

**Sample:
Local Terrorism Incident Response Annex
To a County or City
Comprehensive Emergency Management Plan**

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I. Foreword

It is recommended that this "sample plan" be utilized as a basis and developmental tool for all counties and municipalities in the State of Florida to formulate their own agency-specific Terrorism Response Annex. It is important to realize that all communities in Florida are vulnerable to a terrorist or cyberterrorist attack. A terrorist attack could involve the use of a "weapon of mass destruction (WMD)" that would threaten lives, property, and environmental resources through physical destruction by explosions and resulting fires, and/or by contamination with chemical, biological, and/or radiological materials. A cyberterrorist attack could destroy or significantly disrupt vital computer networks, communications systems, and/or Internet services, interfering with provision of critical community services and thereby causing substantial human and economic impacts.

The first responders in an actual or suspected terrorist event will be from local emergency services. For this reason, _____ County/Municipality has established and will maintain a comprehensive program to prepare for and manage the impacts of terrorist and cyberterrorist events. The program provides for continuing assessment of the community's vulnerability to terrorism, planning, and training to prepare for and respond to such events, pre-deployment of specialized response capabilities throughout the area, and definitions of the operational concepts to be utilized to manage an actual or suspected event. If needed, state and/or Federal assistance will be mobilized to support the local command structure.

II. Executive Summary

This Emergency Management document presents planning guidelines for preparing local law enforcement, fire/rescue, and health and medical services' responses to acts of biological, nuclear, incendiary, chemical, or explosive (B-NICE) terrorist incidents. Additionally, this document will facilitate the escalation of the response from a local first response to the more definitive federal response.

The _____, in its role as the emergency management planning agency, is implementing a systems approach for a unified response to acts of terrorism. This systems approach is designed to complement the State of Florida and the Federal Terrorism Incident Response Annexes.

This document is intended to provide guidance to response and support agencies in the event of a terrorist act. It will identify the key players and the plan of action. It is not meant to replace the field operations guides for first responders. Suggested operational procedures are presented in this document as a guide in managing the response to a terrorist incident or threat involving a weapon of mass destruction.

III. DEFINITIONS

Acute effect

A pathologic process caused by a single substantial exposure.

Acute exposure

A single encounter to toxic concentrations of a hazardous material or multiple encounters over a short period of time (usually ≤ 24 hours).

Air purification devices

Respirators or filtration devices that remove particulate matter, gas, or vapors from the atmosphere. These devices range from full-face piece, dual-cartridge respirators with eye protection to half-mask, face piece-mounted cartridges with no eye protection.

Air-supplied respirators

A device that provides the user with compressed air for breathing.

Antidote

An agent that neutralizes a poison or counteracts its effects.

Apnea

Cessation of breathing.

Asphyxia

A condition in which the exchange of oxygen and carbon dioxide in the lungs is absent or impaired.

B-NICE

Biological, Nuclear, Incendiary, Chemical, and Explosive

CDC

Centers for Disease Control and Prevention

Chemical-protective suit/clothing

Clothing specifically designed to protect the skin and eyes from direct chemical contact. Descriptions of chemical-protective apparel include non-encapsulating and encapsulating (referred to as liquid-splash protective clothing and vapor-protective clothing, respectively).

Chronic effect

A pathologic process caused by repeated exposures over a period of long duration.

Chronic exposure

Repeated encounters with a hazardous substance over a period of long duration.

Contact dermatitis (allergic)

A delayed-onset skin reaction caused by skin contact with a chemical to which the individual has been previously sensitized.

Contact dermatitis (irritant)

Inflammatory skin reaction caused by a skin irritant.

Control zones

Areas at a hazardous materials incident whose boundaries are based on safety and the degree of hazard; generally includes the Hot Zone, Decontamination Zone, and Support Zone.

Decontamination

The process of removing hazardous materials from exposed persons and equipment at a hazardous materials incident.

Decontamination Zone

The area surrounding a chemical hazard incident (between the Hot Zone and the Support Zone) in which contaminants are removed from exposed victims.

Environmental hazard

A condition capable of posing an unreasonable risk to air, water, or soil quality, or plant or animal life.

Hot Zone

The area immediately surrounding a chemical hazard incident, such as a spill, in which contamination or other danger exists.

Immediately dangerous to life and health (IDLH)

That atmospheric concentration of a chemical that poses an immediate danger to the life or health of a person who is exposed, but from which that person could escape without any escape-impairing symptoms or irreversible health effects. A companion measurement to the permissible exposure limit (PEL), IDLH concentrations represent levels at which respiratory protection is required. IDLH is expressed in parts per million (ppm) or mg/m^3 .

Incident commander

The person responsible for establishing and managing the overall operational plan at a hazardous material incident. The incident commander is responsible for developing an effective organizational structure, allocating resources, making appropriate assignments, managing information, and continually attempting to mitigate the incident.

InfraGard

A program designed to address the need for a private and public-sector information sharing mechanism at both national and local levels.

Material safety data sheet (MSDS)

Documents prepared by a manufacturer to transmit health and emergency information about their product. This fact sheet summarizes information concerning material identification; hazardous ingredients; health, physical, and fire hazards; chemical reactivities and incompatibilities; spill, leak and disposal procedures; and protective measures required for safe handling and storage. See 29CFR 1910.1200 (as amended) for more information.

Mass Casualties Incident - (MCI) *(Insert county criteria)*

Mitigation

Actions taken to prevent or reduce the severity of harm.

Respiratory depression

Slowing or cessation of breathing due to suppression of the function of the respiratory center in the brain.

Routes of exposure

The manner in which a chemical contaminant enters the body (for example, inhalation, ingestion).

Secondary contamination

Transfer of a harmful substance from one body (primary body) to another (secondary body), thus potentially permitting adverse effects to the secondary body.

Self-contained

Breathing Apparatus (SCBA)

Protective equipment consisting of an enclosed facepiece and an independent, individual supply (tank) of air used for breathing in atmospheres containing toxic substances or underwater.

Terrorism

A violent act, an economically destructive act, or an act dangerous to human life which is in violation of the criminal laws of the United States. This includes the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.

Terrorism Response System - (TRS)

A system designed to identify, notify, and activate the emergency support functions of the local, state, and federal agencies.

WMD

Weapon of Mass Destruction. A WMD is any device, material, or substance used in a manner, in a quantity or type, or under circumstances evidencing an intent to cause death or serious injury to persons or significant damage to property.

IV. Introduction

Terrorist incidents involving biological, nuclear, incendiary, chemical, or explosive materials (B-NICE) and cyberterrorism are considered technologically hazardous incidents by nature. Almost all incidents that are believed to be a terrorist act will be treated as both a crime scene and as a hazardous materials incident with additional complicating factors. If the incident is only a potential act of terrorism, it is still considered a crime scene. Regardless of the mechanism or motive behind the incident, responders should remain focused on reducing the impact of the event as efficiently and safely as possible. Terrorist event or not, all responders must follow established safety guidelines that are pertinent to their respective agencies.

Due to the highly destructive and technical nature of cyber and B-NICE terrorist incidents, special technical expertise, training, and equipment are required to provide a public safety, health, and medical services response in an extremely time-critical manner.

Terrorism Response System (TRS)

The Terrorism Response System (TRS) strategic plan concept has two major tenets. First, to assist local government agencies and key private sector assets to gain the additional necessary capability and expertise to effectively and appropriately respond in a coordinated manner to a local terrorist incident. Second, to significantly improve area capability to rapidly augment local governments in responding to a major terrorist incident.

Building enhanced area capability is an on-going process that includes the following key activities:

- 1) Analysis of potential threats and potential threat elements (PTE),
- 2) Building and maintaining communication links between agencies,
- 3) Prevention of terrorist incidents,
- 4) Planning, training, and exercises,
- 5) Developing pharmaceutical and equipment caches,
- 6) Developing an information management operation system for first responders,
- 7) Identifying local laboratory support,
- 8) Information sharing, through organizations such as InfraGard, and
- 9) Enhancing existing mutual aid agreements.

V. Assumptions

The following assumptions have been provided as examples:

- a. A terrorist incident may be made readily apparent to the responding organizations by the characteristics of the impacts or a declaration on the part of the perpetrators, or may be very difficult to initially detect and identify because of uncertainty as to the cause or extent of the situation.
- b. The resources and/or expertise of local agencies could quickly be depleted by a response to a major terrorist incident and its consequences. Extensive use of Area, State, and Federal resources and intrastate mutual aid agreements must therefore be anticipated.
- c. Specialized resources, as well as those normally utilized in disaster situations, will be needed to support the response to a terrorist incident. Such resources may not be located in the Area or in the State of Florida.
- d. The Department of Health will have a minimum of four Biosafety Level 3 laboratories available for analytical services to assist in the response to a terrorist event in Florida.
- e. Resources from local, state, and federal agencies, as well as from private organizations, will be made available on a timely basis upon request.
- f. All state and local response agencies and organizations will establish and participate in a unified command structure at or near the scene, and the emergency operations center of the responding jurisdictions will be activated and staffed (if indicated by the size or scope of the incident).
- g. Federal agencies with statutory authority for response to a terrorist incident, or for the geographic location in which it occurs or has impacted, will participate in and cooperate with the unified command structure established by the responding local jurisdiction.
- h. A terrorist event will result in the timely activation of the comprehensive emergency response plans of the local jurisdictions impacted. When needed, the Florida Division of Emergency Management (DEM) will activate the State Comprehensive Emergency Management Plan (CEMP), and the Federal Emergency Management Agency (FEMA) will activate the Federal Response Plan (FRP).
- i. Responding county and municipal jurisdictions will have supportive plans and procedures, as well as appropriately trained and equipped personnel, that may be needed for the general response operations related to management of the terrorist incident. This annex assumes the resources and procedures for such related operations as hazardous material response, mass casualty incident management, law enforcement, search and rescue, and others will be in place to be utilized when needed during a terrorist incident.
- j. For terrorist events involving weapons of mass destruction, there may be a large number of casualties. Injured or ill victims will require specialized medical treatment, potentially including decontamination and medical facilities and may require establishing temporary medical operations in the field. Fatally injured victims may be numerous and their bodies contaminated or infectious. Special mortuary arrangements are likely to be necessary.

- k. Terrorist incidents may involve damage or disruption to computer systems, telecommunications networks, or Internet systems; disturbance to vital community networks for utilities, transportation, or communication; and/or could endanger the health and safety of the population at risk, interrupt emergency response operations, and result in substantial economic losses.
- l. There will be very extensive media interest in a terrorist event and media management operations will require resources beyond those needed for other types of emergency management operations.
- m. Counties and municipalities are subscribers to the Secure Florida Alert System (when available) and are on the FBI Law Enforcement Online (LEO) Network.
- n. County and municipal jurisdictions have taken proper precautions such as firewalls and password access to their computer systems and have implemented the same reporting mechanism that was used during Y2K for cyber incidents.
- o. County and municipal jurisdictions have standby contracts with cyber security consultants for response and recovery operations.

VI. Purpose

The Terrorist Incident Response Annex establishes the policies, programs, and procedures that will be utilized by local agencies to prepare for, respond to, and recover from a threatened or actual emergency resulting from a terrorist act. It also defines the roles of the local agencies in the development, implementation, and maintenance of these procedures.

VII. Scope

Primary Objectives in Response to a Terrorist Act

The following points are the main objectives for the first responders to a terrorist incident:

- 1) Protect the lives and safety of the citizens and first responders;
- 2) Isolate, contain, and/or limit the spread of any cyber, nuclear, biological, chemical, incendiary, or explosive devices;
- 3) Identify the type of agent/devices used;
- 4) Identify and establish control zones for the suspected agent used;
- 5) Ensure emergency responders properly follow protocol and have appropriate protective gear;
- 6) Identify the most appropriate decontamination and/or treatment for victims;
- 7) Establish victim services;
- 8) Notify emergency personnel, including medical facilities, of dangers and anticipated casualties and proper measures to be followed;
- 9) Notify appropriate State and Federal agencies;
- 10) Provide accurate and timely public information;
- 11) Preserve as much evidence as possible to aid in the investigation process;
- 12) Protect critical infrastructure;
- 13) Fatality management;
- 14) Develop and enhance medical EMS; and
- 15) Protect property and environment.

Terrorism Response System (TRS)

The Terrorism Response System (TRS) is designed to identify, notify, and activate the emergency support functions of the local, state, and federal agencies. The following situations

are listed as examples of triggering mechanisms. Agencies having special or critical occupancies may and should modify their triggers to reflect their specific needs.

The Terrorism Response System may be triggered if any of the following criteria are met:

- 1) A credible threat or actual event involving cyber, biological, nuclear, incendiary, chemical, or explosive (B-NICE) agents;
- 2) Call received with information regarding an incident of unknown origin, which has created a large number of casualties in a short period of time;
- 3) Arrival of a unit finding victims displaying signs and/or symptoms of a biological, nuclear, or chemical event with an unknown or suspicious causation origin;
- 4) Any incident, or series of incidents, in which a group of victims seem to be affected with similar symptoms in which the cause for the affliction is not known or is suspicious;
- 5) Any sudden or repeated occurrences of any illness or disease not typically seen in a geographical area; or
- 6) Any incident or series of incidents that indicate cyber intrusions or cyber attacks (such as Denial of Service).

Alert and Notification

Alert and notification will encompass the following items:

A. Establish threat levels.

Determination of an agency's activation will be based on the information surrounding the threat/event and the subsequent designation of one of four designated notification levels. The United States Government Interagency Domestic Terrorism Concept of Operations Plan (CONPLAN) establishes a range of threat levels determined by the FBI that serves to frame the nature and scope of the Federal response. The State of Florida has adopted this classification scheme and has modified it only where necessary to delineate the State's perspective.

Each threat level provides for an escalating range of actions that will be implemented concurrently for crisis and consequence management. Specific actions will take place, which are synchronized to each threat level, ensuring that all agencies are operating jointly with consistent executed plans. Federal and State government will notify and coordinate with State and local governments, as necessary. These threat levels are described below:

Minimal Threat

Received threats do not warrant actions beyond normal liaison notifications or placing assets or resources on a heightened alert (agencies are operating under normal day-to-day conditions).

Potential Threat

Intelligence or an articulated threat indicates a potential for a terrorist incident. However, this threat has not yet been assessed as credible.

Credible Threat

A threat assessment indicates that the potential threat is credible, and confirms the involvement of a weapon of mass destruction in the developing terrorist incident. Intelligence will vary with each threat, and will impact the level of the response. At this threat level, the situation requires the tailoring of response actions to use resources needed to anticipate, prevent, and/or resolve the crisis. The crisis management response will focus on law enforcement actions taken in the interest of public safety and welfare and is predominantly concerned with preventing and resolving the threat. The consequence management response will focus on contingency planning and pre-positioning of tailored resources, as required. The threat increases in significance when the presence of an explosive device or weapon of mass destruction capable of causing a significant destructive event, prior to actual injury or loss, is confirmed or when intelligence and circumstances indicate a high probability that a device exists. In this case, the threat has developed into a weapon of mass destruction terrorist situation requiring an immediate process to identify, acquire, and plan the use of State and federal resources to augment state and local authorities in lessening or averting the potential consequence of a terrorist use or employment of a weapon of mass destruction.

WMD Incident

A weapon of mass destruction terrorism incident has occurred which requires an immediate process to identify, acquire, and plan the use of state and federal resources to augment state and local authorities in response to limited or major consequences of a terrorist use or employment of a weapon of mass destruction. This incident may have resulted in mass casualties. The response is primarily directed toward public safety and welfare and the preservation of human life.

The classification may be upgraded at any time, when warranted by conditions. The State Warning Point will then notify or confirm notification of the local incident commander, the unified command, and the FBI.

For every threat level, the local Incident Commander should notify the local Emergency Operations Center or Unified Command of one of the following two situations:

- 1) Federal and/or state resources will be necessary to support local operations; or,
- 2) Local capabilities are deemed to be adequate for local crisis and consequence management response operations.

The local EOC or Unified Command will pass this information to the State Warning Point. The State will respond appropriately to the information regarding local capabilities for management of the incident. The resulting activation level of the State Emergency Operations Center will be in accordance with the provisions of the State of Florida Comprehensive Emergency Management Plan.

- B.** Assess threat information and initiate protective measures;
- C.** If needed, rapidly escalate the response from the municipal to the county to the state to the federal levels through the appropriate channels. Follow established notification protocols, including the State Warning Point;
- D.** Notify agencies that may be needed in case of a terrorist event; and
- E.** Dispatch appropriate responders to the scene of the incident or staging areas.

Though a warning does not precipitate all terrorist events, a communication system should be established and/or identified to link together the agencies that collect pertinent information. Agencies that may be involved in this would include, but would not be limited to:

- **Local Law Enforcement**
- **FDLE** - Florida Department of Law Enforcement
- **FBI** - Federal Bureau of Investigation
- **EM** - Emergency Management (local, State, and Federal)
- **PH** – Public Health/Medical Surveillance

VIII. Authorities

The authority for the development, implementation and maintenance of this annex is derived from the authority of the Florida Statutes, Section 252.38(1).

IX. Method/Concept of Operations

This plan is based upon operational guidelines established through local, State, and Federal emergency management utilizing emergency support functions and unified command. The following lists an example of an incident and resource utility as it escalates;

- Local jurisdiction - establishes command
- Local Emergency Management - notification and activation, specialized resources utilized, activates standby contractor support for a cyber terrorism incident
- County Emergency Management - notification and activation, specialized resources utilized
- State Emergency Management - Activate resources from the Terrorism Response System
- Federal Assistance

(A declaration by an appropriate government official can occur at any time.)

X. Local Agency Roles and Responsibilities

In order to address the requirements of the varied emergency responders and to insure a coordinated response for the successful accomplishment of their assigned tasks, a system of management is required. Agencies should therefore design their system based on an Incident Management System (IMS) using a Unified Command System. One such example is the Florida Statewide Mutual Aid Agreement (SWMAA).

Several agencies and disciplines are identified below as typically involved in a WMD response. Where necessary, the appropriate Emergency Support Function (ESF) for that agency or discipline is noted. For some examples, there is a discussion of their role in a WMD incident. This is by no means an all-inclusive list, but is simply given as a guide:

A. Emergency Management (EM)

Emergency Management (EM) is responsible for the creation of response plans from their government level perspective (city, county, State, Federal). The EM should activate the Emergency Operations Center (EOC), a centralized location that serves as the clearinghouse for agencies to collect, discuss, and disseminate information in regard to a particular event occurring within the jurisdiction.

Applicable agencies will assign a representative to the EOC who will be responsible for relaying information to and from their field operations. The EOC will maintain contact with appropriate local, State, and Federal Agencies throughout the incident.

B. Transit Assets (TA) - *should be listed under ESF 1*

C. Emergency Communications Center/ Communications Personnel / Terrorism Response Dispatch Procedures - ESF 2

The scope of the incident may not be entirely known when the initial call is received. Initial information that is received, processed, and acted on by a call-taker will be critical.

This plan should be in writing and available as a guideline for automatic dispatching and positioning of needed assets at the first notification of a terrorist incident.

Dispatching guidelines for mass casualty incidents (MCI) and all terrorist type incidents should include the following information, at a minimum:

- Protocols for communication personnel/dispatchers to identify and dispatch the appropriate first response units and/or MCI Level units and advise all responders as to the nature of the incidents and all pertinent information.
- Local and State Warning Points should be notified and/or activated.
- FDLE Computer Crime Center and State Warning Point should be notified of cyber terrorism events.

An example of a terrorist response dispatch is provided in Appendix A.

Caution: Responders should be aware that the person reporting a substance might be a terrorist. Therefore, the caller may intentionally mislead authorities as to the type of substance in question. Gathering as much information as possible about a substance may prevent unnecessary casualties.

D. Public Works (PW) - ESF 3

E. Fire/Rescue Departments - ESF 4

Fire/Rescue will be responsible for establishing and setting up the Incident Command, determining the appropriate mass casualty incident level, analysis of scene, fire suppression, victim extraction, life safety, decontamination, triage, immediate treatment, and transport of victims. Specialized teams such as Hazardous Material Response Teams or search and rescue teams, if available, may be called in to assist.

F. Meteorology/Weather Information - ESF 5

On-scene personnel should confirm local weather conditions. The local weather service can provide wind speed and direction to ensure first responders approach upwind (with the wind behind them and the possible vapors moving away from them.)

G. Florida Poison Control - ESF 8

1-800-282-3171 is a 24-hour contact number.

H. Hospitals - ESF 8

Hospitals are likely to receive the brunt of the victims from a terrorist incident. Many people will leave the scene before first responders arrive and establish an effective perimeter. This may place hospitals and other medical providers at risk of cross-contamination.

Hospitals should plan for a WMD event. It should include, at a minimum, the following:

- Hospital based Incident Command System
- Sudden arrival of contaminated victims
- Large number of worried well patients
- Hospital access control/ security/ crowd control
- Secondary contamination of staff/faculties
- Decontamination of personnel and vehicles
- Exterior triage
- Traffic management
- Personal protection equipment for staff
- Public information officer
- Additional staff
- Enhanced source of pharmaceuticals (for patients and staff)

- Protection of evidence
- Recovery/restoration
- Specialized equipment
- Contaminated waste
- Enhanced lab capabilities

I. Public Health – ESF8

Concept of Operations

This policy on "Terrorism Preparedness" is intended to be general guidance on how the Florida Department of Health and Emergency Support Function 8 (ESF8) will operate in preparedness and consequence management should a terrorist event occur within the State of Florida. This policy, together with a procedural guide, will provide the template for development of a terrorism Preparedness Annex by Health and Medical entities that currently maintain an Emergency Operations Plan (Disaster Plan) on file with the Florida Department of Health-Emergency Operations.

A terrorism event should be viewed the same as other natural or manmade events; it either occurs with a sudden onset or emerges slowly and may be difficult to identify. Parameters of this event may involve biological, nuclear, incendiary, chemical, or explosive material/devices. All these elements currently exist in natural and normal manmade events, with the exception of willful initiation. How the event occurs determines emphasis on the type of response personnel, resources, and techniques to be employed. A second variable is the capabilities of the various response levels (that is, a rural county may have fewer trained personnel and equipment compared to an urban county).

In order to deal with a terrorism event, a network of resources, personnel, equipment, and supplies must already be in place if we are to save lives and lessen morbidity. If these resources are not conveniently available, all entities must know what additional resources are needed and identify where and how to locate the next closest resource. This network must be able to respond in a flexible capacity to small, contained events as well as for those which are large and uncontained. This flexibility will be accomplished by having resources established at three different levels: local, area, and statewide. Each level must be prepared to support another level immediately with maximum response. This document does not deal with the need for education and training of the network, but seeks to identify the players, their roles, and the strategies to be employed.

Assumptions

The lead state agency for the medical response to a terrorism event that involves biologicals or radiologicals is the Department of Health (ESF8). The Secretary of Health, or his/her designate, will identify the lead health and medical official in command of such an event and that person may be at the local, area, or state level. Command may change at the discretion of the Secretary or his/her designate. Any response under this authority is designated as "consequence management". Any type of response will utilize the current state emergency management system of Emergency Support Functions (ESFs), the Incident Command System (ICS), the State Emergency Operations Center (SEOC), and incorporate the Department of Health Emergency Operations Plan as supported by local Emergency Operations Plans with a Terrorism Incident Response Annex. Contingencies within the plans must be established to deal with events that are:

- (1) undetected and have a slow onset with no warning;
- (2) slow onset with a warning;
- (3) quick onset with no warning and;
- (4) quick onset with warning.

Each level will have constraints on its available and trained resources as well as equipment on hand.

Organization: The Department of Health will be organized on three levels of response; Local, Area, and Statewide:

Local: Within each County Health Department (CHD) a minimum capability shall be established. This capability will assure that at least three persons are trained and equipped at a basic level (as defined in training matrix FDOH-EO) so they can respond to local events. Persons trained to respond at the local level will have knowledge about resources, personnel, and equipment available within the state ESF8 system, serve as an adviser to the local Incident Commander, and be the primary communicator of relevant scene information to state ESF8 officials.

Maximum capabilities within any CHD will include trained and equipped personnel to respond to an event scene to conduct epidemiological investigations, conduct ongoing surveillance programs pre- and post-event, and to take biological samples to be packaged and forwarded for laboratory testing.

Area: Within each area there should be a minimum of three persons who are trained and equipped to work with the Area Hazardous Materials Team (AHMT) and respond as members of

that team when called out for a regional mission. These personnel will also serve as technical specialists in bio-terrorism, serving as consultants to a local Incident Commander if the AHMT is not activated and as consultants to the AHMT Team Leader when that team is deployed. They will also be expected to function as ESF 8 Area Emergency Coordinators for other types of disaster emergency events.

Personnel functioning in this role, when in training or deployed, will be directly under the control of Chief, Emergency Operations, Florida Department of Health.

Also at the Area Level, responders from the Bureau of Epidemiology and the Bureau of Environmental Epidemiology shall be identified for each of the response areas. They will receive additional training in terrorism response and serve as consultants to local Incident Commanders, CHDs, and ESF 8 Area Emergency Coordinators. In this role, their primary function will be education and training, and during an event, keep in constant communication with their Bureaus and Emergency Operations (SEOC if activated).

Statewide: At the Statewide level, the Office of Emergency Operations (EO) shall be responsible for managing all health and medical response at any terrorist event that escalates beyond the capacity of a local jurisdiction. In order to be able to assume that responsibility, EO will assure that response education, training, equipment, and communications needs are met for all responding individuals and agencies from both government and private sector agencies. EO shall identify a minimum of three Regional Emergency Metropolitan Medical Response System Teams (MMRS), Disaster Medical Assistance Teams (DMAT); develop statewide laboratory testing capacity; design and implement a Weapons of Mass Destruction education and training program for pre-hospital, hospital, and emergency management personnel and agencies; and develop sufficient staff with skills to operate the ESF8 desk at the SEOC.

EO shall be responsible for conducting such assessments as are required to support the State Terrorism Plan, manage requests and distribution of any National Medication Stockpiles items, and carry out assignments/responsibilities designated for ESF8 in the state plan. For radiological events, EO shall coordinate all activities with the Bureau of Radiation Control and support them as necessary with equipment, supplies, staff, and other resources.

Undetected/slow onset event, no warning: Biological or Radiological:

Response during an unannounced, slow, or insidious onset will require the use of surveillance techniques and epidemiological personnel at the local, area, and statewide levels to recognize that a potential or actual problem exists. Each County Health Department (CDH), other ESF8 entities, and the Florida State Department of Health shall be required to have systems of surveillance in place which can trigger an early warning that abnormal conditions exist. This

early warning system must not be exclusive to departments of health but as a minimum include hospitals, laboratories, pharmacies, primary care providers, and emergency medical services. Expansion of this list of organizations should occur, as appropriate.

Responsibility for giving early warning of a possible problem should come from anyone in the system who identifies an abnormal observation or finding. Warnings should be immediately transmitted to the CHD epidemiologist, disaster coordinator, or any other official at the local health department level.

When warnings are received at the local level they are immediately forwarded to the state epidemiologist, who then notifies the office of emergency operations, other appropriate DOH staff, and, when necessary, federal health officials at CDC. Emergency Operations will notify the Florida Division of Emergency Management and alert them to this early warning.

At anytime during this process, local officials can request assistance from the state for supplies, equipment and/or personnel. In some instances, a decision by state officials to request similar federal assistance will occur.

Resources at the local level may include staff who can be deployed to the field to interview potential victims, take additional samples, or provide information to the local health system on what to look for and report into the surveillance system. In some instances this staff is not available locally and requests for assistance should immediately be made to the State Epidemiologist and the Office of Emergency Operations.

Area epidemiologists, area laboratories, and area health emergency coordinators are also available to support efforts at the local level.

State assistance is available through epidemiologists who can assist by assigning additional field personnel to provide consultation, do field investigations, and establish more robust surveillance programs. State laboratory personnel will also provide specialized services to assist with quick identification of agents and sample transportation to other confirmation laboratories. Emergency management assistance will also be available to assist with communications, resource identification and procurement, and general logistical support.

Local requests for assistance from local and area resources should follow already established procedures that provide for 24-hour access. In the event established systems do not work the system may be accessed by calling the State Warning Point at 850-413-9900 or 800-320-0519.

Slow onset with warning:

An event with slow onset characteristics may receive some type of warning from a perpetrator, including the possibility of a hoax. This type of event will result in immediate heightened awareness by the health and medical system and will most likely result in increased resources being directed to detect and control the event. This type of event will be supported no differently than one without warning except that initial state and federal assistance may become more quickly involved and have a greater presence. When this occurs it is important to remember that if able, **the local jurisdiction is designated to be in charge with state and federal officials providing a supportive role, but the State Health Officer does have statutory responsibility for management of the health response to the event.** The local jurisdiction may have sufficient resources to conduct assessments, prepare plans, and perform all the functions of the Incident Command System; however, it should be proactive in requesting assistance from area or state resources to accomplish operational objectives.

Sudden onset without warning:

This type of event triggers the need for first responders at the local level who are knowledgeable about consequences and serve as resource advisers to the Incident Commander. Typically, this person would be the CHD Emergency Coordinator, who can provide a list of health and medical resources that are available to support the incident responders and the ability to mobilize these resources upon request. This person is also responsible for notifying the state DOH Emergency Coordinating Officer of event occurrence and providing status updates.

At the area level, two specific resources will automatically respond. An area epidemiologist and ESF 8 area emergency coordinator who will respond to the scene to support the on-scene Incident Commander. They will provide additional technical expertise about the incident agent, appropriate means of managing the agent consequences, and the ability to communicate by means of telephone, satellite, or radio with state or federal specialists for further information, consultation, and advice. There will also be a health technical specialist assigned to the Area Hazardous Materials Response Team who will have the ability to gather samples, do some preliminary analysis, and safely package samples for further transportation to designated laboratory sites.

At the statewide level, there will be technical specialists to support and assist local entities with information and provision of additional resources of personnel, equipment, and supplies. They will provide guidance, planning, and expertise in management of consequences arising from the event and will coordinate with other areas of the state, other states, and federal resources should the event expand outside the local jurisdiction.

Quick onset with warning:

An event may occur suddenly, but with prior warning. Consequences of the event would be handled as in an event without warning except that there would be a significant increase in planning and preparedness. Prevention would be the ultimate goal and this will require intimate sharing of information between local, state, and federal entities. In an event of this type, communications systems of radio, telephone, satellite, and Internet will play a major role.

Coordination oversight of this type of event will be performed at the state level and involve federal, state, and local agencies performing investigations. If the event involves biological or radiological agents, health personnel will be deeply involved in surveillance and monitoring.

Equipment and Supplies:

The Office of Emergency Operations - DOH, shall perform assessments to identify types of equipment and supplies needed by local and state organizations to prepare and respond to a domestic terrorism event.

Training and Education:

Statewide education and training for domestic terrorism from pre-hospital to post-hospital rehabilitation will be addressed by the Office of Emergency Operations-DOH. A coalition of concerned parties will be formed to establish education and training objectives and development of a comprehensive domestic terrorism standardized certificate.

J. Hazardous Material Response Teams (HAZMAT) - ESF 10

Local, mutual aid, or area Hazardous Material Teams will be routinely dispatched to all events that involve, or are suspected of involving, situations that require hazardous material type protective equipment, the disposal of hazardous wastes, and the decontamination of victims or property. Hazardous Material Teams will also assist with control zone demarcations, agent identification, and victim extraction.

K. Public Information/ Media Relations - ESF 14

The Public Information Officer shall coordinate all information with appropriate agencies and provide a single point of contact so that a clear, informed, and non-contradictory message is given to the public.

L. Law Enforcement Agencies - ESF 16

Law enforcement agencies will very likely be among the first responders to an event. The response of law enforcement must be quick, assertive, and in such numbers that they can quickly and effectively setup and control a perimeter and isolate the area. It is imperative that victims remain on the scene, as the best-equipped and trained units will be responding to the scene.

In addition to scene security, law enforcement is responsible for assessment, traffic management, and subsequent investigation of the incident. Support from law enforcement may also include (if available): special response teams, bomb squad, hostage negotiators, K-9 units, crime scene preservation, and homicide investigations. Law enforcement may also be asked to provide security and crowd control at other locations including medical treatment facilities, casualty collection points, and emergency news centers. They must be properly equipped to enter contaminated areas. The local law enforcement having jurisdiction may be the lead agency.

Local law enforcement will coordinate with State and Federal law enforcement agencies when they arrive. Once the incident is determined to be a potential terrorist event, the FBI is the lead agency for federal crisis management under Presidential Decision Directive 39 (PDD-39) and will work jointly with, and in support of, the lead local and state law enforcement agencies.

Similarly, local law enforcement will be the lead investigative agency for a cyber terrorism event and will notify/coordinate with the FDLE Computer Crime Center and the FBI. Law enforcement will treat computer equipment/systems damaged by a cyber terrorism event as evidence at a crime scene.

M. Medical Examiner - ESF 16

The ME's Office is activated through law enforcement. A representative should be made available to respond to an Incident Command Post in the event of fatalities. Part of the response by the Medical Examiner's Office should include the ability to quickly set up refrigeration and operational equipment at the scene and coordinate with the local Incident Commander.

N. Bomb Squads - ESF 16

Bomb Squads, if available, should be capable of operating in a chemical, radiological, and/or biological atmosphere. When deployed as part of the terrorism response system, bomb squads should be prepared to handle both a primary and a secondary device simultaneously. The local FBI field office should be contacted prior to conducting "render safe" operations on devices containing biological, chemical, and/or radiological materials.

XI. State Agencies' Roles and Responsibilities

The state government has the principle responsibilities for development, maintenance, and implementation of the Terrorism Response System. State agencies' and support functions' roles and responsibilities will be followed as described in Section 8C of the Terrorism Incident Response Annex to the State of Florida Comprehensive Emergency Management Plan.

XI. Federal Agencies' Roles and Responsibilities

Refer to the Federal Response Plan.

APPENDIX A

Terrorism Response Dispatch Example

The following Terrorism Response Dispatch is an example of what "automatic" dispatch protocols should look like. Naturally they should be tailored to address local needs and response disciplines and should be flexible enough to deal with both small and large incidents. Consider using the following guidelines to develop the local Terrorism Response Dispatch in your area.

The Terrorism Response Dispatch

The first arriving officer will size up the situation, estimate the number of victims, and estimate the need for additional units. The appropriate MCI protocols should be initiated. The three recommended levels of Mass Casualties Incident (MCI) Dispatch are:

Mass Casualties Incident (MCI) - Level I (5-10 Casualties) - In addition to original assignment:

- Appropriate number of law enforcement units
- Appropriate number of EMS units
- Appropriate number of fire units
- Sheriff/Chief of Police
- Appropriate number of Ambulance Transport

Additionally, the following should be Advised and/or Notified

- All Operations Fire Chiefs
- EMS Chief Officers
- EMS O.I.C
- Closest Air Rescue
- The two hospitals within area of incident
- Closest Trauma Center
- Local Emergency Management
- County Emergency Management
- State Emergency Management (800-320-0519)
- Medical Examiner
- Local Public Health Office
- Local Public CISD Team Works
- Elected Official/County Manager (*Staff Duty Officer*)
- Public Information Officers
- Closest Hazardous Material Team

Advise/Notify: (within the Area)

- All local Fire/EMS Departments
- All Local Police/Sheriff Departments
- Closest certified Bomb Disposal Unit
- Closest Canine Unit
- Closest Critical Incident Management Squad
- Florida Department of Law Enforcement (FDLE)
- County Health Department

**Mass Casualties Incident (MCI) - Level II
(11-20 Casualties) - In addition to Level I assignment dispatch, the following units in proportion to the number of casualties expected.**

- Additional Rescue Units
- Additional Suppression Units
- Additional Police/Sheriff's Units
- Additional Fire Chief Officers
- Additional EMS Officers
- Additional Ambulances/Routine

Advise/Notify: (within the Area)

- Additional Police Units
- Three Hospitals within area of incident
- Ambulance Company
- Additional Hazardous Material Teams from neighboring communities
- Federal Bureau of Investigation (FBI)
- Florida Department of Law Enforcement (FDLE)
- Emergency Management (EM)

Advise/Notify:

- State Warning Point

**Mass Casualties Incidents (MCI) - Level III
(Over 20 Casualties) - In addition to Level II assignment dispatch, the following units in proportion to the number of casualties expected.**

- Additional Rescue Units
- Additional Suppression Units
- Additional Police/Sheriff's Units
- Additional Fire Chief Officers
- Additional EMS Officers
- Additional Ambulances/Routine

Advise/Notify: (within the Area)

- All local Fire Chiefs
- All local EMS Senior Officers
- Additional Emergency personnel on standby
- Closest Air Rescue
- Fire Department Safety Officer
- All Hospitals within area of incident
- Transit Assets (Stand-by for bus)
- Ambulance Company
- All local Hazardous Material Teams
- Air Truck for Self-Contained Breathing Apparatus (SCBA)
- The Closest Mobile Command Post
- All local Fire Chiefs
- 2 Aerials (Platform/Ladder)
- Federal Bureau of Investigations (FBI)
- All Local Bomb Disposal Units
- The closest Critical Incident Management Squad
- The closest Canine squad

Advise/Notify:

- All local hospitals
- All local ambulance companies
- All local municipal fire departments
- Local EM Staff Duty Officer
- Local Poison Control Center
- Health Department (*Staff Duty Officer*) *Level 1*

APPENDIX B

Tiered Approach of the Terrorism Response System

Tier 1 - RESPONSE AND COMMAND

The initial response may originate in one of two ways:

- 1) Units on scene realize that they are involved in a terrorist incident and activate the terrorism response system; or
- 2) The terrorism response system is activated due to obvious indications of a terrorist incident.

Hazardous Material Teams

A Disaster Response Team (DRT) is usually comprised of a HazMat Team, a rescue truck, an engine company, an aerial company, and an officer. The purpose of this joint response is that all of these units work together to provide a self-sufficient entry, extrication, decontamination, and rescue capability. HazMat Teams should respond as part of the first tier. If a HazMat Team is already on the scene, then a second one should be dispatched as a backup for the first unit. The first arriving HazMat officer will be the officer in charge until relieved as per standard incident command procedures. The mission of the HazMat Teams will be to:

- 1) Establish Command
- 2) Identify Perimeter
- 3) Isolate and Deny Entry
- 4) Attempt to Identify the Product Involved
- 5) Initiate Action Plan
- 6) Threat Assessment
- 7) Resource Assessment
- 8) Emergency Decontamination
- 9) Escalate Response (if appropriate)

Law Enforcement

The local law enforcement forces will respond as part of the first tier. Their mission is to:

- 1) Enforce the Perimeters and Isolate the Area
- 2) Provide Security
- 3) "Render Safe" any Devices (if appropriate)
- 4) Conduct Search for any Possible Secondary Devices
- 5) Escalate Response (if appropriate)

Local Response

The local first responders will usually be made up of fire rescue and police units from the original dispatch and any second alarms made by first arriving units. Their mission is to:

- 1) Assess the Scene
- 2) Mitigate Hazards
- 3) Triage, Treat, and Transport Patients
- 4) Set-up Decontamination Corridor
- 5) Begin Decontamination (if appropriate)
- 6) Initiate Incident Management System

Tier 2 - STRUCTURE AND SUPPORT

The Tier 2 is designed to provide structure and support to the Tier 1 dispatch. Tier 2 responses may originate in one of two different ways. Each will expand the Incident Management System (IMS) structure by dispatching units:

- 1) As part of the original dispatch due to the nature and/or gravity of the incident; or
- 2) At the request of Tier 1 forces on the scene.

Command

The responding Command Personnel will:

- 1) Coordinate all tactical operations for HazMat Teams and EMS
- 2) Supervise and direct emergency decontamination
- 3) Supervise and direct emergency medical treatment
- 4) Coordinate all tactical law enforcement operations

Hospital Emergency Room Department/Medical Director/Health Department

The Hospital Emergency Room Department, the Physician, the Medical Director and Health Department will:

- 1) Coordinate issues in threat assessment.
- 2) Design and implement the action plan with the hospital response.

Tier 3 - UNIFIED COMMAND

Unified Command

The mission of the Incident Commander will be to establish an integrated Unified Command encompassing:

- 1) Local jurisdiction Fire, EMS, and HazMat Teams
- 2) Local law enforcement
- 3) State and local resources/agencies
- 4) Federal agencies through FBI and FEMA

Specialists

Specialists will be responding as part of the Tier 3 response to facilitate and process available data to refine threat assessment. Their action plan should include:

- 1) Evidence collection
- 2) Cyber terrorism investigators/experts
- 3) Secondary devices
- 4) Medical personnel

Public Information Officer (PIO)

The mission of the responding PIO elements will be to:

- 1) Process and disseminate information
- 2) Facilitate Joint Information Center (JIC)

APPENDIX C

Recommended Operating Procedures

Initial First Response Actions

The responding agency's operational SOPs take precedence in all circumstances.

The following guidelines are used when the standing applicable SOPs do not cover a specific situation. The primary concept that must be kept in mind at all times is first responder safety. First responders who are not trained to the required level for operations in possibly contaminated or otherwise hostile areas are best used to demarcate the affected area and effect an evacuation of the surrounding area.

Arrival on Scene

The initial actions that are taken by the first responders will set the stage for the rest of the operation. The first responders should:

- 1) Respond to all incidents using appropriate protective equipment.
- 2) Gather as much information from dispatch as possible regarding the incident.
- 3) Determine wind direction and speed at incident location. This information should be available from police and fire dispatchers. Approach the incident scene from upwind (with the wind behind you) and uphill, when possible.
- 4) Survey the scene from a safe distance before making approach.
- 5) Park responding apparatus a safe distance away. Do not drive apparatus into the suspected area, as crews may become casualties. Do not block access.
- 6) Stage additional responding units a safe distance away from the scene. Anticipate and position the apparatus at an advantageous position for both an easy deployment and a quick tactical retreat.
- 7) Initiate Incident Command.
- 8) Assess on-scene indicators and request additional resources if needed. Keep in mind that a common mistake made by first responders is to expect the usual and not the unusual. If in doubt, err on the side of safety and request additional resources as they can easily be cancelled later. In the case of suspected multiple casualties, always consider activating a mass casualty call as early as prudently possible.
- 9) Initiate accountability system.

Threat Assessment

Do a visual assessment of the scene and report this information back to dispatch. The location of the incident may be an indicator as to whether or not this may have been a terrorist event. This information may be provided by the:

- 1) dispatcher
- 2) first responder
- 3) local law enforcement intelligence
- 4) Specialized terrorism response groups (for example, the Integrated Threat Assessment Group - ITAG)

Indicators may include:

- 1) Occupancy or location
- 2) Symbolic or historical
- 3) Public buildings or assembly areas
- 4) Controversial businesses
- 5) Infrastructure systems
- 6) Type of event
- 7) An intentional act or unusual circumstances.
- 8) Explosives and/or incendiaries
- 9) Trends or previous terrorist events
- 10) Incidents involving firearms
- 11) Non-trauma mass casualty incidents
- 12) Timing of the event
- 13) Events that occur on the anniversary date of another significant event (for example, Waco, Oklahoma City)
- 14) On-scene warnings
- 15) On-scene observations could indicate something out of the ordinary (that is, unusual equipment or supplies on site, secondary devices)
- 16) Unexplained illnesses or deaths
- 17) Items that seem out of place, such as containers, spray devices, and items that have been moved from their normal location.
- 18) Prior incident history for location

Scene Control

It is highly likely that many people, including responders, will want to rush into a scene to rescue people. Personal safety must be considered once an incident has occurred because additional casualties and victims must be avoided. It is paramount that emergency responders work together to establish a perimeter control; set up field command centers, triage, and decontamination areas; direct victims to appropriate sites/facilities, determine evacuation and/or shelter in place zones; and follow strict personal safety protocols.

Witnesses and people close to the incident may be wandering around or inside buildings waiting for direction from emergency personnel. Presence of people on the scene should be controlled either by sheltering in place or extraction.

Emergency responders should perform a sweep of the area to locate/assist possible disoriented victims and secondary or multiple devices. Victims that are able to walk may wander away from the initial scene.

Establish and Secure Communications

It is important to identify the channel or frequency on which the responders will need to monitor and transmit. In the case of multi-agency responses, it will be paramount to establish a location where personnel with a variety of equipment can be staged to assist with the communication between agencies.

Identify the "Hazard Control Zone"

With every terrorist incident there will be an area that may be hazardous to any personnel or civilians within the area. When possible, first responders should determine where the most hazardous location is and initiate control zone procedures.

Establish an Inner Incident Perimeter

An inner perimeter must be established so emergency personnel have a safe and controlled area to work in and assemble. The establishment and demarcation of the inner perimeter will automatically designate the inside boundary of the "Outside Incident Perimeter." The inner perimeter will include additional operational and/or functional perimeters to be determined by first responding personnel. These additional perimeters will include hot, warm, and cold zones and small staging or operational areas, such as decontamination corridors and triage and transport areas.

Establish and Adjust the Outer Incident Perimeter (As Needed)

The establishment of the outer incident perimeter will be a by-product of the establishment of the "Inner Incident Perimeter" as the inside demarcation line of the outer perimeter is also the outside demarcation line of the inner perimeter. The outside demarcation line of the outer perimeter will be established under the advice of the appropriate command officer. The intent of the outer perimeter is to secure a buffer area between the working units and the general community.

Outside perimeter control will be maintained by local law enforcement forces and should be setup as early as possible. Clearly marked and designated entry and exit points must be identified and communicated to Command, Dispatch, and all responding units.

The effects of possible chemical plumes should be taken into consideration when determining the outer perimeter. The outer perimeter must also provide for traffic control and allow for entry and egress corridors for emergency vehicles. When designating perimeters, natural barriers such as roads, canals, and fences should be considered.

Once the perimeters are established, the evacuation of all non-emergency and unauthorized personnel inside the designated perimeters must be accomplished. The appropriate command officer must determine whether or not any of these individuals will need to be decontaminated and/or if contact information needs to be documented for future follow-up.

Establish Scene Incident Command Post

An Incident Command Post should be established between the inner perimeter and the outer perimeter to provide on-site coordination of services. Mobile units should be brought in when there are no suitable buildings in the area. Contact and request the closest mobile Incident Command Post available (this should have been previously identified as part of the planning process.) Direct contact from the Scene Incident Command Post to the Emergency Operations Center should be established and maintained to ensure requests for assistance and information updates are communicated. The Incident Command Post should be located uphill and upwind of the incident, if possible.

When setting up an Incident Command Post, the area should be swept for secondary devices prior to the command post being set up. Once the Incident Command Post area has been swept for secondary devices, the law enforcement sector will make provisions for providing command post security to guard against the placement of a secondary device and intrusions in general.

Area traffic should be monitored and controlled to protect against the placement of large secondary explosive devices, such as car bombs.

Selecting Staging Area

An area where resources and equipment can be delivered, stockpiled, and utilized should be established. The staging area should be selected far enough away from the actual scene so that safety is guaranteed. However, it also must be close enough for instantaneous deployment of staged resources.

This area should also be swept for secondary devices prior to becoming operational. Law enforcement will set up perimeter security and maintain security until the conclusion of the incident. Security should be designed against the placement of secondary devices and intrusions.

Provisions must be made for the hydration and alimentation of staged staffing resources. The pre-identified Logistic Group must be contacted so that they can setup a refueling schedule for operational and staged apparatus.

Identify and Request Additional Resources

As soon as possible, the first responders should assess the situation and determine what type of additional support is, or may be, needed.

Once the specialized teams arrive, the response actions may include:

- 1) Identification of agent
- 2) Identification of any possible secondary devices
- 3) Protective measure to reduce and/or eliminate the threat
- 4) Preservation of crime scene
- 5) Identification and removal of casualties/fatalities
- 6) Decontamination of casualties/fatalities
- 7) Triage of casualties

Identification of B-NICE/Cyber Agent

Unknown Substance Testing and Identification - During an incident there might be a need to test an unknown substance to determine whether or not it is a hazardous material or a WMD agent. Most first responding Hazardous Material Teams are able to conduct preliminary testing to determine, to a certain degree, the makeup of the substance. More definite testing will need to be conducted to positively identify the substance in question.

Biological - On-scene Hazardous Material/Bio Teams may conduct or assist in evaluation of a preliminary sample collection for the presence of biological agents. If more definitive testing is required, the testing will be conducted by one of the pre-designated Florida Department of

Health Bureau of Laboratories, Florida Department of Agriculture Consumer Services, and/or Center for Disease Control and Prevention Emergency Response 770-488-7100.

- 1) Any test with a positive indication of a hazardous material may automatically escalate the response. Law enforcement will usually take possession of the properly bagged substance and start the procedure for transporting the substance so that more definitive testing can be conducted. The substance will be transported to a testing facility where further testing will be conducted.
- 2) Any positive indication as manifested by multiple casualties exhibiting the same to similar types of symptoms, in and of itself, will be cause enough to escalate the on-scene response and may activate the Federal Response Plan or CONPLAN.
- 3) In the situation where there is a negative result on the field-testing and there is an absence of casualties, a sample of the unknown material may still be collected as evidence for law enforcement case investigation. The Florida Department of Health, Bureau of Laboratories will conduct a follow-up test to supplement the field test for suspect biological agents.

The standard operating procedure for transporting a sample of the unidentified substance to one of the Florida Department of Health, Bureau of Laboratories for testing is as follows:

- 1) The Bureau of Laboratories will be notified by phone as soon as possible and will be informed of the nature and extent of the incident and they will be informed that they will need to test a substance in order to identify its nature.
- 2) While under the direct supervision of the ranking or senior on-scene, properly trained and protected personnel, a sample of the substance in question will be triple bagged. The bags will be decontaminated using all appropriate safety procedures to render it safe for transport.
- 3) The sample will then be transported to the appropriate laboratory by an appropriate vehicle and escort.
- 4) Upon arrival at the lab, the substance will be turned over to lab personnel.
- 5) This exchange will be done following all applicable procedures to protect the chain of custody.
- 6) Florida Department of Health, Bureau of Laboratories will conduct the test in its facilities and provide test results to the on-scene Hazardous Material Team leader, the FBI, and the State Warning Point as soon as possible after the delivery of the substance in question.

Nuclear - On-scene Hazardous Material Teams will survey for the presence of radioactive types of materials and should be able to provide a quantitative assessment on the exposure levels emanating from alpha, beta, and gamma sources present on the scene. The Hazardous Material Team will identify and establish an appropriate safety perimeter. The Florida Bureau of Radiation Control at 407-297-2095 is available to conduct definitive testing.

Chemical - On-scene Hazardous Material Teams will conduct preliminary field-testing for the presence, classification, and concentration of hazardous chemicals. The on-scene Hazardous Material Teams may be supported by the Florida Poison Information Center; 24-hour "Hot Line" at 1-800-282-3171. They will use victim symptomology to try to further identify the substance in question. Additional assistance in chemical identification and course of action is available at ChemTrec's 24-hour "Hot Line" at 1-800-424-9300. If the substance in question is military in nature, contact U.S. Army Operations Center at 703-697-0218 (for explosive materials) or Defense Logistics Agency at 1-800-851-8061 (dangerous materials other than explosives).

Identification of Possible Secondary Devices

Recent events with incendiary devices have highlighted the need for extreme caution on the part of responders. Secondary devices aimed at first responders have been found and have detonated at the initial scene. Bomb squad and/or other qualified personnel should perform this assessment.

The law enforcement sector officer, upon the advice of the on-scene bomb squad, must determine whether or not cellular phones, radios, beepers, and car alarm remotes must be turned off or kept away from suspected bombs. The radio frequency transmitted by one of these devices may cause a device to detonate.

Once the command post area has been swept for secondary devices, law enforcement will make provisions for providing command post security to guard against the placement of a secondary device and intrusions in general.

Removal of Casualties/Fatalities

Designated and properly protected response personnel will extricate victims who are unable to move themselves outside of the hot-zone. The extrication of victims will be done in accordance to standard triage practices. Obvious fatalities will be left in place pending the activation and arrival of the Medical Examiner's Team and/or Disaster Mortuary Operational Response Team (D-MORT).

Decontamination of Casualties

The standard Hazardous Material decontamination procedure will be followed. If it is determined that an alternate decontamination method is needed due to a particular contaminant, the on-scene Medical Officer in Charge, Poison Control, ChemTrec, local Hazardous Material Team, and/or the military will be consulted.

The local Fire/Rescue decontamination standard operating procedures, developed by their respective Hazardous Material Team, should address the capabilities and provisions for decontaminating mass casualties from triage to hospital.

Decontamination (decon) is to proceed as soon as possible, based on two considerations:

- 1) Whether a person or an article is contaminated; and
- 2) The physical property of the contaminant (gas, liquid, or solid).
- 3)

In all cases, as much contamination as possible should be left in the Hot Zone.

Priority must be given to the decontamination of persons. Generation of diluted contaminant (due to flushing or any other action) requires the capture and confinement of that material, whenever possible.

In decontamination, time is of the essence. The longer that a person remains in contact with a hazardous material, the greater the absorption of the contaminant by that person. Quick decontamination of victim(s) is the goal of first responders. The most effective decontamination time is within 1 to 2 minutes after exposure. The simple removal of the victims' clothing can effectively remove much of the contaminants.

All decontamination actions conducted by first responders will be carried out using the appropriate personal protection equipment (PPE) as determined by the senior Hazardous Materials Officer on-scene or by the appropriate standard operating procedures (SOPs). ***In the event of gas or vapor contamination, the simple removal of the outer layer of clothing on the victim may be sufficient decontamination.*** If further, or more thorough, decontamination is necessary, it will be performed in the following three stages:

- 1) Gross decontamination, involves the safe removal of the victim from the contaminated environment, complete removal of the victims' clothes, and a complete head to toe rinse with the appropriate solution (usually plain water or a combination of water and 0.5% household bleach.)
- 2) Secondary decontamination involves more thorough washing of the victim in a head to toe fashion using a decontamination solution, which is then followed by a complete rinsing.
- 3) Definitive decontamination is carried out by a series of washes and rinses until such time that it is certain that all contaminants have been removed from the victim. Definitive decontamination will usually take place at a medical facility.

In the absence of Hazardous Materials trained personnel, the following chart provides a guide as to the type of decontaminating solution best suited for a particular substance:

| Substance | Decontamination |
|-----------------------------------|-------------------------------|
| Nerve Agent | Soap, Water & Bleach Solution |
| Sulfur Mustard | Soap, Water & Bleach Solution |
| Lewisite | Soap, Water & Bleach Solution |
| Cyanide | Soap & Water |
| Phosgene | Soap & Water |
| Ammonia | Soap, Water & Irrigate Eyes |
| Chlorine | Soap, Water & Irrigate Eyes |
| CN Gas (Mace) | Soap, Water & Irrigate Eyes |
| CS Gas (Tear) | Soap, Water & Irrigate Eyes |
| Oleoresin capsicum (Pepper Spray) | Soap, Water & Irrigate Eyes |

First responding units arriving at a suspected terrorist attack will position their apparatus and equipment in an up-wind position and prepare to set up a drench decontamination corridor using on-board appliances and water supply, if necessary. If and when possible, first-in engine or aerial companies should connect to an appropriate hydrant and conduct a forward lay to provide a supply line to guarantee an uninterrupted water supply to adequately perform gross decontamination operations and anticipate the initial elements of a decontamination corridor. In the absence of a hydrant, a secondary source of water must be located, drafting operations should be considered, and the appropriate tanker apparatus should be deployed.

Triage of Casualties

Triage will be performed in accordance with the Simple Triage and Rapid Treatment (S.T.A.R.T) method. Most Florida fire rescue departments have adopted this MCI triage method. Every local fire department should have START kits on their first response apparatus as part of their standard equipment inventory.

S.T.A.R.T. is a tag system designed to assess a large number of victims rapidly and can be used by all personnel regardless of their medical training. The initial triage is accomplished by the assessment of respiratory rate, perfusion, and mental status. Triage ribbons/tags are used to identify the priority of the patients.

- **RED - First Priority - IMMEDIATE**
- **YELLOW - Second Priority - DELAYED**
- **GREEN - Third Priority - AMBULATORY**
- **BLACK - Deceased**

Secondary triage is performed on all patients during the treatment phase in the medical sector. During this phase patients can be up-graded or down-graded depending upon the dynamics of their injuries.

Treatment of Casualties

The reality of an incident of large proportions has shown that victims will leave the scene and either walk to or find a rapid transport to a medical facility--usually the facility closest to the incident site. The danger in this is that victims may be contaminated with an agent that could then contaminate other people, vehicles, and medical facilities which will in turn increase the number of casualties and overwhelm the facility.

Emergency personnel on scene should plan to have a staging area for victims. Local medical facilities will be contacted as soon as possible in order for them to prepare an exterior triage and decontamination area to ensure the safety of their staff and facility.

Medical and other personnel will be apprised of conditions that may develop over time in case patients develop complications later on. Patients who exhibit suspect symptoms will be treated by established protocols.

Isolation and Quarantining of the Injured and Exposed

The criteria and procedures for isolating/quarantining the injured and other exposed people who cannot be safely extracted, pending arrival of appropriate assistance, should be addressed in the local fire/rescue department's procedure manuals.

Usually the first arriving unit will perform the initial size-up. An approximation of the number of victims and MCI level will be announced. Special needs such as isolation or quarantining exposed victims will be determined at this point. Incident command and a staging area will be established.

Most fire department hazardous materials operating policies require that the area be isolated and entry denied to all personnel until the material(s) has/have been identified. Protective clothing and equipment necessary to operate safely in the affected area must be utilized.

Decisions regarding long-term quarantining of the community for highly contagious biological agents will be made by Emergency Management in consultation with the County Health Department, State Health Department, and the Centers for Disease Control and Prevention (CDC).

Transport of Victims

Victims should be decontaminated at the scene prior to transportation. Transportation of decontaminated patients to the appropriate facilities will follow the standard protocols for a mass casualty incident. In-place, on-scene, temporary sheltering of victims may be deemed necessary while receiving facility resources are stabilized. Coordination with other county, state, and federal resources will be conducted through the State Division of Emergency Management.

Stocks of Available Antidotes

Currently the amount of antidotes carried routinely on local pre-hospital rescue vehicles is minimal. Most rescue trucks only carry enough atropine to treat one or two patients (for organophosphate exposure, like nerve gas). These rescue trucks are supplied with no other type of antidote.

In order to treat a large-scale contamination, three approaches should be taken:

- First, the local Terrorism Response System should stockpile quantities of antidotes available for distribution to field responders and local hospitals. Local hospitals may also be able to provide rescue trucks with antidotes, depending upon the antidote and required amount.
- Second, additional supplies may be available from State and/or Federal sources, but these sources must be pre-identified and pre-planned prior to an incident. Additional antidotes may be available from surrounding Veterans Administration Medical Centers, Fire/Rescue Supply Bureaus, EMS supply bureaus, and local pharmaceutical distribution warehouses.
- Finally, through activation of National Disaster Medical Services (NDMS), additional resources can be requested.

Preservation of Crime Scene

If the event is determined to be a possible terrorist act, evidence collection will be essential. The responding local law enforcement agency will secure the crime scene, and notify the state law enforcement and the FBI.

Health and Human safety issues will take precedence over evidence collection. However, responders should try to minimize the amount of disruption to the scene.

The FBI will be notified of any potential terrorist-related act, regardless of the number of casualties. The FBI response may include such field office resources as the WMD Coordinator, SWAT, HAZMAT-trained personnel (like the Hazardous Materials Response Unit or HMRU), Bomb Technicians, and the Evidence Response Team (ERT). Additional FBI resources may be called from outside the local area, as needed.

The initial local FBI Field Office point of contact is the WMD Coordinator. Other FBI personnel may be dispatched to the scene, or appropriate areas, for liaison or investigative purposes. These technical teams may make entry into hazardous material scenes and work alongside local Hazardous Material and Bomb Squad personnel. These FBI resources are capable of agent detection, identification, and sampling, but may request the assistance of local first responder resources. Additionally, FBI Bomb Technicians will assist in the detection and neutralization of possible secondary devices.

The purpose of the FBI's Evidence Response Team is to photograph, sketch, document, and gather evidence at the crime scene for the purpose of investigation and eventual prosecution. Depending on the previous training, members of the ERT may be capable of conducting operations at hazardous material scenes.

Disposition of the Deceased

In the event of a mass casualty incident involving the use of a B-NICE device, decontamination of the deceased will need to be performed. Decontamination of the deceased should take place at the scene, while preserving any significant evidentiary material. It is the responsibility of the lead Incident Commander to determine who will be the best suited to perform this function and to supervise the procedure.

If the incident involves a biological agent, the Medical Examiner's Office will work with experts from the County Health Department to determine the best way to deal with the disposition of the deceased. The Centers for Disease Control and Prevention (CDC) may also be involved, depending on the circumstances.

Given the type and nature of the device that is used, it is possible that evidence such as projectiles, bomb fragments, and/or chemical compounds could be found on the bodies of the deceased. The FBI Evidence Response Team will place evidence collection experts and equipment on the scene and/or at the Medical Examiner's Office where the bodies are taken for autopsy. In the event that the FBI is not on the scene and will not be responding, normal evidence gathering protocols will be implemented. In the absence of the FBI, the responsibility for crime scene preservation and evidence will belong to the local law enforcement agency with assistance from state law enforcement, as required.

In an event where the District's Medical Examiner's Office becomes overwhelmed, the Medical Examiner's Commission (within FDLE) could activate the Disaster Mortuary Operational Response Team (D-MORT). The incident must be declared a *federal* emergency in order to activate this resource. D-MORT provides assistance to local agencies in terms of morgue equipment, personnel and total mortuary care (such as autopsies, preparations, caskets, and funeral arrangements).

Facilities

In order to meet the needs of the victims, responders, and the media in a terrorist event, the following facilities may be needed:

Incident Command Post:

The first responders may choose to run their operations from a mobile command post, a tent, or an existing structure. Some agencies have mobile command units and/or tents that can be set up at the incident site to run their operations. These agencies must be identified and mutual aid pacts must be arranged so that these assets can be made immediately available.

If a suitable building is close to the scene, the Incident Commander may request the use of this structure. A determination by the Incident Commander would be made as to what support equipment is needed in any of these situations.

Casualty Collection Point:

Large facilities, such as auditoriums or schools, may be necessary to hold victims waiting to be treated or to be reunited with family members. It is critical to ensure that screening is performed to ensure proper decontamination of exposed individuals. Appropriate officials will provide guidance as to which contaminant(s) has/have been used and the appropriate measures to be taken.

Initial monitoring should consist of a brief screening to simply identify contaminated individuals. More detailed screening and decontamination will take place if the initial monitoring determines that contamination does or may exist. Vehicles can be directed through a vehicle wash down to eliminate any gross contaminants prior to initial survey.

Joint Information Center

As a result of terrorist incidents, media representatives from all over the world will likely be present. In order to facilitate their needs and keep the media up to date, the Public Information Officer in charge will establish an Emergency News Center. This site may be either an indoor or outdoor facility. It should be close to the incident scene, but not so close that it interferes with the response operations.

The Public Information Officer of the local jurisdiction in charge will be responsible for the coordination of public information.

There are three main mechanisms for the delivery of Emergency Public Information:

- 1) Emergency Management may use the Emergency Alert System (EAS) when a sudden event requires immediate contact with the general public. Pre-scripted EAS messages should be designed and stored at the local EOC. The Public Information Officer should execute these messages at the county warning point.
- 2) A local Emergency Information Hotline (Rumor Control) should be established to adequately inform the public. The Rumor Control number may be made public through the local media. The clear, accurate, and timely distribution of information to the public is essential.
- 3) Media interface: The local jurisdiction's Public Information Officer should manage the media interface in the appropriate languages for the region. All other departmental spokespeople must coordinate their announcements through the designated Public Information Officer.

Additionally, the local response agency's websites should be updated as an event evolves providing more detailed information for the public, press quotes, and photos of the event if needed.

Resources

Military Assistance - refer to ESF 13

Some local jurisdictions have a close working relationship with military installations. These relationships could be beneficial to local first responders. A Memorandum of

Understanding with local military installations may provide specialized technical resources in situations involving an "Imminent Serious Need".

Obtaining State/Federal Assistance

Requests for additional assistance are made directly to the State Emergency Operations Coordinator in accordance with the statewide Mutual Aid Agreement and Comprehensive Emergency Management Plan.

Forensic Investigation and Evidence Collection

Terrorist acts are criminal acts and, as such, evidence collection will be an essential component to the incident recovery. Depending on the crime scene, the evidence collection may delay restoration of normal activities at the location for an extended time.

Recovery

The length of the recovery period from a terrorist incident will depend greatly on the type of incident that has occurred. The following items need to be considered:

Search and Rescue Operations

In the case of a large building collapse, a search and rescue operation could last until the last body is removed from the site. Search and rescue operations for viable victims usually last for about ten days. Further operations will continue from there, as directed, or as the situation dictates.

Long Term Issues

Depending on the incident and agent used, the victims could require very complicated and lengthy treatment.

- **Biological** - If a biological agent is used the recovery stage could last for years. Large numbers of people may need to be quarantined for long periods of time.
- **Nuclear** - If people are contaminated with radioactive material, there may be a lot of people who are sick for extended periods of time. If structures are exposed to large doses of radiation, they may not be usable for years.
- **Chemical** - The short and long-term effects of people exposed to chemicals varies

widely according to type and dosage. There may be a terrific strain on the medical community in an effort to meet the needs of victims. In addition to the human factors, decontamination of facilities may be a very lengthy process.

People may be in hospital facilities for weeks or months, depending on their condition. The critical time before a facility can return to normal operations will depend on the circumstances.

Other factors must be considered for the following circumstances and will be based upon incident-specific criteria and local issues:

- **Cyber**
- **Public Awareness**
- **Victim Support Services**
- **Legal Considerations**
- **Site Remediations**

Appendix D Agent Morphology

Ballistics/Explosives

Ballistic injuries resulting from terrorist attacks are still the most common and have the highest "lethality index". A determined individual or group of individuals armed with assault type weapons can produce a high rate of casualties in a short period of time.

Table 1 - Lethality Index for Ballistic Injuries¹

| Weapon | Fatalities | Nonfatal Injuries | Lethality Index* |
|---|------------|-------------------|------------------|
| Bullets | | | |
| Low Velocity | 35 | 430 | 0.08 |
| High Velocity | 152 | 261 | 0.37 |
| Fragmentation Munitions | 5 | 33 | 0.13 |
| Homemade Bombs | 10 | 164 | 0.06 |
| High explosive Devices | 79 | 281 | 0.22 |
| Hand Thrown missiles | 0 | 304 | 0 |
| *Lethality Index is the number of fatalities divided by the number of injuries and fatalities combined [LI=fatalities / (injuries + fatalities)]. | | | |
| Information derived from Journal of the Royal Army Medical Corps | | | |

Bombs are the most common weapons of terrorists. Bombs are easy to make from ordinary household materials and can be very effective. A fertilizer bomb blasted the Alfred P. Murrah Federal Building in Oklahoma City. When a bomb of this type explodes, it sends a shockwave in all directions and smashes into buildings blocks away. As this shock wave travels, powerful vacuum forms behind it, sucking in the entire atmosphere that has been displaced by the original shockwave. The surrounding area is smashed a second time by the aftershock. All this takes less than a second. Materials in the way of these shockwaves became high velocity projectiles. Walls move away from the blast and then back toward the blast before finally crumbling. Floors and roofs defy gravity for a split second before collapsing to the ground. This can all be accomplished by the use of common household substances.

Most fertilizer bombs, like the Oklahoma City bomb, generate blast waves that can exceed 6800 miles per hour. High-order military explosives, such as C4 and Semtex, can create blast waves almost three times as fast.

¹ Owen-Smith MS. A computerized data retrieval system for the wounds of war: the Northern Ireland casualties. *J R Army Med Corps.* 1981; 127:31-54.

Table 2 - Mechanisms of Blast Injuries²

| Type of Blast Injury | Mechanism | Injuries | Diagnostic Procedures | Treatment |
|----------------------|---|---|--|--|
| Primary | Injury from blast wave as it travels through the air or water | Pulmonary contusion Hollow viscous perforation (possibly delayed) Perforated eardrums | History and Physical examination Chest Radiograph Serial abdominal examination | Pulmonary toilet Ventilatory support Laparotomy as indicated |
| Secondary | Injury from primary and secondary missiles as they are propelled outward by the explosion | Penetrating missile injury Orthopedic injuries | History and physical examination Neurovascular evaluation of involved extremities Direct skeletal radiographs | Fracture stabilization Debridement Tetanus prophylaxis Laparotomy or thoracotomy as indicated |
| Tertiary | Injury sustained when the casualty is propelled (displaced) through the air and then impacts onto a relatively fixed object | Closed head injury Cervical spine injury Orthopedic injuries | History and physical examination Cervical spine evaluation Computed tomography of the head as indicated Direct skeletal radiographs | Neurosurgical intervention for intracranial mass lesions Fracture Stabilization |
| Miscellaneous | Burn injuries, inhalation injuries, and injuries related to structural collapse | Burns Inhalation injury Crush syndrome Compartment syndrome | History and physical examination Creatine kinase level | Secure airway Fluid resuscitation Burn coverage |

Primary missiles are those derived from the bomb container itself. Secondary missiles are those generated from the surrounding blast environment (e.g. Glass and other building materials).

NUCLEAR/RADIATION

Radiation is defined as high-energy particles or gamma rays that are emitted by an atom as the substance undergoes radioactive decay, which is the process in which a radioactive nucleus emits

² **Terrorism in America, An Evolving Threat:** Matthew S. Slater, MD; Donald D. Trunkey, MD; Archives of Surgery, Special Article B October 1997

radiation and changes to a different isotope or element. The types of radiation are in the following forms of energetic particles:

- o Alpha particles
- o Beta particles
- o Photons (gamma rays and X-rays)
- o Neutrons

Particles lose their energy by depositing it in the material they move through, whether that material is air, water, people, or lead. Radiation, regardless of intensity, has the potential to produce harmful effects on human beings, animals, and plant life. Background (natural) radiation poses little threat to our systems. However, serious health consequences can be expected if a person is subjected to large amounts of radiation. The types of radiation and their effects are as follows:

- o **ALPHA** (particulate) radiation particles cannot penetrate the outer layer of skin. They can be stopped by thin layers of light materials (such as a sheet of paper) and pose no direct or external radiation threat. *However, they pose a serious health threat if inhaled or ingested.* Therefore, a respirator or the use of Self-Contained Breathing Apparatus (SCBA) is recommended. The range in air for alpha particles is 1 to 3 centimeters.

- o **BETA** (particulate) radiation particles can penetrate skin, but not vital organs (lungs, gastrointestinal tract, heart, etc.) and represent a hazard both internally and externally. Beta radiation can be lethal depending upon the dose and length of time of exposure. It is easily shielded by aluminum. The range in air for beta particles is approximately 10 feet. Initial symptoms are itching and burning of the skin, with later symptoms that include reddening of the skin and more severe changes in pigmentation, hair loss, and sores.

- o **GAMMA** (energy) and **NEUTRON** radiation particles can penetrate through the body and represent a hazard both internally and externally. These rays have high energy and a short wavelength. Shielding against gamma radiation requires thick layers of dense materials, such as lead. Gamma and neutron radiation typically have a range in air of several hundred feet.

Table 3 - Nuclear Agents³

| Agent | Particles | Planned Use | Potential For Terrorist Use | Mode of Contamination | Critical Body Site |
|-------------------|------------------------|--|-----------------------------|--|--------------------|
| Uranium 235 & 238 | Alpha Beta Gamma | Reactor fuel Nuclear weapons | Nuclear weapons | Inhalation Skin Wound absorption | Bone |
| Plutonium 239 | Alpha Gamma | Reactor fuel Nuclear weapons | Nuclear weapons | Inhalation Wound absorption | Bone |
| Cesium 137 | Beta Gamma | Medical & Industrial radiation source | Radiation Poisoning | Inhalation Skin Gastrointestinal | Total Body |
| Iodine 131 | Beta Gamma | Medical | Radiation Poisoning | Inhalation Skin Gastrointestinal | Thyroid |
| Cobalt 60 | Gamma | Medical & Industrial radiation source | Radiation Poisoning | Inhalation Gastrointestinal | Gastro-intestinal |

The main concern with radiation is that it is an invisible hazard. Unless the responding public safety agency has radiological detection equipment, or the nuclear material at issue is clearly marked and identified, there is a strong chance that the initial identification of a radiological or nuclear hazard will go unnoticed. Although, there is no one piece of equipment available on the market to meet all detection requirements, there are separate detectors for each type of radiation. An additional concern would be the availability of protective clothing and breathing gear, in sufficient quantities, to protect first responders.

If first responders are subjected to large amounts of radiation due to major radiation accidents or nuclear attack, they can expect serious consequences to their health. *It should be noted that individuals suffering from radiation injuries are NOT radioactive!*

³ Adapted from Textbook of Military Medicine

Of importance is the dose or amount of radiation absorbed over a period of time. There are many terms used to measure the dose of radiation. One is the Roentgen Equivalent Man (rem), which is a unit of absorbed dose that takes into account the relative effectiveness of the radiation involved in causing health effects. Another measurement of the absorbed dose of radiation is known as rad. Sometimes rad measurements are referred to as Gray, which is the equivalent of 100 rad. In this document, health effects are expressed in rad.

- 1) 50 to 200 rad - Approximately 6 hours after exposure, the individual may have symptoms ranging from none to transient mild headaches. There may be a slight decrease in the ability to conduct normal activities. Less than 5 percent of individuals in the upper part of the exposure range will require hospitalization. Average hospital stay will be 45 to 60 days, with no deaths.
- 2) 200 to 500 rad - Approximately 4 to 6 hours after exposure, individuals will experience headaches, malaise, nausea, and vomiting. Symptoms are not relieved by antiemetics in the upper exposure range. Individuals can perform routine tasks, but any activity-requiring moderate to heavy exertion will be hampered for 6 to 20 hours. After this period, individuals will appear to recover and enter a latent period of 17 to 21 days. If individuals have received 300 rads or more, they will have large quantities of hair loss between 12 to 18 days after exposure. Following the latent stage, symptoms will return, requiring 90 percent of the personnel to be hospitalized for 60 to 90 days. Probably less than 5 percent of those at the lower dose range will die, the percentage increasing toward the upper end of the dose range.
- 3) 500 to 1,000 rads - Approximately 1 to 4 hours after exposure, severe and prolonged nausea and vomiting will develop that are difficult to control. Diarrhea and fever develop early in individuals in the upper part of the exposure range. Significant incapacitation is seen in the upper ranges. Initial symptoms last for more than 24 hours, then go into a latent period lasting 7 to 10 days. Following the latent stage, the symptoms return requiring 100 percent of the individuals to be hospitalized. Of those in the lower range, 50 percent will die, the percentage increasing toward the upper range. All deaths occur within 45 days. The survivors require 90 to 120 days of hospitalization before recovery.
- 4) 1,000 rad or more - Less than 1 hour after exposure, individuals develop severe vomiting, diarrhea, and prostration. There is no latent period. All individuals require hospitalization and die within 30 days.

BIOLOGICAL AGENTS

Governments have used biological warfare as long as civilization has depended on agriculture. Today, various governments continue to research the development of poisonous toxins that are far more deadly than chemical warfare agents. Two of the earliest reported uses of toxins occurred in the sixth century BC: the Assyrian poisoning of enemy wells with rye ergot, and Solon's use of the purgative herb hellebore during the siege of Krissa.

The use of biological agents is the oldest weapon of the NBC triad. Biological agents are more deadly than chemical agents and occur in nature and are being artificially developed in the laboratory. Large numbers of naturally occurring poisons have also been examined to determine their value as warfare agents. These include Capsaicin (an extract of cayenne pepper and paprika), Ricin (a toxic substance found in the castor bean), and Saxitoxin (a toxic substance secreted by certain shellfish).

Table 7 - Biological Agent Quick Information Chart ⁴

| Agent | Class | Transmission | Symptoms | Treatment |
|--|---------------------------|------------------------------------|---|--|
| Anthrax (<i>Bacillus anthracis</i>) | Bacteria | Inhalation of bacillus or spores | Dyspnea Cyanosis Pulmonary edema Respiratory failure | Vaccination Antibiotics |
| Bubonic plague (<i>Yersinia pestis</i>) | Bacteria | Fleas | Fever Delirium Cutaneous lesions | Vaccination Antibiotics |
| Salmonella species | Bacteria | Ingestion | Gastrointestinal symptoms Fever | Antibiotics |
| Botulinum toxin (<i>Clostridium botulinum</i>) | Bacterial (Neurotoxin) | Inhalation Contact (skin wound) | Paralysis | Supportive |
| Gas gangrene (<i>Clostridium perfringens</i>) | Bacteria | Wound infection | Necrotizing Soft tissue infection | Antibiotics Surgical Debridement |
| Ebola | Virus (Filoviridae) | Body fluids | Fever Hemorrhage Convulsions | Supportive No specific treatment |

⁴ **Terrorism in America, An Evolving Threat:** Matthew S. Slater, MD; Donald D. Trunkey, MD; **Archives of Surgery**, Special Article B October 1997

Biological agents generally fall into one of three types:

- 1) **PATHOGENS** - Living, reproducing, disease-producing organisms.
 - a) **Bacteria**. Capable of reproducing outside living cells. *Examples: anthrax, tularemia, bubonic plague, cholera, and typhoid fever.*
 - b) **Viruses**. Infective agents composed of DNA or RNA that can only reproduce inside living cells. *Examples: Venezuelan equine encephalitis (VEE), yellow fever, smallpox, hemorrhagic fever (Marburg and Ebola), and human immunodeficiency virus (HIV).*
 - c) **Rickettsia**. Parasitic microorganisms whose diseases are transmitted by the bite of ticks, lice, and fleas. These parasites require a living host as opposed to bacteria. *Examples: Rocky Mountain spotted fever, Q fever, and flea-borne typhus.*
 - d) **Yeast and Fungi (Mycotoxins)**. Mycotoxins were allegedly used in aerosol form ("yellow rain") to produce lethal and non-lethal casualties in Laos (1975-1982), Kampuchea (1979-1981), and Afghanistan (1979-1981). Since the alleged victims were usually unprotected civilians or guerilla forces in remote jungle areas, it was extremely difficult to confirm the attacks or recover samples. However, over 10,000 deaths have been attributed to the use of these agents in these three campaigns.⁵
 - e) **Genetically Engineered Pathogens**. Through advanced biochemical techniques, pathogens are subject to enhancement to increase their utility. *Examples: antibiotic-resistant bacteria, bacteria genetically altered to have advanced aerosol and environmental durability, immunologically altered viruses resistant to standard vaccines and not identifiable to classical serological means.*
- 2) **TOXINS** - Non-living, poisonous chemical compounds produced through the metabolic activities of living organisms. Toxins are 1,000 times more lethal or effective than standard chemical agents. *Examples: snake venom, scorpion venom, Ricin, Saxitoxin (produced by marine algae), and puffer fish venom.*
- 3) **ENDOGENOUS BIOLOGICAL REGULATORS (EBRs)** - Chemical substances produced in the body to regulate various body functions such as muscle contractions, blood pressure, heart rate, temperature, and immune responses. *Examples: hormones, adrenalin, and delta sleep-inducing peptide.*

⁵ Janes's Chem-Bio Handbook. Frederick R. Sidell, m.d.; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Page 147.

The most practical method of initiating infection using biological agents is through the dispersal of agents as minute, airborne particles (aerosols). Finely divided particles of liquid or solid suspended in a gas are sprayed over a target where the particles may be inhaled. An aerosol may be effective for some time after delivery, since it will be deposited on clothing, equipment, and soil. When the decontaminated clothing is used later, or dust is stirred up, responding personnel may be subject to a secondary dispersal.

Biological agents may be able to use portals of entry into the body other than the respiratory tract. Individuals may be infected by ingestion of contaminated food and water or even by direct contact with the skin or mucous membranes through abraded or broken skin. This makes the use of protective clothing a must, along with protection of the respiratory tract through the use of a mask with biological filters or SCBA.

Exposure to biological agents, unlike chemical agents, may not be immediately apparent. Casualties may occur minutes or hours to days or weeks after an incident has occurred. The time required before symptoms are observed is dependent on the agent used. There are currently no effective monitoring devices available for first responders for use in determining whether they are involved in an incident involving biological agents, though work continues on developing such devices. Often the first clue will come from blood tests, or by other means used by medical personnel, or by observing possible symptoms of people exposed in the area. HazMat Teams and local FBI special response teams have field test kits and procedures to detect the presence of some biological agents such as anthrax.

Some clues may be present that could be indicators that an NBC incident involving biological agents has taken place:

- 1) Unusual numbers of sick or dying people and animals are present. For example, all the birds that are usually present at outside trash bins are dead; no insect sounds, etc.
- 2) Reported illness reflects an unusual or impossible agent for the geographic area or there is an unusual distribution of the disease (that is, the casualties are aligned with the wind direction outdoors).

Biological attacks will be different from natural outbreaks of disease. For example, a steady stream of patients presents to medical facilities instead of the usual peaks and valleys. Or the illness may occur in an unusual environment or time of year (such as cases of anthrax showing up where none have occurred before).

Early warning and rapid identification of biological agents is of primary importance. This warning can sometimes be supplied by intelligence sources, but early warning is not usually available.

Some of the more common or anticipated biological weapons are as follows:

Anthrax is an acute infectious disease caused by the spore-forming bacterium bacillus anthracis. It occurs most frequently in cattle, goats, and sheep that acquire spores from direct contact with contaminated soil. Humans usually become infected through contact with, ingestion of, or inhalation of anthrax spores from infected animals or their products (like goat hair). Human-to-human transmission has not been documented.

Following are sample guidelines for responding to a WMD threat involving anthrax. ⁶

1. Anonymous caller indicating a WMD threat (including anthrax)

- Law enforcement response including local authorities, State Warning Point, and FBI.
- Fire department/HazMat response not recommended unless device or substance is found
- Routine law enforcement investigation.
- Investigative actions during this response may include:
 - Information gathering at the scene
 - Building evacuation/search following local protocol
 - Taking control of the building ventilation system may be warranted, but only if based upon investigative findings.
 - Attention should be focused on appliances or devices foreign to the surroundings.
 - Included should be an assessment of the building ventilation system to rule out forced entry and tampering.
 - ***Protective equipment should not be required unless hazards or risks are indicated.***
 - Investigations similar to a telephonic bomb threat.
- Suspicious findings during investigation should initiate a public safety response including:
 - Fire/EMS/HazMat
 - EOD team.
 - Notifications per local plan which should include local and state health departments.

2. Potential WMD device located

- Follow local protocols for risk assessment and evaluation of potential explosive devices. Included in the response should be:
 - Law enforcement including local authorities, State Warning Point, and FBI.
 - Fire/EMS/HazMat.
 - EOD team.

⁶ Adapted from National Domestic Preparedness Office, Special Bulletin Number 6. January 12, 2000.

- Local and state health departments
- If explosive device is not ruled out, coordinate efforts with local/regional EOD authority and notify FBI Bomb Data Center (BDC).
- If explosive device is ruled out:
 - Evaluate for potential chemical, biological, or radioactive filler.
 - If radioactive filler appears to be present, follow plans for requesting additional assistance, to include Department of Health, Bureau of Radiation Control.
 - If no hazardous materials appear to be present, response continues as a law enforcement investigation.
- Device with potential chemical or biological filler or supplement.
 - Follow local and FBI ERT protocols for documentation of the crime scene.
 - Contain the package following recommendations from a hazardous materials authority. FBI will assure notification of FBI/HMRU.
 - Options include double bagging, steel cans, poly containment vessels, or utilization of a hazardous materials over-pack.
 - Control the material as evidence and follow plan for laboratory analysis.
- Potential release of WMD material from a device.
 - Control the ventilation system.
 - Follow protocols for a hazardous materials incident.
 - Evaluate the extent of contamination.
 - Evacuation of affected areas and decontamination procedures should be selected on the basis of an incident and risk assessment.
 - Provide medical attention following the recommendations from the local/regional public health medical authority.
 - Control and/or isolate the hazard.
 - Treat as a hazardous materials crime scene.
 - FBI will request assistance from FBI-HMRU.

3. Specific situations - envelope with potential threat of anthrax, letter opened, and material present.

- Public safety response including local authorities, State Warning Point, and FBI.
- Contain the package following recommendations from a hazardous materials authority.
 - Options include double bagging, steel cans, poly containment vessels, or utilization of a hazardous materials over-pack.
 - Control the material as evidence and follow plan for laboratory analysis.
- Provide medical attention/decontamination following the recommendations from the local/regional public health medical authority.
 - Evaluate the extent of contamination.

- Evacuation of the affected area and decontamination procedures should be selected on the basis of an incident hazard and risk assessment.
- *Generally, medical prophylaxis and decontamination have not been indicated except for washing hands with soap and warm water.*

4. Specific Situations - envelope with potential threat of anthrax, letter opened, and no specific material present.

- Law enforcement response including local authorities, State Warning Point, and FBI
 - Fire department/EMS/HazMat response not recommended unless suspicious material is found or individuals are presenting symptoms.
- Handle the package following local and FBI ERT protocols
 - Double bag the material and place in a suitable container such as an evidence paint can.
 - Control the material as evidence and follow plan for laboratory analysis.
- *No medical attention/decontamination is necessary unless symptoms are present, although local public health authorities should be notified.*
- Handle as a law enforcement investigation.

5. Specific situations - envelope with potential threat of anthrax, letter not opened.

- Law enforcement response including local authorities, State Warning Point, and FBI.
 - Fire department/HazMat response not recommended unless unsuspected material is found.
- Handle the package following local and FBI ERT protocols.
 - Double bag the material and place in a suitable container such as evidence paint can.
 - Control the material as evidence and follow plan for laboratory analysis.
- **No medical attention/decontamination is necessary.**
- Handle as a law enforcement investigation.

Please Note: According to the CDC, hand washing is sufficient for those who have touched the envelope and letter. Decontamination or prophylaxis is not warranted.

Smallpox

The last reported case in the world was in 1977, and the last case in the U.S. was in 1949. This devastating disease, for which there is no therapy, has a 30% mortality rate and commonly leaves survivors blind or seriously scarred. Smallpox is spread by aerosol or droplets and has an incubation period of 14 days. Initial symptoms resemble the flu but are followed by a rash which, unlike chicken pox, evolves with lesions in identical stages of evolution. The disease is infectious only during the rash phase. The major mechanisms of disease control are isolation

(quarantine) and vaccination. **Vaccination up to 4-5 days after exposure may prevent mortality.**

Vaccination is confounded by two problems: first, the national stockpile is not currently sufficient for more than several million people. The second problem is adverse reaction to the vaccination (occurs with a frequency of 3 per million--40% of these cases are fatal and the rest usually have residual neurologic problems).

This disease has historically been the most feared in medicine and now represents a highly attractive form of biological weapon. Smallpox is attractive as an agent of bioterrorism in part because abandonment of vaccine programs has resulted in near universal vulnerability to smallpox.⁷

⁷ D.A. Henderson, Director, Johns Hopkins Center for Civilian Biodefense **Studies, reviewed**

CHEMICAL AGENTS

Chemical agents are defined as any chemical substance intended to kill, seriously injure, or incapacitate humans due of its physiological effects. They are compounds that, through their chemical properties, produce lethal or damaging effects on man.

Persistency is an expression of the duration of effectiveness of a chemical agent. The level of persistency is used to describe the tactical use of chemical agents and should not be used as terms to technically classify the agent:

Nonpersistent Agents - Remain in the target for a relatively short period of time. The hazard, predominately vapor, will exist for minutes or, in exceptional cases, hours after dissemination of the agent. *As a general rule of thumb, nonpersistent agent duration will be less than 12 hours.*

Persistent Agents - Remain in the target area for longer periods of time. Hazards from both vapors and liquids may exist for hours, days, or even weeks after dissemination of the agent. *As a general rule of thumb, persistent agent duration will be greater than 12 hours.* There are many factors that will affect the persistency of chemical agents:

- 1) **Type of Agent** - Different agents have various consistencies or viscosity with similarities ranging from rubbing alcohol to motor oil and will evaporate or dissipate at approximately the same rate.
- 2) **Amount of Agent** - Different amounts and dispersal methods used (aerosol, splash) also determine the persistency of an agent.
- 3) **Terrain** - The terrain will also affect the duration of an agent (open area, vegetative, urban, soil composition).
- 4) **Weather** - Wind, temperature, humidity, solar radiation, and precipitation all impact on the duration of an agent.

Types of Chemical Agents

The menu of chemical agents is enormous as there are agents typically used by the military, agents found in industry, agents concocted in clandestine labs, and combination agents (more than one chemical agent combined for dual effects).

It would be impossible to put together a complete list of all possible chemical agents and their possible combinations, but it is feasible to list a group of chemical agents that have a higher degree of likelihood for being used in the field by terrorists agents. This list is presented in symptom logic order:

- 1) Nerve Agents
- 2) Blister Agents
- 3) Choking Agents
- 4) Blood Agents
- 5) Incapacitating Agents
- 6) Vomiting Agents
- 7) Compound/Mixed Agents
- 8) Irritant or Tear Gas

These agents are further described in more detail in the following pages.

Table 4 - Chemical Agent Quick Information Chart ⁸

| Class | Examples | Mechanism | Symptoms | Treatment |
|---------------------------------------|---|---|---|-----------------------------|
| Nerve Agents | Tabun, Sarin, Soman, VX, malathion, parathion, sevin | Inhibition of acetylcholine-esterase | Weakness Salivation Miosis Paralysis Hypoxia | Atropine 2 - Pralidoxime |
| Vesicants (Blister Agents) | Mustard Gas, Lewisite Nitrogen Mustard Gas | Alkylation | eye inflammation or upper respiratory tract irritation | Decontamination |
| Choking Agents | Phosgene Diphosgen | Variable | Tearing, coughing, Dyspnea Pulmonary edema | Supportive |
| Cyanide (Blood Agents) | Hydrogen cyanide (AC) Cynogen halides (cyanogen chloride) | Form stable complexes with metallo-porphyrins | Hypoxia | Nitrites |
| Incapacitating Agents | Quinuclidinyl benzilate Cannabinols Barbituates | Variable | Central nervous system alterations | Physostigmine |

⁸ *Adapted from; Terrorism in America, An Evolving Threat: Matthew S. Slater, MD; Donald D. Trunkey, MD; Archives of Surgery, Special Article B October 1997*

NERVE AGENTS

Nerve agents acquired their name because they affect the transmission of nerve impulses in the nervous system. All nerve agents belong chemically to the group of organo-phosphorus compounds. They are stable, easily dispersed, highly toxic, and have rapid effects both when absorbed through the skin and via respiration.

All these nerve agents produce the same basic physiological effect: they act upon enzymes at the myoneural (muscle-nerve) junction, causing immediate convulsions, paralysis, and death. They are capable of entering the body either through the lungs or the skin and are deadly in very small quantities.

Nerve agents may be absorbed through the skin, respiratory tract, gastrointestinal tract, and the eyes. However, significant absorption through the skin takes a period of minutes, and prompt medical treatment and decontamination are imperative and sometimes quite successful.

Physical and Chemical Properties

The most commonly mentioned nerve agents are listed below⁹:

The "G" series of nerve agents include **Tabun (GA)**, **Sarin (GB)**, and **Soman (GD)**. These military nerve agents are generally volatile and will evaporate at approximately the same rate as water. As a liquid, these substances are heavier than water and will sink. As a vapor, they are heavier than air and will tend to sink to the lowest level (like basements and subways).

VX is a persistent military nerve agent that does not evaporate readily and is significantly heavier than air. Its primary contact hazard is as a liquid.

Parathion and Malathion are commercial pesticides. They are quickly metabolized in the body and cause effects similar to those of nerve agents. However, they are significantly less toxic.

Sevin (carbaryl) is a commonly used insecticide that is absorbed by ingestion and through the skin and eyes. Carbamates cause similar effects as nerve agents. However, unlike the organophosphate compounds, the toxic effect is not permanent. After several hours, the carbamate will spontaneously leave the system. This should be considered in victim care and medical treatment.

⁹ Janes's Chem-Bio Handbook. Frederick R. Sidell, m.d.; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Page 32-52.

Mechanism of Action

A characteristic of nerve agents is that they are extremely toxic and that they have very rapid effect. The nerve agent, either as a gas, aerosol, or liquid enters the body through inhalation or through the skin. Poisoning may also occur through consumption of liquids or foods contaminated with nerve agents.

The route for entering the body is of importance for the period required for the nerve agent to start having effect. It also influences the symptoms developed and, to some extent, the sequence of the different symptoms. Generally, the poisoning works faster when the agent is absorbed through the respiratory system than via other routes.

Poisoning takes longer when the nerve agent enters the body through the skin. Since the first symptoms do not occur until 20-30 minutes after the initial exposure, immediate decontamination is essential. The poisoning process may be rapid, however, if the total dose of nerve agent is high.

Symptoms

The most identifiable characteristic of nerve agent exposure is the extreme constriction of the iris (miosis) causing pinpoint pupils. Other characteristic symptoms include increased production of saliva, a running nose, and a feeling of pressure on the chest. Short-range vision also deteriorates and the victim feels pain when they try to focus on an object nearby. This is usually accompanied by headache. More unspecific symptoms are tiredness, slurred speech, hallucinations, and nausea.

Exposure to a higher dose leads to more pronounced symptoms. Tightening of the chest and dramatic mucous membrane secretions (eyes, nose, and mouth) lead to coughing and difficulty in breathing. Discomfort in the gastrointestinal tract may develop into cramps and vomiting. Involuntary discharge of urine and defecation may also occur. Symptoms, like twitching, from the skeletal muscles are very typical. If the poisoning is moderate, this may express itself as muscular weakness, local tremors, or convulsions.

When exposed to a high dose of nerve agent, the muscular symptoms are more pronounced. The victim may suffer convulsions and lose consciousness. To some extent, the poisoning process may be so rapid that earlier mentioned symptoms may never have time to develop. Muscular paralysis caused by nerve agents also affects the respiratory muscles, which is the direct cause of death. Consequently, death caused by nerve agents is a kind of death by suffocation.

Table 5 - Effects of Nerve Agents in Humans ¹⁰

| Organ or System | Effect |
|-------------------------------|---|
| Eye | Miosis (pinpoint pupils), conjunctival injection; pain in or around eye; complaints of dim or blurred vision |
| Nose | Dramatic mucous discharge (Rhinorrhea) |
| Mouth | Increased salivation |
| Pulmonary Tract | Tightness of chest (Bronchoconstriction) and increased secretions, cough; shortness of breath; on exam: wheezing, rales, ronchi |
| Gastrointestinal Tract | Increase in secretions and motility; nausea, vomiting, diarrhea; complaints of abdominal cramps, pain |
| Skin and Sweat Glands | Sweating |
| Muscular | Fasciculations ("rippling"), local or generalized; twitching of muscle groups, flaccid paralysis; complaints of twitching, weakness |
| Cardiovascular | Decrease or increase in heart rate; usually increase in blood pressure |
| Central Nervous System | <i>Acute effects of severe exposure:</i> loss of consciousness, convulsions (or seizures after muscular paralysis), depression of respiratory center to produce apnea <i>Acute effects of mild or moderate exposure:</i> forgetfulness, irritability, impaired judgment, decreased comprehension, a feeling of tenseness or uneasiness, depression, insomnia, nightmares, difficulties with expression |

¹⁰ *Adapted from:* Recommended therapy for casualties of nerve agents; Textbook of Military Medicine Part I: Warfare, Weapons, and the Casualty; Medical Aspects of Chemical and Biological Warfare, Office of the Surgeon General, Department of the Army, United States of America: 1997, page 145: #97-22242

Table 6 - Recommended Therapy for Casualties of Nerve Agents¹¹

| Exposure Route | Exposure Category | Signs & Symptoms | Therapy |
|-------------------------------------|-------------------|--|--|
| Inhalation <i>(Vapor)</i> | Minimal | Pin-point pupils with or without nasal discharge; reflex nausea and vomiting | <5 min of exposure: 1 MARK I kit >5 min of exposure*: observation |
| | Mild | Pin-point pupils; nasal discharge; mild difficulty breathing; reflex nausea and vomiting | <5 min of exposure: 2 MARK I kits >5 min of exposure: 0 or 1 MARK I kit, depending on severity of difficulty in breathing |
| | Moderate | Pin-point pupils; nasal discharge; moderate to severe difficulty breathing; reflex nausea and vomiting | <5 min of exposure: 3 MARK I kits + diazepam >5 min of exposure: 1 - 2 MARK I kits |
| | Moderately Severe | Severe difficulty breathing; gastrointestinal or neuromuscular signs | 3 MARK I kits; standby ventilatory support; diazepam |
| | Severe | Loss of consciousness; convulsions; flaccid paralysis; breathing stops | 3 MARK I kits; ventilatory support; suction; diazepam |

¹¹ Adapted from: **Recommended therapy for casualties of nerve agents; Textbook of Military Medicine Part I; Warfare, Weapons, and the Casualty; Medical Aspects of Chemical and Biological Warfare**, Office of the Surgeon General, Department of the Army, United States of America: 1997, page 167: #97-22242

Table 6 - Recommended Therapy for Casualties of Nerve Agents (cont.) ¹²

| | | | |
|--|-------------------|--|---|
| Dermal <i>(Liquid on Skin)</i> | Mild | Localized sweating, twitching | 1 MARK I kit |
| | Moderate | Gastrointestinal signs and symptoms | 1 MARK I kit |
| | Moderately Severe | Gastrointestinal signs plus respiratory or neuromuscular signs | 3 MARK I kits; standby ventilatory support |
| | Severe | Same as for severe vapor exposure | 3 MARK I kits; ventilatory support; suction; diazepam |

**Casualty has been out of contaminated environment during this time*

¹² Adapted from: **Recommended therapy for casualties of nerve agents; Textbook of Military Medicine Part I; Warfare, Weapons, and the Casualty; Medical Aspects of Chemical and Biological Warfare**, Office of the Surgeon General, Department of the Army, United States of America: 1997, page 167: #97-22242

BLISTER / MUSTARD AGENTS

These are chemical agents that affect the eyes, respiratory tract, and skin. Blister agents initially cause irritation of the eyes (and respiratory tract, if inhaled), erythema (reddening of the skin), then blistering or ulcerations, followed by systemic poisoning. There are three types of blister agents: mustards, arsenicals, and urticants.

Mustard is usually classified as a blistering agent owing to the wounds caused by this substance resembling burns and blisters. However, blister agents also cause severe damage to the eyes, respiratory system, and internal organs. The effect of mustard agent is delayed and the first symptoms do not occur until 2-24 hours after exposure. Lewisite and phosgene oxime, however, produce immediate pain on whatever part of the body comes in contact with the liquid or vapor, such as the eyes or skin.

Physical and Chemical Properties

Mustard “gas” is actually a liquid that is much heavier than water and its vapor is heavier than air. It has an odor of mustard, onions, or garlic that is usually detected when concentrations are close to toxic levels. Mustard can be absorbed into the body through the eyes, the skin, and the airways within seconds of contact.¹³

Symptoms

There are no immediate physical signs of mustard exposure. The first sign of exposure to mustard is usually redness of the skin. Over a period of hours small blisters appear and gradually combine to form larger blisters. Irritation and redness are usually the first effects in the eyes. Victims may complain of not being able to see; this is usually due to swelling and inflaming eyelids.

Signs of damage to the upper airways may include sinus pain, irritation of the nose, a sore throat, or a hacking cough. If more than a minimal amount is inhaled symptoms may include voice changes, with hoarseness or loss of voice. If large amounts are inhaled it can lead to damage of the lower airways producing shortness of breath and a severe productive cough. The shorter the onset time of these lower airway effects, the more threatening the diagnosis. Survival is unlikely if these symptoms appear earlier than 4 hours after exposure.

Absorption of a large amount will also damage the bone marrow. However, these effects are not evident for approximately 3-5 days.

¹³ Janes's Chem-Bio Handbook. Frederick R. Sidell, m.d.; Dr. William C. Patrick, III; and Thomas R. Dashneill. Jane's Information Group, 1998. Page 63-74.

Antidotes & Treatments

There is no treatment or antidote that can affect the basic cause of mustard agent injury. Therefore, the most important measure is to rapidly and thoroughly decontaminate the patient with soap and water. Eyes are rinsed with water or a physiological salt solution for at least five minutes. A casualty should remain under observation since no signs or symptoms occur within the first few hours.

Medical treatment may include antibiotics and local anesthetics to relieve pain. Despite treatment, inflammation and light sensitivity in the eyes may remain for long periods.

CYANIDES/BLOOD AGENTS

Cyanide produces clinical effects by causing cell death. It does so by entering each contaminated cell of the body and poisoning the mechanism that uses oxygen. Oxygen enters the body through the lungs and is carried by the blood to the cells. Cyanide prevents the cells from using the oxygen and they suffocate.

The body can destroy small amounts of cyanide and leave no effects on the body. Large amounts will effect the brain or central nervous system. The brain and central nervous system are dependent on oxygen and most effects of cyanide poisoning are those caused by a lack of oxygen in the brain. Exposure to a large amount will cause a sudden loss of consciousness, followed by convulsions. After 3-5 minutes breathing will stop. Death will usually occur within 10 minutes.

INCAPACITATING / IRRITATING AGENTS

Riot control agents such as CS, CN, CR, and pepper spray are commonly used in the civilian world. These agents are solids that are usually dispersed in a liquid spray. There are minor differences between riot control agents, however, the effects are similar: they cause pain or burning on exposed mucous membranes and skin.

Tearing, reddening, and closing of the eyes usually accompany burning in the eyes. If these substances are inhaled, there will be a difficulty in breathing and tightening in the chest. Skin may also become irritated and burn. The effects of these agents begin within seconds of contact and decrease as the casualty moves to clean air. It is rare for these agents to produce serious harm to a casualty, unless disseminated in a forceful manner.

COMPOUND/MIXED AGENTS

The possible mixing of chemical agents presents an additional concern to first responders in that it will be difficult to identify (by symptoms alone) which type of chemical agent is being used.