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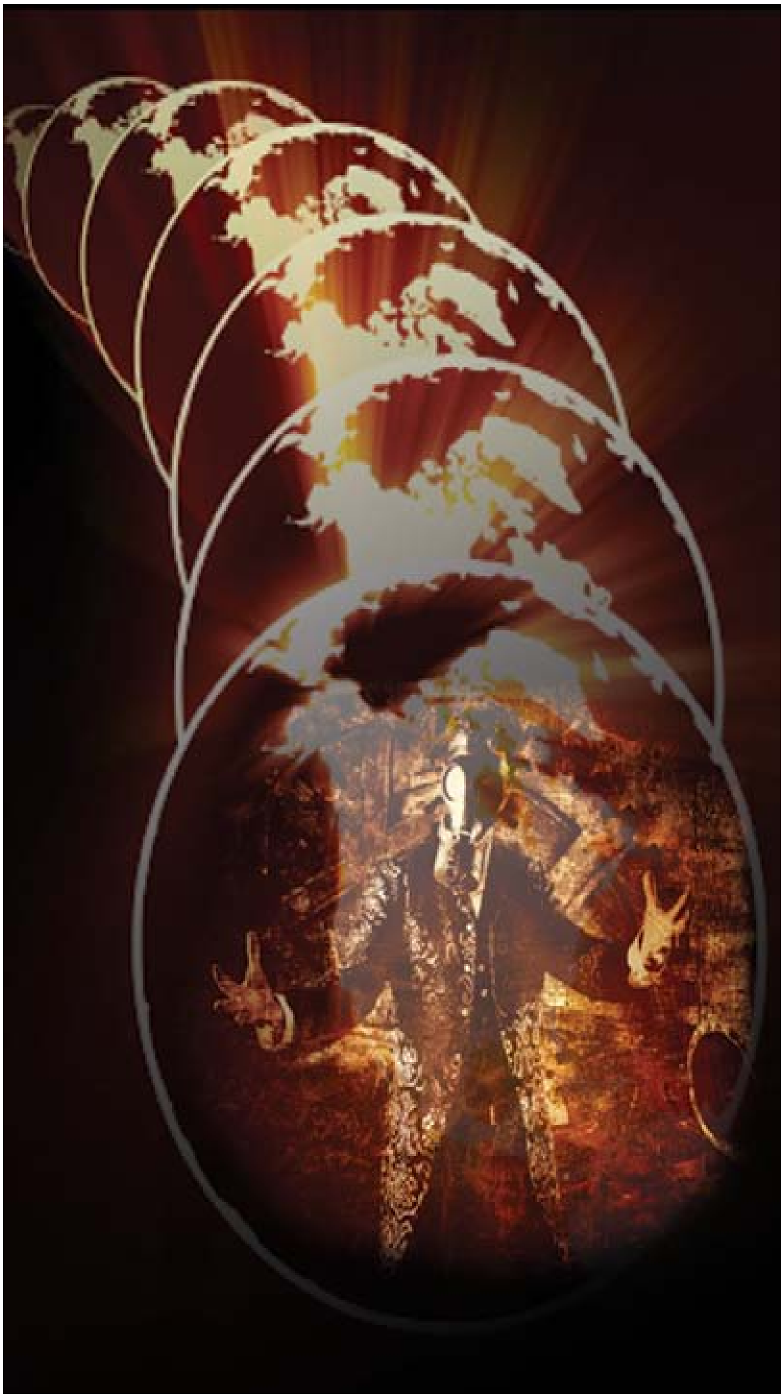
CBRNE




POLICE

Business Office
517 Benfield Road, Suite 303
Severna Park, MD 21146 USA
www.DomesticPreparedness.com
(410) 518-6900

Staff

Martin Masiuk
Publisher
mmasiuk@domprep.com

James D. Hessman
Editor in Chief
JamesD@domprep.com

John Morton
Strategic Advisor
jmorton@domprep.com

Susan Collins
Creative Director
scollins@domprep.com

Catherine Feinman
Associate Editor
cfeinman@domprep.com

Carole Parker
Database Manager
cparker@domprep.com

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Editor's Notes

By James D. Hessman, Editor in Chief

The general subject is CBRNE (Chemical, Biological, Radiological, Nuclear, Explosives) weapons and devices, the havoc they create, the growing threat they pose to all civilized nations – indeed, to all human beings living anywhere throughout the entire world – and how to detect them, defeat them, and destroy them. The latter task will take time, planning, dedication and ingenuity, the allocation of huge financial resources, and dogged perseverance. All of which still might not be enough.

The narrower and more specific focus of this month's printable issue is chemical weapons: now relatively easy to manufacture – on a massive scale. Also relatively low in cost, hard to detect, even harder to destroy, and capable of killing hundreds or even thousands of innocent people at a time. Such weapons have been around in one form or another for more than 2500 years, but did not really get much publicity until World War I, when they were used on a to kill or disable hundreds of thousands of troops, most of them foot soldiers, on both sides of what used to be called the Maginot Line.

The baker's dozen of world-class experts contributing articles to this issue of *DPJ* all have first-hand experience – on the local, state, and national levels of government – in the field of chemical weapons, and they agree that the use of such weapons against the U.S. homeland is today not only more likely than ever before in the nation's history but also would kill or permanently disable many more Americans than the thousands who died at Pearl Harbor and in the 9/11 terrorist attacks combined. Making the situation worse, as Stephen Reeves points out in his leadoff piece, is that the threat continues to grow almost exponentially while at the same time, and for the foreseeable future, U.S. counter-threat capabilities are likely to decrease – primarily because of current and future limitations on spending at all levels of government.

Joselito Ignacio looks at a specific terrorist target of opportunity: U.S. subways, which carry more passengers, unscreened, day after day than are carried by all of the nation's airlines combined during the entire year. James Wilcox points out that U.S. sports arenas, including a growing number of 100,000-seat football stadiums, are particularly attractive targets for chemical attacks – London and the 2012 Olympic Games will probably take center stage this year, though. Ensuring that emergency medical services (EMS) are prepared for such an attack, Joseph Cahill points out, is but one of the challenges that modern EMS units must face. And Richard Schoeberl, another distinguished career professional, appropriately asks what has happened to the previously hidden, and now apparently stolen, tons of mustard gas and other lethal weapons in Muammar Qaddafi's Libyan arsenal. Meanwhile, preparedness on the home front also is lagging, Craig DeAtley comments, with many hospitals not even prepared to cope with the increase, in recent years, of so-called "suicides by chemicals."

Fortunately, the U.S. government, the nation's armed services, and various private-sector organizations are moving forward vigorously to combat the rapidly growing threat, as several authors point out. Glen Rudner discusses the cautious "detection triage" now used to prevent first responders themselves from becoming victims; Tony Lamberth spotlights the important and much needed contributions being made by individual volunteers and civic-minded organizations; and Bruce Clements reviews some of the advanced medical countermeasures developed in recent years. The equipment available to responders, and to medical professionals, also is much improved, and likely to continue its upward trajectory in the future, according to articles contributed, respectively, by Jordan Nelms and Thomas Norstrand.

The federal government also is moving ahead, and looking forward, both substantively and on a moral level. The Department of Defense's new and immensely capable CBRN Response Force, Jamie Stowe points out, possesses unprecedented and ubiquitous response capabilities, and has been provided the tons of equipment and medical supplies, and the air transport needed, to deal with medical disasters anywhere in the country. Finally, the American people themselves – each and every citizen, as W. Ross Ashley notes – are now being asked, appropriately – under the recently announced SAR (Suspicious Activity Reporting) Initiative – to join the battle against chemical terrorism. Perhaps, as MG Reeves says, quoting Winston Churchill, when supplies are low and the nation is at the point of maximum peril, it may finally be "time to start thinking."

About the Cover: Thanks (sort of) to many recent scientific advances, the ability of military forces, or terrorists, to use chemical, biological, and/or other weapons to kill millions of people, and perhaps destroy the entire world, is now a real and frightening possibility. (Doomsday/nightmare image created by Susan Collins from two iStockphotos)

DomPrep Writers

Raphael Barishansky
Public Health

Joseph Cahill
EMS

Bruce Clements
Public Health

Craig DeAtley
Public Health

Kay Goss
Emergency Management

Stephen Grainer
Fire/HazMat

Rodrigo (Roddy) Moscoso
Law Enforcement

Corey Ranslem
Coast Guard

Glen Rudner
Fire/HazMat

Richard Schoeberl
Law Enforcement

Dennis Schrader
DRS International LLC

Joseph Trindal
Law Enforcement

Theodore (Ted) Tully
Health Systems

CBRN FUNDING: Going Backwards Is Not Smart

By Stephen Reeves, Viewpoint

The national security establishment, the U.S. Congress, the media, and the American public are all aware that an enemy threat exists. U.S. adversaries have clearly demonstrated their capabilities and stated their intent to do grievous harm to the nation. A large new federal agency is created, first by Presidential Order and then by Congressional action. The federal government is fully engaged with ambitious plans and budget requests for both federal spending and grants to state and local governments.

Despite all this, and the known and continuing threat to the nation, only 10 percent of the budget requests submitted by the President are actually funded by Congress. In addition, it is an election year and several presidential candidates have expressed concern about the significant economic commitment required to fully fund all of the defense measures proposed by the current administration.

This position strongly resonates with the members of the opposition party in Congress – who several times have announced that they intend to curtail federal spending significantly and balance the overall federal budget. That position also resonates well with numerous state and local governments that also are under enormous fiscal pressure and have little or no use for yet another unfunded federal mandate.

To all who think the preceding sounds all too familiar and needs no repeating: Welcome back to the 1950s – and to what was then called the Federal Civil Defense program. Over the following 25 years – into the middle and late 1970s, in other words – a total of 16 federal agencies would, despite severe budgetary limitations, make considerable progress in creating a reasonably workable civil-defense infrastructure. Public fallout shelters were created, plans for homemade family shelters also were distributed, and emergency operations centers were established in many cities and states throughout the country.

In addition, stockpiles of food and medicine were funded, warning sirens were installed, the CONELRAD (Control of Electromagnetic Radiation) emergency broadcast system was created, and scores of planning documents – ranging from mass-evacuation routes to continuity-of-government contingency plans – were designed, developed in considerable detail, and promulgated. Distribution of the plans was usually limited, though, to those certified as possessing the correct "need to know" credentials.

The Era of Dual-Use Civil Defense

By the 1970s (another period of major economic challenges), interest in civil defense had all but evaporated. In what might be called frugal innovation, civil defense morphed into the "dual use" category and was no longer focused solely on military attacks, but also on natural disasters (and, not incidentally, on the accompanying disaster-associated federal grants available to state and local governments).

Today, the case for chemical, biological, radiological, and nuclear (CBRN) defense is in much the same position as civil defense was in the 1970s. Almost every state and major city in the entire country faces difficult budget shortfalls. In addition, federal grant funding is now less than half what it was four years ago and, in many areas of special concern, almost evaporated. Moreover, after having purchased equipment and pharmaceuticals in the relatively prosperous funding years that immediately followed the 2001 terrorist attacks, almost all states and local jurisdictions are now facing the follow-on cost of: (a) maintaining (and/or replacing) the equipment purchased earlier; (b) sustaining the associated training costs; and (c) replacing the expiring pharmaceuticals. One major consequence of these new budget pressures is that the still relatively new requirement to provide an effective CBRN defense capability is rapidly becoming unaffordable to many agencies and organizations.

Dirty Bombs, Bird Flu & Other Emerging Threats

Nonetheless, the CBRN threat is frighteningly real – and still growing. The disintegration of the previous Western technological oligopoly puts potentially catastrophic weapons into the hands of almost any group, organization, or individual terrorist seeking to harm the United States. Moreover, the knowledge base required, as well as the materials that could be used, is already widely available for: (a) making homemade explosives and improvised explosive devices; (b) making rudimentary chemical and biological weapons; and (c) building explosives with a radiation source (which are readily available in almost any hospital). The result of this combination of increase in knowledge and easy availability of materials is the recipe to build a "dirty" bomb.

In that context, it is relevant to note that, in November 2011, many people around the world were "shocked" to learn that a group of scientists in The Netherlands had created an H5N1 Avian Flu strain (Bird Flu) that was just as lethal as the original virus and could be easily passed between mammals. Perhaps equally shocking is that anyone was or could be shocked to begin with. Even science students know that bio-engineering tools and the ability to genetically modify organisms have become exponentially simpler each and every year over the past decade.

Despite diminished resources, therefore, it is evident that effectively addressing the CBRN threat must remain a key component of any "all hazards" U.S. preparedness and planning doctrine for the foreseeable future. It is, in short, once again time for a period of frugal innovation. For those who plan, develop, and implement programs, and/or provide the products and services needed, this means building much greater flexibility into the system. It also means developing the capacity to deal with the "most probable" events – an effort that could and would also increase the capacity and capabilities critical to dealing with less probable CBRN events as well.

Most importantly of all, though, it also means making adaptability a very high priority. As Winston Churchill once so aptly stated, "We have run out of money. Now we have to think."

Major General Stephen Reeves, USA (Ret.), is the Former Joint Program Executive Officer for Chemical & Biological Defense of the U.S. Department of Defense. He also is a highly accomplished senior business executive and an internationally recognized expert on chemical and biological defense as well as defense acquisition. He has testified as an expert witness on multiple occasions before the U.S. Congress and has been interviewed numerous times by members of the national and international print and television press. He also is a frequent speaker at both national and international defense and homeland security conferences. Experienced in leading and managing large, diverse, global, multi-billion dollar organizations, he established, and for seven years led, the first Department of Defense Joint Program Executive Office for Chemical and Biological Defense.

Protecting Subway Riders from a Chemical Attack

By Joselito S. Ignacio, Transportation

In 2010, New York City had the fourth highest annual subway ridership in the world – more than 1.6 billion people, according to the Metropolitan Transportation Authority. In that same year, a much smaller number of passengers – 713 million – boarded airplanes across the United States, according to FAA (Federal Aviation Administration) statistics. Despite this significant difference, the nation's subway systems have not imposed strict passenger or baggage screening requirements similar to those used in civil aviation.

In other words, there is no passenger vetting, similar to what is used to compile the aviation industry's "no-fly" lists, to prevent someone identified as a potential terrorist from boarding a subway car – or, for that matter, any of the nation's trains and buses.

The Vulnerabilities of Subway Systems

Literally millions of Americans (and foreign visitors) ride subways every day. One of the most important challenges facing those responsible for the safety of these transit systems, therefore, is to protect them against chemical terrorism – i.e., the use of chemical agents by persons seeking to kill or injure others, intentionally harm the environment, and/or adversely affect the nation's economy. The two principal categories of chemical weapons or devices typically used by terrorists are chemical warfare agents (CWAs) and toxic industrial chemicals (TICs). Most CWAs, which are designed primarily to disrupt enemy assaults on the battlefield, are produced in mass quantities. Most TICs are manufactured by private-sector companies to create a broad spectrum of commercial products – including plastics, fuels, fiberglass, and household cleaners – that are readily available for purchase in supermarkets and many other stores throughout the country.

Enclosed spaces such as subway systems are particularly susceptible to attacks using TICs because most chemical agents can be released simply by attaching an explosive device to a canister of some type that is being used to contain the agent. The heat and pressure produced by the explosion may not substantially degrade the toxic characteristics of the agent, which means that it may still cause significant harm. In addition, the "push/pull" airflow created by incoming and outgoing railcars that are traveling, usually at high speed, through subway tunnels can rapidly disperse chemicals from their source of release toward unsuspecting passengers – those already aboard the train as well as those waiting in the station. Further complicating the problem, and exacerbating the danger, is that the typically limited egress from many stations hampers a rapid evacuation, and that secondary problem also could cause crushing injuries, and additional deaths, as people stampede to the nearest exit.

To detect and warn patrons and authorities – and potentially save lives – transportation planners must design a system for integrating, into current and future subway systems, chemical detection systems and devices that can work in any of the stations in any given subway system. What follows are six key steps – partially developed and strongly recommended by planners in the DHS Office of Health Affairs' Chemical Defense Program – to help protect subway riders from a chemical attack:

1. *Develop the risk assessment methodology* needed to: (a) characterize specific chemical threats; and (b) carry out a vulnerability assessment of a subway system that can be used to protect against those same threats. Chemical detection systems are designed specifically to save lives – but will be able to do so only if the detectors procured and installed detect and warn against the presence of the agents used in an attack.

2. *Establish detection performance specifications*, based on the vulnerability assessment, to determine the detection technology requirements. In addition to developing these specifications, the target agents should be tested, to validate the performance claims made by the vendors of detection equipment, by using a set of Acute Exposure Guideline Levels (AEGLs) – a task managed by the U.S. Environmental Protection Agency – and/or a NIOSH (National Institute for Occupational Safety and Health) list of "Immediately Dangerous to Life and Health" (IDLH) values. The AEGL list defines the threshold exposure limits of specific hazardous chemicals, under emergency conditions, whereby – at or above those levels – harmful health effects are most likely to occur. AEGL values apply to first responders as well as to the general public. The IDLH values also define exposure limits, and are generally higher than the AEGL values. At IDLH levels, which apply to first responders only, escape from the immediate area

within 30 minutes is critical, or permanent disability or death may result. Moreover, performance specifications must include a list of chemicals commonly present and/or used in a subway system for cleaning or maintenance, and – to minimize false positive alarm rates – should require that such chemicals not be able to trigger an alarm by the chemical detectors. Rigorous and effective performance specifications are essential to determine the appropriate detection technology that should be used.

3. *Evaluate the information available about the various types of detection technologies* that are being considered for use as stationary, autonomous detection systems. Single detection technologies involving one type of process typically have a fast detection response and are relatively small in size. Orthogonal detection technologies involving two or more types of in-series detection processes usually have a longer detection response time than single detection technology detectors but, because of their ability to separate the chemical constituents present in an air sample mixture, possess greater sensitivity. In addition, orthogonal detectors often have lower false positive alarm rates than those that are characteristic of detectors with only a single detection technology. Evaluating different types of technology is key to success in this area, because detection technology systems are not "one size fits all" products, and the use of more than one type of technology may in many situations not only be advisable but mandatory.

4. *Use a detector placement method*, primarily through the use of dispersion modeling and field studies to determine the optimal number and placement of detectors needed to provide the full range of detection response capabilities needed. There are a number of different ways to use both methods to predict the downwind spread of chemical vapors and gas through a subway system – while also taking into account the need, if and when possible, to continue routine subway system operations. To determine the number of detectors needed for a particular system, computational modeling can identify the appropriate detector placement locations, and thus the number of units required to best detect a chemical agent immediately after its release – from either a single source or multiple sources. A methodological approach to detector placement is particularly important to ensure adequate and effective system-wide coverage.

5. *Develop a concept of operations* (CONOPS) to coordinate all elements of the system's detect-to-warn-to-response capabilities. Integration of the system's new chemical detection system should, in fact, be the principal factor used in developing a response plan specifically designed to protect against chemical agents.

6. *Create and implement a training and exercise program* to help first responders familiarize themselves with the actions that they must take after a detector has signaled a release. A key component of this program should focus on "patron awareness" of the detect-to-warn capabilities of the new system. This step could also provide valuable feedback from users to identify gaps – in the detector systems or in the response plans – that may have been overlooked during the initial design and development processes. Continued training and a broad spectrum of exercises are needed to ensure that all personnel involved not only know their individual, and collective, roles and responsibilities but also are able to carry them out both fast and efficiently.

To briefly summarize, a properly planned and implemented chemical detection architecture can assist immensely in the design and implementation of the effective chemical-protection capabilities needed in the subway transit environment. The key steps described above – risk assessment methods, establishment of performance specifications, review of current detection technologies, detector placement, CONOPS development, and training and exercise programs – are the essential building blocks needed to help transit authorities, and subway system personnel, evaluate and install the detection products that best meet their needs.

A deliberate approach, as proposed here, will help transit authorities and homeland security professionals minimize casualties in the event of a chemical agent release in a subway system. The sooner such a framework is implemented, the better prepared they will be should such an attack occur at any time in the foreseeable future.

Captain Joselito S. Ignacio, M.A., M.P.H., is a U.S. Public Health Service Officer now serving as Acting Director of the Chemical Defense Branch in the U.S. Department of Homeland Security's Office of Health Affairs. He previously served as Deputy Director of the Chemical Defense Branch, which he joined in 2010. He has, among other responsibilities, overseen a two-year demonstration project in Baltimore on how to protect the city's subway system in the event of a chemical attack. He holds a master's degree in public health from the University of California at Los Angeles as well as a master's degree in homeland defense and security from the Naval Postgraduate School.

Nationwide Suspicious Activity Reporting (SAR) Initiative (NSI)

By W. Ross Ashley, Interviews

The See Something, Say Something Act of 2011 was enacted for the purpose of countering "homegrown radicalization and violent Islamist extremism." As an amendment to the Homeland Security Act of 2002, the See Something, Say Something Act offers liability protection for people who, in good faith, report suspicious – and possibly terrorist – activity. Fusion centers, which are a network of information sharing groups, play a key role in securing the homeland and in supporting both the See Something, Say Something Act and the Intelligence Reform and Terrorism Prevention Act of 2004 by providing an outlet for local, state, tribal, and federal officials to communicate and share reports of suspicious activity.

Various legislative efforts address the need for sharing information concerning possible terrorist threats. Fusion centers help streamline the reporting process for suspicious activity by pulling data from and making information available to a wide range of sources.

Tourism vs. Terrorism

Managed by the U.S. Department of Justice, the Nationwide Suspicious Activity Reporting (SAR) Initiative (NSI) provides a business process to report, track, and access information on critical infrastructure and key assets – including but not limited to chemical, biological, radiological, nuclear, and explosive (CBRNE) assets – from all levels of law enforcement, while still protecting the privacy as well as civil rights and liberties of those involved. The nationwide SAR Initiative was developed in response to the 9/11 Commission Report, which addressed two main problems with the information sharing process that predated the 11 September 2001 terrorist attacks: (a) finding and asking the right people for pertinent information; and (b) determining who should, and more importantly who is allowed, to receive such information. SAR solves these two problems by making the information available to the right people at the right time so the appropriate action can take place.

In a 23 March 2012 *DomPrep Journal* interview, Thomas J. O'Reilly, Director of the SAR Initiative, stated that if more suspicious activity had been identified before the attacks on 9/11, "it might have helped us prevent or thwart the issues that occurred that day." SAR helps raise awareness about people and organizations responsible for CBRNE assets and improve training among law enforcement officials. Behavior analytics places the focus on the "what" (terrorism) rather than the "who" (tourism) to spot anomalies.

According to O'Reilly, there are two major areas of challenges for fusion centers today: (a) diversity of programs that have developed in terms of trying to report suspicious activity across various domains; and (b) today's economics of dwindling budgets and personnel. Both of these challenges put a strain on public safety and the ability to assist in critical infrastructure protection.

The THADIAS System

The U.S. Department of Energy's Argonne National Laboratory system helps support the security of radiological and nuclear materials. According to Joe Adduci, GIS (Geographic Information Systems) Analyst/Project Leader at Argonne National Laboratory, because of the Laboratory's GIS capabilities, staff members were approached in 2001 after the 9/11 attacks to determine the existence of a relationship between radiological/nuclear trafficking and traditional drug smuggling routes. This inquiry led to the precursor of the THADIAS system (Radiological Theft and Diversion Incident Analysis System) – high-powered relational databases and GIS system for tracking and mapping radiologic losses, recoveries, criminal prosecutions, etc. The THADIAS system is now capable of identifying spatial and temporal patterns that can be seen at the regional, national, and international levels.

GIS analytics is an integrator and a benefit to the overall fusion center mission. As the NSI advances, online availability of GIS systems will enable decision makers to view datasets in a form that is mobile. This mobility produces technologies that are more interactive, offer live data, and are more readily available in the field.


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SURVIVAL EVOLUTION

Better Situational Awareness

In an October 2010 Research Triangle Institute study that looked at all terrorist events – both actual and thwarted – since 9/11, it was determined that more than 80 percent of the initial information was derived from state and/or local law enforcement officials and/or members of the public. Although public safety officers are typically not experts in the area of GIS and CBRNE, they still may have valuable information to share. As such, by collaborating and sharing data from all areas of expertise, fusion centers could paint a clearer picture and provide better situational awareness for CBRNE threats.

By May 2012, NSI plans to release a number of frontline training programs for police officers, private security officers, 911 dispatchers, hotel housekeeping staff, and owners and operators of critical infrastructure. By establishing a robust suspicious activity reporting program, properly identifying various pieces of information, and utilizing analytical tools such as GIS, law enforcement agencies are able to not only better allocate a diminished presence, but also use that presence more aggressively and more effectively to prevent or mitigate future terrorist threats.

For additional information on:
The Nationwide Suspicious Activity Reporting (SAR) Initiative, visit http://nsi.ncirc.gov/

The 9/11 Commission Report, visit http://www.9-11commission.gov/report/911Report.pdf

Argonne National Laboratory, visit http://www.anl.gov/

The October 2010 Research Triangle Institute study, titled "Building on clues: Examining successes and failures in detecting U.S. terrorist plots, 1999-2009," visit http://www.rti.org/publications/abstract.cfm?pubid=15621

Ross Ashley is the Executive Director of the National Fusion Center Association (NFCA). He also serves on the Board of Advisors to numerous corporate clients. He was confirmed by the U.S. Senate in December 2007 and served as Assistant Administrator of the Grant Programs Directorate until August 2009. Previous roles include: Chief Executive Officer of the National Children's Center (NCC), founder of the Templar Corporation, Director of Law Enforcement Technologies at ISX Corporation, and other private-sector positions. He is a retired Air Force Intelligence Officer who served in both the Virginia Air National Guard and the U.S. Air Force Reserve.

Nationwide Suspicious Activity Reporting Initiative (NSI) Roundtable Interview

Click to listen to ***NSI Roundtable Discussion***

Presenters

W. Ross Ashley
Executive Director, National Fusion Center Association (NFCA)

Thomas J. O'Reilly
Director, Nationwide Suspicious Activity Reporting (SAR) Initiative

Joe Adduci
GIS Analyst/Project Leader, Argonne National Laboratory

Photo not available for publication

Since the terrorist attacks on 11 September 2001, law enforcement agencies across the United States have made significant effort to prevent similar tragedies from occurring on U.S. soil. Efforts made by the National Fusion Center Association (NFCA), the Nationwide Suspicious Activity Reporting (SAR) Initiative, Argonne National Laboratory, and others are bringing together information from multiple sources and using modern technology such as Geographic Information Systems (GIS) to better protect the nation against threats such as chemical, biological, radiological, nuclear, and explosive (CBRNE) events.

Thomas J. O'Reilly, Director of the Nationwide SAR Initiative, and Joe Adduci, GIS Analyst/Project Leader at Argonne National Laboratory, join W. Ross Ashley, DomPrep40 Advisor and Executive Director of the NFCA, in discussing the benefits of having members of multiple disciplines in multiple jurisdictions participate in the process of reporting suspicious activity.

Hospital Preparedness for "Chemical/Detergent" Suicides

By Craig DeAtley, Health Systems

The Hospital Accreditation Standards established by The Joint Commission, and followed by almost all of the nation's healthcare facilities, mandate that U.S. hospitals should be prepared to decontaminate patients who have been exposed to hazardous materials. However, although thousands of incidents involving hazardous materials occur annually in the United States, only a small percentage of them result in injuries or disabilities requiring hospital care. In most of these cases, moreover, the risk is usually visible to the naked eye.

That is not always true, though, of a new risk now evolving in some areas of the country – so-called chemical/detergent suicide. Suicide itself is not new, but the ways in which individual citizens choose to end their lives has evolved over time – from self-hanging and artery-cutting to self-inflicted gunshot wounds and so-called "suicide by cop" – i.e., putting oneself in a situation in which a policeman or other responder must use lethal force to stop a murder or some other type of horrendous crime. Chemical/ detergent suicide first came to widespread public notice in Japan, where in recent years literally hundreds of people have been committing suicide by mixing a sulfur-containing product (e.g., a dandruff shampoo, a pesticide, or even bath salts) with an acid-producing chemical.

Hydrogen sulfide (H2S), a common ingredient in a toilet bowl cleaner, has been the "weapon of choice" used by many of those who decided to take their own lives. A colorless gas with a characteristic rotten egg or sewer gas smell, H2S can cause the death of anyone inhaling just a few breaths of the gas. A number of cases similar to those in Japan already have occurred in the United States and now pose a serious danger to first responders and hospital personnel.

A suicide case of a patient who had ingested rat poison (aluminum phosphide) was admitted in December 2011 to a Northern Virginia hospital. In this case, the ingested agent mixed with fluids in the patient's airway and gastrointestinal systems to produce phosphine – another deadly gas. The patient later died, but not before the hospital's emergency department also had become contaminated from what is called "off gassing" – i.e., staff members became ill from inhaling the poisonous byproduct – and the care of other patients had to be quickly moved into a tent outside the hospital.

Another incident occurred in December 2011 at St. Joseph Mercy Hospital in Ann Arbor, Michigan, where hazmat teams had to be called in after it was determined that a patient who had ingested rat poison was "emitting potentially toxic gas." The patient was then isolated to preclude the contamination of staff members and/or other patients.

Preparedness: How Much Is Too Costly?

The basic elements of almost all hospital preparedness plans and policies begin with an annual hazard-vulnerability analysis identifying external risks – including the threats posed by hazardous materials. These threats normally are associated with transportation or industrial accidents, but not – so far, in most U.S. hospitals – with the mixing of common household chemicals and/or the deliberate ingestion of a pesticide.

At the heart of the typical emergency department line of defense is a hazmat response appendix – usually included as part of the facility's Emergency Operations Plan. The plan typically details, among other things: (a) alert and notification procedures; (b) the medicines, medical equipment, and other material resources needed in emergency situations; (c) the personal protective equipment (PPE) clothing and gear also required; and (d) detailed specifications related to a "decontamination-corridor" set-up and operations. Many hospitals also follow the OSHA (Occupational Safety and Health Administration) "Best Practices" federal guidelines for hospital-based First Receivers to develop their response plans.

Training hospital personnel to safely and quickly don and doff PPE, set up the decontamination corridor, and carry out the decontamination of both ambulatory and non-ambulatory patients (and those with special needs) not only takes considerable time but also, in most cases, adds significantly to routine ongoing expenses. Many hospitals continue their everyday life-saving work for many years, though, without having to respond to a real-life hazmat incident, so the need for this significantly higher level of preparedness is usually not at the forefront of planning efforts.

Suicide victims are often admitted to and treated in hospital settings. However, when the toxins ingested – sometimes deliberately – make the patient's body dangerous to others, hospital caregivers must be fully prepared to protect themselves.

Unique Response Needs – None of Them Easy, or Inexpensive

Although patients exposed to chemical/detergent suicide agents may benefit from being decontaminated if the product is spilled on them, the off-gassing that results still poses a secondary threat to the treatment team and the facility. Hospitals faced with the need to successfully resuscitate a critically ill patient must decide, therefore, both where and how to provide ongoing care.

The most immediate steps taken usually include ongoing use of the PPE required, the rotation of hospital staff (to avoid provider fatigue and/or heat-related illnesses), and the maintenance of "clean air" in the treatment area – none of which is easily, or inexpensively, accomplished.

Some facilities may have the capability to vent contaminated air from a treatment area to an exterior connection. Facilities that are not able to vent to the outside can, however: (a) transfer the patient to another facility that has the capability needed; or (b) provide care at a temporary site outside the facility – a medical tent, for example. Temperature control, lighting, and access to the medical equipment, supplies, and medications needed all must be provided for the tent or any other type of "outside" or auxiliary facility to function properly.

Decedent management is the next procedural task that must be carried out if the patient succumbs to the poison. Here, close coordination between the hospital, medical examiner, and funeral director will help prevent the spread and/or relocation of the immediate danger.

Poisonings are not uncommon everyday problems for emergency department clinicians. Even if they were extremely rare, though, it is now obvious: (a) that the threats posed by chemical/detergent suicides cannot be ignored; and (b) that dealing with such threats usually requires both special preparation and early recognition to prevent yet another attempted suicide from becoming a statistical reality.

Craig DeAtley is the Director of the Institute for Public Health Emergency Readiness at the Washington Hospital Center, the National Capital Region's largest hospital, Emergency Manager for National Rehabilitation Hospital and co-executive director of the Center for HICS Education and Training. Prior to assuming his current position, he was an Associate Professor of Emergency Medicine at George Washington University for 28 years, before leaving to start the Institute. He also works as an Emergency Department Physician Assistant for Best Practices, a large physician group that staffs emergency departments in Northern Virginia; he also has been a volunteer paramedic with the Fairfax County Fire and Rescue Department, and a member of the department's Urban Search and Rescue Team. He also has served as the Assistant Medical Director for the Fairfax County Police Department since 1991.

The Detection Triage – A Systematic Approach to Identification

By Glen D. Rudner, Fire/HazMat

When responding to hazmat (hazardous materials) and/or CBRNE (Chemical, Biological, Radiological, Nuclear, Explosive) incidents, emergency responders have many detection devices at their disposal. These devices vary from the simple to the complex – some require a considerable amount of training, both initially and for ongoing proficiency, and others provide readings that can lead the responder down the wrong tactical and/or operational decision path.

With all the detection devices now on the market, responders should be aware of the processes that can help direct them toward the most effective devices and methodologies that should be used when making decisions about not only their personal safety but also the safety of the community as a whole. By adopting a systematic approach of first "triaging" the incident scene, then using several time-tested detection methods, responders will have a better idea of what equipment to use and how to manage the incident in general, regardless of its size and scope.

The Basic Steps of Detection Triage

Even while they are still just approaching the incident scene, emergency response personnel should at the same time be assessing the initial information available from the scene to find clues that may indicate the specific hazards involved – the location of the incident, for example, the number and types of containers involved, and the credibility of any threats that might have been made as well as the signs and symptoms observed by responders and/or mentioned by possible victims.

Upon arrival at the scene, the next step in this triage method is to determine the possible materials involved and the state of matter that is being released. The determination of whether the product released is a solid, liquid, gas – or a combination of any or all of these substances – will usually lead emergency responders to the correct third step in the detection triage by indicating which devices, systems, or other "tools" at their disposal will work most effectively.

Responders will first have to address the primary hazards at the incident scene, though – and to ask a few common-sense questions about whether the release is flammable, toxic, or corrosive, for example, or whether it has an energy component. For the detection of these particular hazards, responders should have immediately available such equipment as: (a) multi-gas meters and photoionization detectors (to determine flammability potential and oxygen levels); (b) toxic sensors (to determine the presence of carbon monoxide and/or hydrogen sulphide); (c) radiation detection devices such as pagers and meters (both of which are available in most jurisdictions) to determine basic energy emitters; and (d) pH paper (to determine the "corrosivity" – i.e., tendency to rust or erode – of certain products). After these primary hazards have been investigated, responders can then use the scientific arsenals of sophisticated detection equipment that the more advanced hazmat teams bring with them to identify products.

Following are a few examples of how and when to use the triage approach to obtain a more definitive identification.

Chemical Products: After a chemical hazard has been identified, responders can and should use any or all of the following: calorimetric Tubes; "Wet" Chemistry; FTIR (Fourier Transform Infrared Technology); Raman systems; and/or Gas Chromatography/Mass Spectroscopy (GC/MS). Two caveats should be noted: (a) This algorithm is heavily dependent on the capabilities and availability of the response teams and the authority possessing legal jurisdiction at the scene; and (b) There are many other instruments that can be used in conjunction with those mentioned here.

Biological Equipment: After it has been determined that there is or might be a biological threat present, responders can and should use any or all of the following: Protein Test Kits; Hand-Held Assays (for Immuno-Assay Detection); Polymerase Chain Reaction (PCR) equipment; the FTIR and/or GC/MS systems mentioned above; and/or lab cultures and analyses.

Note: Before "processing" an incident involving a biological threat, responders should not only consult with the law-enforcement officials present but also adhere to the following ASTM (American Society for Testing and Materials) Standards:

- The E2770-10 Standard Guide for Operational Guidelines for Initial Response to a Suspected Bio-threat Agent; and
- The E2458-10 Standard Practices for the Bulk Sample Collection and the Swab Sample Collection of Visible Powders Suspected of Being Bio-threat Agents from Nonporous Surfaces.

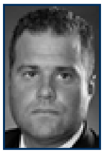
Radiological: After the identification of a possible radiological hazard has been determined, responders can and should use, as appropriate, any or all of the following: Personal Radiological Dosimetry (PRD – to help determine personal dose/exposure); Radiological Isotope Identifier Devices (RIIDs); and/or Laboratory Analyses. In addition, and before processing an incident involving a radiological threat, responders should consult with appropriate law-enforcement officials and adhere to the ASTM's E2601-08 Standard Practice for Radiological Emergency Response.

To briefly summarize, the triaging process is often used not only to determine the priority in which victims should be treated (usually based on the severity of injuries suffered), but also to determine the priority of the equipment that should be used – a decision that in most cases will be based on its effectiveness in particular situations. Using a triage approach to identify CBRNE products is, in short, an efficient way to provide a more accurate identification of any hazardous materials that might be present at an incident scene. It also usually leads to better tactical decisions and provides more definitive protection for the responders themselves as well as better care for the victims who may have been exposed.

Glen Rudner is the project manager for CRA-USA, where he works with senior management executives on major corporate issues; he is currently assigned to project management of State and Local Training Programs. A recently retired Northern Virginia Regional Hazardous Materials Officer, he has been heavily involved during the past 35 years in the development, management, and delivery of numerous local, state, federal, and international programs for such organizations as the National Fire Academy, the FBI, and the Defense Threat Reduction Agency.

Libya's Missing Chemical Caches: The Weapons of Armageddon?

By Richard Schoeberl, Law Enforcement



The idea of using chemical and biological weapons against enemy forces is by no means a novel concept – historical evidence suggests that the use dates back for more than 2500 years. Wells used for drinking and cooking water were poisoned with "rye ergot" by the Assyrians and the Persians in the 6th and 5th centuries BC. In the mid-13th century, the English hurled containers of blinding quicklime onto French ships. In the 18th century, British soldiers intentionally doled out "smallpox-infected" blankets to American Indian tribes as "gifts" or "gestures of good will." Between 1914 and 1918, the aggregate loss of life caused by chemical weapons (notably mustard gas) during World War I exceeded 1.3 million (the introduction of the gas mask prevented the death toll from being ominously greater).

Although the use of chemical and biological weapons has a long history, their current potential for death and destruction goes far beyond anything ever before imagined. One distinguishing trait of chemical agents is that their use can be both instantaneous and widespread, which makes them particularly attractive to terrorist organizations. A major concern to the international community today is that the possession of chemical-type weapons by unstable governments or failed states – particularly during a civil uprising – could directly translate into uncertain or even nonexistent security of such weapons. In the immediate aftermath of a sudden civil uprising or revolution, when the current government is no longer in power, chemical caches are often left both unsecured and unaccounted for.

Since and partially because of the chaos caused by and during Libya's eight-month civil war (February-October 2011), for example, the number of missing weapons from the previous regime's stockpile is still unknown. However, various security experts, human rights groups, and international reporters have stumbled across weapons depots that were left unguarded – and some of them had obviously been looted – after Muammar Qaddafi's fighters fled.

Recognizing the Threat

According to a 6 November 2011 *Huffington Post* article, the top Libyan envoy, Ian Martin, told the Associated Press that many weapons depots were at that time still not properly secured and that a significant portion of the weaponry stocked in them "has already gone missing." Although mustard gas attacks the eyes and skin, it is dissimilar to other chemical agents in that the victims will not usually display immediate symptoms. In fact, the effects of exposure typically do not appear until one to six hours after contact, which makes mustard gas particularly difficult to counter. A high percentage of the exposed victims undergo severe tissue damage well before they even recognize the necessity for treatment.

During the 1987 conflict in Northern Iraq, Saddam Hussein used mustard gas against the Kurdish people living there. In the Kurdish village of Halabja, "a combination of chemical agents including mustard gas and sarin killed 5,000 people and left 65,000 others with severe skin and respiratory diseases, abnormal rates of cancer and birth defects, and a devastated environment," according to the Council on Foreign Relations. The recovery process is still continuing today, some 25 years later, according to the Council – an independent nonpartisan organization with offices in New York City and Washington, D.C.

Of particular concern is the possibility that untold tons of ammunition and unknown weapons – such as mustard gas – might easily, and quickly, fall into the hands of terrorist organizations. Shortly after the end of the Libyan conflict, the United States immediately started distributing a "Recognition Guide" to the nations bordering Libya as one step in a concerted international effort to trace and secure at least some of the munitions and equipment that had already been looted from Qaddafi's well stocked weapons caches. The distribution of the guide, it is hoped, will help border guards in the region to: (a) identify the different weaponry components more readily; and (b) prevent at least some of the weapons being smuggled into bordering communities from falling into the hands of terrorist groups such as al-Qaida. In 2011, Egyptian officials were in fact able to capture several groups of smugglers who were carrying Libyan weapons and apparently on their way to the Israeli/Egyptian border.

Secured But Under Attack

Because of the still chaotic situation in Libya – and the importance of international monitoring of chemical weapons in

general – the United States and its allies continue to keep a close watch on the huge stockpiles of chemical weapons cached in another Mideast nation, Syria, which is also going through an extended period of turmoil. Of significant concern is the strong possibility that the current unrest in Syria could allow that nation's chemical weapons to be used against U.S. forces and supporters within the region. In a 17 February 2012 letter to U.S. Secretary of State Hillary Clinton, a bipartisan group of legislators – Maine Republican Senator Susan Collins, New York Democratic Representative Kirsten Gillibrand, and New Hampshire Democratic Representative Jeanne Shaheen – expressed their concern that the "growing breakdown of order and security in Syria could place its significant stockpiles of poison gases and operational chemical weapons at risk."

It is no secret that: (1) Syria may hold one of the largest chemical weapons stockpiles in the world; and (2) the known stockpile sites are currently secured by a regime that is under constant attack by opposition forces (which are not yet very well organized). The numerous complexities involved in what is still an unraveling political situation would make it extraordinarily difficult to secure Syria's chemical weapon sites. An additional complication is that the locations of at least some of them may not be known to Western intelligence agencies. Nonetheless, according to the unverified, and unattributed, estimates of some U.S. and allied officials, it could take approximately 75,000 troops on the ground to secure Syria's 50-plus chemical weapon and production sites if the sites were left unguarded and/or at risk of being looted by the opposition. Largely for that reason, it also has been reported, U.S. and Jordanian forces are working together to develop the strategic plans needed to secure Syria's known or suspected caches of chemical and biological weapons. However, there are still major, and unanswered, concerns that the security of those arsenals are now and will continue to be at risk during the still growing instability within the region.

There is no indication at this time, it should be noted, that Syria's Assad regime will intentionally use chemical weapons during the civil uprising and/or leave the caches unsecure. However, there are several factions of the Syrian opposition closely connected to al-Qaida and other terrorist organizations. In fact, Ayman al-Zawahiri, Osama Bin Laden's successor of al-Qaida worldwide, recently issued a statement – in what seemed to be an effort to take advantage of the violent uprisings in Syria and other Arab Nations – urging all Muslims to support civil uprisings in the region.

Eradicating the Threat

Further complicating the unstable situation throughout the region is the fact that the exact locations and numbers of Syria's chemical weapon stockpiles can only be speculated. A UN-chartered agency, the Organization for the Prohibition of Chemical Weapons (OPCW) – headquartered in The Netherlands – has been in existence now for more than a decade and is the principal instrument being used by the international community to reduce and/or eliminate the further development, production, stockpiling, and use of chemical weapons. Significantly, Syria – along with Angola, Egypt, North Korea, Somalia, and South Sudan – has not yet come to an agreement on or signed the Chemical Weapons Convention (CWC).

Libya did sign the Convention, though. However, OPCW inspectors – who are charged with monitoring the actual compliance of nations that have signed the CWC – said two months ago that former Libyan leader Qaddafi had possessed an "undeclared" stockpile of chemical weapons, mainly sulphur-mustard agents. Under Qaddafi, Libya joined the OPCW in mid-2004, and the Libyan leader acknowledged at that time that Libya had in excess of one hundred metric tons of the materials needed to develop chemical weapons and 55 tons of mustard gas. By mid-2011, a little more than half of that cache had been destroyed. An estimated 11 tons of mustard gas remained in the inventory, but disposal of the remaining chemicals were interrupted by the civil uprising.

Obviously, the continuing conflicts in the Arab nations have significantly strengthened the need for the world community to be equipped for the unknown when it comes to a potential chemical weapons attack. After Qaddafi's death, additional unknown and undeclared caches of chemical weapons were discovered in the southern region of Libya. The interim government seized control of the sites – but, significantly, also notified the OPCW that there was a strong possibility that most of the weaponry was originally undeclared and unaccounted for.

Over the years, the international community has taken the possession of chemical weapons much more seriously than ever before. The number of countries possessing chemical weapons has in fact decreased over the past 30 years – primarily as a result of the active implementation of the CWC. However, the unknown whereabouts of the chemical caches still remaining raise concern, and United Nations officials have already called on leaders of the interim Libyan government to cooperate fully with the CWC by: (a) destroying Libya's remaining chemical weapon stockpiles; and (b) working with the UN in attempting to locate the weapons believed to be still missing. Until those demands/requests are answered, though, there will be justified concern that the weapon caches still missing from the Libyan stockpile could fuel terrorist activities, including those launched by al-Qaida and other extremist movements within the region.

With terrorist groups constantly attempting to acquire materials to create large-scale weapons, the chemical caches missing from Libyan stockpiles pose a serious and present danger. Steps are needed to prevent or mitigate the potentially cataclysmic consequences.

Protecting International And Domestic Borders

Compounding the problem is the possibility that, if any of the chemical-weapon caches that remain unaccounted for do fall into the hands of terrorists, the weapons could be used either as a threat to or in an actual attack on the 2012 London Olympics. Because of their relative ease of dispersal, toxic and often lethal chemicals such as mustard gas are particularly attractive weapons for terrorist groups. An attack using a chemical agent (in the form of mustard gas) has the potential, if delivered most effectively, to cause a very high number of casualties – particularly if the release occurs in an indoor stadium, an airport, or any of London's many underground train stations. The economic losses to the United Kingdom would be significant, of course, if only because of the time it would take to remediate the area following such an attack. The probably colossal loss of life would be much more devastating, though.

U.S. troops discovered information in Afghanistan suggesting that al-Qaida has been conducting rudimentary chemical warfare experiments. Information on how to produce and manufacture such weapons has been readily accessible in the scientific community for decades and, more recently, made even more easily accessible on the internet. This information supports the worst fears suggested by U.S. intelligence agents, who have warned that terrorist groups such as Hamas and al-Qaida are and for some time have been seeking to acquire such chemical weapons to use within U.S. borders.

The possibility of smuggling chemical weapons into the United States is not a totally new concern – but it has not yet been truly tested and perfected. Moreover, although the U.S. Customs and Border Protection (CBP) agency has introduced a "Chemical Detector Dog" program, that one small step may not be enough. In 2009, the Inspector General of the Department of Homeland Security (DHS) completed an investigation of the CBP and its ability to detect chemical or biological weapons. The IG's report – *CBP's Ability to Detect Biological and Chemical Threats in Maritime Cargo Containers* – indicates that the CBP has still not conducted a formal risk assessment to determine what potential conduits, including maritime cargo containers, pose the highest risk of containing biological and chemical weapons entering the United States. Conducting a formal risk assessment of the various conduits may not solve the entire problem, but it would at least help CBP apportion its detection technology development resources to the highest-risk threat conduits. In that context, it should be noted that the DHS Inspector General also expressed the need for CBP to update its own policies and procedures on how to carry out the inspections needed to verify and counter such threats.

Prevention First

The best protection against a chemical terrorist attack begins by preventing, if possible, a terrorist group's acquisition of these types of weapons – by obtaining and destroying the caches missing from Libya's stockpile, for example, or by taking a well calculated advantage of the civil unrest in Syria. Because it is unrealistic to assume that all of the missing caches of Libyan weapons can in fact be recovered, a post-attack disaster response plan should be in place. Preparedness is the paramount prerequisite for an effective response to chemical terrorism. But developing and fielding such preparedness requires adequate training, the development, acquisition and use of effective personal protective equipment, and ample supplies of the detection systems and devices needed by local first-responder units. A chemical attack happens too quickly, and its effects are too sudden, to depend on other national resources that would have to be brought in from other locations. Nonetheless, a fast and effective local response can still save many lives and significantly reduce the number of other victims of chemical attacks.

Today, more than a decade after the 11 September 2001 terrorist attacks on the World Trade Center and the Pentagon, no one knows with any certitude when, where, and if the next wave of attacks would most likely occur, and/or whether terrorist groups could effectively carry out such an attack – but using biological and/or chemical weapons instead of hijacked passenger aircraft this time around. However, as long as the availability exists, the intentional use by terrorists of chemical and biological agents as their new weapons of choice will continue to be a valid concern for the international community. The pillage of unknown and unsecured weapons from Libya's arsenals that occurred both during and after that country's chaotic civil war may well have threatening consequences not only for Libya itself but also for the international community at large.

At this juncture, locating, securing, and destroying such weaponry is a main concern for Libya's interim government as well as for the United Nations – and particularly for the United States and other peace-loving nations throughout the world. The missing Libyan weapons are now somewhat antiquated, outdated, and possibly not quite ready for delivery. But until recovered and destroyed, they still have the potential to be extremely dangerous in the wrong hands.

For additional information on:
The Organisation for the Prohibition of Chemical Weapons' (OPCW) Chemical Weapons Convention (CWC), visit http://www.opcw.org/chemical-weapons-convention/

Mustard gas, visit the Council on Foreign Relations website at http://www.cfr.org/iraq/mustard-gas/p9551

The DHS/CBP's "Ability to Detect Biological and Chemical Threats in Maritime Cargo Containers," visit https://www.dhs.gov/xoig/assets/mgmtrpts/OIG_10-01_Oct09.pdf

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Richard Schoeberl has over 17 years of counterintelligence, terrorism, and security management experience, most of it developed during his career with the Federal Bureau of Investigation (FBI), where his duties ranged from service as a field agent to leadership responsibilities in executive positions both at FBI Headquarters and at the National Counterterrorism Center. During most of his FBI career he served in the Bureau's Counterterrorism Division, providing oversight to the FBI's international counterterrorism effort. Schoeberl also was assigned a number of collateral duties – serving, for example, as an FBI Certified Instructor and as a member of the FBI SWAT program. He also has extensive lecture experience worldwide and is currently a terrorism and law-enforcement media contributor to Fox News, Sky News, al-Jazeera Television, and al-Arabiya.

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Advances in Medical Countermeasures for Chemical Terrorism

By Bruce Clements, Public Health

The notorious 1995 Aum Shinrikyo terrorist attack on the Tokyo subway system that used sarin nerve agent to kill or injure a number of innocent citizens was a small but well publicized example of the major impact that even a relatively "minor" chemical-weapons incident can have on a major metropolitan area – and an entire nation. The fanatical religious/terrorist group had managed to produce a small quantity of sarin, deliver it in a simple way, and create widespread damage that resulted in 12 deaths and an estimated 50 or so serious injuries.

Hundreds of other people were directly exposed, though, and thousands more sought emergency care – most of them out of fear – as a precautionary measure. The attack, although tragic, had the potential to be much worse.

The one consolation for Japan and many other equally vulnerable nations is that what is now simply called "the Aum Shinrikyo incident" provides a small but enlightening glimpse into the numerous and unique challenges likely to be involved in responding to a much larger and better orchestrated terrorist attack, particularly one using chemicals.

The Challenges Posed by Chemical Terrorism

The management of a chemical terrorism response must take into consideration a wide range of challenges – involving, for example, responder health and safety, detection and analysis of the specific chemical agent(s) used, isolation and/or decontamination of patients, and diagnosis and treatment of victims. In recent years, fortunately, important progress has been made in dealing with numerous other types of mass-casualty incidents, both natural and manmade. Most responder agencies know how to cope effectively with hazmat (hazardous materials) spills and incidents.

Today, the weakest link in chemical terrorism preparedness, in most if not all political jurisdictions, is the medical component. Nonetheless, many chemical threats – including an array of toxic industrial chemicals that may be accidentally or intentionally released from a train, truck, or even a fixed facility – generate relatively common syndromes that the medical community is already fairly well trained and equipped to manage.

Industrial sources and many chemical weapons cause several types of toxic trauma such as respiratory failure, pulmonary edema (fluid accumulation in the lungs), and burns on the skin and mucous membranes. Although both physically and psychologically challenging, these are not uncommon conditions for well-trained clinicians to manage. However, there are certain chemicals that pose greater and immensely more difficult challenges, particularly in relation to the treatment(s) needed and/or readily available. Two particularly challenging chemical treatments involve organophosphorous agents and insecticides (nerve agents).

One year after the 11 September 2001 terrorist attacks against the United States, a new program was launched by the Strategic National Stockpile (SNS), a division of the U.S. Centers for Disease Control and Prevention (CDC), to address mounting concerns that future terrorist attacks might well include the use of nerve agents. What came to be known as the CHEMPACK Program led to the pre-positioning – in communities large and small throughout the United States – of nerve agent antidotes. Eventually, more than 1,600 containers – each of them packed with hundreds of antidote doses – were distributed to political jurisdictions in every state and major city throughout the country. The SNS rationale was both clear and logical: (1) to give local responders closer and better control; and (2) to decrease response times as much as possible – without compromising security.

Containers & Antidotes; Nerve Agents & the Time Factor

There are two types of containers fielded: (a) EMS (Emergency Medical Services) containers, primarily made up of auto-injectors designed for the rapid treatment of exposed populations in the field; and (b) hospital containers, which are tailored more for clinical care and consist mostly of multi-dose vials of antidotes. Both types of containers store all three of the drugs used, in combination, as the antidote for nerve agent exposure: atropine, pralidoxime chloride, and diazepam. The containers are strategically positioned in communities selected by the CDC in coordination with local officials. Each container is maintained under secure and very tightly controlled environmental conditions. All containers are monitored constantly, a precautionary requirement that not only improves safety but also helps assure the shelf life of the drugs.

In addition to commercial organophosphorus insecticides, there are four principal "nerve agents": sarin, soman, tabun, and VX. All nerve agents attack and weaken or destroy the body's neurological system – in two ways: (a) through the agents' muscarinic effects on the glands (which are characterized as muscle twitching or jerking, followed by seizures or paralysis); and (b) through nicotinic effects on the skeletal muscles, which are characterized by increased salivation, watery eyes, runny nose, and an increased flow of mucous (which leads to coughing, wheezing, difficulty in breathing, diarrhea, and involuntary urination).

These symptoms are controlled by first using the drug atropine. As it blocks the effects caused by excess acetylcholine, the patient will become more "dry" and have less difficulty breathing. The administration of atropine is immediately followed by administering a second type of drug, pralidoxime chloride, which can break the bond between the nerve agent and the neurological system by reactivating acetyl cholinesterase and reducing the levels of acetylcholine, thus ameliorating the symptoms. Finally, in severely exposed patients, diazepam also may be administered – primarily to decrease the severity of symptoms caused by the acetylcholine-induced seizures.

The same three drugs comprise the complete antidote for nerve agent exposure and, for that reason, have been a principal focus of U.S. efforts to upgrade and improve the nation's overall chemical terrorism preparedness capabilities.

Because time is so critical in the administration of nerve agent antidotes, a kit was developed decades ago for field military use to rapidly inject the drugs. The kit contains two auto-injectors: (a) a small injector containing atropine; and (b) a larger one containing pralidoxime chloride. Not only do the auto-injectors provide a rapid, spring-loaded injection, they also deliver the drugs with enough force to diffuse them, quickly and safely, into the muscle tissue for rapid uptake by the body. During a mass-casualty response involving a nerve agent, the speed at which an antidote is delivered is perhaps the most critical factor in determining the overall severity of an injury or disabling medical condition. The auto-injector technology now available enables first responders to treat a large number of exposed individuals in the field much more rapidly than was ever previously possible.

A Two-in-One Solution: The Dual-Chambered Auto-Injector

In recent years, this new rapid-delivery process has been cut in half through the development of a dual-chambered auto-injector containing both atropine and pralidoxime chloride. When the device is activated (usually by pressing it against the victim's thigh), it delivers one drug from the first chamber as the needle proceeds through the thigh tissue and, after that chamber is fully extended, continues the flow by starting the other drug from the second chamber. For practical purposes, two rapid injections are given with one needle, in one quick auto-injection, while at the same time keeping the drugs safely separated within the tissue.

The necessity to properly train and frequently exercise EMS responders and/or hospital providers in the CHEMPACK sequence cannot be emphasized too strongly. Any lack of program awareness among responders could significantly delay fielding of the nerve-agent antidote and result in critical minutes being lost. Training providers to quickly recognize the unique clinical signs indicative of nerve agent exposure is particularly important for assuring rapid treatment. After the ability to quickly diagnose is refined and the logistics of fast deployment are established, focus will turn to the safe use of auto-injectors.

An important cautionary note: Despite current training methods, and notwithstanding the clear directions printed on the device, it is not uncommon for responders to initially flip the device backward. This almost reflexive action is partly due to the fact that the safety cap of the auto-injector is on the back side of the device, in a better position to release the activation mechanism – instead of on the front of the device to shield the needle itself, as is common on syringes. The real danger is that, if a healthcare worker puts his or her thumb over the end of the device (to apply pressure more quickly), that action might well activate the needle through the person's thumb. Consequently, training should always emphasize the proper handling of the device – namely, make a fist without placing a thumb on the end.

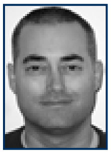
The CHEMPACK program has significantly enhanced U.S. preparedness to cope with a nerve agent terrorist attack and/or an industrial accident involving organophosphorus insecticides. The fielding of this antidote is therefore an important step forward in chemical terrorism preparedness. As is required and expected in the treatment of nerve agents, any antidote must be available very quickly so that it may be administered before a permanent injury occurs. By allowing stock to be rotated and expanding the use of medical countermeasures, public health preparedness capabilities will benefit on an even broader scale in the foreseeable future.

For additional information on:
The CHEMPACK Program, visit the U.S. Department of Health and Human Services, Chemical Hazards Emergency Medical Management website at http://chemm.nlm.nih.gov/chempack.htm

Bruce Clements is the Public Health Preparedness Director for the Texas Department of State Health Services in Austin, Texas, and in that post is responsible for health and medical preparedness and response programs ranging from pandemic influenza to the health impact of hurricanes. A well-known speaker and writer, he also serves as adjunct faculty at the Saint Louis University Institute for BioSecurity. His most recent book, Disasters and Public Health: Planning and Response, was released in 2009.

A Helping Hand from the Defense CBRN Response Force

By Jamie Stowe, DoD



On 1 October 2011, the former CBRN (Chemical, Biological, Radiological, Nuclear) Consequence Management Response Force (CCMRF) was upgraded by the U.S. Department of Defense to what is now officially designated as the Defense CBRN Response Force (DCRF). The upgrading is much more than a mere name change because the U.S. Northern Command's DCRF possesses not only more robust capabilities than the CCMRF but also the ability to respond much more rapidly to a CBRN event.

> *The Department of Defense draws on the expertise of the nation's armed forces to expand the medical capabilities needed for local and state responses to CBRN events. Use of the Defense CBRN Response Force is one way the federal government is able to provide additional resources and civilian support to cities and states throughout the nation.*

The DCRF is the active-duty component of the new CBRN Response Enterprise – which includes not only National Guard units, but also the other federal forces trained and prepared to respond to a CBRN event anywhere throughout the United States and its territories. Joint Task Force Civil Support, also under the U.S. Northern Command, serves as the DCRF's operational headquarters to provide continuous guidance and support and to ensure that it is always fully prepared to respond to the nation's needs during times of crisis.

In that context, it should be emphasized that the DCRF does not supplant or replace any local, state, or other federal authority. Rather, it supports those authorities by providing response capabilities that local and state as well as other federal agencies request during a CBRN incident or event. If a state requires assistance, the governor of that state would request federal assistance from the President – and the Department of Defense would be one of the possible responders.

Force-Flow Flexibility

After being approved for deployment, the DCRF would fill the requests for assistance submitted by state and local governments and approved by the President – as would other federal agencies such as the Department of Health and Human Services (HHS) and the Federal Emergency Management Agency (FEMA).

A major ancillary benefit provided by the DCRF's capabilities is that the response usually can be scaled and tailored more precisely to meet the specific needs requested. The personnel assistance provided, for example, could range from the deployment of relatively small advisory teams to the use of the DCRF's entire 5,200-man response force. Moreover, if additional resources are needed, the DCRF could deploy even more personnel – as well as large quantities of the supplies that also would be needed.

According to the U.S. Army's "2011 Army Posture Statement," the U.S. Transportation Command will be able to deploy large DCRF forces to the incident scene both quickly and safely – typically by using a pre-written "force flow" contingency plan that calls for the first 2,100 personnel and their equipment to deploy within 24 hours of activation, and the remaining 3,100 personnel postured to deploy within 48 hours.

The Medical Component: Bigger, Faster, More Responsive

Under the DCRF construct, medical response capabilities have been increased by almost 60 percent. As a result, the new response force will be able to respond twice as fast as was possible under the CCMRF system. Out of the 5,200-man DCRF force, 1,051 are medical personnel; that percentage reflects the importance of providing lifesaving care and force health protection both during and after a major CBRN event.

The medical component of the DCRF, officially designated "Task Force Medical," possesses significant personnel and equipment capabilities (provided by both the Army and Air Force) including but not limited to the following: 50 beds, 160 treatment/holding cots, 84 ambulances, 12 operating tables, patient decontamination and movement teams, and a specialized force of CBRN health-protection experts.

Today, the DCRF stands ready to respond, as directed by the President, in support of civil authorities to do whatever is needed to save lives, prevent further injuries, and provide temporary critical support to facilitate community recovery. The 86 different military units that comprise the DCRF (during one- to two-year mission rotations) are stationed at 37 different bases throughout the United States – which means, of course, that there will almost always be at least one DCRF unit in position to quickly respond when a CBRN incident occurs.

Moreover, to keep its teams fully trained and ready to rapidly deploy on short notice, the DCRF conducts numerous drills and exercises each year, including a major annual field training and certification exercise. The DCRF, through its headquarters Joint Task Force Civil Support – located in Fort Eustis, Virginia – is already building closer relationships with local, state, and federal agencies to better prepare a synergistic, whole-of-government approach both before and during incident responses.

For additional information on:
The "2011 Army Posture Statement," visit https://secureweb2.hqda.pentagon.mil/VDAS_ArmyPostureStatement/2011/information_papers/PostedDocument.asp?id=261

Major Jamie Stowe, USAF, is a Medical Plans and Operations Officer at Joint Task Force Civil Support, a U.S. Northern Command unit that prepares for and responds to large-scale emergencies. He has 13 years of experience in emergency planning and response operations with the U.S. Air Force and the U.S. Army. He also has completed a Department of Defense medical readiness fellowship, possesses significant functional expertise in CBRN scenario planning and mass-casualty treatment, holds a Master's degree in Business Administration, and is pursuing a Master's degree in National Security and Strategic Studies from the U.S. Naval War College.

New HazMat Challenges For Modern EMS Units

By Joseph Cahill, EMS

A major dilemma in establishing, and operating, modern EMS (Emergency Management Systems) units is that many smaller political jurisdictions field proportionately smaller EMS agencies – many of them manned principally by volunteers. Leadership of these agencies is often a balancing act, therefore, between meeting minimum requirements – e.g., ensuring that there is a certified emergency medical technician (EMT) on every ambulance – and overwhelming the local volunteers, already overworked in many jurisdictions, with a heavy load of additional "required training."

The lack of adequate staffing is, in fact, often the most significant controlling factor that keeps many jurisdictions from fielding their own specialized EMS units. For that reason alone, it should always be remembered that establishing any specialized new unit (in almost any field) to provide an operational service is not simply a matter of collecting the equipment needed and assigning staff to a vehicle or predesignated space. Simply "wanting to do it" because it seems like a good idea is not enough.

As a corollary, it also should be recognized that there are almost always at least three special considerations that must be addressed prior to the purchase of even the first piece of equipment: legal authorities, established procedures, and detailed planning requirements. Following are brief summaries of the principal issues usually involved.

Authorities & Procedures

Before taking any substantive actions, local leaders must first answer the question, "Does the agency [being established] have the legal authority needed to field (and operate) this unit?" This authority may come from a legal statute or an executive-branch decree. This step should also answer not only to what degree the agency is obliged to provide such a unit but also the penalties that might be imposed for any gaps in service.

In addition, a comprehensive set of procedures and regulations must be adopted to tell staff and other responders, in very specific terms, what is expected of them, including the full details of required certifications as well as any restrictions on staff activity. The certifications required not only document the fact that the member has the base of knowledge needed in the subject discussed, but also affords the unit some initial legal protection by attesting that the certifying agency has provided either the appropriate training or testing required, or both. In addition, by basing the regulations adopted on national or international standards, the unit is afforded an even stronger degree of shelter from legal risks and does not have to start from scratch in developing its own standards.

Response Planning

Many of the nation's larger cities – New York City, Los Angeles, and Pittsburgh, for example – maintain specially trained and equipped EMS units that respond primarily if not exclusively to hazardous materials (hazmat) incidents. These special units usually have the capacity not only to deal with "routine" day-to-day incidents but also to cope with most if not quite all CBRNE (chemical, biological, radiological, nuclear, explosive) threats as well.

Regional Teams: A Cost-Effective & Sometimes Mandatory Approach

A dedicated core group of members may be enthusiastic about fielding a specialized unit, but there simply may not be a sufficient number of trained staff members to avoid gaps in coverage. One example of the potential problems that might develop: It is often possible, in many jurisdictions both large and small, to collect the donations needed to fully equip a unit. But all types of equipment eventually break down, and the initial stocks of expendable supplies are used up or expire. Very careful planning is needed, therefore, to determine if, or how, these items will be replaced on an ongoing basis. The inability to meet so-called "routine" or continuing costs are one of the principal reasons, in fact, that well intended in-kind donations may not always be worth accepting.

Preparing to cope successfully with incidents involving hazardous materials almost always requires special training, additional staff, and more equipment. Many smaller U.S. cities are facing these challenges through collaborative efforts and careful planning.

Many smaller communities address staffing and ongoing costs by sharing regional or county resources – a fully capable hazmat team, for example. In this instance, it may be more effective for many relatively small EMS agencies to provide equipment and staff as part of a regional team, rather than expecting each agency to field its own local team – from an obviously much smaller personnel pool. The main drawback of this model is political in nature. Regional teams and local EMS agencies should but do not always recognize that the members they share in common belong to *the specific agency that puts them in the field to cope with a specific incident*. Largely for that reason, all members must fully understand what role they are playing in each incident to which they might be assigned.

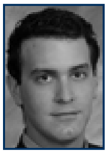
Another way to meet staffing needs during (but preferably long before) a hazmat event occurs is through use of the so-called "cold zone" model, where EMS staff remain safely out of Harm's Way in the clean, or cold, area around an event and patients are brought to the staff's staging area – after the patients have been decontaminated by the hazmat team and/or other responders. This model has two big advantages: (a) no additional training for EMS staff is required; and (b) it is much easier, and safer, to keep staff members themselves in relatively safer areas. The downside is that some patients need medical care much faster than the time it takes to decontaminate the patients prior to taking them to the clean/cold area designated.

In short, there are several ways to provide adequate hazmat response coverage, and having more than one option available allows emergency response leaders to provide the protection from chemical hazards needed in the modern environment – while also guaranteeing a certain but not overly ambitious level of legal and political protection before, during, and after CBRNE incidents.

Joseph Cahill is a medicolegal investigator for the Massachusetts Office of the Chief Medical Examiner. He previously served as exercise and training coordinator for the Massachusetts Department of Public Health and emergency planner in the Westchester County (N.Y.) Office of Emergency Management. He served five years as the citywide advanced life support (ALS) coordinator for the FDNY – Bureau of EMS. Prior to that, he was the department's Division 6 ALS coordinator, covering the South Bronx and Harlem. He also served on the faculty of the Westchester County Community College's Paramedic Program and has been a frequent guest lecturer for the U.S. Secret Service, the FDNY EMS Academy, and Montefiore Hospital.

Equipment Standardization – A New-Old Approach

By Jordan Nelms, Standards



In the ever-changing environment of homeland security policy and strategy, a discipline that has yet to fully mature is highlighted in the National Strategy for Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) Standards issued in May 2011. That document – an evolution of disparate federal agency regulations and procurement guides – and the interagency program it led to, aims to simplify the complex process of ensuring that state and local first responders possess effective and robust CBRNE preparedness capabilities.

The strategy, as proposed, has two major goals: (a) to coordinate the development and promulgation of public safety CBRNE standards; and (b) to ensure the proper certification of burgeoning technologies. What remains to be seen, however, is how this new interagency approach will be any different from past efforts, including those carried out by the current Inter-Agency Board (IAB) for Equipment Standardization and Interoperability and the U.S. Department of Homeland Security's SAVER (Systems Assessment and Validation for Emergency Responders) program.

The DHS Approach

In 2004, the Department of Homeland Security (DHS) adopted the first set of CBRNE personal protective equipment (PPE) standards – governing such gear as personal respirators, escape masks, and protective garments – for state and local first responders. These National Fire Protection Administration (NFPA) and National Institute for Occupational Health and Safety (NIOSH) standards were used as procurement guidelines for the millions of dollars offered annually to state and local governments through various DHS grant programs. In 2007, a review of the 2004 policy resulted in the adoption of three NFPA standards that had not been addressed by the 2004 policy.
Established in 2004, the SAVER program, which operates out of the DHS's Science and Technology Directorate, uses already established DHS standards – including but not limited to those in the CBRNE field – to assist first responder agencies in making procurement decisions. SAVER provides commercial product evaluations and distributes publications in print and via the DHS Responder Knowledge Base website. This program aims to reduce the time it takes for an agency to properly investigate equipment solicitations by producing a comprehensive DHS Authorized Equipment List.

The "National Strategy for CBRNE Standards" emphasizes the need for such standards, but lacks some key elements of the current system. How these elements are handled may well determine the outlook for the nation's success in overall CBRNE preparedness.

Interagency Cooperation

To foster an integrated approach to CBRNE equipment procurement decisions, the National Institute for Standards and Technology (NIST) spearheaded a coordinated effort to ensure a common standardization – or at least a better coordinated approach to the elements of CBRNE equipment standardization – through the IAB. The IAB brought together law enforcement, fire, and homeland security officials to: (a) discuss common elements of CBRNE standardization policy – including areas where standardization could not be achieved across disciplines due to the unique nature of certain missions; and (b) evaluate equipment performance standards for use in federal equipment grants. The result of the IAB's seven sub-working groups is a much more comprehensive Standardized Equipment List (SEL).

With both DHS and interagency standardized equipment lists to choose from, the Federal Emergency Management Agency (FEMA) Responder Knowledge Base program developed an integrated list to "simplify" responder agencies attempting to navigate through the extensive equipment list.

New-Old Approach

The 2011 National Strategy designates the National Science and Technology Council to lead the effort to "establish and coordinate the implementation of an integrated standards development approach." This approach rests on the execution of five strategic goals:

Goal 1: Establish an interagency group for CBRNE standards to promote the coordination of these standards among federal, state, local, and tribal communities;

Goal 2: Coordinate and facilitate the development of CBRNE equipment performance standards and promote the use of standards for federal, state, local, and tribal communities;

Goal 3: Coordinate and facilitate the development and adoption of interoperability standards for CBRNE equipment;

Goal 4: Promote enduring CBRNE standard operating procedures for federal, state, local, and tribal use to improve national preparedness and response; and

Goal 5: Establish voluntary CBRNE training and certification standards for the federal, state, local, and tribal communities and promote policies that foster their adoption.

However, although the 2011 National Strategy highlights the need for interagency cooperation, as stated in Goal 1, very little mention is given to the work of NIST, and no reference at all is made to the IAB as the current mechanism for the interagency coordination of the Board's seven member agencies. The IAB's website presents a Strategic Plan for the Board. Nonetheless, it still is not clear as to whether the Plan will remain the mechanism for coordination under the new approach. Similarly, no mention is made in the National Strategy of the existing SAVER and IAB equipment lists that first responder agencies have become accustomed to use as they make their procurement decisions. As a result, it is possible that at least some of these commercial products, already thoroughly examined, may have to be re-evaluated using a new set of standards and testing protocols.

The first Annual Report of the IAB, issued in 1999, emphasized that this issue should be "addressed now, through nationally recognized standards, before the advent of multi-agency, multi-jurisdictional WMD [Weapons of Mass Destruction] incidents." As of late last year, though, the necessity of developing a National Strategy to address, and resolve, this largely bureaucratic issue shows how little has been achieved in the arena of interagency cooperation – specifically including the failure to reach universal agreement on the standardization of CBRNE equipment.

The Current Grant Cycle

As state and local first responders review their annual budget and grant program requests, they must determine which technical resource they will leverage to identify capable, tested, and approved replacement – or new – CBRNE protective equipment. However, until and unless the interagency approach can coalesce around one standardization body for both fire and law enforcement disciplines, it seems likely that the various agencies involved will still have two choices: SAVER or IAB.

Today, U.S. homeland security agencies, at all levels of government, and private-sector industries are obviously concerned about current and probable future budget cuts affecting CBRNE incident preparedness. Moreover, in the age of cyber-disruption, WMDs may be losing focus as the primary non-conventional homeland security threat. However, the importance of protecting the nation's first responders is no less important than it has been over the past decade. The 2011 National Strategy for CBRNE Standards re-affirms the federal government's commitment to preparing for the CBRNE contingencies – but only time will tell if it can ease the complexity of equipment procurement for local police and fire departments.

For additional information on:
May 2011 National Strategy for Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE) Standards, visit http://www.whitehouse.gov/sites/default/files/microsites/ostp/chns_cbrne_standards_final_24_aug_11.pdf

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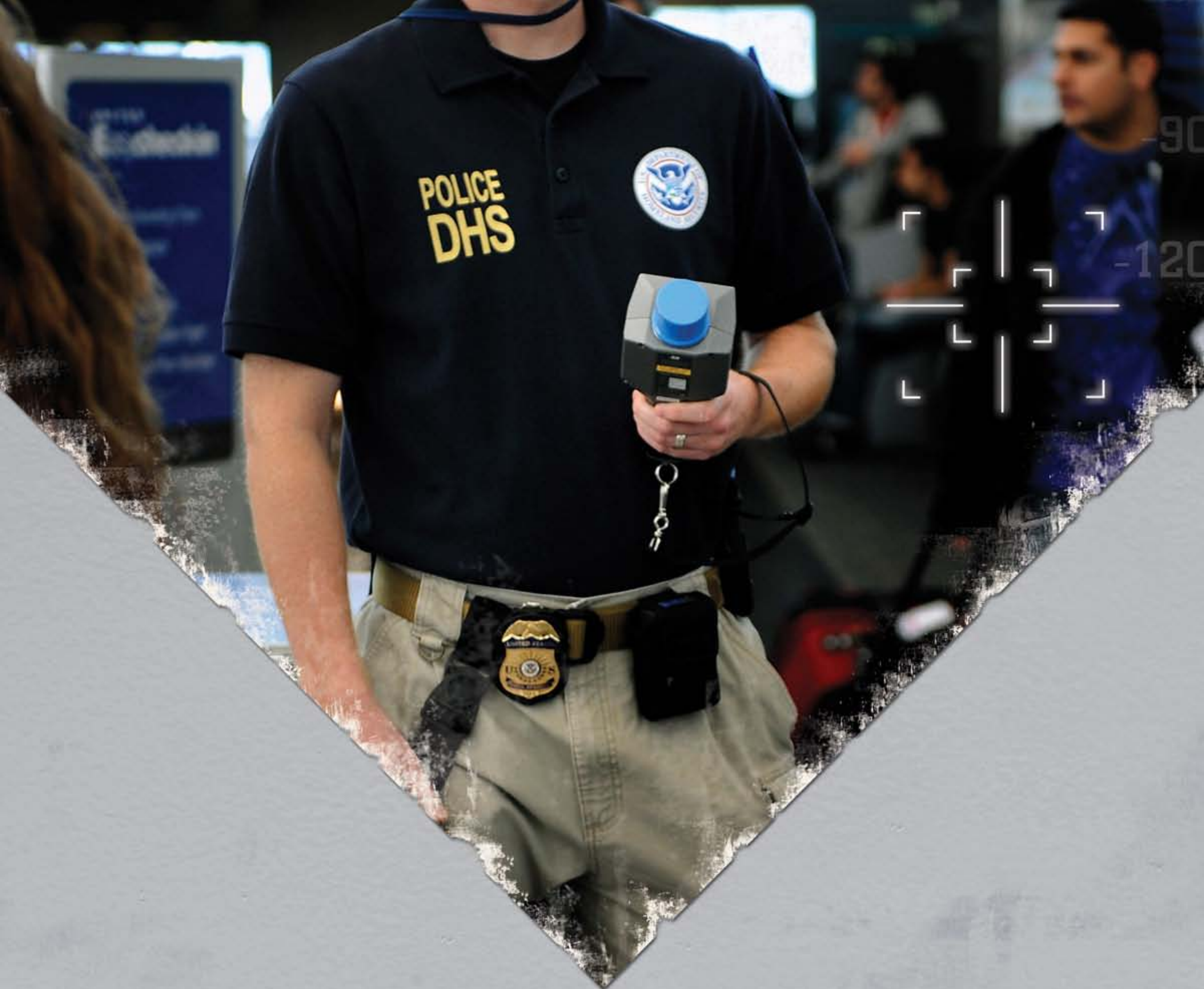
Jordan Nelms is a Homeland Security specialist at Witt Associates, a public safety and crisis management consulting firm. He was on the Witt Associates planning team that assisted a major community police department in conducting an independent assessment of Weapons of Mass Destruction (WMD) response capabilities. Jordan is currently supporting the Presidential Policy Directive 8 (PPD-8) Program Executive Office at FEMA. He is also a published researcher with Johns Hopkins University's Department of Homeland Security Center of Excellence: National Center for Preparedness and Catastrophic Event Response Center (PACER).


POLICE
DHS

HELP: A New Approach to Volunteer Management

By Tony Lamberth, State Homeland News

Emergency management agencies throughout the United States are digging deep into their planning toolboxes in a search for innovative ways to effectively respond, with limited resources, to major disasters. The recovery costs for major incidents such as the tornadoes that devastated Joplin, Missouri, and a number of other communities in 2011 made it a particularly catastrophic year in the annals of major U.S. natural disasters. Nonetheless, recent and anticipated future cuts in the funds available for disaster preparedness may force local governments to place a much greater focus on the role of volunteers within their communities. However, the volunteer management of the past is not necessarily going to be the volunteer management of the future as well.

In the past, volunteer management focused primarily on the human services element. The new approach uses the Incident Command System (ICS) principles of the Federal Emergency Management Agency (FEMA) both to gather and to manage the resources available. By using the ICS guidelines – "a standardized, on-scene, all-hazards incident management approach," as described in FEMA publications – an Incident Management Team (IMT) usually can manage the overall volunteer resources component of a response, while allowing nonprofit agencies to remain in charge of their own resources.

In addition to managing the overall resources, the volunteer IMT can also organize spontaneous unaffiliated volunteers (SUVs) – i.e., everyday citizens, either local-area residents or those from other areas, who offer to help during disasters, but are not specifically affiliated with an organized volunteer group. Because the management of SUVs is not only unique to each political jurisdiction involved but also based on the specific requirements that develop during times of no-notice disasters, the IMT would in almost all circumstances follow the planning standards specifically appropriate for the response location.

By having one IMT manage the influx and output of the volunteers reporting to various locations, emergency operations teams would gain the benefit of having a single point of contact for volunteer management during an incident. To be successful, the IMT must focus on and be able to produce such intangible benefits as accountability and organizational effectiveness, particularly as applicable to the emergency management culture. The provision of "human services" – another difficult-to-define benefit – will still be important, of course, but the ICS management model for volunteers brings the command-and-control function to the forefront, coordinates the efforts of several volunteer organizations involved in the same incident, and provides overall accountability.

In Texas, the HELP Foundation (Healing. Engaging. Learning. Preparing), a not-for-profit disaster management agency, works with local governments to develop a broad spectrum of volunteer management plans. By focusing special attention on eight core capabilities, the Foundation also builds relationships with volunteer organizations able and willing to help provide additional disaster-response services and capabilities to local jurisdictions in such areas of special expertise as: (a) Planning; (b) Community Preparedness and Participation; (c) Intelligence and Information Sharing and Dissemination; (d) On-Site Incident Management; (e) Volunteer Management and Donations; (f) Emergency Public Information and Warnings; (g) Restorations of Lifelines; and (h) Economic and Community Recovery.

As plans continue to be drawn, developed, promulgated, and implemented for the volunteer management function, it is important to remember that American volunteerism, now and for the foreseeable future, must go well beyond the "giving back" of volunteer hours during times of disasters. When managed efficiently, the fiscal value of those hours will help reduce overall recovery costs. In short, the management, design, and exercising of volunteer resources will and should be key components of most if not quite all emergency management plans designed and developed for future response and recovery operations. By continuing to build close working relationships and using the latest and most effective technologies available, current and future volunteer IMTs can help organize and disperse valuable resources that might otherwise be ineffective, underused, or – even worse – an actual hindrance to response and recovery efforts.

For more information on:
The HELP Foundation, visit www.thehelpfoundation.org, Twitter @HELPFoundation, or Facebook http://www.facebook.com/HELPfound

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Tony Lamberth is President of the HELP Foundation, a not-for-profit disaster management agency he founded in 2001 to help local governments develop volunteer management plans. He previously served as the MMRS/UASI (Metropolitan Medical Response System/Urban Areas Security Initiative) Coordinator for the city of Jacksonville, Florida, where he gained grassroots experience within an EMAP (Emergency Management Accreditation Program). He previously served as a planner with the State of Florida's Division of Emergency Management, and has provided service and support for a number of incident management teams, such as the Plans Chief for the State of Florida's Nuclear IMT. In addition to his HELP duties, he also currently serves on the San Jacinto IMT in South East Texas.

Indication

DuoDote® Auto-Injector (atropine and pralidoxime chloride injection) is indicated for the treatment of poisoning by organophosphorous nerve agents as well as organophosphorous insecticides.

DuoDote® Auto-Injector should be administered by emergency medical services personnel who have had adequate training in the recognition and treatment of nerve agent or insecticide intoxication. DuoDote® Auto-Injector is intended as an initial treatment of the symptoms of organophosphorous insecticide or nerve agent poisoning; definitive medical care should be sought immediately.

Important Safety Information

Individuals should not rely solely upon agents such as atropine and pralidoxime to provide complete protection from chemical nerve agents and insecticide poisoning. Primary protection against exposure to chemical nerve agents and insecticide poisoning is the wearing of protective garments including masks designed specifically for this use. Evacuation and decontamination procedures should be undertaken as soon as possible. Medical personnel assisting evacuated victims of nerve agent poisoning should avoid contaminating themselves by exposure to the victim's clothing.

In the presence of life-threatening poisoning by organophosphorous nerve agents or insecticides, there are no absolute contraindications to the use of DuoDote® Auto-Injector. When symptoms of poisoning are not severe, DuoDote® Auto-Injector should be used with extreme caution in people with heart disease, arrhythmias, recent myocardial infarction, severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal insufficiency, chronic pulmonary disease, or hypersensitivity to any component of the product. Elderly people and children may be more susceptible to the effects of atropine. DuoDote® Auto-Injector is Pregnancy Category C and should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus. Safety and effectiveness in children have not been established.

Muscle tightness and sometimes pain may occur at the injection site.
The most common side effects of atropine can be attributed to its antimuscarinic action. Pralidoxime chloride can cause changes in vision, dizziness, headache, drowsiness, nausea, tachycardia, increased blood pressure, muscular weakness, dry mouth, emesis, rash, dry skin, hyperventilation, decreased renal function, excitement, manic behavior, and transient elevation of liver enzymes and creatine phosphokinase. When atropine and pralidoxime are used together, the signs of atropinization may occur earlier than might be expected when atropine is used alone.

DuoDote® AUTO-INJECTOR
(atropine and pralidoxime chloride injection)
READY TO RESPOND

Please see brief summary of full Prescribing Information on adjacent page.

References: 1. Agency for Toxic Substances and Disease Registry. Medical Management Guidelines (MMGs) for nerve agents: tabun (GA); sarin (GB); soman (GD); and VX. http://www.atsdr.cdc.gov/MHMI/mmg166.html. Updated August 22, 2008. Accessed May 20, 2010. **2.** DuoDote Auto-Injector [package insert]. Columbia, MD: Meridian Medical Technologies, Inc.; 2007. **3.** Rebmann T, Clements BW, Bailey JA, Evans RG. Organophosphate antidote auto-injectors vs. traditional administration: a time motion study. *J Emerg Med.* 2009;37(2):139-143.

DuoDote® AUTO-INJECTOR

(atropine and pralidoxime chloride injection)

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Rx Only
Atropine 2.1 mg/0.7 mL
Pralidoxime Chloride 600 mg/2 mL

Sterile solutions for intramuscular use only

FOR USE IN NERVE AGENT AND INSECTICIDE POISONING ONLY

THE DUODOTE™ AUTO-INJECTOR SHOULD BE ADMINISTERED BY EMERGENCY MEDICAL SERVICES PERSONNEL WHO HAVE HAD ADEQUATE TRAINING IN THE RECOGNITION AND TREATMENT OF NERVE AGENT OR INSECTICIDE INTOXICATION.

INDICATIONS AND USAGE

DuoDote™ Auto-Injector is indicated for the treatment of poisoning by organophosphorus nerve agents as well as organophosphorus insecticides.

DuoDote™ Auto-Injector should be administered by emergency medical services personnel who have had adequate training in the recognition and treatment of nerve agent or insecticide intoxication.

DuoDote™ Auto-Injector is intended as an initial treatment of the symptoms of organophosphorus insecticide or nerve agent poisonings; definitive medical care should be sought immediately.

DuoDote™ Auto-Injector should be administered as soon as symptoms of organophosphorus poisoning appear (eg, usually tearing, excessive oral secretions, sneezing, muscle fasciculations).

CONTRAINDICATIONS

In the presence of life-threatening poisoning by organophosphorus nerve agents or insecticides, there are no absolute contraindications to the use of DuoDote™ Auto-Injector.

WARNINGS

CAUTION! INDIVIDUALS SHOULD NOT RELY SOLELY UPON ATROPINE AND PRALIDOXIME TO PROVIDE COMPLETE PROTECTION FROM CHEMICAL NERVE AGENTS AND INSECTICIDE POISONING.

PRIMARY PROTECTION AGAINST EXPOSURE TO CHEMICAL NERVE AGENTS AND INSECTICIDE POISONING IS THE WEARING OF PROTECTIVE GARMENTS INCLUDING MASKS DESIGNED SPECIFICALLY FOR THIS USE.

EVACUATION AND DECONTAMINATION PROCEDURES SHOULD BE UNDERTAKEN AS SOON AS POSSIBLE. MEDICAL PERSONNEL ASSISTING EVACUATED VICTIMS OF NERVE AGENT POISONING SHOULD AVOID CONTAMINATING THEMSELVES BY EXPOSURE TO THE VICTIM'S CLOTHING.

When symptoms of poisoning are not severe, DuoDote™ Auto-Injector should be used with extreme caution in people with heart disease, arrhythmias, recent myocardial infarction, severe narrow angle glaucoma, pyloric stenosis, prostatic hypertrophy, significant renal insufficiency, chronic pulmonary disease, or hypersensitivity to any component of the product. Organophosphorus nerve agent poisoning often causes bradycardia but can be associated with a heart rate in the low, high, or normal range. Atropine increases heart rate and alleviates the bradycardia. In patients with a recent myocardial infarction and/or severe coronary artery disease, there is a possibility that atropine-induced tachycardia may cause ischemia, extend or initiate myocardial infarcts, and stimulate ventricular ectopy and fibrillation. In patients without cardiac disease, atropine administration is associated with the rare occurrence of ventricular ectopy or ventricular tachycardia. Conventional systemic doses may precipitate acute glaucoma in susceptible individuals, convert partial pyloric stenosis into complete pyloric obstruction, precipitate urinary retention in individuals with prostatic hypertrophy, or cause inspiration of bronchial secretions and formation of dangerous viscid plugs in individuals with chronic lung disease.

More than 1 dose of DuoDote™ Auto-Injector, to a maximum of 3 doses, may be necessary initially when symptoms are severe. **No more than 3 doses should be administered unless definitive medical care (eg, hospitalization, respiratory support) is available.**

Severe difficulty in breathing after organophosphorus poisoning requires artificial respiration in addition to the use of DuoDote™ Auto-Injector.

A potential hazardous effect of atropine is inhibition of sweating, which in a warm environment or with exercise, can lead to hyperthermia and heat injury.

The elderly and children may be more susceptible to the effects of atropine.

PRECAUTIONS

General: The desperate condition of the organophosphorus-poisoned individual will generally mask such minor signs and symptoms of atropine and pralidoxime treatment as have been noted in normal subjects.

Because pralidoxime is excreted in the urine, a decrease in renal function will result in increased blood levels of the drug.

DuoDote™ Auto-Injector temporarily increases blood pressure, a known effect of pralidoxime. In a study of 24 healthy young adults administered a single dose of atropine and pralidoxime auto-injector intramuscularly (approximately 9 mg/kg pralidoxime chloride), diastolic blood pressure increased from baseline by 11 ± 14 mmHg (mean ± SD), and systolic blood pressure increased by 16 ± 19 mmHg, at 15 minutes post-dose. Blood pressures remained elevated at these approximate levels through 1 hour post-dose, began to decrease at 2 hours post-dose and were near pre-dose baseline at 4 hours post-dose. Intravenous pralidoxime doses of 30-45 mg/kg can produce moderate to marked increases in diastolic and systolic blood pressure.

Laboratory Tests: If organophosphorus poisoning is known or suspected, treatment should be instituted without waiting for confirmation of the diagnosis by laboratory tests. Red blood cell and plasma cholinesterase, and urinary paranitrophenol measurements (in the case of parathion exposure) may be helpful in confirming the diagnosis and following the course of the illness. However, miosis, rhinorrhea, and/or airway symptoms due to nerve agent vapor exposure may occur with normal cholinesterase levels. Also, normal red blood cell and plasma cholinesterase values vary widely by ethnic group, age, and whether the person is pregnant. A reduction in red blood cell cholinesterase concentration to below 50% of normal is strongly suggestive of organophosphorus ester poisoning.

Drug Interactions: When atropine and pralidoxime are used together, pralidoxime may potentiate the effect of atropine. When used in combination, signs of atropinization (flushing, mydriasis, tachycardia, dryness of the mouth and nose) may occur earlier than might be expected when atropine is used alone.

The following precautions should be kept in mind in the treatment of anticholinesterase poisoning, although they do not bear directly on the use of atropine and pralidoxime.

- Barbiturates are potentiated by the anticholinesterases; therefore, barbiturates should be used cautiously in the treatment of convulsions.
- Morphine, theophylline, aminophylline, succinylcholine, reserpine, and phenothiazine-type tranquilizers should be avoided in treating personnel with organophosphorus poisoning.
- Succinylcholine and mivacurium are metabolized by cholinesterases. Since pralidoxime reactivates cholinesterases, use of pralidoxime in organophosphorus poisoning may accelerate reversal of the neuromuscular blocking effects of succinylcholine and mivacurium.

Drug-drug interaction potential involving cytochrome P450 isozymes has not been studied.

Carcinogenesis, Mutagenesis, Impairment of Fertility: DuoDote™ Auto-Injector is indicated for short-term emergency use only, and no adequate studies regarding the potential of atropine or pralidoxime chloride for carcinogenesis or mutagenesis have been conducted.

Impairment of Fertility: In studies in which male rats were orally administered atropine (62.5 to 125 mg/kg) for one week prior to mating and throughout a 5-day mating period with untreated females, a dose-related decrease in fertility was observed. A no-effect dose for male reproductive toxicity was not established. The low-effect dose was 290 times (on a mg/m^2 basis) the dose of atropine in a single application of DuoDote™ Auto-Injector (2.1 mg).

Fertility studies of atropine in females or of pralidoxime in males or females have not been conducted.

Pregnancy:

Pregnancy Category C: Adequate animal reproduction studies have not been conducted with atropine, pralidoxime, or the combination. It is not known whether pralidoxime or atropine can cause fetal harm when administered to a pregnant woman or if they can affect reproductive capacity. Atropine readily crosses the placental barrier and enters the fetal circulation.

DuoDote™ Auto-Injector should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Nursing Mothers: Atropine has been reported to be excreted in human milk. It is not known whether pralidoxime is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when DuoDote™ Auto-Injector is administered to a nursing woman.

Pediatric Use: Safety and effectiveness of DuoDote™ Auto-Injector in pediatric patients have not been established.

ADVERSE REACTIONS

Muscle tightness and sometimes pain may occur at the injection site.

Atropine

The most common side effects of atropine can be attributed to its antimuscarinic action. These include dryness of the mouth, blurred vision, dry eyes, photophobia, confusion, headache, dizziness, tachycardia, palpitations, flushing, urinary hesitancy or retention, constipation, abdominal pain, abdominal distention, nausea and vomiting, loss of libido, and impotence. Anhidrosis may produce heat intolerance and impairment of temperature regulation in a hot environment. Dysphagia, paralytic ileus, and acute angle closure glaucoma, maculopapular rash, petechial rash, and scarletiniform rash have also been reported.

Larger or toxic doses may produce such central effects as restlessness, tremor, fatigue, locomotor difficulties, delirium followed by hallucinations, depression, and, ultimately medullary paralysis and death. Large doses can also lead to circulatory collapse. In such cases, blood pressure declines and death due to respiratory failure may ensue following paralysis and coma.

Cardiovascular adverse events reported in the literature for atropine include, but are not limited to, sinus tachycardia, palpitations, premature ventricular contractions, atrial flutter, atrial fibrillation, ventricular flutter, ventricular fibrillation, cardiac syncope, asystole, and myocardial infarction. (See **PRECAUTIONS**.)

Hypersensitivity reactions will occasionally occur, are usually seen as skin rashes, and may progress to exfoliation. Anaphylactic reaction and laryngospasm are rare.

Pralidoxime Chloride

Pralidoxime can cause blurred vision, diplopia and impaired accommodation, dizziness, headache, drowsiness, nausea, tachycardia, increased systolic and diastolic blood pressure, muscular weakness, dry mouth, emesis, rash, dry skin, hyperventilation, decreased renal function, and decreased sweating when given parenterally to normal volunteers who have not been exposed to anticholinesterase poisons.

In several cases of organophosphorus poisoning, excitement and manic behavior have occurred immediately following recovery of consciousness, in either the presence or absence of pralidoxime administration. However, similar behavior has not been reported in subjects given pralidoxime in the absence of organophosphorus poisoning.

Elevations in SGOT and/or SGPT enzyme levels were observed in 1 of 6 normal volunteers given 1200 mg of pralidoxime intramuscularly, and in 4 of 6 volunteers given 1800 mg intramuscularly. Levels returned to normal in about 2 weeks. Transient elevations in creatine kinase were observed in all normal volunteers given the drug.

Atropine and Pralidoxime Chloride

When atropine and pralidoxime are used together, the signs of atropinization may occur earlier than might be expected when atropine is used alone.

OVERDOSAGE

Symptoms:

Atropine

Manifestations of atropine overdose are dose-related and include flushing, dry skin and mucous membranes, tachycardia, widely dilated pupils that are poorly responsive to light, blurred vision, and fever (which can sometimes be dangerously elevated). Locomotor difficulties, disorientation, hallucinations, delirium, confusion, agitation, coma, and central depression can occur and may last 48 hours or longer. In instances of severe atropine intoxication, respiratory depression, coma, circulatory collapse, and death may occur.

The fatal dose of atropine is unknown. In the treatment of organophosphorus poisoning, doses as high as 1000 mg have been given. The few deaths in adults reported in the literature were generally seen using typical clinical doses of atropine often in the setting of bradycardia associated with an acute myocardial infarction, or with larger doses, due to overheating in a setting of vigorous physical activity in a hot environment.

Pralidoxime

It may be difficult to differentiate some of the side effects due to pralidoxime from those due to organophosphorus poisoning. Symptoms of pralidoxime overdose may include: dizziness, blurred vision, diplopia, headache, impaired accommodation, nausea, and slight tachycardia. Transient hypertension due to pralidoxime may last several hours.

Treatment: For atropine overdose, supportive treatment should be administered. If respiration is depressed, artificial respiration with oxygen is necessary. Ice bags, a hypothermia blanket, or other methods of cooling may be required to reduce atropine-induced fever, especially in children. Catheterization may be necessary if urinary retention occurs. Since atropine elimination takes place through the kidney, urinary output must be maintained and increased if possible; intravenous fluids may be indicated. Because of atropine-induced photophobia, the room should be darkened.

A short-acting barbiturate or diazepam may be needed to control marked excitement and convulsions. However, large doses for sedation should be avoided because central depressant action may coincide with the depression occurring late in severe atropine poisoning. Central stimulants are not recommended.

Physostigmine, given as an atropine antidote by slow intravenous injection of 1 to 4 mg (0.5 to 1.0 mg in children) rapidly abolishes delirium and coma caused by large doses of atropine. Since physostigmine has a short duration of action, the patient may again lapse into coma after 1 or 2 hours, and require repeated doses. Neostigmine, pilocarpine, and methacholine are of little benefit, since they do not penetrate the blood-brain barrier.

Pralidoxime-induced hypertension has been treated by administering phentolamine 5 mg intravenously, repeated if necessary due to phentolamine's short duration of action. In the absence of substantial clinical data regarding use of phentolamine to treat pralidoxime-induced hypertension, consider slow infusion to avoid precipitous corrections in blood pressure.

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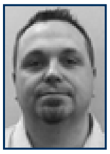
Narrowing the Search for the Best Detection Devices

By Thomas Norstrand, Emergency Management



U.S. response agencies are constantly preparing for, responding to, and/or recovering from a broad and full spectrum of emerging terrorist threats. In addition to planning how to cope with such events, they must also train and equip responders with the capabilities needed to defend against Chemical, Biological, Radiological, Nuclear (CBRN) incidents. A quick review of the 1995 sarin gas attacks on the Tokyo subway system illustrates the necessity for responders to plan more effectively for, among other duties and responsibilities: (a) victim-rescue operations; (b) sheltering and evacuation needs; (c) contamination control and avoidance; (d) the presumptive identification of CBRN contamination; (e) the implementation of strict incident-scene control and evidence-protection requirements; and (f) the logistical and administrative support mandated for the local, state, tribal, territorial, and federal forces involved.

Navigating the sea of information about CBRN detection devices can be a challenging task. The Responder Knowledge Base helps users make better informed decisions through use of an extensive database of equipment and training resources.

In addition to preparing for almost any type of event imaginable, hazmat personnel are often tasked with searching for, purchasing, and using the detection/monitoring equipment needed to identify and classify the potential CBRN agents that might be present and to confirm the signs and symptoms immediately available. It is particularly important, in carrying out these multifaceted goals, to understand equipment capabilities and limitations to determine not only what can – but also, and sometimes of greater importance, cannot – be accomplished. Because they can greatly affect event response and remediation, such limitations must be known before deploying personnel assets into the field.

In addition to detection and monitoring, personnel must also be able to correctly interpret the readings provided. Taking all of these factors into consideration, it quickly becomes apparent that extensive investigations are needed, prior to the purchase of equipment, to ensure that an agency's personnel have the capabilities needed to effectively use the equipment being considered. In an era of extremely limited budgets, this means that all equipment purchases must be contemplated very carefully to ensure that the best and wisest investment decisions are made.

Meeting the Needs of the "Rule of Three"

Whether searching for equipment that meets a particular standard or simply to fill a void in the current responder toolbox, educated purchasing decisions usually ensure that the needs of an organization are met. Use of what is called the Responder Knowledge Base (RKB) – funded by the U.S. Department of Homeland Security (DHS), Federal Emergency Management Agency (FEMA) – assists agencies in obtaining as much information as possible about responder equipment. However, sorting through more than 7,800 products, and considering other relevant information available in and offered by the RKB, can be a daunting task. Fortunately, there are several ways to search for the specific capabilities of almost any equipment item now available and/or likely to be needed in future response operations.

For example, many response agencies are looking for a second or third detector that can identify a broad spectrum of chemical agents. Today, the so-called "rule of three" – defined as the ability to use three different detection technologies (e.g., detector paper, ion mobility spectroscopy, and Raman spectroscopy) – is frequently used to verify the presence of an unknown chemical agent. To help agencies in their quest to acquire the "ideal" detection equipment, the RKB has implemented a detection-products category so that users can research the detection technologies available quickly, and much more easily. If users want to conduct a general search, they can make a quick check of the search field (located at the top right-hand corner of any RKB web page). For more detailed searches, the *Product Details* pages and related *Knowledge Links* offer an abundance of other helpful information about individual products.

One important bit of information that may be found during a product search is an icon indicating that a product has been certified. Certifications inform purchasers that a product has been tested to and meets a specific standard. The "CBRN" icon represents respiratory protection products that have been approved by the National Institute for Occupational Safety and Health (NIOSH) as meeting one of the Institute's own CBRN "Statements of Standard."

Training Available – At Low or No Cost!

With some products, fortunately, additional training opportunities also may be available. Vendor-provided training frequently offers valuable insights into the capabilities and/or limitations of a product. The RKB has compiled a Training & Education section that enables users to determine if in fact such training is available and, if so, if the training is free or fee-based.

(Training that is fee-based is indicated with a dollar-sign or "$" icon; training that is free is indicated with a "FREE" icon.)

In some cases, products also will be associated with the Standardized Equipment List (SEL), which can quickly be identified in the *Knowledge Links* section. The SEL provides a list of product categories that can be used before and during events that threaten the security of the nation, and is similar in many respects to the Authorized Equipment List (AEL). Each FEMA Preparedness Grant is, in fact, associated with an AEL, which specifies the equipment categories that can be purchased with specific grant funding.

Here it should be noted, though, that: (a) the AEL itself does not confirm the specific product that is or might be allowable, but simply lists the product category; and (b) the AEL is available only on the RKB – and is, in fact, the only list directly associated with FEMA Preparedness Grants. Nonetheless, the RKB is able to provide the essential support that responders need to maintain their readiness for duty. Moreover, use of the RKB also helps to develop the well-informed equipment purchasers needed to ensure that organizations can purchase and prepare their resources in the most economical and effective way possible.

For additional information on:
The RKB, visit https://www.rkb.us

How to navigate the RKB website, see Cortney Streets' article, "Emergency Responder 24/7 Information Tool Available Online," at http://www.domesticpreparedness.com/pub/docs/DPJJan12.pdf

How to use the RKB, please contact the RKB Help Desk via e-mail at RKBMailbox@us.saic.com or by phone at 1-877-336-2752.

Thomas Norstrand is a Subject Matter Expert (SME) for the Responder Knowledge Base (https://www.rkb.us) website, the U.S. Department of Homeland Security/Federal Emergency Management Agency's online source of information dedicated to First Responders. In that post he provides perspectives on policy and operational issues relevant to CBRNE incidents; he also has served, for not quite eight years, as a Firefighter/EMT with the Volunteer Fire Company in Bel Air, Maryland.

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Needed: “Off-the-Shelf” Solutions for CBRN Protection

By James Wilcox, Viewpoint

The 21st-century threat posed by potential chemical, biological, radiological, or nuclear (CBRN) incidents is forever evolving as terrorist tactics continue to change. Being able to successfully keep up with this rapidly changing environment is a continuing challenge for responders – particularly CBRN, civil defense, and emergency services personnel who realize that developing and integrating respiratory solutions must meet not only the challenges of today, but the undoubtedly even greater challenges of tomorrow as well.

One timely example: Cost-efficient solutions that effectively answer any call for CBRN personal protective equipment (PPE) would be equally and perhaps even more beneficial at major political and/or sporting events such as the 2012 London Olympics. That is especially true this year because of the upcoming U.S. presidential elections, a lengthy process that includes the major political rallies already taking place throughout the country, the numerous primaries that serve as a precursor to the nominating conventions of the two major political parties, and the November presidential and congressional elections themselves.

The principal challenge for manufacturers is to develop solutions that can efficiently cover the huge and steadily increasing number of stadiums and other sports venues that are regularly, but intermittently, in use. This challenge becomes even greater as the capacities of many stadiums throughout almost every state in the union increase almost exponentially – many football stadiums already seat in excess of 100,000 people. Crowds of that size, particularly in an enclosed area, are extremely vulnerable to potential incidents (manmade or otherwise).

Hub-Site Stockpiles & the Need for Speed

One possible solution to meet the challenge posed by a potential CBRN incident is to have quickly available very large quantities of PPE – specifically including respirators, suits, and decontamination equipment – that could be provided on a lease basis. By having a huge supply of PPE equipment on standby at various centralized “hub” sites throughout the country, the protective gear needed could be put to use on short or no notice if and when the need arises. Of course, it would be particularly important to prepare responders, at all levels of government, by also providing them the training needed well prior to a potential CBRN event; inspection and maintenance of the PPE stockpiles also would be needed on a continuing basis.

Meeting those and other needs is perhaps the single most important reason why, when selecting CBRN protective clothing and equipment, so many military and civilian organizations look first, when faced with an evolving incident, for cost-efficient and effective solutions that offer not only complete protection but also as much flexibility as possible. By addressing several important concerns that often accompany lower-cost solutions – sealing suits to masks more effectively, for example – PPE suppliers not only help decrease the “donning times” needed but also, and of much greater importance, increase the degree of protection provided.

It is at least partly for that reason that some manufacturers now offer cost-efficient solutions by including a “thru-life” service capability with their respiratory equipment. This bonus factor means offering not only the respiratory solution needed but also the servicing, maintenance, and training, both personalized and through service centers, also required – for all parts of the mask. The advantage of having this type of service available is that users can reasonably expect to have working respirators that are primed and ready to go at all times – which in turn means that those same users can concentrate from the start on their most important priority: quickly responding to the situation at hand without having to worry about the maintenance of their equipment.

Exploring the Portable Low-Cost Option

Unfortunately, very few stadium attendants and/or emergency services professionals are currently trained to use and/or even carry CBRN PPE clothing and equipment when attending and/or reacting to a CBRN incident. Obviously, though, there is a real need in today’s world for rapid-response capabilities that are not likely to be slowed down by the additional burdens imposed by training, maintenance, and storage requirements. There are, fortunately, solutions already available to meet this added complication as well – e.g., emergency escape hoods that have passed some rather stringent NIOSH (National Institute for Occupational Safety and Health) tests when used to defend against a broad range of CBRN materials.

For practical as well as planning purposes, what started off as an idea "worth exploring" was now ready to be used in countering terrorist incidents and/or dealing with major threat scenarios in which the first and most immediate requirement, usually, is to clear crowds of participants, spectators, and attendees as quickly as possible from the site of an actual or possible attack.

For example, the idea behind the new Avon Protection Systems' NH15 hood was born out of a concept originally designed for the UK police, who were looking for a compact hood for personal carry that could provide instant protection, against all CBRN materials, to officers carrying out their duties in the midst of a "live-threat" scenario. The hood, which had to be quick to don, was needed primarily to help the wearers themselves leave the scene of a potential or actual CBRN incident both quickly and efficiently.

Unfortunately, the modern day terrorist threat is so great in magnitude that it is no longer only military personnel and civilian first responders who must be able not only to survive but also to deal effectively with a potential attack. It is no secret that major public events and transport systems are already earmarked by security forces as among the most likely potential targets in CBRN threat scenarios. There are now many other sectors of modern society, in fact, that are vulnerable not only to potential terrorist or CBRN attacks but also to nuclear accidents – and, therefore, need PPE "at the ready" to deal quickly and safely with any such emergency.

The challenge of having large quantities of protective equipment at the ready in case of a CBRN event grows as funding for such protection declines. To address this concern, product development is evolving to keep up with the ever-changing terrorist threat.

Unknown Dimensions, Uncertain Scenarios & Unavoidable Problems

Today, many private-sector organizations and businesses – e.g., the oil, gas, pipeline, and chemical industries of all modern nations – as well as the banking and finance sectors, and hotels and entertainment venues, also need to be prepared. Unfortunately, the exact dimensions of the threat parameters are still not fully known and, therefore, not fully understood. From the responder's point of view, each conflict and threat scenario creates its own unique risks, uncertainties, and problems; the protection requirements also need to change from time to time, therefore, to ensure survivability and operability in any given situation.

Prior to and during an actual CBRN incident, there is even greater vulnerability, if only because any requirement to wear or carry a traditional respirator or breathing apparatus at all times would be both impractical and costly. The servicing of such equipment at periodic intervals is also essential. For those and other reasons, the availability of an apparatus that is significantly smaller, needs little training or maintenance, and can be carried around at times of heightened security offers the wearer a much better chance to exit from the scene of an incident quickly, efficiently, and – of the greatest importance – safely.

To briefly summarize: The benefits provided by the new emergency escape hood include: (a) offering a high level of respiratory, eye, and face protection to help the user evacuate from a contaminated area; (b) protecting against airborne CBRN threats and/or liquid-agent splashes; (c) giving the user a nonthreatening appearance while at the same time providing superior visual communication and recognition capabilities; and (d) not requiring annual OSHA "fit" tests or maintenance.

Today, the potential terrorist threat continues to evolve at an ever faster pace, while budgets for defense purposes (including homeland defense) are actually being cut (because of the tightening economies). Civilian-based organizations that are sensitive to the possibility of an attack can therefore no longer justify expenses for complicated and hard-to-use equipment – with additional training requirements also mandated – that is likely to be left in the locker. It is largely for this reason that the product development processes for modern PPE are addressing the changing needs of organizations that must be always ready to meet and effectively deal with a worst-case scenario.

James Wilcox is the Global MARCOM and Product Management and Marketing Director for Avon Protection. He has worked in the field of CBRN respiratory protection for nearly 10 years. Previously, he was responsible for technical development of the new Department of Defense M50 and M53 masks. Prior to joining Avon Protection, he worked at Dyson Ltd. in the United Kingdom, developing consumer products for the commercial market.

