

North Carolina CHEMPACK Workshops
Executive Summary

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Background

Nerve agents are extremely toxic organophosphate-type chemicals, including toxins such as, GA (tabun), GB (sarin), GD (soman), GF (cyclosarin), and VX, which attack the nervous system and interfere with enzymes that control nerves, muscles, and glands. They are odorless and invisible and can be inhaled, ingested, or absorbed through the skin. Once a nerve agent enters the body by whatever means, antidotes are necessary to counteract the affects of the agents by 1) decreasing symptoms and 2) regenerating an enzyme that is consumed by nerve agents.

Common nerve agent antidotes are Atropine, Pralidoxime, and Diazepam. Atropine reduces symptoms of salivation, lacrimation (tearing), urination, defecation, gastrointestinal upset, and emesis (vomiting) [SLUDGE mnemonic device]. Atropine is administered to nerve agent victims in repeated doses.

Pralidoxime (2-PAM Cl or “PAM”) is the oxime usually administered intravenously to moderately sick nerve agent victims. Its principal mode of action is to displace the nerve agent bound to the cholinesterase enzyme, thus replenishing the active enzyme in the body, which badly needs it. Diazepam is used to treats seizures, which are common in severely-poisoned nerve agent victims.

The mission of the CHEMPACK Program is to implement a nationwide project for the “forward” placement of these nerve agent antidotes. Thereby, providing state and local governments a sustainable resource that increases their capacity to respond quickly to a nerve agent event.

There are two types of CHEMPACK containers. The Emergency Medical Services (EMS) container is for the use of EMS personnel (e.g., emergency medical technicians) to treat patients before they reach the hospital. The Hospital container is for use by hospital medical staff to treat patients who arrive to the emergency department. Each type of container contains identical medications, but in different proportions. For example, the EMS container is distinguished by a large number of MARK I kits, and the Hospital container by relatively large amounts of bulk atropine and PAM. North Carolina has chosen to house only the EMS containers.

What is the MARK I kit? The U.S. military MARK I kit contains two (2) Intramuscular (IM) auto injectors: one containing 2 mg of atropine and one containing 600 mg of 2-PAM. The 2 auto injectors are supposed to be administered in the event of nerve agent exposure. The recommended number of MARK I kits to be administered varies from 1-3 and depending on the route of exposure, severity of clinical effects, and elapsed time after exposure.

There are several reasons why the Centers for Disease Control (CDC) believed the CHEMPACK Program was necessary. First, the SNS may take up to 12 hours (from the time of requisitioning by state and local public health officials) to reach a destination, whereupon additional time may be required to transport components to endpoint users, such as hospitals. Yet, death from nerve agent poisoning may be so rapid that the afflicted individual may be entirely unaware of what is happening. According to one source, a one-milligram dose of a nerve agent can usually kill within 15 minutes. Thus, nerve agent antidotes are efficacious only when delivered to victims within minutes of exposure to a nerve agent. Centralization of nerve agent antidotes in the SNS cache makes is not practical because they remain unavailable when victims need them most. Decentralization of caches of nerve antidotes improves the availability, when needed. Second, CDC officials and many researchers believe nerve agents, because of their lethality, are the chemical weapons of choice for terrorists. Of the various nerve agents, terrorists may employ sarin, because its standardization as a U.S. chemical weapon vouches for its effectiveness; and tabun, because it is the easiest to make. Third, nerve agent poisoning is extremely rare in civilian populations. As a result, hospital pharmacies are unlikely to stock sufficient inventory for a nerve agent event affecting hundreds or thousands of individuals. Fourth, nerve antidotes have variable shelf lives, meaning they require restocking as they age. The CHEMPACK program's storage requirements are governed by the Department of Defense's shelf Life Extension Program (SLEP), which extends expiration dates set by a manufacturer. This date is more often associated with limiting the manufacturer's liability than with the quality of the product, and often does not reflect the potential for degradation of the product. Many of these materials are useable within the original specifications long after the manufacturer's expiration date. The Shelf Life Extension Program uses available information on the potential for degradation of specific materials and the materials original specifications to extend the useful life of materials that would otherwise often be discarded. Fifth, because the nerve agents are procured in bulk by the federal government, their cost to the SNS is significantly lower than when locally procured.

CHEMPACK's are distributed to states based on the total population of the state. North Carolina has 57 CHEMPACK containers stored in 41 hospitals across the state. In order for this most valuable asset be deployed and used in a timely fashion, the CHEMPACK workshops were initiated to address the issues that would hinder this process.

Review of the Process

In November 2006, all North Carolina Local Health Departments and Health Department Preparedness Coordinators (PC), Emergency Management (EM) agencies, Emergency Medical Services (EMS) agencies, Law Enforcement agencies, and all North Carolina hospitals were invited to attend a one day Regional CHEMPACK Workshop. Seven (7) regional workshops were scheduled across the State. The workshops provided an overview of the CHEMPACK Program, an opportunity to evaluate current plans, review of the request/deployment/accountability procedures, and an opportunity to network with local responders. The State SNS Coordinator and the three (3) regional pharmacists

served as the planning committee for these workshops. Workshop agenda items and content were determined by the planning committee.

The agenda included a Chempack program overview, Mark-1 kit demonstration, exercise scenario introduction and injects, and workshop hotwash. The workshops were conducted between January and April of 2007.

Results

Overall, these workshops were well received by both the county agency representatives and the hospitals. The workshops lasted between five and six hours each.

The following sections detail areas noted as best practices/ideas and lessons learned. For the purposes of this document, best practices are concepts that were consistently seen across the regions; best ideas creative and/or innovative solutions to common problems, such as transportation and communication.

Best Practices

- Taking a regional approach
 - Pulling together as a region to develop a standardized plan throughout the counties of a particular region. It will foster collaboration among counties and can decrease deployment time delays between counties.
 - Using Emergency Management (EM) to secure transportation throughout region.
 - Requiring similar or equivalent forms of identification for pickup.
- Hospital pharmacist awareness of PAR levels of nerve agent antidotes at their institution. This would enable the institution to have a better indication of quantity on hand to treat incoming patients.

Best Ideas

- Once a CHEMPACK container is opened, boxes can be taken out and transported in vehicle for quicker delivery
- Lights and sirens are not always necessary for transportation of CHEMPACK contents
- Education of employees on all shifts is needed about policies and procedures for CHEMPACK
- CHEMPACK host facilities should post algorithm posted for CHEMPACK deployment
- Agencies such as EM and EMS should contact host facilities in advance for 24-hour contact information

Lessons Learned

- Partner agencies
 - Not all EMS trucks have Mark-1 kits
 - Agencies (e.g. law enforcement) function differently from county to county

- More education needed about CHEMPACK program throughout partner agencies
- Agencies more than willing to work together to deploy this asset in timely fashion
- In most instances, EM should be the transportation coordinator
- Plans
 - Current plans are not specific enough as to transportation details
 - Host & non-host hospitals must have CHEMPACK plans
 - Contact information for county EM must be included in plan
 - Persons/Agencies who may request CHEMPACK must be included in plan
 - Must be reviewed and re-written as necessary
 - State SNS Coordinator must be contacted upon opening CHEMPACK container
 - Location of CHEMPACK containers within region included in plan
- Treatment capacity
 - Current treatment capacity is approximately 1000 patients
 - At some point during the SLEP visit the CHEMPACK treatment capacity will be decreased to 454 patients
 - This change is the result of increased cost of Mark-1 kits

Summary

Overall, the series of workshops was beneficial in opening dialogue between agencies that would be intimately involved in a CHEMPACK deployment. The workshops gave host and non host hospitals, partner agencies, and public health departments the opportunity to share ideas and lessons learned.