TERRORISM AND OTHER PUBLIC HEALTH EMERGENCIES

A Field Guide for Media

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

INTRODUCTION

01

INTRODUCTION

ABOUT THIS GUIDE

The U.S. Department of Health and Human Services (HHS) created this guide to provide the most important information that media professionals might need in the field while covering a terrorist attack or other public health emergency. This guide was developed by HHS' Office of the Assistant Secretary for Public Affairs as a compact companion to a more comprehensive guide on these topics, called "Terrorism and Other Public Health Emergencies: A Reference Guide for Media." This field guide is mainly aimed towards individual reporters, but may also be useful for newsroom managers and other media professionals.

These guides were created specifically to fill the void of expert-reviewed and approved information about terrorist agents and the public health system focusing on the unique needs posed by extreme public health emergencies. Resources dealing with natural disasters and related issues already exist in many forums. Just the same, many of the new programs and resources described in this field guide—and more fully in the media reference guide—are relevant to all public health emergencies including natural disasters. So, we hope this guide will be useful to you in a wide variety of emergencies.

Both publications are available online at http://www.hhs.gov/emergency. We urge you to refer to the Web versions for the latest information. HHS will update the online versions with new information on agents, treatments, new learning, and evolutions in the organization of public health emergency response. You can order

additional copies of this guide or the media reference guide online at http://www.hhs.gov/emergency or by calling (240) 629–3161; (240) 629–3168 (TTY). If you have any questions or comments about this guide, please contact the HHS Public Affairs Office at (202) 690–6343.

HHS would like to thank the many federal government agencies, as well as other organizations and individuals, that helped develop and review the media reference guide, which served as the source for the content of this field guide. For a complete list of these contributors, please see the Acknowledgments page of the media reference guide, available at http://www.hhs.gov/emergency.

Please note: This guide was published in the summer of 2006. All Web sites listed in this guide were checked and available as of February 2006.

WHAT IS CONTAINED IN THE GUIDE

Please note: References for the information in this guide were not included in an effort to keep the size of the guide more manageable for use in the field. For complete references, please see the media reference guide at http://www.hhs.gov/emergency.

SAFETY AND THE STORY– 11 STEPS FOR PERSONAL SAFETY

1. Be physically and mentally prepared for the situation you will be facing on assignment. It may be advisable to enroll in a biohazards hostile-environment course that includes basic first aid training.
2. If you are going into a physically risky situation, make sure to take a well-known, frequently used travel route.
3. If you have to make a road trip into a dangerous area, you might consider taking two vehicles, so that you will have a backup in case something goes wrong with one of them.
4. It is almost always wise to buddy-up with another correspondent for mutual protection when traveling into a hazardous location.
5. Let someone you can count on know when you are leaving and when you expect to return, and have him or her get word to the office if you do not get back in time.
6. If the situation at a hazardous site suddenly turns explosive, make sure you have figured out an escape route and how to flee as soon as possible. It is a good idea to park a car with nothing blocking its escape.
7. If you have a biohazard suit, it is important for you to know that it takes a minimum of 10 minutes to unpack the suit from its vacuum-sealed container. If you think that you may be in danger of sudden exposure, it may make sense to repack your suit into a sealed plastic bag.
8. Keep emergency phone numbers at hand, programmed into mobile phones, with a key (24/7) contact number on speed dial, if possible. Know the location of hospitals and their capabilities.
9. It is always a good idea when covering a hazardous assignment to review your current vaccination and immunization history. A primary care physician can either advise you on necessary vaccinations or refer you to someone who can provide advice and inoculations.

Carry blood-type identification and information on any medical conditions on your person in the field.

10. **In any situation that requires covering stories involving viral or bacterial agents, it is even more important than in normal circumstances to wash your hands carefully. Be sure to use good quality soap and plenty of warm water. (HHS' Centers for Disease Control and Prevention [CDC] recommends that you wash for at least 15–20 seconds.) When soap and water are not available, you can use alcohol-based disposable hand wipes or gel sanitizers.**
11. **Consider whether there are other ways to get the story. In some cases, it might be possible to cover a story from a safer location.**

Sources:

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Franklin, S. (2002). Memo: Staying alive and other tips. *Columbia Journalism Review.* May/June. http://archives.cjr.org/.

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BIOLOGICAL AGENTS

CHEMICAL AGENTS

RADIATION EMERGENCIES

DEFINING PUBLIC HEALTH ROLES, PROGRAMS, AND TERMS

BIOLOGICAL AGENTS

02

BIOLOGICAL AGENTS

This section provides basic information on six biological agents that may potentially be used by terrorists as weapons:

- **Anthrax**
- **Botulism**
- **Plague**
- **Smallpox**
- **Tularemia**
- **Viral Hemorrhagic Fevers**

These agents are classified as Category A (highest concern) by the Centers for Disease Control and Prevention (CDC) because they have the potential for major public impact and are known to have been studied by some countries for use in biological warfare.

Information on other possible biological agents can be found in the media reference guide at http://www.hhs.gov/emergency or at http://www.bt.cdc.gov.

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

BIOLOGICAL AGENTS QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Anthrax	Skin, intestinal, or inhalational infection that is caused by bacteria. Signs and symptoms begin within 7 days. Not contagious.	**Skin:** blisters with black center. **Intestinal:** nausea, loss of appetite, like stomach flu. **Inhalational:** flu-like signs and symptoms that progress to severe breathing problems.	Contact your health care provider.	Antibiotics should be started as soon as possible.
Botulism	Muscle-paralyzing disease caused by exposure to a bacterial toxin. Could be released in air, water, or food. Not contagious.	Blurred/double vision, slurred speech, drooping eyelids. Can lead to paralysis.	Immediately seek medical care.	Antitoxin and/or supportive care and/or ventilator.
Pneumonic Plague	Lung infection caused by bacteria. Could be released into the air. Signs and symptoms generally begin within 2–4 days of exposure. Contagious through coughing.	Rapidly developing pneumonia with fever, cough, and chills.	Immediately seek medical care.	Antibiotics must be started within 24 hours of signs and symptoms. Isolation for infected persons.
Smallpox	Severe illness with rash caused by a virus. Officially eradicated worldwide in 1980, but has resurfaced as a potential bioterrorist agent. Signs and symptoms begin within 7–17 days of exposure. Contagious.	High fever and aches followed by a severe rash of round lesions.	Contact your health care provider.	Vaccines should generally be given within 3 days of exposure to prevent infection or lessen illness. Isolation for infected persons.

BIOLOGICAL AGENTS QUICK REFERENCE CHART *(cont.)*

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Tularemia	Disease caused by bacteria, which could be released in air, food, or water. Signs and symptoms generally begin within 3–5 days of exposure. Not contagious	Sudden fever, chills, coughing, aches.	Contact your health care provider.	Antibiotics
Viral Hemorrhagic Fevers	Diseases contracted from viruses such as Ebola. Could be transmitted via bodily fluids of infected animals or humans. Contagious.	Fever, vomiting, diarrhea, heavy bleeding.	Immediately seek medical care.	Isolation for infected persons. Supportive care.

BASIC FACTS FOR BIOLOGICAL AGENTS

INFECTIOUS DISEASES

Infectious diseases are caused by the invasion of the body by harmful microorganisms. These microorganisms multiply and make the person sick by attacking organs or cells in the body. They include viruses and bacteria, as well as certain other microscopic organisms, and are sometimes called pathogens. All of the diseases discussed in this section are considered infectious diseases.

CONTAGIOUS DISEASES

A *contagious disease* is an infectious disease that can be "caught" by a person who comes into contact with someone who is infected. Not all infectious diseases are contagious. Exposure to a contagious disease usually happens through contact with the infected person's bodily fluids or secretions, such as a sneeze.

TOXINS

Toxins are the poisonous, usually protein-based, substances produced by microorganisms (bacteria, mold, virus) in certain infectious diseases. Microorganisms use these toxins as the specific weapons for attacking organs or cells in the body. Although toxins are usually classified as being biologically

produced, common language often refers to the poisons created by nonliving chemical agents as chemical toxins.

BACTERIA AND VIRUSES

BACTERIA	VIRUSES
• One-celled microorganisms that contain several components within the single cell.	• Bits of deoxyribonucleic acid (DNA) or ribonucleic acid (RNA).
• Some bacteria can also exist as spores that help them survive harsh conditions. Spores can germinate to become full-fledged bacteria; this is the case with anthrax.	• Viruses need to infect living cells to survive and multiply.
• Antibiotics can be used to kill bacteria.	• Antibiotics do not affect viruses; some antiviral medications exist.

DELIVERY OF BIOLOGICAL AGENTS

› The ability to successfully deliver a biological attack depends on:
- The type of agent or organism
- The method of dissemination
- The weather (e.g., wind speed, humidity, time of day, precipitation, temperature)

› Biological agents can enter the body through absorption, inhalation, ingestion, and injection.

› Biological weapons can be delivered by:
- Wet or dry aerosol sprayers
- Explosive devices
- Transmission through insects, animals, or humans
- Introduction into food, water, or even medications
- In or on objects, in some cases (e.g., anthrax in envelopes)

BIOLOGICAL TESTING

Quick diagnosis and treatment of a patient exposed to a biological agent are key to saving that patient's life. A biological attack may go unnoticed until large groups of people begin exhibiting signs and symptoms. But currently there is no single test that can diagnose whether a person has been exposed to biological agents.

It is likely that a combination of tests will be used. In the absence of immediate results, physicians who suspect bioterrorism may begin a preliminary course of treatment until the lab results are in. There is no single answer to the question of how long testing will take. The testing of biological agents is complicated by several factors, which can affect timing. These factors include:

- **Identifying the Agent:** Actual incidents of bioterrorism have been rare, leaving today's physicians with limited experience in identifying these agents in the lab or treating affected patients. The first patients who become sick may be mistaken for having other illnesses, thus causing a delay in the effort to test for biological agents.
- **Presumptive vs. Confirmatory Diagnoses:** Not all tests are conclusive. Some tests can give a presumptive diagnosis that an agent is present, but followup tests are needed. In general, presumptive diagnosis of an agent can usually be made in about a day. Confirmatory diagnosis can take 2–3 days.
- **Viral, Bacterial, or Toxin Load:** The "load" refers to how much of the agent is present in a patient. If relatively large amounts of an agent are present in a patient, cultures designed to grow the bacteria or virus could take as little as a few hours. If smaller amounts of the agent are present in a patient, these same culture tests could take up to 2 or 3 days.
- **Lab Capabilities:** Can the needed tests be done in local labs, near a suspected attack, or do the samples need to be shipped out to more advanced labs, thus affecting the overall timeline? Shipping samples to more advanced labs can tack on an extra day or two to the wait time. CDC's Laboratory Response Network (http://www.bt.cdc.gov/lrn) helps facilitate this process.
- **The Kind of Test Used:** Numerous tests are employed to detect the presence of bioterror agents. Blood cultures can take up to 3 days, in some cases for example, but Gram stains can be ready within an hour. However, some of these quicker tests will only give preliminary information, which must be confirmed with more comprehensive tests.

More information on testing can be found in the media reference guide at http://www.hhs.gov/emergency.

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

ANTHRAX

BASIC FACTS

- Rod-shaped bacteria (not a virus) that can be treated with antibiotics if diagnosed early.
- Anthrax is the disease that develops after exposure to spores produced by these bacteria.
- The spores can remain dormant for long periods but are still capable of causing infection when someone comes in contact with them by touching or breathing them in.
- The anthrax illness is not contagious.
- A new vaccine is currently being produced for the Strategic National Stockpile (SNS) in case of an attack. An older anthrax vaccine exists but is not in widespread use.

ANTHRAX ILLNESSES

Anthrax spores can cause three types of illness, depending on how a person is exposed:

- Inhalational (respiratory)—most lethal
- Cutaneous (skin)
- Gastrointestinal (digestive)

Inhalational Anthrax

Exposure

- Victims breathe in spores floating through the air; the spores then lodge in their lungs.
- Certain cells take the spores to the lymph nodes surrounding the lung. Once the spores enter the lymph nodes, they germinate into bacteria and cause inflammation and enlargement of these lymph nodes.
- Anthrax bacteria then spread from the lymph nodes to sites throughout the body and produce a toxin that can be destructive to organs and is difficult to treat.

Signs and Symptoms

Signs and symptoms can occur within 7 days of infection or can take up to 42 days to appear. These signs and symptoms include:

- Fever (>100°F)
- Flu-like signs and symptoms
- Cough, chest discomfort, shortness of breath, fatigue, or muscle aches
- Sore throat, followed by difficulty swallowing; enlarged lymph nodes; headache; nausea; loss of appetite; abdominal distress; vomiting; or diarrhea

Recovery/Mortality Rate

The survival rate for inhalational anthrax victims depends on quick diagnosis and treatment with antibiotics. The mortality rate is approximately 75 percent even with antibiotics, while untreated inhalational anthrax has a 90 percent mortality rate.

Cutaneous Anthrax

Exposure

Anthrax spores or bacteria enter the body through an open wound or cut or microscopic breakdowns of the skin.

Signs and Symptoms

- Signs and symptoms appear within 1–7 days after exposure.
- A small sore quickly develops into a blister, which becomes a skin ulcer and ultimately develops a black scab in the center.
- The sore, blister, and ulcer do not hurt and initially look like a spider bite.

Recovery/Mortality Rate

The survival rate is 80 percent without treatment and more than 99 percent with treatment.

Gastrointestinal Anthrax

Exposure

Gastrointestinal anthrax occurs when anthrax is ingested, usually through meat from anthrax-infected animals.

Signs and Symptoms

- First signs and symptoms of the infection appear within 2–5 days of exposure, including initial signs and symptoms of nausea and loss of appetite and later signs and symptoms of bloody diarrhea, fever, and severe stomach pain.
- Signs and symptoms mirror those for stomach flu, food poisoning, and appendicitis.

Recovery/Mortality Rate

If untreated, at least 25 percent of gastrointestinal anthrax cases lead to death.

DIAGNOSIS

Early diagnosis is the key to successful treatment of anthrax. However, there is no single screening test to confirm anthrax illness.

- Blood tests may be used, but can take up to 72 hours.
- If inhalational anthrax is suspected, physicians typically obtain a chest X-ray and a CAT scan.
- Nasal swabs can detect the presence of spores, but are not a diagnostic tool. A positive swab does not mean a person will develop an anthrax illness and a negative swab does not mean a person will not develop an anthrax illness. A nasal swab is only an indicator of whether anthrax spores are present in an area.

TREATMENT

- All three types of anthrax can be treated with antibiotics. Ciprofloxacin may be used, but doxycycline is now the preferred antibiotic. Antibiotics are prescribed for 60 days.
- Treatment must begin as soon as possible after exposure to be successful, because the bacteria produce a toxin in the body that poisons the system quickly and sometimes irreversibly. Antibiotics kill the bacteria but cannot remove the toxin or lessen the effects of any toxin already in the body. There is no antitoxin for the anthrax toxin.
- Those with inhalational anthrax may need hospitalization and a ventilator to help with breathing.

BOTULINUM TOXIN

BASIC FACTS

- Botulism is a muscle-paralyzing disease that develops after a person is poisoned with botulinum toxin, which is produced by the bacterium *Clostridium botulinum* (not a virus).
- The toxin is colorless, odorless, and tasteless and can be disseminated via air, water, or food.
- Botulism is not contagious.
- A rare form of botulism, wound botulism, will not be discussed here.

BOTULINUM TOXIN ILLNESSES

Foodborne Botulism

Exposure

- This form of botulism is typically caused by eating improperly preserved or cooked food; it could also occur if food were contaminated deliberately with the toxin.
- Contaminated food may be discolored or have a bad odor or taste.

Signs and Symptoms

- Generally begin 18–36 hours after eating contaminated food but can occur as early as 6 hours or as late as 10 days afterwards.
- Initial signs and symptoms include blurred or double vision, slurred speech, drooping eyelids, difficulty swallowing, dry mouth, and muscle weakness.
- Botulism toxin spreads throughout the body and predominantly affects the nervous system.
- Within hours, a facial paralysis begins and spreads to the rest of the body.
- Botulism can result in respiratory failure.

Recovery/Mortality Rate

If treated, ingested botulism has a survival rate of over 90 percent.

Inhalational Botulism

Exposure

- Does not occur naturally and only three cases (from a laboratory accident) have ever been reported.
- Would be caused if people inhaled refined botulinum toxin disseminated through the air.

Signs and Symptoms

- Similar to those of foodborne botulism.
- Signs and symptoms may begin several hours to several days after an airborne attack.

Recovery/Mortality Rate

Because there are so few recorded cases, the fatality rate is unclear.

DIAGNOSIS

Botulism is a rare disease. Whether it is naturally occurring or the result of terrorism, a single case of the illness may be difficult for physicians to diagnose. However, if several or many cases appear together, it is likely that the diagnosis would be made quickly.

- There is no single test to detect botulinum poisoning. Blood tests and stool sample tests may be useful.
- Suspected foods may also be tested.
- Special tests (e.g., brain scan) may be needed to exclude similar conditions from botulism.

TREATMENT

Prompt medical attention is the key to successful treatment for a botulism illness.

- Treatment should begin as soon as botulism is suspected and may include use of an antitoxin.
- This antitoxin reduces the spread of paralysis but will not reverse paralysis that has already set in.
- With treatment, most paralysis will eventually go away, but in severe cases, patients may need long-term care, including a ventilator.

PLAGUE

BASIC FACTS

- Plague is the disease that develops after infection with the bacterium *yersinia pestis* (not a virus).
- Humans contract plague by inhaling it or from the bite of an infected flea.
- Plague infection takes three primary forms:
  - Bubonic
  - Pneumonic
  - Septicemic
- Only pneumonic plague is contagious through respiratory droplets with direct close contact (within 6 feet).
- Plague is highly lethal if untreated but can be treated with antibiotics if caught early.
- Some plague infections occur naturally each year (usually bubonic).

PLAGUE ILLNESSES

There are three common forms of illness caused by the plague bacteria:

Bubonic

Exposure

- Bubonic plague is caused when infected fleas bite humans or through a break in the skin.
- This form of plague illness is not contagious.

Signs and Symptoms

- Bubonic plague infects the lymphatic system and causes severe swelling.
- The first signs and symptoms appear 2–6 days after infection and include weakness, high fever, and chills.
- If bubonic plague is not treated, bacteria can spread through the bloodstream, causing septicemic plague or a secondary case of pneumonic plague.
- Later signs and symptoms include muscular pain, swelling of lymph glands, and seizures.

Recovery/Mortality Rate

If untreated, bubonic plague is fatal in over 50 percent of cases.

Pneumonic

Exposure

- This form of the disease infects the lungs. It is caused by breathing in aerosolized plague.
- This illness can be transmitted from person to person through respiratory droplets with direct close contact (within 6 feet).

Signs and Symptoms

- Signs and symptoms usually appear 2–4 days (range of 1–6 days) after exposure.
- Initial signs and symptoms include high fever, cough, and chills similar to the flu.
- Later signs and symptoms include pneumonia and bloody sputum (coughing up blood).

Recovery/Mortality Rate

Without early detection and treatment, the mortality rate from pneumonic plague is nearly 100 percent. If treated, the mortality rate from pneumonic plague is still 50 percent.

Septicemic

Exposure

- Septicemic plague may be a secondary illness caused by complications from bubonic or pneumonic plague, or it can occur by itself.
- Plague bacteria enter the bloodstream.
- This form of the disease is not contagious.

Signs and Symptoms

- Signs and symptoms appear 2–6 days after infection.
- Initial signs and symptoms include nausea, vomiting, fever, and chills.
- Later signs and symptoms include low blood pressure, abdominal pain, shock, and finally, internal bleeding.

Recovery/Mortality Rate

Death occurs rapidly if this form of plague is untreated, but even with treatment, the recovery rate is only 50 percent.

DIAGNOSIS

Plague can be difficult to diagnose because its initial signs and symptoms are flu-like and the disease progresses so rapidly. A bioterror attack involving plague could go undetected until large groups of people begin exhibiting signs and symptoms.

- If bubonic plague is suspected, physicians check for the presence of a painful, swollen lymph node called a bubo, which occurs no more than 24 hours after initial signs and symptoms.
- Blood cultures, a sputum sample, or examination of a lymph node sample can confirm plague.
- Physicians will ask for a travel history from the patient to see if he or she has traveled to a known outbreak area.

TREATMENT

- Antibiotic treatment for pneumonic plague must begin within 24 hours after the first signs and symptoms to be successful.
- Antibiotics, such as streptomycin, gentamicin, the tetracyclines, and chloramphenicol, are all effective against plague and may be provided to those exposed or with a suspected diagnosis.
- Patients with pneumonic plague should be isolated to prevent disease spread.

SMALLPOX

BASIC FACTS

- The smallpox virus (variola major) is moderately contagious; direct, face-to-face contact is usually required to spread the disease.
- Characterized by skin lesions and high fever, smallpox historically has killed approximately 30 percent of those infected.
- Officially eradicated in nature in 1980, smallpox has more recently been of concern as a potential bioterrorism threat.
- Routine vaccinations in the United States ended in 1972. At present, a large portion of the population is considered vulnerable to infection should a bioterrorism incident occur.

SMALLPOX ILLNESS

Exposure

- The incubation period is typically 7–17 days following exposure.
- Typically, people with smallpox are not contagious until lesions start appearing and they are obviously ill.
- The virus is usually spread by droplets; however, having it spread by aerosol or contaminated objects (e.g., bedding) is also possible.
- Smallpox is not known to be transmitted by insects or animals.

Signs and Symptoms

- Initial signs and symptoms of smallpox may include high fever, fatigue, headache, and backache.
- *Two to 3 days after the onset of signs and symptoms:* A rash of round lesions develops on the face, arms, and legs. At the same time, lesions in the mouth are also present and release large amounts of the virus into the saliva.
- *Seven days after the onset of signs and symptoms:* The lesions become small blisters and by the seventh day are filled with pus.
- *Twelve days after the onset of signs and symptoms:* Lesions begin to crust over. Severe abdominal pain and delirium can occur in the later stages of the disease.
- *Three to 4 weeks after the onset of signs and symptoms:* Scabs develop and fall off. A patient who survives is no longer contagious after the final scab falls off.

Recovery/Mortality Rate

Death is likely in 30 percent of all smallpox cases, usually during the first or second week of illness.

DIAGNOSIS

- Smallpox is most commonly identified by the distinctive rash it causes, although the rash can sometimes be confused initially with chicken pox.
- The smallpox lesions are painful (as opposed to chicken pox lesions) and the distribution of lesions on the body is different than chicken pox.
- Patients with smallpox are typically much sicker than those with chicken pox.
- Testing of the fluid from the lesions can confirm smallpox.

TREATMENT

- There is no way to fight the virus once patients become sick. Antibiotics are not effective.
- Patients with smallpox are isolated to prevent disease spread.
- Patients with smallpox may require supportive care, such as intravenous (IV) fluids and medication to control fever or pain.

VACCINE

There is now enough vaccine available in the SNS for every American in case of an attack.

- The vaccine contains a live virus (vaccinia) which is related to the smallpox virus but entirely different from it; it cannot give someone smallpox.
- The vaccine provides a high level of immunity from infection for 3–5 years after vaccination and decreasing immunity thereafter. It is unclear how long the vaccine provides some protection against the disease. If a person is vaccinated again later, immunity lasts even longer. However, if a person actually has had smallpox and survives, he or she then has lifelong immunity.
- The vaccine prevents disease in 95 percent of those vaccinated.
- Given within 3 days after exposure to the smallpox virus, the vaccine will prevent or significantly modify smallpox in the majority of persons. Vaccination 4–7 days after exposure likely offers some protection from disease or may modify the severity of the disease.
- The smallpox vaccine is currently not administered to the general public because the likelihood of an attack is not known and vaccination can result in complications for some people.
- The vaccine is effective after one dose, so it could easily be given to many people if a smallpox event or outbreak takes place.
- Vaccination of only those people who might have been exposed to the smallpox virus and their contacts (ring vaccination) was used successfully in the past to eradicate smallpox. However, mass vaccination might be necessary in the aftermath of a terrorist attack.
- More information on smallpox vaccination can be found in the media reference guide at http://www.hhs.gov/emergency.

TULAREMIA

BASIC FACTS

- Tularemia is the disease caused by the bacterium *Francisella tularensis* (not a virus); it is also known as Rabbit Fever or Deer Fly Fever.
- Tularemia can spread to humans from infected animal tissue, contaminated food and water, or the air.
- Tularemia is not contagious.
- There are three types of tularemia:
  - Ulceroglandular
  - Inhalational
  - Typhoidal

TULAREMIA ILLNESSES

The tularemia infection takes several forms, depending on the strength of the bacteria and how they enter the body.

Ulceroglandular

Exposure

People can contract this disease from the bite of an infected tick or fly or when an open wound comes in contact with infected meat.

Signs and Symptoms

- Signs and symptoms typically appear between 3 and 5 days, but sometimes as late as 14 days after exposure.
- Skin ulcers appear at the infection site. Lymph nodes in the area become swollen.

Recovery/Mortality Rate

The disease is treatable with antibiotics and, with treatment, fewer than 2 percent of victims die from this form of tularemia.

Inhalational

Exposure

The disease is contracted by inhaling the bacteria.

Signs and Symptoms

- Signs and symptoms typically appear within 3–5 days, but sometimes as late as 14 days after exposure.
- Early signs and symptoms include sudden fever, chills, coughing, joint pain, weakness, and headaches, similar to the flu.
- Later signs and symptoms include inflamed eyes, oral ulcers, severe pneumonia, chest pain, and respiratory failure.

Recovery/Mortality Rate

This form of the disease is treatable by antibiotics, but inhalational tularemia has a 60 percent mortality rate if untreated.

Typhoidal

Exposure

This is a secondary form of tularemia that develops after a victim has contracted inhalational tularemia.

Signs and Symptoms

- This form of tularemia attacks the circulatory system as well as the respiratory system.
- Signs and symptoms include fever, extreme exhaustion, and weight loss.

Recovery/Mortality Rate

This form of tularemia is treatable with antibiotics. The recovery rate is similar to that for inhalational tularemia.

DIAGNOSIS

All forms of tularemia are difficult to diagnose because early signs and symptoms resemble those of the cold and flu.

A rapid diagnostic test for tularemia does not exist. Chest X-ray and/or blood tests may be used.

TREATMENT

All forms of tularemia can be successfully treated with antibiotics, including streptomycin, gentamicin, or doxycycline.

VIRAL HEMORRHAGIC FEVERS (VHFs)

BASIC FACTS

Viral hemorrhagic fevers (VHFs) are a class of diseases, contracted from viruses, that include:

- Ebola
- Marburg virus
- Other illnesses (e.g., Lassa, Machupo)

The following are general characteristics of VHFs:

- They are naturally occurring in mosquitoes, ticks, rodents, and other animals.
- They cause massive internal and external bleeding.
- The fatality rate can be as high as 90 percent.
- With the exception of yellow fever and Argentine hemorrhagic fever, no vaccines exist.
- No drugs are available to combat the viruses that cause VHFs.

VIRAL HEMORRHAGIC FEVER ILLNESSES

Ebola

Of all the VHFs, Ebola is probably the best known due to outbreaks in Africa.

Exposure

- Ebola can be passed to humans through infected animals.
- Once a person becomes ill, the virus can be transmitted to others through exposure to blood or bodily fluids, including airborne droplets from coughing.

Signs and Symptoms

- Patients usually become sick 4–6 days after exposure.
- The disease attacks blood vessels and organs, particularly the liver, spleen, and kidneys, causing heavy bleeding.
- Signs and symptoms include fever, vomiting, diarrhea, and heavy bleeding from multiple sites.

Recovery/Mortality Rate

The fatality rates range from 50–90 percent within 1–2 weeks of illness onset.

DIAGNOSIS

- Specific laboratory tests do exist to detect the virus in a blood sample. However, the handling of the virus is a biohazard, so tests need to be performed in a biosafety level 4 laboratory.
- Diagnosis is usually made by monitoring signs and symptoms and by tracking a patient's exposure to the virus.

TREATMENT

- Physicians treat the patient with fluids to prevent dehydration and try to control bleeding.
- Patients and people who have had close physical contact with patients will need to be isolated and closely monitored.
- Hospital workers and caregivers must wear gowns, gloves, and masks and practice extreme caution while treating patients.

LESSENING THE IMPACT OF EXPOSURE FOR ALL CHEMICAL AGENTS

- Follow the instructions of emergency workers.
- Move away from the site of release (if known) during an outdoor release or go indoors.
- Shelter-in-place if indoors near an outdoor release.
- Evacuate the affected building during an indoor release.
- If exposed, remove contaminated clothing and place in a plastic bag.
- Wash with soap and water.
- Flush irritated eyes with water.
- Seek medical attention if you have breathed in chemical fumes or if chemicals have touched your skin.
- Patients should be decontaminated if they have chemicals on their clothes and/or skin.
- If medically indicated and available, get appropriate antidote(s).
- Consider using protective masks and clothing to minimize exposure.
- Whenever possible, get emergency personnel in protective gear to assist in the removal of contaminated clothing.

CHEMICAL AGENTS

This section provides basic information on four major categories of chemical agents that could be used by terrorists, grouped according to how they affect the human body. These categories are:

- Blister (e.g., mustards)
- Blood (e.g., cyanides)
- Choking (e.g., chlorine)
- Nerve (e.g., sarin, VX agents)

Information on other kinds of chemicals can be found in the media reference guide at http://www.hhs.gov/emergency and at http://www.bt.cdc.gov.

Please note that neither of the media guides provides detailed information on toxic industrial chemicals because there are thousands that could potentially be used by terrorists. However, the public health response to a toxic industrial chemical attack or accident would be very similar to the response to an incident involving the chemicals in these guides.

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

CHEMICAL AGENTS QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Blister Agents (e.g., mustard gas, lewisite)	Group of agents that cause blistering or burns on the skin or lungs. Could be transmitted by inhaling, or contact with skin or eyes.	Skin and eye burning, coughing, severe respiratory irritation.	Leave the affected area. Immediately remove clothing, place in a plastic bag, and shower or wash. Seek medical care if exposed.	**Mustard gas:** treatment for blisters as burns, supportive care. **Lewisite:** same treatment; antidote available.
Blood Agents (e.g., cyanide, arsine)	Group of agents depriving cells and tissues of oxygen. Could be released in air, water, or food.	Rapid breathing, nausea, convulsions, loss of consciousness.	Same as for blister agents.	**Cyanide:** antidote. **Arsine:** supportive care; blood transfusions and intravenous fluids may be needed.
Choking Agents (e.g., chlorine, phosgene)	Group of agents attacking the respiratory system. Most likely to be released in air.	Coughing, burning eyes or throat, blurred vision, nausea, fluid in lungs, difficulty breathing.	Same as for blister agents.	Monitoring for delayed signs and symptoms. Supportive care. Oxygen as needed.
Nerve Agents (e.g., sarin, soman, tabun, VX)	Group of agents that affect the nervous system. Released in air, water, or food.	Seizures, drooling, eye irritation, sweating or twitching, blurred vision, muscle weakness.	Same as for blister agents.	Antidote; supportive care (e.g., oxygen as needed).

BASIC FACTS FOR ALL CHEMICAL AGENTS

- Chemical agents can be poisonous gases, liquids, or solids.
- Most of these agents are usually fast acting and toxic to people, animals, or plants.
- Chemical agents can be deployed in five ways:
  - Spraying with wet or dry aerosol sprayers (e.g., crop dusters, handheld spraying devices)
  - Using a heat source to vaporize the chemical for release
  - Using an explosive device to disperse the chemical
  - Pouring the chemical on a specific site (e.g., floor, sidewalk, subway platform)
  - Contamination of food, water, or pharmaceuticals

- Weather factors (e.g., temperature, wind speed and direction, humidity, and air stability) have an impact on the effectiveness of an open-air release.
- A chemical release may result in environmental clues, including:
  - Dead plants, animals, or insects
  - Pungent odor
  - Unusual clouds, vapors, or droplets
  - Discoloration of surfaces
- Some common immediate physical signs and symptoms from an airborne attack may include:
  - Tightness in chest and difficulty breathing
  - Nausea and vomiting
  - Watery eyes, blurry vision

INSTRUCTIONS TO SHELTER-IN-PLACE AND SEAL THE ROOM DUE TO CHEMICAL INCIDENTS

If you have been exposed:

- **Remove contaminated clothing if coming from outside and seal it in a plastic bag**
- **Shower and wash with soap, if possible**

To shelter-in-place and seal the room:

- **Find a room with as few windows and doors as possible**
- **Go to the *highest* level possible**
- **Turn off the air conditioner, heater, and fans**
- **Close the fireplace damper**
- **Tape plastic over windows and doors; seal with duct tape***
- **Tape over vents and electrical outlets (and any other openings)**
- **Fill sinks and tubs with water**
- **Turn on the radio for instructions**
- **Keep a telephone handy**

*** Within a few hours, the plastic and tape may need to be removed to allow fresh air to enter the room to prevent suffocation. *Follow the instructions of emergency workers and/or public health officials.***

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

BLISTER AGENTS

(EXAMPLES: MUSTARDS, LEWISITES/CHLOROARSINE, PHOSGENE OXIME)

Also called vesicant agents, mustards and lewisites cause blistering on the skin after exposure. Mustard gas is the best-known example. A lesser-known but possible threat is lewisite.

MUSTARD GAS

Mustard Gas Basic Facts

- Can be a colorless, oily, odorless liquid.
- Can be vaporized to form a gas, if heated.
- In some quantities, may have a slight garlic odor and a yellowish-to-brownish tint.

Mustard Gas Illness

- Enters the body through inhalation or contact with skin or eyes.
- Causes skin damage on contact, especially on hot, humid days or in tropical climates.
- Typically, signs and symptoms do not occur immediately. It may take 2–24 hours for signs and symptoms to develop.
- Signs and symptoms include:
  - Skin burns, then blisters within a few days; blisters become large and may be yellowish-brown in color
  - Eyes burning and swelling, which can cause blindness (lasting up to 10 days)
  - If gas is inhaled, may result in coughing, bronchitis, long-term respiratory disease, and cancer in the airways and lungs later in life
- Exposure is usually not fatal.

Mustard Gas Diagnosis and Treatment

- No effective medical test exists.
- Urine tests can be inconclusive.
- No known specific antidote or treatment exists.
- Supportive medical care is helpful.
- Blisters should be treated as burns.
- If swallowed, do not induce vomiting. Give milk to drink.

LEWISITE

Lewisite Basic Facts

- Oily liquid that can be colorless or can appear amber to black.
- Smells like geraniums and could be confused with the smell of ammonia.
- Can be vaporized and released into the air, or released into the water or food supply as a liquid.

Lewisite Illness

- Exposure occurs by breathing in or ingesting it, or contact with skin or eyes.
- Causes immediate damage to the skin, eyes, and respiratory (breathing) tract.
- Effects are similar to those of arsenic poisoning, including stomach ailments and low blood pressure.
- Signs and symptoms include (all health information was gathered from animal studies, since there are no known cases of human exposure):

Seconds to minutes:

- Skin pain and irritation
- Immediate eye irritation, pain, swelling, and tearing
- Runny nose, sneezing, hoarseness, bloody nose, sinus pain, shortness of breath, and cough

15–30 minutes:

- Skin redness

Within hours:

- Blisters

- Diarrhea, nausea, and vomiting
- Low blood pressure or "lewisite shock"

Within days:

- Blisters form lesions

Within weeks:

- Discoloration of the skin

› Long-term health effects after prolonged exposure or in the case of exposure to high doses:

- Skin burning
- Chronic respiratory disease
- Permanent blindness

Lewisite Diagnosis and Treatment

› Smell of lewisite may signal a release.

› Diagnosis is confirmed from people's signs and symptoms.

› British-Anti-Lewisite is the preferred antidote and is most effective if given immediately after exposure.

› If swallowed, do not induce vomiting or drink fluids.

BLOOD AGENTS

(EXAMPLES: ARSINE, CYANIDE)

These agents deprive the blood and organs of oxygen.

ARSINE

Arsine Basic Facts

› Colorless toxic gas.

› Has a mild garlic odor that can be detected only at levels greater than those necessary to cause poisoning.

Arsine Illness

› Severity of poisoning depends on the amount and duration of exposure.

› Enters the bloodstream and damages red blood cells.

- Exposure to low or moderate doses causes signs and symptoms within 2–24 hours, including:
  - Weakness
  - Fatigue
  - Headache
  - Drowsiness
  - Confusion
  - Shortness of breath
  - Rapid breathing
  - Nausea, vomiting, and/or abdominal pain
  - Red or dark urine
  - Yellow skin and eyes (jaundice)
  - Muscle cramps
- Exposure to high doses can cause:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure possibly leading to death
- Long-term side effects of exposure include:
  - Kidney damage
  - Numbness and pain in the extremities
  - Memory loss or confusion

Arsine Diagnosis and Treatment

- Release is confirmed when people start exhibiting signs and symptoms.
- Only during a large release will the garlic odor be prevalent.
- No known antidote.

CYANIDE

Cyanide Basic Facts

- The following four types are most likely to be seen:
  - Hydrogen cyanide
  - Cyanogen chloride
  - Potassium cyanide
  - Sodium cyanide
- In gas form, is colorless and may have a slight almond odor.
- Can be released into the air, soil, drinking water, or food supply.
- Fast acting.
- Evaporates quickly in open areas.

Cyanide Illness

- Prevents the body's cells from using oxygen.
- Breathing and ingesting are the most harmful routes of exposure.
- Most harmful to the heart and brain which rely heavily on oxygen.
- Signs and symptoms include:
  - Rapid breathing, restlessness, dizziness, weakness, and headache
  - Nausea, vomiting, and convulsions
  - Loss of consciousness, injury to the lungs, and respiratory failure
  - Permanent heart and brain damage
  - Rapid progression to coma and death

Cyanide Diagnosis and Treatment

- Environmental testing can confirm a release.
- Blood tests can confirm individual exposure.
- Immediate medical attention is recommended.
- Preferred antidotes are a nitrite or a thiosulfate compound.

CHOKING AGENTS

(EXAMPLES: AMMONIA, CHLORINE, HYDROGEN CHLORIDE, PHOSGENE, PHOSPHINE, PHOSPHOROUS [CERTAIN FORMS])

These agents attack the respiratory system, making it difficult to breathe.

CHLORINE

Chlorine Basic Facts

- Used in industry and found in bleach and other common household products.
- Can take a gas form (most likely) or a yellow-green liquid form.
- Emits a strong odor, like bleach, and can become explosive and flammable when mixed with other chemicals.
- Can be released into the air and spreads rapidly.
- Settles close to the ground.
- Liquid form can be released into the water or food supply.

Chlorine Illness

- Signs and symptoms of exposure include:
  - Coughing and tightness in the chest
  - Burning eyes, nose, and throat
  - Blurred vision, nausea, and vomiting
  - Blistered skin
  - Shortness of breath and fluid in the lungs
- Long-term complications including pneumonia and chronic bronchitis

Chlorine Diagnosis and Treatment

- Air sampling is conducted to confirm a release.
- No known antidote exists.
- Supplemental oxygen should be given as needed.
- Immediate medical treatment is essential.
- If ingested, do not induce vomiting or drink fluids.

PHOSGENE

Phosgene Basic Facts

- Industrial chemical used to make plastics and pesticides.
- Poisonous gas at room temperature that could be released in the air.
- When cooled, is converted into liquid form.
- In a liquid release or spill, changes to gas and stays close to the ground.
- Colorless or a white or pale yellow cloud.
- In low concentrations, smells like newly mown hay.
- In high doses, has a strong unpleasant odor.
- Can cause flammable substances to burn but is not flammable itself.
- Not found naturally in the environment.
- Liquid could be released into food or water.

Phosgene Illness

- In gas or liquid form, can damage the skin, eyes, nose, throat, and lungs.
- Proximity to a release and the length of exposure determine how serious illness is.
- Signs and symptoms may occur immediately after exposure if doses are extremely high. These include:
  - Coughing
  - Burning sensation in the throat and eyes
  - Watery eyes
  - Blurred vision
  - Difficulty breathing or shortness of breath
  - Nausea and vomiting
  - With skin contact, possible development of lesions like those from frostbite or burns
  - Within 2–6 hours after exposure to high doses, possible development of fluid in the lungs (pulmonary edema)
- Exposure to low or moderate concentrations of phosgene may have few early clinical findings. Development of worsening signs and symptoms may occur

12–24 hours after the initial exposure. Delayed signs and symptoms may surface up to 48 hours after exposure. These include:

- Difficulty breathing
- Coughing up white- to pink-tinged fluid and pulmonary edema
- Low blood pressure
- Heart failure
- Severe respiratory distress

Phosgene Diagnosis and Treatment

- No known antidote.
- Quickly moving away from the source of exposure is most important.
- Supplemental oxygen should be given as needed.
- People should be monitored for up to 48 hours for delayed signs and symptoms.
- Most people exposed recover, but high doses can result in chronic bronchitis and emphysema.
- If ingested, do not induce vomiting or drink fluids.

NERVE AGENTS

(EXAMPLES: SARIN, SOMAN, TABUN, VX)

Affecting the nervous system of victims, these agents are of the greatest concern because of the low amounts needed to produce significant signs and symptoms and even death.

SARIN

Sarin Basic Facts

- Manufactured compound that is colorless, odorless, and tasteless.
- Gas or liquid form and is highly volatile and lethal.
- Absorbed through the skin or respiratory tract and causes severe respiratory damage.
- Even very small amounts can kill people.
- Vaporized sarin stays near the ground.
- Remains deadly in warm, dry temperatures but can degrade in humidity.

Sarin Illness

Signs and symptoms include:

- Difficulty breathing, tightness in chest, and respiratory arrest
- Nausea, drowsiness, vomiting, and diarrhea
- Confusion and seizures
- Drooling, runny nose, eye irritation, and tearing
- Severe muscle weakness

Sarin Diagnosis and Treatment

- With large doses, death can occur within seconds to minutes after exposure.
- Rapid recognition after a suspected attack is the key to successful treatment.
- Atropine and pralidoxime are the preferred antidotes, but must be used quickly to be effective.
- Oxygen should be administered to those having difficulty breathing.
- If ingested, do not induce vomiting or drink fluids.

SOMAN

Soman Basic Facts

- Clear, colorless, tasteless liquid that can smell fruity or like oil of camphor.
- Can be heated into a vapor form.

Soman Illness

- Can get sick after inhaling or absorbing it through skin or eye contact.
- Can get sick by drinking poisoned water or swimming in contaminated water.
- Can get sick by eating contaminated food.
- Signs and symptoms will appear within a few seconds after exposure to the vapor form.
- In liquid form, produces signs and symptoms within a few minutes or up to 18 hours after exposure.
- Even a tiny drop on the skin can cause sweating and muscle twitching at the site of contact.

- Low or moderate doses cause the following signs and symptoms:
  - Runny nose
  - Watery eyes
  - Small, pinpoint pupils
  - Eye pain
  - Blurred vision
  - Drooling and excessive sweating
  - Cough
  - Chest tightness
  - Rapid breathing
  - Diarrhea
  - Increased urination
  - Confusion
  - Drowsiness
  - Weakness
  - Headache
  - Nausea, vomiting, and/or abdominal pain
  - Slow or fast heart rate
  - Abnormally low or high blood pressure
- Exposure to a large dose may result in these additional health effects:
  - Loss of consciousness
  - Convulsions
  - Paralysis
  - Respiratory failure, possibly leading to death
- Vapors can be trapped on a person's clothing and can expose others.

Soman Diagnosis and Treatment

- Odor may be a signal of a release.
- Treatment with antidotes (atropine and pralidoxime) is recommended as soon as possible (ideally within minutes).

- Long-term supportive health care may be necessary.
- Mild or moderately poisoned people that are treated both rapidly and adequately usually recover completely.
- Severely exposed people or those victims who are ineffectively treated may not survive.
- If ingested, do not induce vomiting or drink fluids.

TABUN

Tabun Basic Facts

- Clear, colorless, tasteless liquid with a faint fruity odor.
- Can become a vapor, if heated.

Tabun Illness

- Can become ill after breathing, ingesting, or through contact with skin or eyes.
- Can get sick by eating contaminated food or water.
- After exposure in vapor form, signs and symptoms should appear within a few seconds.
- Exposure in liquid form produces signs and symptoms within a few minutes or up to 18 hours later.
- Can remain active on a person's clothing leading to exposure of others.
- A tiny drop on the skin can cause sweating and muscle twitching at the site of contact.
- People exposed to low or moderate doses may experience some or all of the following signs and symptoms within seconds to hours after exposure:
  - Runny nose
  - Watery eyes
  - Small, pinpoint pupils
  - Eye pain
  - Blurred vision
  - Drooling and excessive sweating
  - Cough

- Chest tightness
- Rapid breathing
- Diarrhea
- Increased urination
- Confusion
- Drowsiness
- Weakness
- Headache
- Nausea, vomiting, and/or abdominal pain
- Slow or fast heart rate
- Abnormally low or high blood pressure

› Exposure to a large dose may result in:

- Loss of consciousness
- Convulsions
- Paralysis
- Respiratory failure, possibly leading to death

Tabun Diagnosis and Treatment

› Treatment with antidotes (atropine and pralidoxime) is recommended as soon as possible.

› Other supportive health care may be necessary.

› Mild or moderately poisoned people that are treated both rapidly and adequately usually recover completely.

› Severely exposed people or those victims who are ineffectively treated may not survive.

› Repeated exposure can result in long-term damage to the body.

› If ingested, do not induce vomiting or drink fluids.

VX

VX Basic Facts

- VX is an odorless and tasteless amber-colored oily liquid that is very slow to evaporate.
- Can be heated to create a vapor form, but only in small amounts.
- The agent is stable in the environment.
- In average weather, can last on objects for days.
- In extremely cold weather, can sustain its potency for months.
- Can be a long-term hazard on surfaces.
- Considered more toxic than other nerve agents.

VX Illness

- Can ingest it, breathe it in, or come into contact with it through skin or eyes.
- Vapor form can produce signs and symptoms within seconds after exposure.
- In liquid form, produces signs and symptoms within a few minutes or up to 18 hours after exposure.
- Unless washed off immediately, liquid on the skin can be lethal.
- Even a tiny drop on the skin can cause sweating and muscle twitching at the site of contact.
- Remains potent on a person's clothing, meaning that others can be exposed.
- Within seconds or hours of moderate exposure, signs and symptoms include:
  - Runny nose
  - Watery eyes
  - Small, pinpoint pupils
  - Eye pain
  - Blurred vision
  - Drooling and excessive sweating
  - Cough
  - Chest tightness
  - Rapid breathing

- Diarrhea
- Increased urination
- Confusion
- Drowsiness
- Weakness
- Headache
- Nausea, vomiting, and/or abdominal pain
- Slow or fast heart rate
- Abnormally low or high blood pressure

› Exposure to a large dose may cause:

- Loss of consciousness
- Convulsions
- Paralysis
- Respiratory failure, possibly leading to death

VX Diagnosis and Treatment

› A release may not be easy to detect because it has no odor.

› A release is confirmed by the signs and symptoms of those exposed.

› Atropine is the preferred antidote and must be given quickly after exposure.

› People can recover completely from mild or moderate poisoning that is both rapidly and effectively treated.

› Those exposed to large doses or those people ineffectively treated may not survive.

› Prolonged exposure can result in long-term damage to the body.

› If ingested, do not induce vomiting or drink fluids.

LESSENING THE IMPACT OF EXPOSURE TO RADIOLOGICAL AND NUCLEAR AGENTS

- Follow the instructions of emergency workers.
- The most important concepts to minimize exposure are time, distance, and shielding.

  Time: Decrease the amount of time spent near the radiation source.

  Distance: Increase your distance from the radiation source.

  Shielding: Increase the shielding between you and the radiation source. Shielding is anything that creates a barrier between people and the radiation source.
- Stay indoors and "shelter-in-place" to reduce exposure. Being inside a building (particularly a basement), inside a vehicle, or behind a wall would provide some protection.
- Close doors and windows and shut off ventilation systems using outside air.
- If outdoors, cover mouth and nose with a scarf, handkerchief, or other type of cloth to avoid inhaling radioactive dust.
- If near the site of an attack and dust or debris is on one's body or clothing, decontaminate (remove outer layer of clothing and bag it, shower without harsh scrubbing, and wash hair) before leaving to avoid spreading contamination.
- Treatment of life-threatening injuries should not be delayed in order to perform decontamination. Seek medical attention if injured by the explosion.
- Do not eat potentially contaminated foods or drink potentially contaminated water.
- Federal agencies have developed real-time models to predict how a nuclear or radiological attack would affect a given area. This information can be used to quicken response efforts and limit the number of people affected by an attack.

RADIATION EMERGENCIES

This section provides basic information on four types of radiation emergencies:

- **Nuclear power plant attack**
- **Radiological dispersal device (e.g., dirty bomb)**
- **Improvised nuclear device (e.g., suitcase bomb)**
- **Nuclear weapon**

Please note that the descriptions of signs and symptoms in this section are not meant to be used to self-diagnose illness—they are for informational purposes only. Contact a health care provider if you suspect that you have been exposed to one of these agents or if you feel sick.

RADIATION EMERGENCIES QUICK REFERENCE CHART

AGENT	DESCRIPTION	FIRST SIGNS AND SYMPTOMS	FIRST ACTIONS	MEDICAL RESPONSE
Nuclear Power Plant Attack	Attack on a nuclear power plant using explosives, hacking into computers, or crashing a plane into a reactor or other structures.	Radiation release unlikely—power plants are built to sustain extensive damage. Possible traumatic injuries if there is an explosion.	As a precaution, seek shelter or stay indoors if near the plant. Tune to local radio and television for further instructions from public health authorities. Immediately seek medical care for blast injuries.	Care for blast injuries.
Radiological Dispersal Device (e.g., dirty bomb)	Dirty bomb: explosive device laced with radioactive materials. Radioactive materials may also be spread as aerosol or liquid.	Traumatic injuries caused by the explosion. Radiation sickness not likely with dirty bomb, but shrapnel could be highly radioactive.	Seek shelter or stay indoors. Immediately seek medical care for blast injuries. Cover nose and mouth with mask or cloth. If exposed, remove clothing, place in a plastic bag, and shower or wash.	Care for blast injuries. Possible decontamination if radioactive material is present.
Improvised Nuclear Device/ Nuclear Weapon	Powerful bomb involving splitting of atoms. Comes in various sizes and types, producing various levels of destruction.	Severe thermal burns, lung and ear drum damage, blindness or retinal burns, injuries from flying objects. Radiation sickness may follow.	Do not look toward the explosion. Seek shelter behind any shield or in a basement. Lie on the ground and cover your head.	Wide range of medical response depending on severity of exposure.

BASIC FACTS

The first step in understanding radiation emergencies is to draw the distinction between a **nuclear event** (like the bomb dropped on Hiroshima, Japan) and a **radiological event,** such as a nuclear power plant incident or a radiological dispersal device (e.g., dirty bomb).

NUCLEAR EVENT

- Produces a nuclear detonation involving the joining (fusion) or splitting (fission) of atoms to produce an intense pulse or wave of heat, light, air pressure, and radiation.
- Highly destructive explosion that instantly devastates people and buildings because of extreme heat and impact of the blast.
- Leaves large amounts of radioactivity and "fallout" behind.

RADIOLOGICAL EVENT

- May involve explosion and release of radioactivity, but no nuclear fission.
- Typically less radioactivity is released than in a nuclear event.

In both cases, wind direction and weather patterns can spread radioactivity beyond the immediate incident site.

RADIOACTIVE CONTAMINATION

The deposition of radioactive material (e.g., dirt, dust, debris, liquid) on the surfaces of structures, areas, objects, or people. It can be airborne, external, or internal.

RADIATION EXPOSURE

Exposure occurs when radiation penetrates the body and deposits its energy. For example, when a person has a chest X-ray, they are exposed to radiation, but they are not contaminated.

For more details on the difference between radioactive contamination and exposure, see http://www.bt.cdc.gov/radiation/contamination.asp.

INSTRUCTIONS TO SHELTER-IN-PLACE AND SEAL THE ROOM DUE TO RADIATION EMERGENCIES

If you have been exposed:

- If coming from outside, remove outer layer of clothing and seal it in a plastic bag
- Shower and gently wash with soap, if possible

To shelter-in-place and seal the room:

- Find a room with as few windows and doors as possible
- Go to the *lowest* level possible
- Turn off the air conditioner, heater, and fans
- Close the fireplace damper
- Tape plastic over windows and doors; seal with duct tape*
- Tape over vents and electrical outlets (and any other openings)
- Fill sinks and tubs with water
- Turn on the radio
- Keep a telephone handy

* Within a few hours, the plastic and tape needs to be removed and fresh air should be allowed to enter the room to prevent suffocation. *Follow the instructions of emergency workers and/or public health officials.*

You may notice that specific guidance on food and water safety after a terrorist attack is not included in this guide. The effect of an attack or other public health emergency on food and water supplies is very situation specific. As a result, public health officials will provide specific information on food and water safety as needed.

TYPES OF POTENTIAL EMERGENCIES

	NUCLEAR POWER PLANT ATTACK	RADIOLOGICAL DISPERSAL DEVICE (RDD)	IMPROVISED NUCLEAR DEVICE (IND)	NUCLEAR WEAPON
Type of Event	Radiological	Radiological	Nuclear	Nuclear
Examples of Radiation Dispersal	• Possible escape of radioactive material from attack on plant • Attack could include using explosives, hacking into computers, or crashing a plane into the reactor or other structures	• May be conventional explosives laced with radioactive material (e.g., dirty bomb) • Aerosols or sprays • Could include hiding radioactive material in a populated area (radiation-emitting device [RED])	Smaller nuclear weapon (e.g., suitcase bomb)	Nuclear weapon developed for strategic military purposes
Nuclear Blast	No	No	• Smaller nuclear explosion of varying size • Can be as large as the bomb dropped on Hiroshima	• Highly destructive nuclear explosion • Can be in the order of 100 times the bomb dropped on Hiroshima

Continued on next page.

TYPES OF POTENTIAL EMERGENCIES *(cont.)*

	NUCLEAR POWER PLANT ATTACK	RADIOLOGICAL DISPERSAL DEVICE (RDD)	IMPROVISED NUCLEAR DEVICE (IND)	NUCLEAR WEAPON
Amount of Radiation Exposure	• Less than a nuclear event • Although unlikely, radioactive materials could escape/contaminate the area and environment	• Limited • Dirty bomb blast could spread contamination around area the size of several city blocks • Exposure from a RED would depend on the size of the source and speed of detection	• Varying • May or may not include fallout	• Considerable • Creates a large fireball that would vaporize everything within it to form what is known as the "mushroom cloud." When materials cool, they condense, form particles and fall back to earth (fallout) • Radioactive particles from the fallout could be carried long distances
Consequences	• Death toll could be limited • Plants are built to sustain extensive damage without releasing radioactive material • Psychological impact could be severe	• Limited death toll • In the case of a dirty bomb, initial explosion could kill or injure people in the immediate area • RED would depend on size of source, how it early it is detected and other factors • Psychological impact could be severe	• Depends on the size of the blast, whether there is fallout, and population of area • Psychological impact could be severe	• Catastrophic damage to people, buildings, and the environment • Psychological impact could be severe

THE IMPACT OF RADIATION EMERGENCIES

RADIATION INJURIES

- Could result from the aftermath of a nuclear blast—less likely after a radiological incident.
- May not be apparent for months or years after exposure to radiation.
- The type and extent of injury may depend on:
  - The amount (dose) of radiation to which a person is exposed
  - The type of radiation (alpha, beta, gamma) to which a person is exposed (more information on this topic can be found in the media reference guide at http://www.hhs.gov/emergency)
  - Whether exposure is external (e.g., skin) versus internal (e.g., inhaled)
- Internal contamination occurs if someone ingests or inhales radioactive materials and the materials are incorporated by the body.
- If the radiation dose is large enough, victims can develop acute radiation syndrome or radiation sickness (more information at http://www.bt.cdc.gov/radiation/ars.asp). Signs and symptoms, not all of which develop at the same time, include:
  - Nausea
  - Vomiting
  - Diarrhea
  - Fever
  - Loss of appetite
  - Skin damage (e.g., redness, itching, swelling, blisters)
  - Seizures
  - Coma
  - Signs and symptoms are nonspecific and may be indistinguishable from those of other injuries or illness.
- If radiation dose is small, no immediate health effects will be observed. In the long-term, there may be an increased risk of developing cancer.
- In general, the higher the radiation dose the greater the severity of immediate health effects and the greater the possibility of long-term health effects.

- Children exposed to radiation may be more at risk than adults. Radiation exposure to the unborn child is of special concern—the human embryo is very sensitive to radiation.

TREATMENT

- Many victims would likely need treatment for injuries associated with the explosion (e.g., burns, wounds).
- If contaminated, people should decontaminate themselves by removing the outer layer of clothing, placing the clothing in a bag and sealing it, taking a shower without harsh scrubbing, and washing hair. Exposure may be reduced by removing external contamination.
- Treatment for radiation sickness would depend on the severity of the signs and symptoms. Physicians will treat signs and symptoms, provide supportive care, and try to prevent infections. The worst cases may require blood transfusions and bone marrow transplants.
- There are different classes of drugs that can help:
  - Blocking agents prevent absorption of certain radioactive material in the body (e.g., Potassium iodide)
  - Decorporation agents speed up elimination of certain radioactive materials from the body (e.g., Prussian blue, diethylenetriaminepentaacetate)
  - Other drugs are used to help recovery from radiation sickness (e.g., Neupogen®)
- Potassium iodide, when taken before or soon after exposure to radioactive iodine, can protect the thyroid gland from absorbing radioactive iodine and developing thyroid cancer, but this does not help against other forms of radioactivity that may come with an attack. In addition, not all attacks will involve the release of radioactive iodine.
- There is no vaccine or drug that can make people immune to the effects of radiation.

DEFINING PUBLIC HEALTH ROLES, PROGRAMS, AND TERMS

05

Topics covered in this section include:

- **Key functions of federal government public health agencies in an emergency**
- **Syndromic surveillance**
- **BioSense**
- **BioWatch**
- **Laboratory Response Network (LRN)**
- **Health Alert Network (HAN)**
- **Epidemic Information Exchange (EPI-X)**
- **Strategic National Stockpile (SNS)**
- **Vaccination**
- **Isolation and quarantine**
- **National Disaster Medical System (NDMS)**
- **Additional personnel and assistance**
- **Emerging infectious diseases**
- **Pandemic influenza**

THE KEY FUNCTIONS OF FEDERAL GOVERNMENT PUBLIC HEALTH AGENCIES IN AN EMERGENCY

The U.S. Department of Health and Human Services (HHS) is the U.S. Government's principal agency for protecting the health of all Americans. **The overall goal of HHS' preparedness and response program is to ensure sustained public health and medical preparedness within our communities and our nation in defense against terrorism, infectious disease outbreaks, medical emergencies, and other public health threats.**

In a public health emergency, HHS' responsibilities include:

- Monitoring, assessing, and following up on people's health
- Ensuring the safety of workers responding to an incident
- Ensuring that the food supply is safe
- Providing medical, public health, and mental/behavioral health advice
- Establishing and maintaining a registry of people exposed to or contaminated by a given agent

To fulfill this role, HHS works closely with state, local and tribal public health departments, the U.S. Department of Homeland Security (DHS), other federal agencies, and medical partners in the private and nonprofit sectors. Under the Public Health Service Act, HHS has the authority to:

- Declare a public health emergency
- Make and enforce regulations (including isolation and quarantine) to prevent the introduction, transmission, or spread of communicable diseases into the United States or from one state or possession into another
- Conduct and support research and investigation into the cause, treatment, or prevention of a disease or disorder
- Direct the deployment of officers of the Public Health Service (PHS), a division of HHS, in support of public health and medical operations
- Provide public health and medical services and advice
- Provide for the licensure of biological products

It is important to recognize that state, local, or tribal governments have the initial responsibility for responding to an emergency and protecting the people, property, and environment within their jurisdiction. The federal government generally supports the state, local, and tribal response when one or more of the following occurs:

- **A state requests assistance from the federal government and the President**
- **The President declares a state of emergency**
- **An incident takes place in areas that are owned or controlled by the federal government**

Overall, federal response is coordinated through DHS.

For more information on the roles of HHS and other agencies, see the National Response Plan (NRP) at http://www.dhs.gov/nrp or the media reference guide at http://www.hhs.gov/emergency.

FEDERAL PROGRAMS AND PROCESSES THAT MAY SUPPORT STATES AND LOCALITIES IN AN EMERGENCY

DETECTING DISEASE THREATS

Although some public health emergencies may be overt (e.g., a bomb, an envelope containing a suspicious powder along with a message saying the powder is a deadly substance), many may be covert, or quietly conducted without an obvious beginning (e.g., transmitting a disease, like smallpox, to people without any distinct signals).

Syndromic Surveillance

A covert attack would unfold more slowly and could be harder to identify. Such an attack is likely to be identified by the routine monitoring and analysis of data, called syndromic surveillance, on disease patterns and deaths that are performed in the public health and medical communities. The Centers for Disease Control and Prevention (CDC) and individual states have numerous surveillance policies and networks, some of which are fairly broad in scope and others which are focused on the tracking of specific diseases.

The data fed into the local systems are often the result of alert health care professionals (e.g., doctors, nurses, medical examiners, veterinarians). When health care professionals see atypical diseases, unusual patterns (e.g., many cases of disease at the wrong time of year), higher than normal death rates from a disease, unusual rises or patterns in purchases of drugs, or uncommon test results, they contact local public health officials. These officials will start investigating and may contact state and federal officials, as well as law enforcement, depending on the situation.

BioSense

BioSense is a bioterrorism detection program run by the CDC that monitors and flags possible health emergencies by constantly scanning medical information from hospital emergency rooms and pharmacies (http://www.syndromic.org/pdf/work3-JL-BioSense.pdf). BioSense monitors enormous databases to find groups of common signs and symptoms, such as fever, rash, diarrhea, and nausea. The system can assess whether there are any sudden increases in the numbers of visits to emergency rooms or whether there are sharp increases of prescription and over-the-counter medication purchases in any given location. BioSense also scans environmental data from Project BioWatch, which is described on the next page.

BioWatch

Project BioWatch is an air-monitoring system that will provide an early warning for biothreats in urban areas. The initiative is led by DHS, in partnership with the U.S. Environmental Protection Agency (EPA) and CDC's Laboratory Response Network. This biosurveillance system includes round-the-clock air-monitoring stations in more than 30 cities across the United States.

Technicians collect air samples from BioWatch sensors at least once a day. The samples then go to labs to undergo testing for the presence of specific bioagents, including anthrax, smallpox, and plague. In general, EPA collects the samples and designated labs that are a part of the Laboratory Response Network (described below). If lab workers detect a possible bioagent, a rapid response protocol goes into effect that involves DHS, CDC, EPA, and the Federal Bureau of Investigation (FBI).

RESPONDING TO DISEASE THREATS

LABORATORY RESPONSE NETWORK

The Laboratory Response Network (LRN) is a network of laboratories around the country that can work together in the case of an act of terrorism or other public health emergency and facilitate rapid identification of a bioterrorism agent. The LRN was developed by CDC (http://www.bt.cdc.gov/lrn), the Association of Public Health Laboratories (http://www.aphl.org), and the FBI.

The LRN has two major components: a network of public health laboratories dealing with biological agents and a network dealing with chemical agents.

Bio-LRN

The Bio-LRN network has about 120 labs in all 50 states that include local, state, and federal public health labs as well as international, veterinary diagnostic, military, and other specialized labs that test environmental samples, animals, and food. It is made up of three levels of labs that handle progressively more complex testing:

Sentinel Labs:

- Private and hospital labs that routinely process patient tests
- May be the labs to first test and/or recognize a suspicious organism

- Conduct tests to "rule out" less harmful organisms
- Refer samples to a reference lab, if they cannot rule out that the sample is a bioterror agent

Reference Labs:

- Have specialized equipment and trained personnel
- Perform tests to detect and confirm the presence of a bioterror agent
- Are capable of producing conclusive, confirmatory results
- Include local, state, and federal labs

National Labs:

- Includes the CDC, the U.S. Army Medical Research Institute for Infectious Diseases in Maryland, and the Naval Medical Research Center, also in Maryland
- Perform highly specialized testing to identify specific disease strains and other characteristics of an investigated agent
- Test certain highly infectious agents that require special handling

Chem-LRN

Chem-LRN is a network of 61 laboratories in all states and some territories and municipalities that test for chemical agents in human samples, such as urine or blood. Chem-LRN laboratories have three levels of activities. Each level builds on the preceding level.

- **Level 1 (All laboratories):** Work with hospitals in their jurisdiction and maintain competency in clinical specimen collection, storage, and shipment
- **Level 2 (41 laboratories):** Can detect exposure to a limited number of toxic chemical agents
- **Level 3 (Five laboratories):** Can detect exposure to an expanded number of chemicals, including those analyzed by Level 2 laboratories, as well as mustard agents, nerve agents, and ricin

Responding to an Event

- By the request of a state, CDC may deploy a Rapid Response Team to the affected state to assist with specimen collection, packaging, storage, and shipment.

- Representative samples from people who are suspected to be exposed are sent to CDC for analysis through the Rapid Toxic Screen, which can analyze people's blood or urine for a large number of chemical agents likely to be used by terrorists.
- Data produced from the Rapid Toxic Screen and the health implications associated with those exposures will be communicated in a secure, electronic manner to the affected state.
- Hospitals and laboratories may be dealing with many people concerned about exposure. There will be a need to respond to these concerns and determine whether an individual has been exposed and at what level. CDC will contact the appropriate LRN labs to help participate in the response.

HEALTH ALERT NETWORK

Once lab tests confirm the presence of a terrorism agent, information will need to be distributed throughout the medical community quickly to identify additional patients and advise health care providers about treatment. The Health Alert Network (HAN) (http://www.phppo.cdc.gov/HAN/Index.asp) is a nationwide, integrated electronic information and communications system for the distribution of health alerts, prevention guidelines, national disease surveillance, and laboratory reporting. HAN is a collaboration between CDC, local and state health agencies, and national public health organizations. It allows for the sharing of information between state, local, and federal health agencies as well as hospitals, laboratories, and community health providers. The network shares information routinely, but during an event, HAN provides early warnings by broadcast fax and e-mail to alert officials at all levels about urgent health threats and appropriate actions. There are three categories of HAN messages:

- **Health Update:** provides updated information regarding an incident or situation; unlikely to require immediate action
- **Health Advisory:** provides important information for a specific incident or situation; may not require immediate action
- **Health Alert:** conveys the highest level of importance; warrants immediate action or attention

These messages can be viewed on the HAN Web site (http://www.phppo.cdc.gov/HAN/Index.asp). States may also have their own HAN networks, some of which are accessible online.

EPIDEMIC INFORMATION EXCHANGE

The Epidemic Information Exchange (Epi-X) is a secure, Web-based communication network that connects the CDC and more than 3,000 professionals working at federal health agencies, state and local health departments, poison control centers, and laboratories in the United States and neighboring countries. Health agencies authorize certain officials to participate on Epi-X and share technical information. Peers contribute information to CDC, monitor the network 24 hours a day and typically post reports within minutes to hours of submission. Staff can also notify users immediately by e-mail, pager, and telephone in an emergency.

CONTAINING DISEASE THREATS

STRATEGIC NATIONAL STOCKPILE

The Strategic National Stockpile (SNS) (http://www.bt.cdc.gov/stockpile/index.asp) is a national repository of critical medical supplies designed to supplement and resupply state and local public health agencies in the event of a national emergency anywhere and at anytime within the United States or its territories within 12 hours of the federal decision to deploy. The SNS program is managed by CDC and is carried out in conjunction with state and local communities who have responsibility for developing their own local plans for the receipt and distribution of SNS supplies. SNS only distributes medical supplies—it does not operate mass casualty centers or clinics.

What SNS Includes

Items included in SNS are based upon current terror threats, the vulnerability of the U.S. civilian population, and availability and ease of distribution of supplies. SNS contains multiple caches of medical supplies stored in warehouses in different regions across the country. These caches include antibiotics, chemical antidotes, antitoxins, life-support medications, intravenous (IV) administration, airway maintenance supplies, and medical/surgical items.

How SNS Is Activated and Managed

- The affected state's Governor's office requests SNS materials from HHS or CDC.
- HHS assesses the situation and determines prompt and appropriate action. This assessment could include consultation with other federal agencies and entities (e.g., DHS).

- Supplies are sent in "12-hour Push Packages," which contain a broad range of products that may be needed in the early hours of an emergency and are ready to be loaded on trucks or an aircraft. These supplies would go directly to predesignated sites, depending on the situation and the plans made by the affected community.
- Additional supplies are available through Vendor Managed Inventory and Stockpile Managed Inventory, and will arrive within 24–36 hours. Shipments can be tailored to provide pharmaceuticals, supplies, and/or products specific to the suspected or confirmed agent(s) in addition to or instead of Push Packages.
- Local and state officials are responsible for the distribution of SNS supplies once they arrive at agreed upon receiving sites. However, while SNS supplies are being transported, the SNS program will deploy its Technical Advisory Response Unit to help receive and distribute supplies upon arrival at the site.

VACCINATION

One method that public health officials may use to control an outbreak of some diseases caused by bioterrorism is vaccination. Vaccines cause the body to produce antibodies, which protect the body against later infection by a particular agent. However, vaccines are not available for many diseases and not all vaccines work the same way. Smallpox vaccine, for example, provides almost immediate immunity and can be beneficial even if someone is vaccinated a few days after exposure. Other vaccines, such as the anthrax vaccine, may require a number of doses over time before the recipient builds up immunity. Therefore, vaccines may or may not be helpful in a sudden outbreak, depending on the disease and incident.

It is possible in a widespread attack that pubic health officials may use a mass vaccination approach for some agents to protect people in affected areas. Public health officials will provide information on what people should do if this is needed in a given community. Some information on how such a vaccination clinic might function is provided on the following page. For more information on vaccination strategies, please see the media reference guide at http://www.hhs.gov/emergency.

HOW A VACCINATION CLINIC OR SNS DISTRIBUTION SITE MIGHT FUNCTION

Although most communities have done advance planning in terms of where clinics and dispensing sites may be held and how they will work, the exact location and setup will be incident specific. As a result, the local media would be heavily relied upon to get information out about who should go to one of these sites, and where and when they will be open.

Public health officials will request that people bring the following information to receive appropriate treatment:

- **Photo identification (driver's license, military ID, company badge)**
- **Medical records, including previous immunizations, current medications, and allergies**
- **Current age and weight of children**

It is helpful for people to gather this information before the emergency and keep it in a safe but easily accessible place.

This information would be requested strictly for medical reasons. Anyone who needs services will be able to get them free of charge and regardless of immigration and residency status.

ISOLATION AND QUARANTINE

To protect the public in the case of an outbreak of a highly contagious infectious disease, such as smallpox or plague, public health officials may decide to employ isolation and/or quarantine strategies.

Isolation removes people who are ill with contagious diseases from the general public and restricts their activities to stop the spread of a disease. Isolation is not required for patients with noncontagious diseases, such as anthrax.

Isolation:

- Confines infected persons to their homes, hospitals, or designated health facilities
- Allows health care providers to provide infected persons with specialized care
- Is commonly used in hospitals for people with certain diseases, such as tuberculosis
- Is initiated mostly on a volunteer basis, but government officials at all levels have the authority to enforce it

Quarantine separates people who have been potentially exposed to a contagious disease and may be infected but are not yet ill to stop the spread of that disease.
Quarantine:

- Confines persons to their homes or community-based facilities
- Can apply to a group that has been exposed at a public gathering
- Can apply to persons who are believed to have been exposed while traveling, particularly overseas
- Can apply to an entire geographic area, in which case a community may be closed off by sealing its borders or by a barricade, known as a "cordon sanitaire"
- Is enforced at the state level and/or by CDC's Division of Global Migration and Quarantine

NATIONAL DISASTER MEDICAL SYSTEM

The National Disaster Medical System (NDMS) (http://ndms.dhhs.gov) provides medical services to help local and state agencies respond to major emergencies and disasters, including acts of terrorism. The system is made up of specialized teams and a network of approximately 2,000 hospitals. Medical professionals in the system are specially trained and volunteer their services in case of an emergency as a supplement to local hospital systems. NDMS operates as a part of DHS, in partnership with HHS, the U.S. Department of Defense, and the U.S. Department of Veterans Affairs. NDMS is operational in two situations: (1) if a National Emergency is declared or (2) at the request of a state or local government.

The five types of NDMS teams are:

- Disaster Medical Assistance Teams (rapid response units to supplement local services)
- Disaster Mortuary Operational Response Teams (provide help to local officials in the recovery, identification, and burial of victims)
- Veterinary Medical Assistance Teams (veterinary care in major emergencies)
- National Nursing Response Teams (mass vaccination and other nursing functions)
- National Pharmacy Response Teams (assist when large numbers of pharmacy professionals are needed)

ADDITIONAL PERSONNEL AND ASSISTANCE

The Epidemic Intelligence Service (EIS) (http://www.cdc.gov/eis) is a 2-year postgraduate program of service and on-the-job training for health professionals interested in epidemiology.

The Commissioned Corps of the U.S. Public Health Service (http://www.usphs.gov) includes a variety of health professionals, including physicians, dentists, pharmacists, nurses, veterinarians, and other scientists and professionals.

The Medical Reserve Corps (http://www.medicalreservecorps.gov) are teams of local volunteer medical and public health professionals who have offered to contribute their skills and expertise during times of community need.

The American Red Cross (http://www.redcross.org) is a nonprofit humanitarian organization led mostly by volunteers. Although not a government organization, the American Red Cross was given authority through a Congressional Charter in 1905 to provide assistance in disasters, both domestically and internationally. American Red Cross Chapters work closely with federal, state, and local governments to respond to disasters. Their services include:

- Emergency first aid
- Health care for minor injuries and illnesses in mass-care shelters or other sites
- Supportive counseling for victims and those affected by the event
- Personnel to assist in the temporary infirmaries, immunization clinics, morgues, hospitals, and nursing homes
- Assistance with meeting basic needs (e.g., food, shelter)
- Provision of blood products

IMPORTANT PUBLIC HEALTH THREATS BEYOND TERRORISM

EMERGING INFECTIOUS DISEASES

There are a number of infectious diseases that are of increasing concern to scientists and the medical community because they have previously infected only animals but are now infecting humans. In this section, a few of these diseases will be discussed—SARS, West Nile Virus, and “Mad Cow” Disease.

SARS

SARS (severe acute respiratory syndrome) is viral respiratory illness caused by a coronavirus. The first confirmed cases occurred in Guangdong Province in China in November 2002. These 11 independent cases appear to have resulted from human consumption of wild animals. The virus quickly evolved to a form that could be transmitted among humans. In the 2003 outbreak, a total of 8,098 people worldwide contracted SARS and 774 died. Most SARS cases were in Asia. There were eight lab-confirmed cases of SARS in the United States, but none of these individuals died from the disease. Those affected had all traveled to parts of the world where SARS outbreaks were occurring. By late July 2003, no new cases were being reported and the World Health Organization (WHO) declared that the global outbreak was over. In April 2004, there were several cases of SARS in China that were laboratory acquired infections. CDC now has a plan in place to respond quickly if SARS recurs. Tremendous progress has been made in the development of experimental SARS vaccines.

Coronaviruses are a group of viruses that have a halo or crown-like appearance under a microscope. They are a common cause of mild to moderate upper respiratory illness, but the SARS-associated coronavirus (SARS-CoV) caused much more severe illness. SARS appears to be spread through close person-to-person contact through respiratory droplets (such as coughing or sneezing). Once exposed to the virus, symptoms can appear from 2 to 7 days afterwards, although in some cases it has taken as long as 10 days. Currently, SARS-CoV is being tested against antiviral medications to see if an effective treatment can be found. Until then, medical treatment is mostly supportive care to manage symptoms, provide breathing support if needed (such as a respirator), and to keep the patient isolated from others to prevent the spread of infection.

For more information on SARS, including current information on SARS transmission throughout the world, see CDC's SARS Web site (http://www.cdc.gov/ncidod/sars) or WHO's SARS Web site (http://www.who.int/csr/sars/en/).

West Nile Virus

West Nile virus (WNV), which is transmitted by mosquitoes from birds to humans or other animals, appeared in North America in 1999. Humans, horses, and some species of domestic and wild birds are susceptible to WNV. The most serious form of the disease is viral encephalitis, which is an inflammation of the brain.

No human-to-human transmission has been reported. According to CDC, in 2003, 9,862 cases were documented in humans in the United States and 264 people died. Efforts are now underway to develop specific treatments and different vaccine approaches to manage WNV. More information on WNV can be found at http://www.cdc.gov/ncidod/dvbid/westnile/index.htm.

Bovine Spongiform Encephalopathy ("Mad Cow" Disease)

Bovine spongiform encephalopathy (BSE), which is commonly known as "mad cow" disease, was a concern in the United States in the winter of 2003–2004 after the discovery of a single dairy cow in Washington state with BSE. In a separate incident in Texas, another cow with BSE was confirmed in the spring of 2005. Neither cow ever became part of the U.S. food supply. BSE is a progressive neurological disorder that is typically spread in cows when they eat animal feed containing neural tissue (e.g., spinal cords, brain tissue) of BSE-infected cows. Feed bans were implemented in North America in 1997, which prohibited the use of this kind of cattle feed. The concern about BSE is that it appears linked to a neurological disease in humans called variant Creutzfeldt-Jackob disease (vCJD). As of December 1, 2003, there had been 153 vCJD cases reported worldwide—143 of them in Great Britain. The CDC has increased surveillance, however, to monitor for cases of vCJD in the United States, and the U.S. Department of Agriculture has enhanced regulations, inspections, and surveillance related to BSE.

Pandemic Influenza

Pandemic influenza is an extreme, acute outbreak of influenza that is very different from the typical annual flu outbreak. Pandemics occur when there is a major change in an influenza virus, resulting in a new strain that most of the world has never been exposed to—leaving most individuals susceptible to infection. Unlike the gradual changes that occur in the influenza viruses that appear each year during flu season, a pandemic influenza virus is one that represents a major, sudden shift in the structure of the virus that increases its ability to cause illness in a large proportion of the population. In past pandemics, influenza viruses have spread worldwide within months. With increased globalization, a new pandemic could cross the globe within weeks or perhaps even days.

The rare appearance of a flu pandemic virus would likely be unaffected by currently available flu vaccines that are modified each year to match the strains of the virus that are known to be in circulation among humans around the world.

Three major influenza pandemics occurred during the 20th century. The most deadly influenza pandemic outbreak was the 1918 Spanish flu pandemic, which caused illness in roughly 20–40 percent of the world's population and more than 50 million deaths worldwide. In 1957, the Asian flu pandemic resulted in about 70,000 deaths. The most recent influenza pandemic occurred in 1968 with the Hong Kong Flu outbreak, which resulted in nearly 34,000 deaths in the United States.

Avian flu or bird flu is one type of influenza virus that is of concern to many public health officials. Both the 1957 and 1968 pandemics are thought to have had avian origins. Avian flu is caused by a group of influenza viruses that circulate among birds. It is thought that most human cases have resulted from contact with infected birds. However, because influenza viruses have the potential to change and gain the ability to spread easily between people, monitoring for human infection and person-to-person transmission is important. A small number of humans have been infected with avian flu since 1997 in Asia and the Netherlands.

Although some of the planning activities for terrorism and other public health emergencies are relevant to an influenza pandemic (e.g., strengthening surveillance systems), planning is also underway that is more specific to influenza. HHS' current Pandemic Influenza Plan (http://www.pandemicflu.gov) provides guidance to national, state, and local policymakers and health departments for public health preparation and response in the event of a pandemic influenza outbreak. Pandemicflu.gov is also the primary Web site portal to a variety of resources for governments at all levels, individuals and families, businesses, health care providers, and community organizations.

At the federal level, health officials are also conducting a number of other activities in preparation for the next pandemic, including international surveillance activities, vaccine development and research, and antiviral drug stockpiling and research. Among other activities, resources are being allocated to expand vaccine production as needed and add influenza antiviral drugs to SNS.

SOME DIFFERENCES BETWEEN TYPICAL INFLUENZA OUTBREAKS AND PANDEMIC INFLUENZA OUTBREAKS

TYPICAL INFLUENZA	PANDEMIC INFLUENZA
Yearly occurrence.	Rare occurrence (last one was in 1968).
Virus undergoes gradual change from previous years.	Major, sudden shift in virus structure (antigenic shift).
Previous exposure to similar viruses may provide some protection.	Little or no previous exposure in the population to similar viruses.
Healthy adults usually not at high risk for complications.	Entire population may be at risk for complications.
Vaccines may be developed in advance to combat the virus.	Vaccines cannot be developed until virus strain appears. Some antiviral medications may be effective.
Approximately 5–20 percent of Americans get the flu each year and approximately 36,000 die from the disease.	Percentages of the population that would be infected by a pandemic influenza virus and die from it are hard to predict ahead of time but would be significantly higher than a typical flu season.
Signs and symptoms include fever, cough, runny nose, and muscle pain.	Signs and symptoms could be more severe, including shortness of breath, acute respiratory distress, pneumonia, and organ failure.

WWW

WEB SITES

06

KEY FEDERAL GOVERNMENT AGENCY WEB SITES

Department of Energy (DOE)
http://www.energy.gov/

Department of Health and Human Services (HHS)
http://www.hhs.gov/

- **Centers for Disease Control and Prevention (CDC)**
  http://www.cdc.gov/

- **Food and Drug Administration (FDA)**
  http://www.fda.gov/

- **National Institutes of Health (NIH)**
  http://www.nih.gov/

- **Substance Abuse and Mental Health Services Administration (SAMHSA)**
  http://www.samhsa.gov/

Department of Agriculture (USDA)
http://www.usda.gov/

Department of Homeland Security (DHS)
http://www.dhs.gov/

Environmental Protection Agency (EPA)
http://www.epa.gov/

Federal Bureau of Investigation (FBI)
http://www.fbi.gov/

Federal Emergency Management Agency (FEMA)
http://www.fema.gov/

Ready.Gov (from the U.S. Department of Homeland Security)
http://www.ready.gov/

IMPORTANT TOPICAL WEB SITES

American Red Cross
http://www.redcross.org/

Biological Agents
http://www.bt.cdc.gov/agent/agentlist.asp

BioSense
http://www.syndromic.org/pdf/work3-JL-BioSense.pdf

Chemical Agents
http://www.bt.cdc.gov/chemical/

Epidemic Information Exchange (Epi-X)
http://www.cdc.gov/epix/

Epidemic Intelligence Service (EIS)
http://www.cdc.gov/eis/

Foodborne Diseases Active Surveillance Network (FoodNet)
http://www.cdc.gov/foodnet/

Health Alert Network (HAN)
http://www.phppo.cdc.gov/han/

Laboratory Response Network (LRN)
http://www.bt.cdc.gov/lrn/

National Disaster Medical System (NDMS)
http://ndms.dhhs.gov/

National Response Plan (NRP)
http://www.dhs.gov/nrp/

Pandemic Influenza
http://www.pandemicflu.gov/

Radiological Agents
http://www.bt.cdc.gov/radiation/

Severe Acute Respiratory Syndrome (SARS)
http://www.cdc.gov/ncidod/sars

Strategic National Stockpile (SNS)
http://www.bt.cdc.gov/stockpile/index.asp

West Nile Virus (WNV)
http://www.cdc.gov/ncidod/dvbid/westnile/index.htm

CONTACT LISTS, CHECKLISTS, AND ADDITIONAL TOOLS

07

A. WORKPLACE DISASTER SUPPLIES CHECKLIST

The following checklist is meant to be a quick reference of supplies that you may need during your work in the field. On your way out to cover a story, it may be helpful to grab enough supplies to last you about a day. It may also be helpful to place the supplies in a portable container (e.g., backpack) for easy transport.

❑ **Flashlight With Extra Batteries**

❑ **Battery-Powered Radio With Extra Batteries**

❑ **Food**

Enough nonperishable food to sustain you for at least 1 day (three meals) is a good idea. Select foods that require no refrigeration, preparation, cooking, or water. Examples:

- Ready-to-eat canned meals, meats, fruits, and vegetables
- Canned juices
- High-energy foods (granola bars, energy bars, etc.)

❑ **Water**

Keep at least 1 gallon of water available, more if you are taking certain medications. Store water in sturdy plastic containers, such as soft drink bottles.

❑ **Medications**

Include any nonprescription medications you usually take (e.g., pain relievers). If you use prescription medications, keep at least a 3-day supply at your workplace.

❑ **First Aid Supplies**

If your employer does not provide first aid supplies, have the following essentials:

- An assortment of bandages and gauze pads
- Hand wipes or waterless alcohol-based hand sanitizer
- Antiseptic wipes and antibacterial ointment
- Nonlatex gloves
- Adhesive tape
- Cold pack
- Scissors (small, personal)
- Tweezers
- CPR breathing barrier, such as a face shield

❑ Tools and Supplies

- Emergency "space" blanket (mylar)
- Paper plates and cups, plastic utensils
- Nonelectric can opener
- Personal hygiene items, including a toothbrush, toothpaste, comb, brush, soap, contact lens supplies, and feminine supplies
- Plastic garbage bags and ties (for personal sanitation uses)
- One complete change of clothing and footwear, including a long-sleeved shirt, long pants, and closed-toe shoes or boots
- An extra pair of eyeglasses, if you wear them

You may also want to consider adding tools you might need to do your work (e.g., power inverters, cell phone chargers, etc.)

(Sources: Federal Emergency Management Agency [www.fema.gov], American Red Cross [www.redcross.org])

Note: For information on Personal Protective Equipment (e.g., masks or respirators), please see the "Self-Care for Media" section of the extended reference version of the media guide at http://www.hhs.gov/emergency or the Center for Disease Control's (CDC) National Institute for Occupational Safety and Health at http://www.cdc.gov/niosh/npptl/topics/respirators/factsheets/respfact.html.

B. IMPORTANT PROFESSIONAL CONTACTS

Local response units will likely be the first to arrive at the scene of a public health emergency or terrorist attack. Later, your state may ask for help from the federal government. The following chart lists some of the initial response groups you may encounter on the scene and includes space for you to fill in contact information.

LOCAL	CONTACT NAME	PHONE NUMBER/E-MAIL	ROLE
Public health department			Coordination of early medical response, assistance in investigations
Police			Security, crowd control, surveillance
Fire department			Fire, rescue, emergency medical service
Emergency medical services			Emergency treatment, transport to medical facilities
Local American Red Cross chapter			First aid, supportive care, basic needs assistance, mass care and housing
Local Federal Bureau of Investigation office			Criminal investigation, assistance with lab testing
Other local contacts			
STATE	**CONTACT NAME**	**PHONE NUMBER/E-MAIL**	**ROLE**
Public health department			Assistance in early medical response, coordination with federal government
Other state contacts (e.g., state emergency management)			

NATIONAL	CONTACT NAME	PHONE NUMBER/WEB SITE	ROLE
Department of Health and Human Services, including:	Press Office	(202) 690-6343 www.hhs.gov/news	Tracking and reporting health data, medical investigation, managing medical supplies, quarantine and isolation, public health advice
• Centers for Disease Control and Prevention	Press Office	(404) 639-3286 www.cdc.gov/od/oc/media	
• National Institutes of Health	Press Office	(301) 496-5787 www.nih.gov/news	
• Food and Drug Administration	Press Office	(301) 827-6250 www.fda.gov/opacom/hpwhats.html	
• Health Resources and Services Administration	Press Office	(301) 443-3376 http://newsroom.hrsa.gov	
• Substance Abuse and Mental Health Services Administration	Press Office	(240) 276-2130 www.samhsa.gov/news/news.html	
Department of Homeland Security (including FEMA)	Press Office	(202) 282-8010 www.dhs.gov/dhspublic	Disaster/community recovery, victim ID, public works and engineering, mass care and housing
Environmental Protection Agency	Press Office	(202) 564-4355 www.epa.gov/newsroom	Environmental contamination, evaluating chemical attacks
Department of Energy	Press Office	(202) 586-5806 www.doe.gov/engine/content.do	Radiological testing and response
Federal Bureau of Investigation	Press Office	(202) 324-3691 www.fbi.gov/pressroom.htm	Criminal investigation, assistance with lab testing
Other national contacts			

C. PERSONAL EMERGENCY INFORMATION

Planning ahead and making sure that you have all of the essential contact information that you and your family may need in an emergency can provide much needed peace of mind when an emergency happens. The following chart is designed to help you document some of this key information. We recommend that you fill this chart out here and provide copies for your family.

CONTACT	NAME/PHONE NUMBER/E-MAIL
Local emergency contacts (e.g., neighbor)	
Nonlocal emergency contacts (e.g., out-of-state relative)	
Hospitals near: • Work • School • Home	
Family physicians	
Veterinarian	
Employer contact and emergency information	
School contact and emergency information	
Your medical information • Allergies • Blood type • Medications • Chronic conditions	

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES http://www.hhs.gov/emergency