently. Whether a full or partial lockdown is called for depends on the severity of the incident. Beyond containment considerations, however, once a mass exposure incident has been identified, it is important that a clear action plan is put in place to properly control both ingress into and egress out of treatment- chamber environs.

HANDLING VEHICLE, VISITOR, PATIENT, AND MEDIA ISSUES

It is security's job to direct vehicles, visitors, patients and staff during a mass causality incident; it should ensure that emergency vehicles have free and unobstructed access. Likewise, security advocates need to continually maintain a clear and unobstructed roadway throughout hospital property, and especially into and out of the critical treatment environs.

Entrances should be closed, and all persons wishing to enter the hospital should be questioned to determine their business-related needs before they enter the inner bowels of the hospital. During disaster scenarios, security operatives who are posted at access portals should step to the outside of the hospital to physically stop *persons desiring entry. This is an extremely important consideration because allowing contaminated persons inside of the facility could prove to be extremely dangerous for all concerned.* The hospital disaster plan should include security staff trained on procedures for identifying access portals for hospital staff, disaster victims, disaster victim family members, the media, delivery personnel, and regular in-patient visitors. Experience has shown

that each of the above categories should be segregated and an access procedure established, complete with cueing lines.

FACILITY LOCKDOWN

It is important that all hospitals have an appropriate "lockdown procedure." In the event of an incident involving weapons of mass exposure, hospital security personnel must know what procedures to follow in a quick and efficient manner. Security operatives must be an integral part of the exposure notification process, they must know whether to institute a partial or full facility lockdown; they need to know when it is necessary to institute an emergency department lockdown; and they must be capable of directing vehicles, visitors, patients and staff to *"run toward safety and not just away from danger."* To accomplish this, security staff, need to be periodically drilled on this process so that when the time comes, they can methodically institute lockdown procedures with relative ease.

Depending on the type and extent of the disaster, a partial facility lockdown may be in order. As an aside, if details about the magnitude of the exposure are sketchy, the hospital my wish to implement only a partial lockdown until better information is brought forward. Often, a partial lockdown entails the closing of *certain* entrances or areas of the hospital. This is done to re-deploy staff and/or supplies and to control access into and out of the hospital. As an example, a hospital may want to curtail access to all clinic areas or business offices so that it is better able to re-deploy staff to the emergency treatment areas. In the event of a major incident of mass destruction, a hospital may need to lock down the entire hospital, except for emergency operations, to protect the hospital from outright contamination. Because victims can arrive via cab, bus, or ambulance, it may be necessary to confine access to one or two specific entrances designated to receive disaster victims. At some point during a disaster it may be necessary to lock down the Emergency Room (ER). Locking down of the ER may occur because of contamination or the need to restrict access into the area by unauthorized staff. If the ER becomes contaminated, security may be required to keep all patients and staff inside

of the area and restrict outsiders from entering until the area is decontaminated.

PERSONAL PROTECTION DEVICES

Security operatives need to learn to identify the exposure symptoms for the most common biological, chemical and radiological agents. Once a disaster victim is identified, it is important to send the person to the designated emergency receiving point outside of the hospital, so that they do not contaminate inner hospital environs. Security officers need to become familiar with decontamination and treatment processes and with departmental procedures relating to how and where to properly isolate infected persons to avoid facility-wide contamination. Moreover, security operatives must be taught how to effectively disrobe and scrub down potential casualty victims.

Wearing and using personal protective equipment (PPE)

Security officers need to wear PPE for protection from exposure to dangerous substances. They need to become familiar with properly using PPE and learn how to don it and disrobe after exposures. Different PPEs are used depending on the type of potential exposure. Practicing the donning of the different PPE costumes is important in the preparation drills for mass causality incidents. When donning PPE, the body garment is always put on first. Boots are put on next, followed by the protective mask. Gloves should be the last of the items donned.

Decontamination Equipment Types

Level D protection consists of work clothes or, in the case of security, the security uniform. The Level D uniform is covered with a light fluid-resistant gown, latex gloves, goggles for eye protection, and an M-95 respirator facemask. Level D protection is used for biological and flu situations and is worn by security officers at access portals, in treatment areas, or when guarding patients.

Level C protection consists of a "Tyvek" plastic full body suit with a hood embodying a full-face M-40 respirator; rubber boots or work boots; and heavy rubber gloves. A security officer should wear this level of protection when confronted with possible chemical and radiological exposures.

Removal of Equipment

Level D Equipment removal begins with the gown, and is followed

by the goggles, then the gloves. One glove is removed by pulling it off at the end of the glove at the wrist. The glove is pulled off so that it is inside out when removed. That first-removed glove is used to grab the other glove at the end by the wrist, and the second glove is pulled off. Both gloves are discarded. Lastly, the respirator is removed and discarded.

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EXPOSURE SOURCE CHARACTERISTICS

As part of the training and education process, security officers need to be periodically trained on the basic symptoms associated with the different types of weapons of mass exposure so that they are better able to identify potential victims before they are permitted access into the healthcare confines.

Biological Agents

The **anthrax bacterium** (*Bascillus anthracis*) causes an acute infection of the skin, lungs or gastrointestinal system. Its related spores can survive for a few days in temperatures as high as 318 degrees Fahrenheit and can remain viable in soil and water for years or even decades. About 8,000 to 10,000 spores are required to cause pulmonary infection, and 1,000 spores for intestinal infection. If diagnosed quickly, anthrax is treatable with several different types of antibiotics. The route of infection can affect the course of the disease.

- *Skin contact:* Such contact can lead to sores or blisters that may develop into an infection. These infections generally are not fatal.
- *Inhalation\Ingestion:* When bacterial spores are inhaled into the lungs or ingested into the stomach, victims develop flulike symptoms within one to seven days of exposure. After two to four days, victims have difficulty breathing, often experience severe exhaustion, and may develop a fever. There is a 90% fatality rate for untreated inhalation anthrax, and symptoms begin appearing between the first 24 to 36 hours of exposure.

Ebola is a virus that requires direct contact with the blood or secretions of bodily fluids to produce an infection. It is the most dangerous virus known to science. It causes death in 50% to 90% of all exposure cases. The virus is in incubation for two to 21 days. Symp-

toms include fever, weakness, muscle pain, headache, and sore throat and often involves vomiting, rash, diarrhea, and internal and external bleeding.

The **smallpox virus** (the variola virus) produces an infection after people come in contact with blood or secretions of bodily fluids or inhale virus from infected individuals. The incubation period is about12 days. Symptoms include malaise, fever, vomiting, and headaches. Victims develop a rash, which blisters within two to three days. Smallpox is generally not fatal, but a victim must be in isolation for 16 to 17 days from the onset of the virus.

Ricin is a toxin made from the left-over mash of the castor bean, which is processed to produce castor oil. It is easily accessible and is easy to produce. It can be inhaled or ingested. It kills body cells on contact. Death occurs within 36 to 48 hours after exposure. There is no cure for this toxin. A large aerosol dose is required to be effective, at least 320 mg.

HAZARDOUS CHEMICAL AGENTS

Cyanide is a commonly used chemical agent in ore extraction, tanning, and electroplating. In liquid form, it emits a heavy gas that smells like bitter almonds. It poisons its victims through inhalation of gas. Inhalation of cyanide blocks the ability of the body's cells to consume oxygen, which causes the cells to die. Exposure causes irritation to the eyes, nausea, dizziness, weakness, and anxiety. This is followed by convulsions, unconsciousness, then death. The longer the exposure or the higher the concentration of cyanide, the quicker a victim will be contaminated and die.

Mustard Gas is a blistering agent; it is an oily liquid that is heavier than water. The vapors and/or liquid are the danger. The liquid and gas have the odor of mustard, onions, or garlic. Two to 24 hours after exposure, a victim will notice eye irritation, burning of the skin, and upper airway irritation. Exposure to high amounts will cause blistering of the skin, eyes, and throat. Absorption into the body damages cells and causes death.

Sarin Gas is a nerve gas. It disrupts the mechanism by which nerves communicate with organs, causing overstimulation of the organs. Sarin is a clear, colorless liquid that emits a heavy gas that

sinks to the ground. The gas is odorless. Exposure causes a diminishment of the pupils, runny nose, and shortness of breath. Large exposures can cause loss of consciousness, convulsions, and death.

RADIOLOGICAL EXPOSURE

Radiation poisoning is caused by exposure to irradiated uranium that gives off "alpha" and "gamma" rays. Exposure can be caused by exploding a nuclear device, which gives off massive amounts of these rays, or by exploding an irradiated source that distributes thousands of finite pieces throughout the explosion area. Exposure to radiation disrupts or kills cells in the body. The cell disruption generally affects the bloodstream and gastrointestinal areas. Symptoms often include nausea, vomiting, and malaise, followed by a symptom-free period. Cell death can lead to major organ malfunction and to death. For mild cases of exposure, a victim can take iodine, which will absorb the radiation and help the body to pass the radiation out of the body.

CONCLUSION

The establishment of a WMD-training program gives the security department the ability to help contain WMD exposures before they adversely impact the institutional setting. The Security Department's role in keeping hospitals free from contamination is an awesome job, often requiring a dedicated, well-trained, appropriately equipped, and highly motivated security staff always on guard at the gate protecting us from harm! Continuous drilling and education are key to a diligent response when, and if, a mass exposure incident should occur.

Resources

Jane's Chem-Bio Handbook. Alexandria, Virginia: Jane's Information Group. ISBN 0-7106-1923-5

U.S. Department of Homeland Security. *Weapons of mass destruction*. https://www.dhs.gov/topic/weapons-mass-destruction

Center for Domestic Preparedness. *Hazardous materials course on WMD: Attack and response*. This course of study furnishes students an overview of the international and domestic threats while focusing a spotlight on identification and decontamination of hazards and evidence preservation https//cdp.dhs.gov/ news-media/article/hazardious-materials-course-focus-on-wmd-attack-and-response

The Canadian Center for Occupational Health and Safety. *Working with toxic materials*. http://www.ccohs.ca

First Aid Re-Certification. *Emergency personal protective equipment*. http://first aidrecert.com/emergency-personal-protective-equipmentDefense Threat Reduction Agency. *Weapons of mass destruction training and education*. http://www.dtra.mil/Mission/WMD-Training-and-Education

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