

Basic Awareness describes chemical, biological, radiological/nuclear, and high-yield explosives (CBRNE) agents and how a terrorist might use them. It also helps prepare you to act if a CBRNE incident occurs in your workplace.



Suppose you are in the cafeteria at work one day and suddenly notice a group of people across the room suffering a coughing spell. Some seem to be gasping for air. Some are clutching their chests. Upon closer inspection you notice an abandoned duffel bag next to the heating, ventilating, and air conditioning (HVAC) vent with some fog spewing out of it.

Does this mean you've been targeted by a terrorist? If so, would you know what to do?





Learning Objectives

This course will help you answer those questions. You will be able to:

1. **Identify** facts about CBRNE agents, their hazards, and risks.
2. **Identify** facts about how CBRNE agents can be used in criminal or terrorist activities and the potential outcome of a weapon of mass destruction (WMD) used by a terrorist.
3. **Identify** indicators, signs, and symptoms of exposure to CBRNE agents.
4. **Identify** facts about CBRNE crime scene and evidence preservation.
5. **Identify** how to use self-protection measures in a CBRNE incident.
6. **Identify** the procedures necessary to perform individual chemical and biological (CB) decontamination.
7. **Identify** the steps required to protect others and safeguard property in a CBRNE incident.
8. **Identify** your role in the CBRNE response plan.
9. **Identify** the steps required to notify and communicate a CBRNE hazard.
10. **Identify** the steps required to recognize and communicate the need for additional resources during a CBRNE incident.

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Introduction

The terrorist attacks on the World Trade Center in New York City and the Pentagon on September 11, 2001 shook the very fiber of our nation like no event since the Japanese attack on Pearl Harbor. CBRNE (chemical, biological, radiological/nuclear, and explosive) incidents like 9/11 can cause hundreds, thousands, or even tens of thousands of injuries or deaths.

Because the victims of CBRNE incidents need urgent medical care, your awareness, recognition of signs, and speedy notification to authorities can save your life and the lives of others.



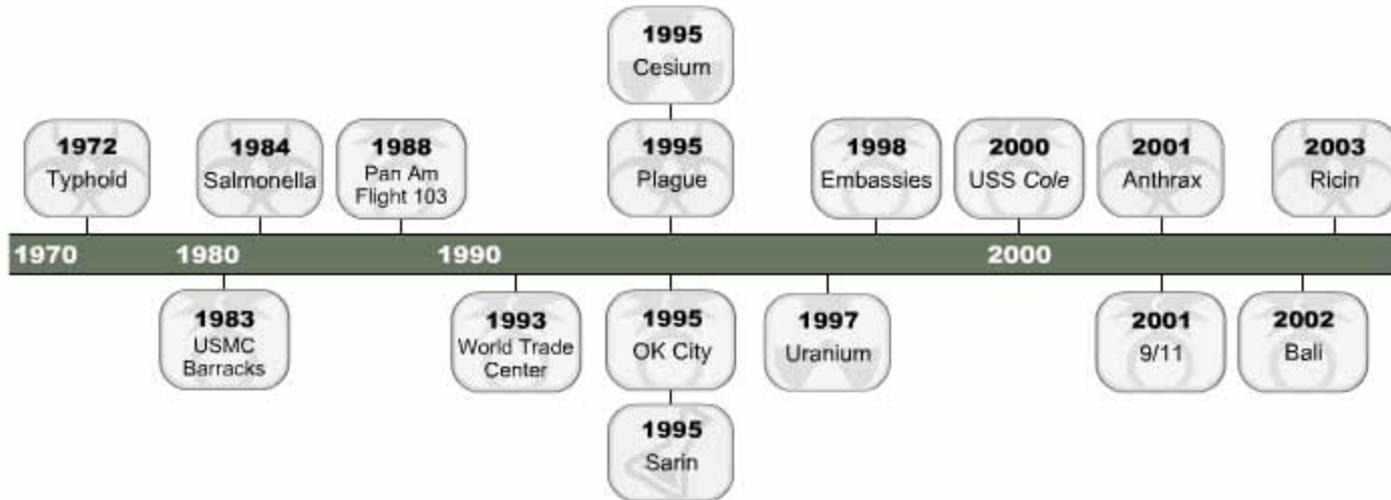


Understanding CBRNE incidents requires an understanding of terrorism. The Federal Bureau of Investigation (FBI) defines terrorism as "the unlawful use of force or violence against persons or property to intimidate or coerce a government or civilian population, in furtherance of political or social objectives."





Terrorists have the knowledge and the capability to strike anywhere in the world. Disturbingly, their targets have shifted from primarily government and business figures to the population at large.





Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

What does the B in CBRNE stand for?

- (a) Bombing
- (b) Bacteria
- (c) Botulism
- (d) Biological
- (e) Bioterrorism

Correct!



CBRNE Agents

If you think you're witnessing a CBRNE attack, you too could be a victim. In fact, the agent could still be present when emergency responders arrive on the scene. Depending on the type of CBRNE agent used, human health effects can differ and a different emergency response may be required.

Many CBRNE agents are invisible, making detection difficult. Some agents, such as chemical agents, have an immediate effect, but the effects of nuclear and biological agents can take hours to days to occur. Types of CBRNE agents include:

- **Chemical**
- **Biological**
- **Radiological/Nuclear**
- **High-yield explosives**



Knowledge Check

Click and drag the terms to the box next to their definitions. Incorrect selections will snap back to original location.

Radiological/Nuclear

Substances that emit high amounts of radioactivity (spontaneously released energy)

Chemical

Artificially produced substances that can inflict serious illness or injury on persons exposed to minute quantities

High-yield explosives

Materials that rapidly release large amounts of energy and produce a pressure shock wave during detonation

Biological

Living organisms or material derived from them that are used for military or terrorist purposes to cause death or incapacitation to humans, animals, or plants

Correct!



Chemical Agents: Types

Lethal chemical agents are used in warfare, although the U.S. no longer uses them. The police and the military use non-lethal chemical agents. Common industrial chemicals, such as ammonia and chlorine, are highly toxic to humans and could be used as terrorist weapons.

- Nerve agents can be lethal and affect the central nervous system.
- Cyanide (blood agent) affects the ability of cells to use oxygen, causing cell death throughout the body and coma.
- Choking agents such as phosgene affect the respiratory system.
- Blister agents such as mustard gas blister the skin and damage the airways.
- Riot control agents such as tear gas and pepper spray are non-lethal and irritate the skin, eyes, and inside of the mouth.

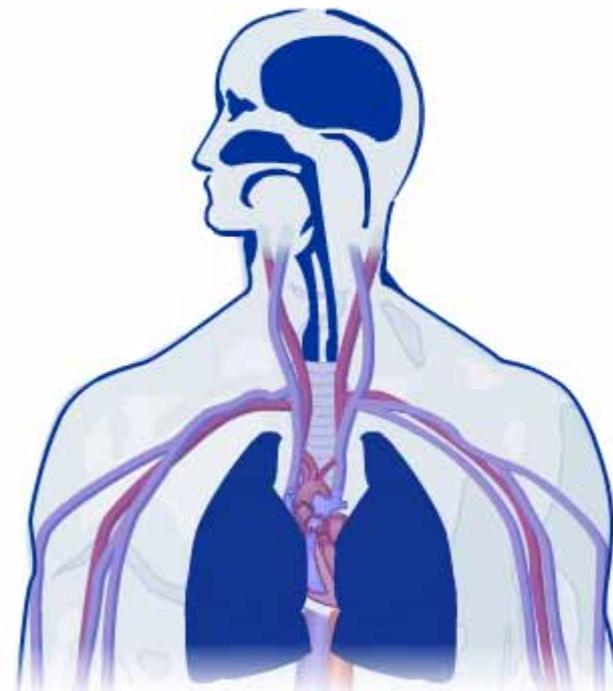


Photos courtesy of Kurdistan Democratic Party-Iraq

Chemical Agents: How Agents Enter the Body

Chemical agents can enter the body in three ways:

- **Breathing**
- **Direct contact with skin or eyes**
- **Eating/drinking**





Chemical Agents: Symptoms

The effects of chemical agents depend on the type of agent, how the agent gets into the body, and the concentration, amount, and length of exposure. Effects can be immediate or take days to appear. Signs may look like other illnesses, but if you see several people with the same symptoms, use common sense. For example, it would be highly unlikely that several people would have a heart attack at the same time. Symptoms might include:

- Red or irritated eyes and skin
- Shortness of breath or tightening of chest
- Choking and coughing
- Vomiting and nausea
- Runny nose
- Dizziness/Loss of consciousness
- Convulsions or seizures
- Pinpoint pupils and dimness of vision



Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

Which of the following is a symptom of exposure to chemical agents?

- (a) Red or irritated eyes and skin
- (b) Hair loss
- (c) Weakness or fatigue
- (d) Ruptured organs

Correct!



Biological Agents: Types

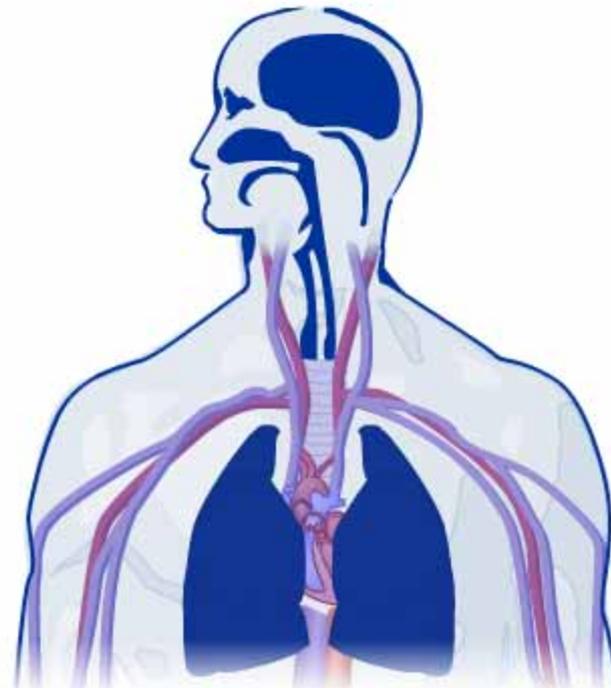
There are three types of biological agents:

- **Bacteria**
- **Viruses**
- **Toxins**

Biological Agents: How Agents Enter the Body

Biological agents can enter the body in four ways:

- **Breathing**
- **Breaks in the skin or direct contact with the eyes**
- **Injection**
- **Eating/drinking**





Biological Agents: Symptoms

Biological agents can be damaging or deadly in very small amounts. Effects are seen in hours to days. Children, the elderly, and the chronically ill may be the most seriously affected. Effects differ, but symptoms may initially look like a common illness such as the flu. Unfortunately, the illnesses caused may be contagious. Symptoms include:

- Coughing/flu-like symptoms
- Fever
- Shortness of breath
- Weakness or fatigue
- Vomiting and diarrhea



Photo: Demonstration of symptoms of biological agent exposure: weakness and vomiting





Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

Which of the following is one way that biological agents can *easily* enter the body?

- (a) By penetrating energy that affects the organs and blood chemistry
- (b) Direct contact with *unbroken* skin or the eyes
- (c) Absorption through *unbroken* skin
- (d) Breathing

Correct!

Radiological/Nuclear Agents

In small amounts, such as an X-ray, radiation is not dangerous. Radiation can be dangerous, though, depending on how much is received, the length of exposure, and how it enters the body. Large numbers of people can be injured or killed and large geographical areas can be contaminated if drinking water becomes affected, if a nuclear facility is sabotaged, or if a nuclear device is detonated.

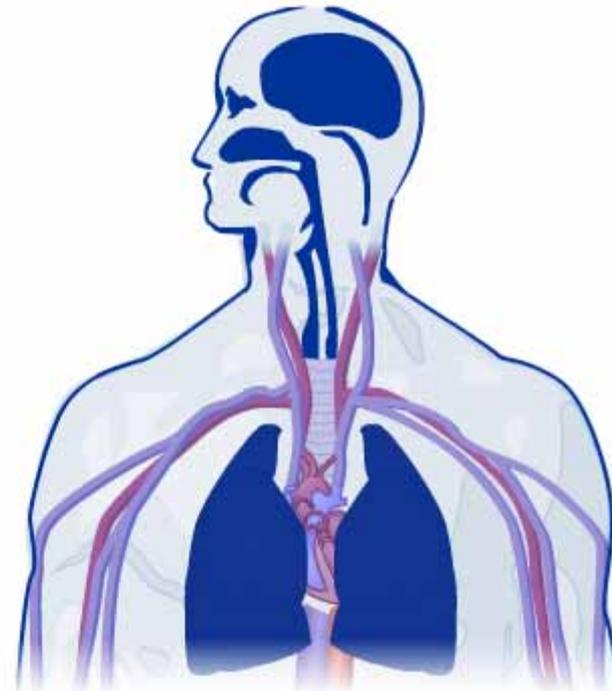


Photo: The mushroom cloud of a nucl

Radiological/Nuclear Agents: How Radiation Enters the Body

Radiation can enter the body in four ways:

- Breathing
- Eating/drinking
- Absorption through the skin
- By penetrating energy that affects the organs and blood chemistry





Radiological/Nuclear Agents: Symptoms

Symptoms of radiation exposure depend on the amount and duration of exposure and the person's age, gender, and health. If there is high exposure for a short time, symptoms include:

- Burned, reddened skin
- Nausea, vomiting, and diarrhea
- Hair loss
- Convulsions
- Unconsciousness



US Army Photo

US Army Photo



If there is lower exposure for a longer time, the effects may be the same but take longer to show up. Other symptoms include brain swelling, blood chemistry changes, internal organ and tissue damage, and birth defects.

Note: Healthcare workers and responders to victims are not at personal risk from short-term exposure to affected patients.



Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

Which of the following is a symptom of exposure to nuclear/radiological agents?

- (a) Loss of blood
- (b) Nausea, vomiting, and diarrhea
- (c) Pinpoint pupils and dimness of vision
- (d) Shortness of breath or tightening of chest

Correct!

High-yield Explosives

The shock wave and heat from an explosion are what injure and kill people. The great pressure of an explosion can disperse shrapnel, causing penetrating or blunt trauma. It can also create great pressure on the body, rupturing organs.

An explosion can also cause fires, resulting in burns and smoke inhalation injury or, worse, suffocation.

Death from an explosion is usually due to damage to the central nervous system (brain), inhalation of toxic byproducts, or loss of blood.



Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

Which of the following symptoms is NOT generally associated with high-yield explosives?

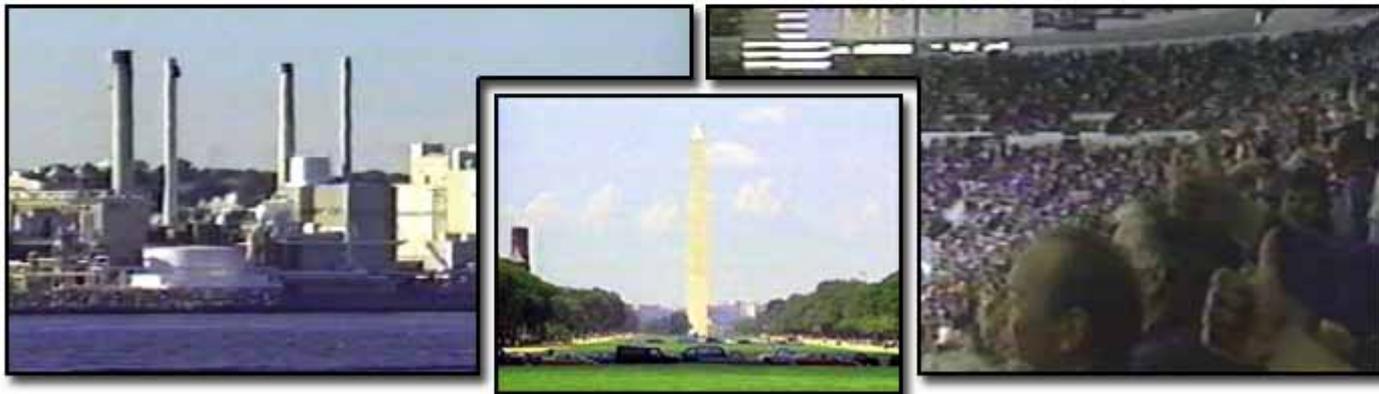
- (a) Inhalation of toxic byproducts
- (b) Ruptured organs
- (c) Loss of blood
- (d) Convulsions

Correct!



Terrorist Activities

All communities—especially those in free societies—are vulnerable to incidents involving terrorism. If you know what to look for, you might be able to decrease the vulnerability of your workplace or, if a terrorist strikes, decrease the effect of an attack.

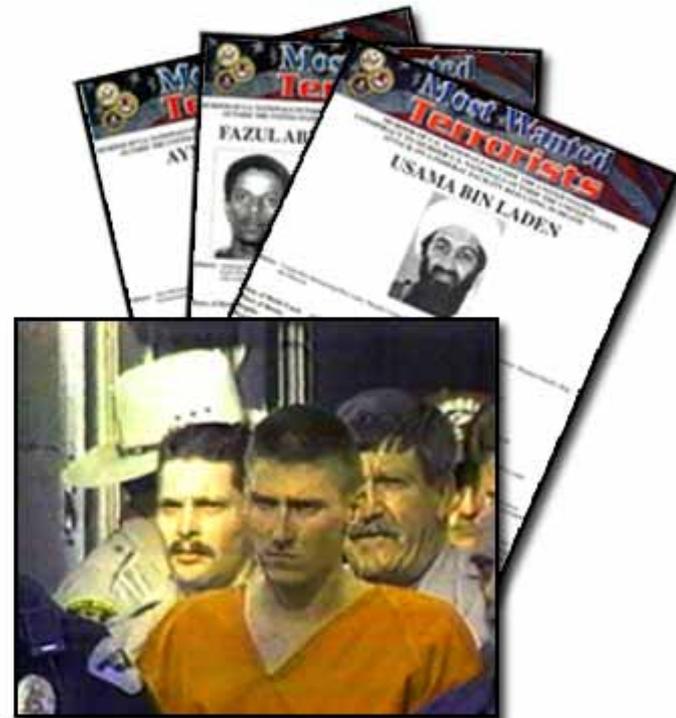




Terrorist Activities: Who the Terrorists Are

Terrorists are individuals or groups using unlawful force or acts to achieve a political or social aim. They are willing to injure or kill innocent people. They may act alone, in small groups, or as part of an international terrorist network. They may even have the support or direction of a foreign government. Terrorist groups may include:

- Foreign terrorist organizations
- Ethnic separatist and "migr" groups
- Left-wing radical organizations
- Right-wing racist, anti-authority, or survivalist groups
- Issue-oriented groups (such as animal rights groups, extremist environmental groups, extremist religious groups, anti-abortionists, etc.)





Terrorist Activities: Targets They Select

Groups that hold a grudge toward the United States could hardly mount a campaign using conventional military weapons. So they turn to CBRNE weapons, which offer the opportunity to "level the playing field."

Many different types of facilities or activities are potential targets of terrorists, depending on whether they:

- Attract a large number of victims
- Affect places of symbolic value
- Attract media attention
- Cause mass panic
- Suit the CBRNE material used





Facilities or activities that terrorists could target include:

- Sports arenas, parks, schools, hospitals, shopping centers, and venues for special events
- Civilian or military government installations; industries that are part of the "military-industrial complex," manufacture environmentally sensitive products, operate in politically sensitive countries, or generally represent capitalist endeavors; financial institutions
- Places with historical or symbolic significance
- Infrastructure components (transportation, communications, utilities, or energy systems)
- Explosive storage facilities (construction sites, quarries, etc.)





Terrorist Activities: Devices They Use

Information about obtaining CBRNE materials and making and delivering CBRNE devices is remarkably easy to find from resources such as the Internet. The devices a terrorist uses depend on the material used and the goals of the activity. Examples include:

- Retrofitted fire extinguisher or aerosol can
- Crop dusting plane
- HVAC system of building
- Explosive device
- Railcar





Terrorist Activities: Awareness and Indicators

Although the signs of a high-yield explosive and a chemical attack are obvious, the signs of a nuclear or biological attack may be difficult, if not impossible, to recognize:

- **Chemical**
- **Biological**
- **Radiological/Nuclear**
- **High-yield explosives**



Knowledge Check

Click and drag the CBRNE agent to the box next to their indicator(s). Incorrect selections will snap back to original location.

High-yield explosives

Explosion

Radiological/Nuclear

No real signs

Biological

Unseasonable illness

ChemicalUnexplained dead animals,
birds, or insects***Correct!***



If an Incident Occurs

If a CBRNE attack occurs in the workplace, your ability to recognize it and act appropriately can make a big difference in the outcome. If you see something suspicious, don't hesitate to report it. Action you take could save your life and the lives of others.

- Be alert.
- Be observant of your surroundings.
- Check for indicators:
 - Pools of liquid
 - Abnormal smells
 - Unusual fog indoors
 - Unusual devices or things out of place
 - Signs of exposure to an agent
 - Strange behavior
 - Environmental signs such as dead birds
- Follow your organization's emergency plan.



**If an Incident Occurs: Protect Yourself**

Your first action should be to protect yourself. Otherwise you could be a victim too.

The greater your distance from the source of harm, the less your exposure. Therefore, spend the shortest amount of time possible in the hazard area and minimize the time you're exposed to the hazard. You should take measures to protect yourself from a hazard even if you don't exhibit symptoms.





If an Incident Occurs: Notify Authorities

Once you've gotten safely away from the CBRNE incident, notify the authorities. **Call 9-1-1, the Command Duty Office, Security, or other designated authority for reporting suspicious or unusual activity.**

Victims can survive if decontaminated and medically treated as soon as possible. Your prompt response can help ensure the emergency crew's proper response to a CBRNE incident.



**If an Incident Occurs: Protect the Crime Scene**

Besides treating victims, another task of the emergency crew is collecting physical evidence to connect the perpetrator to the CBRNE scene. The recognition, collection, and preservation of physical evidence may be the only means to identify, and successfully prosecute, those responsible. Such tasks are not your responsibility, but you should know how you can help support emergency responders.



To help protect the crime scene, follow these guidelines:

- Do not attempt to secure the scene yourself. The CBRNE agent or a secondary device intended to injure or kill could be present.
- Do not handle incendiary devices discovered before they've ignited. Handling of such devices by inexperienced individuals can result in injury or death.
- Disturb the scene as little as possible.
- Note any unusual circumstances. Be aware of persons coming or going on foot or by vehicle. Jot down license plate numbers and brief descriptions in order to refresh your memory.
- Coordinate closely with the first-responding fire, medical, and law enforcement personnel to ensure that important evidence is not destroyed.
- Remain available to investigators who may need to interview you.





Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

Which of the following is one way that biological agents can *easily* enter the body?

- (a) By penetrating energy that affects the organs and blood chemistry
- (b) Direct contact with *unbroken* skin or the eyes
- (c) Absorption through *unbroken* skin
- (d) Breathing

Correct!

Knowledge Check

To complete the statement, click on a Checkbox, and then select the Check Answer button.

Once you've gotten safely away from the CBRNE incident, call 9-1-1 and provide the operator with:

- (a) a description of the first aid measures you took.
- (b) a description of the evidence you collected.
- (c) your home address and phone number.
- (d) the location of the incident.

Correct!



Disaster and Emergency Management

Disaster management is more often referred to as **emergency management**. All staff should be familiar with the health and medical concepts of operations in a disaster and know their roles in response operations.

The Federal Emergency Management Agency (FEMA), under the Department of Homeland Security, is the lead agency for managing the Federal response to disasters.



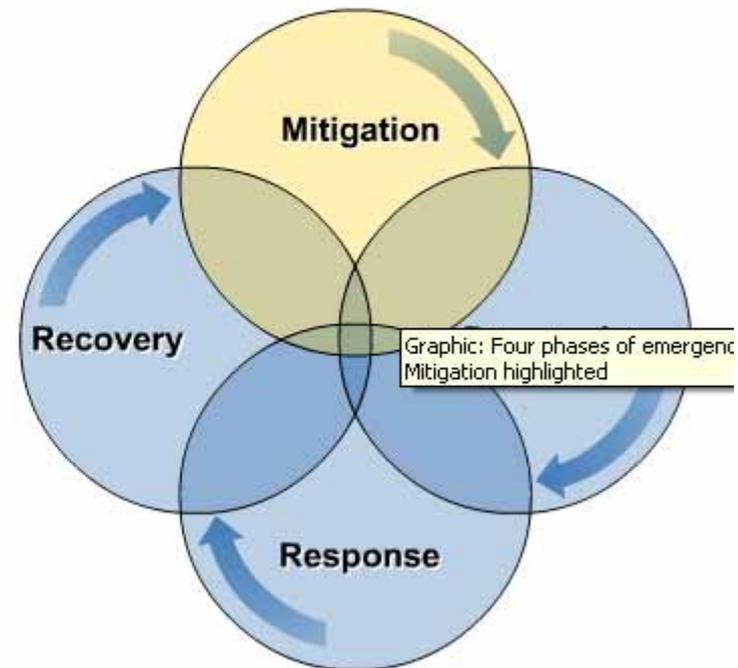
FEMA identifies four phases of emergency management:



Disaster and Emergency Management: Mitigation

Mitigation activities are aimed at reducing human suffering and property loss resulting from disaster. Mitigation is closely related to prevention actions, which are taken to eliminate the threat in the first place.

An example of mitigation involves motorcycle helmets. Most states require helmet usage (an administrative action). Yet preventing injury or death also requires that helmets be designed not to restrict vision or hearing and to protect the rider in the event of a crash (engineering design).

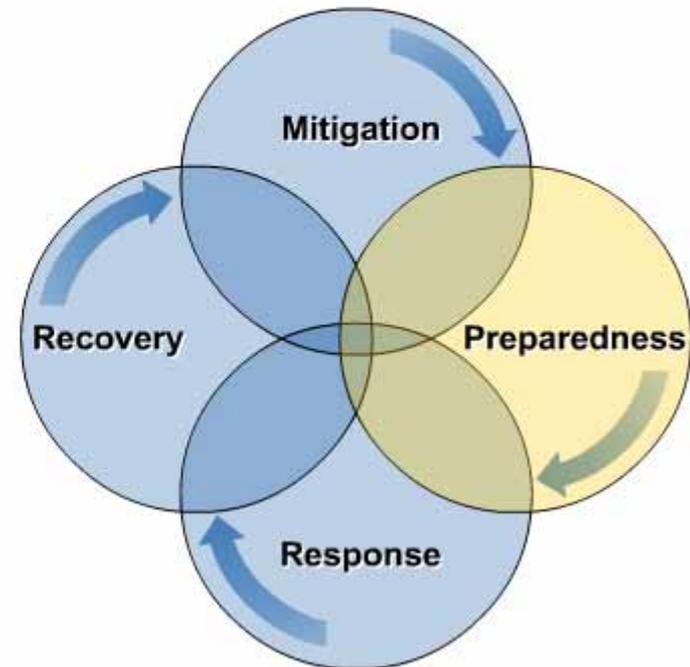




Disaster and Emergency Management: Preparedness

Preparedness actions are taken to limit the impact of a disaster by:

- Creating a response structure
- Establishing a mechanism for a quick and orderly reaction



Planning is one component of preparedness. It includes developing response plans, manuals, and procedures.

Response plans are developed at three levels:

- **Local**
- **State**
- **Federal**





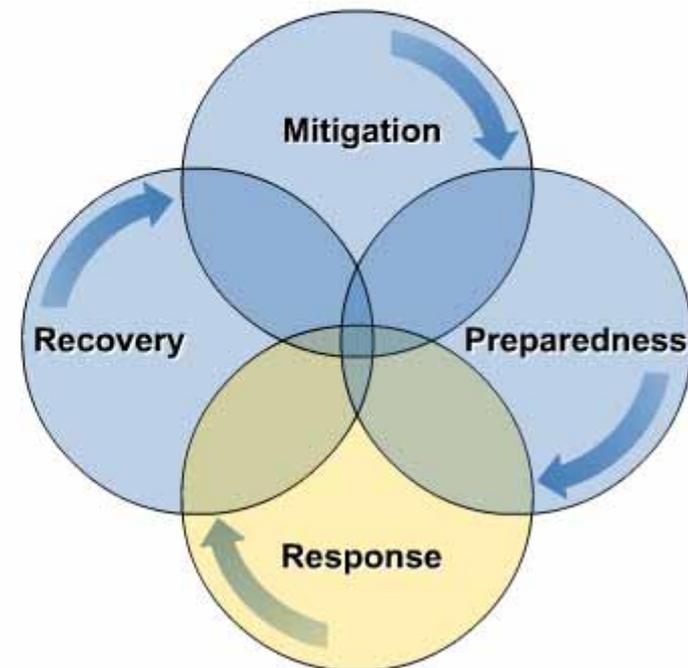
The preparedness phase of emergency management also includes the following components:

- Supplies and logistics. Example: pre-positioning supplies and equipment
- Education and training of personnel. This course is part of such preparedness efforts.
- Exercises to practice responding to CBRNE incidents
- Continuous Quality Improvement (CQI)



Disaster and Emergency Management: Response

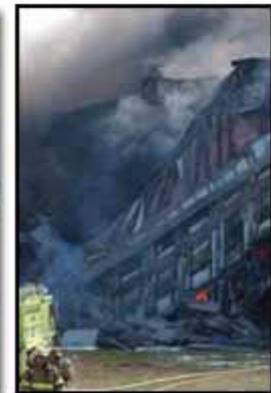
Response actions are taken immediately before or after a disaster occurs. Such actions limit damage, save lives, protect property, and re-establish the continuity of essential community operations. Activating the Incident Command System (ICS) provides a means to coordinate the response efforts of individual agencies.





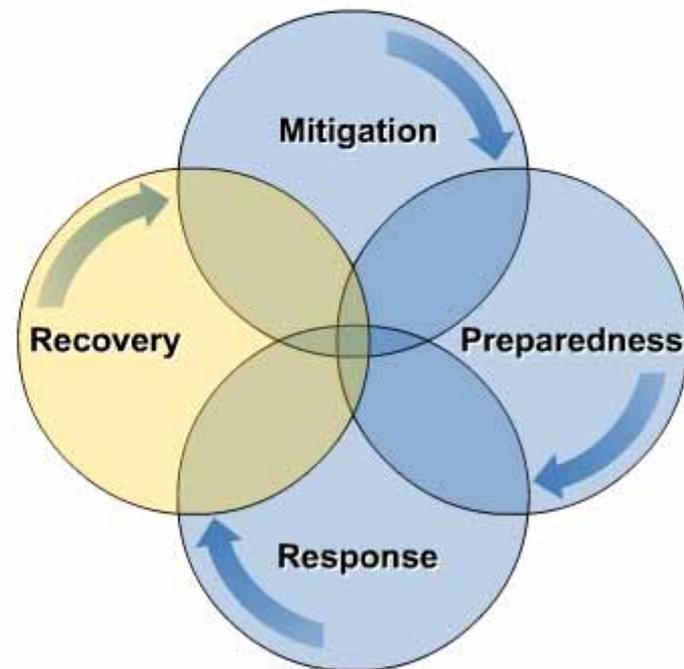
FEMA identifies five phases of emergency response:

- Warning and notification of the emergency
- Immediate public safety
- Property security
- Public welfare of citizens in the community
- Restoration of critical functions such as utilities



Disaster and Emergency Management: Recovery

Recovery involves the physical reordering of the community and its environment. During this period, people reconstruct housing and other community facilities, and agriculture returns to normal. Recovery may be rapid, may take years to accomplish, or may never completely happen.



Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

What does the mitigation phase of disaster and emergency management involve?

- (a) The physical reordering of the community and its environment
- ✓ (b) Activities aimed at reducing human suffering and property loss resulting from disaster
- (c) Actions to limit damage, save lives, protect property, and re-establish the continuity of essential community operations
- (d) Actions taken to limit the impact of a disaster by creating a response structure and establishing a mechanism for a quick and orderly reaction

Correct!



Knowledge Check

To answer the question, click on a Checkbox, and then select the Check Answer button.

The local response plan includes a method to activate what kind of resources?

- (a) Federal
- (b) FEMA
- (c) State
- (d) FRP

Correct!



Summary

The intent of this lesson was not to scare you, but to inform you about the possibility of a terrorist attack in the workplace. Knowing what to expect enables you to take action to protect yourself and your coworkers. If a CBRNE attack occurs, an alert work force that responds quickly could make a big difference.



Certificate of Completion



for

CBRNE EMPRC Basic Awareness
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