Chapter 40 - Terrorism Response & Disaster Management

1. National EMS Education Standard Competencies (1 of 2)
   EMS Operations
   Knowledge of operational roles and responsibilities to ensure patient, public, and personnel safety.

2. National EMS Education Standard Competencies (2 of 2)
   Mass-Casualty Incidents Due to Terrorism and Disaster
   - Risks and responsibilities of operating on the scene of a natural or man-made disaster

3. Introduction
   - You may be called on to respond to a terrorist event during your career.
   - It is difficult to plan for and anticipate a response to many terrorist events.
     - Several key principles apply to every response.

4. What Is Terrorism? (1 of 4)
   - Terrorist forces have been at work since early civilizations.
   - Terrorism involves violent acts or acts dangerous to human life that violate federal or state law and appears to be intended to:
     - Intimidate or coerce a civilian population
     - Influence the policy of a government by intimidation or coercion
     - Affect the conduct of a government by mass destruction, assassination, or kidnapping

5. What Is Terrorism? (2 of 4)
   - International terrorism occurs primarily outside of the United States.
     - Terrorism is common in the Middle East.
   - Domestic terrorism occurs primarily within the United States.
     - In the United States, domestic terrorists have struck multiple times.
   - Only a small percentage of groups actually turn to terrorism to achieve their goals.

6. What Is Terrorism? (3 of 4)
   - Religious extremist groups/doomsday cults
     - May participate in apocalyptic violence
   - Extremist political groups
     - Include violent separatist groups and those who seek political, religious, economic, and social freedom

7. What Is Terrorism? (4 of 4)
   - Cyber terrorists
     - Those who attack a population’s technological infrastructure
   - Single-issue groups
     - Include antiabortion groups, animal rights groups, anarchists, racists, ecoterrorists

8. Weapons of Mass Destruction (1 of 6)
   - Also called weapons of mass casualty
   - Any agent designed to bring about:
     - Mass death
     - Casualties
     - Massive damage to property and infrastructure
Weapons of Mass Destruction (2 of 6)
- B-NICE and CBRNE are mnemonics for the kinds of WMDs.
- B-NICE
  - Biologic
  - Nuclear
  - Incendiary
  - Chemical
  - Explosive

Weapons of Mass Destruction (3 of 6)
- CBRNE
  - Chemical
  - Biologic
  - Radiologic
  - Nuclear
  - Explosive

Weapons of Mass Destruction (4 of 6)
- Explosives have been the preferred WMD.
- Chemical agents consist of:
  - Vesicants (blister agents)
  - Respiratory agents (choking agents)
  - Nerve agents
  - Metabolic agents (cyanides)

Weapons of Mass Destruction (5 of 6)
- Biologic terrorism/warfare
  - Biologic agents are organisms that cause disease.
  - The primary types are:
    - Viruses
    - Bacteria
    - Toxins

Weapons of Mass Destruction (6 of 6)
- Nuclear/radiologic terrorism
  - Only two publicly known incidents: Hiroshima and Nagasaki
  - These materials are far easier for a determined terrorist to acquire and require less expertise to use.
  - “Dirty bombs” can cause widespread panic.

EMT Response to Terrorism (1 of 3)
- The basic foundations of patient care remain the same.
  - However, treatment can and will vary.
  - Always remember situational awareness
- Recognizing a terrorist event
  - Planning of acts of terror is covert.
  - You must know the current threat level issued by the Department of Homeland Security (DHS).
(2 of 3)
- National Terrorism Advisory System (NTAS).
  - Alerts from the NTAS contain a summary of the threat and the actions that first responders, government agencies, and the public can take to maintain safety.

17 EMT Response to Terrorism
(3 of 3)
- On every call, you must make the following observations:
  - Type of location
  - Type of call
  - Number of patients
  - Victims' statements
  - Preincident indicators

18 Response Actions (1 of 6)
- Scene safety
  - Stage your vehicle a safe distance away.
  - Wait for law enforcement personnel.
  - If you have any doubt, do not enter.
  - The best location for staging is upwind and uphill from the incident.
- Secondary device
  - Additional explosives set to explode after the initial bomb

19 Response Actions (2 of 6)

20 Response Actions (3 of 6)
- Responder safety
  - The best form of protection is preventing yourself from coming in contact with the agent.
  - Contamination occurs when you have direct contact with the WMD.
  - Cross-contamination occurs when you come in contact with a contaminated person.

21 Response Actions (4 of 6)
- Notification procedures
  - Notify the dispatcher of:
    - The nature of the event
    - Any additional resources that may be required
    - The estimated number of patients
    - The upwind or optimal route of approach
  - Establish a staging area.
  - Trained responders in PPE are the only persons equipped to handle the WMD incident.

22 Response Actions (5 of 6)
- Establishing command
  - You may need to establish command until additional personnel arrive.
  - You and other EMTs may function as:
    - Medical branch directors
    - Triage, treatment, or transportation supervisors
    - Logistics officers
    - Command and general staff
Response Actions (6 of 6)

- Reassessing scene safety
  - It is every EMT’s responsibility to constantly assess and reassess the scene for safety.
  - This is an important component of situational awareness.

Chemical Agents (1 of 2)

- Liquids or gases that are dispersed to kill or injure
  - Persistent (nonvolatile) agents can remain on a surface for long periods.
  - Nonpersistent (volatile) agents evaporate rapidly.

Chemical Agents (2 of 2)

- Route of exposure is a term used to describe how the agent most effectively enters the body.
  - Agents with a vapor hazard enter through the respiratory tract in the form of vapors.
  - Agents with a contact hazard (or skin hazard) give off very little vapor or no vapors and enter the body through the skin.

Vesicants (1 of 5)

- Primary route is the skin (contact).
  - If vesicants are left on the skin long enough, they produce vapors that can enter the respiratory tract.
  - Cause burnlike blisters to form on the victim’s skin and in the respiratory tract
  - Usually cause the most damage to damp or moist areas of the body

Vesicants (2 of 5)

- Signs of vesicant exposure on the skin:
  - Skin irritation, burning, and reddening
  - Immediate, intense skin pain
  - Formation of large blisters
  - Gray discoloration of skin
  - Swollen and closed or irritated eyes
  - Permanent eye injury (including blindness)

Vesicants (3 of 5)

- Sulfur mustard (H)
  - Brownish-yellowish oily substance
  - Generally considered very persistent
  - Begins an irreversible process of damage to the cells
  - Attacks vulnerable cells within the bone marrow and depletes the body’s ability to reproduce white blood cells
  - Sulfur mustard vapors can be inhaled, creating upper and lower airway compromise.

Vesicants (4 of 5)

- Lewisite (L) and phosgene oxime (CX)
  - Produce blister wounds very similar to those caused by mustard
  - Produce immediate intense pain and discomfort when contact is made
  - The patient may have a grayish discoloration at the contaminated site.

Vesicants (5 of 5)

- Vesicant agent treatment
  - No antidotes for mustard or CX exposure
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– Ensure that the patient has been decontaminated before treatment is initiated.
– If agent has been inhaled, the patient may require prompt airway support.
– Initiate transport as soon as possible.
– Generally, burn centers are best equipped to handle the wounds and infections.

Pulmonary Agents (1 of 4)
• Gases that cause immediate harm to persons exposed to them
• Primary route is through the respiratory tract.
  – Once inside the lungs, they damage the lung tissue and fluid leaks into the lungs.
  – Pulmonary edema develops, resulting in difficulty breathing because of severely impaired gas exchange.

Pulmonary Agents (2 of 4)
• Chlorine (Cl)
  – First chemical agent ever used in warfare
  – Initially, produces upper airway irritation and a choking sensation
  – Patient may later experience:
    • Shortness of breath
    • Chest tightness
    • Hoarseness and stridor
    • Gasping and coughing
    • Pulmonary edema

Pulmonary Agents (3 of 4)
• Phosgene
  – Product of combustion
  – Very potent agent with a delayed onset of symptoms
  – Initially, a mild exposure may include:
    • Nausea
    • Chest tightness
    • Severe cough
    • Dyspnea on exertion
    • Pulmonary edema

Pulmonary Agents (4 of 4)
• Pulmonary agent treatment
  – Remove the patient from the contaminated atmosphere.
  – Manage the ABCs aggressively.
  – Pay particular attention to oxygenation, ventilation, and suctioning.
  – Do not allow the patient to be active.
  – There are no antidotes.
  – Consider requesting ALS.

Nerve Agents (1 of 4)
• Among the most deadly chemicals developed
• Can cause cardiac arrest within seconds to minutes of exposure
• G agents came from the early nerve agents, the G series.

Nerve Agents (2 of 4)

Nerve Agents (3 of 4)
• Nerve agents all produce similar symptoms but have varying routes of entry.
  – Use SLUDGEM and DUMBELS

38 Nerve Agents (4 of 4)
• Nerve agent treatment
  – DuoDote Auto-Injector (Antidote Treatment Nerve Agent Auto-Injector ([ATNAA]))

39 Metabolic Agents (1 of 4)
• Hydrogen cyanide (AC) and cyanogen chloride (CK) are both agents that affect the body's ability to use oxygen.
• Commonly found in many industrial settings
• Associated with dizziness, light-headedness, headache, and vomiting

40 Metabolic Agents (2 of 4)
• High doses will produce:
  – Shortness of breath/gasping respirations
  – Respiratory distress or arrest
  – Tachypnea
  – Flushed skin
  – Tachycardia

41 Metabolic Agents (3 of 4)
• High doses will produce (cont'd):
  – Altered mental status
  – Seizures
  – Coma
  – Apnea
  – Cardiac arrest

42 Metabolic Agents (4 of 4)
• Cyanide agent treatment
  – All of the patient's clothes must be removed to prevent off-gassing in the ambulance.
  – Support the patient's ABCs.
  – Initiate transport immediately if antidote by ALS is not available.

43 Biologic Agents (1 of 2)
• Can be almost completely undetectable
• Diseases caused will be similar to other minor illnesses
• May be spread in various ways
  – Dissemination is the means by which a terrorist will spread the agent.
  – A disease vector is an animal that spreads disease to another animal.

44 Biologic Agents (2 of 2)
• How easily the disease is able to spread from one human to another human is called communicability.
• Incubation is the period of time between the person becoming exposed to the agent and the appearance of the first symptoms.

45 Viruses (1 of 5)
• Germs that require a living host to multiply and survive
• Invades healthy cells and replicates itself to spread through the host
• Moves from host to host by direct methods or through vectors

46 Viruses (2 of 5)
• Smallpox is highly contagious.
  – You must wear examination gloves, a HEPA-filtered respirator, and eye protection.
  – Observe the size, shape, and location of the lesions.

47 Viruses (3 of 5)

48 Viruses (4 of 5)
• Viral hemorrhagic fever (VHF)
  – Causes the blood in the body to seep out from the tissues and blood vessels
  – The patient will have flulike symptoms, progressing to more serious symptoms such as internal and external hemorrhaging.
  – All standard precautions must be taken.

49 Viruses (5 of 5)

50 Bacteria (1 of 6)
• Do not require a host to multiply and live
• More complex than viruses and can grow up to 100 times larger
• Most can be fought with antibiotics.
• Most will generally begin with flulike symptoms.

51 Bacteria (2 of 6)
• Inhalation and cutaneous anthrax
  – Anthrax is caused by a deadly bacterium that lays dormant in a spore.
  – Routes of entry are inhalation, cutaneous, and gastrointestinal.
  – Pulmonary anthrax is the most deadly.
  – Antibiotics can be used to treat anthrax successfully.

52 Bacteria (3 of 6)

53 Bacteria (4 of 6)
• Plague
  – Natural vectors are rodents and fleas.
  – Bubonic plague infects the lymphatic system and creates buboes.
  – Pneumonic plague is a lung infection that results from inhalation of plague bacteria.

54 Bacteria (5 of 6)

55 Bacteria (6 of 6)

56 Neurotoxins (1 of 5)
• Most deadly substances known to humans
• Produced from plants, marine animals, molds, and bacteria
• Route of entry is ingestion, inhalation, or injection.
• Not contagious and have a faster onset of symptoms

57 Neurotoxins (2 of 5)
• Botulinum toxin
  – Most potent neurotoxin
  – Produced by bacteria
– Affects the nervous system’s ability to function
– Voluntary muscle control diminishes.
– Eventually the toxin causes muscle paralysis, leading to respiratory arrest.

58 Neurotoxins (3 of 5)
59 Neurotoxins (4 of 5)

• Ricin
  – Derived from mash from the castor bean
  – Causes pulmonary edema and respiratory and circulatory failure, leading to death
  – Quite stable and extremely toxic
  – Treatment is supportive and includes both respiratory support and cardiovascular support as needed.

60 Neurotoxins (5 of 5)
61 Other EMT Roles (1 of 2)

• Syndromic surveillance
  – Monitoring of patients presenting to EDs and alternative care facilities
  – Patients with signs and symptoms that resemble influenza are important.
  – Quality assurance and dispatch need to be aware of an unusual number of calls from patients with unexplainable symptom clusters.

62 Other EMT Roles (2 of 2)

• Points of distribution (POD)
  – Established in the time of need for the mass distribution of antibiotics, antidotes, vaccinations, and other medications and supplies
  – Push packs distributed by the Centers for Disease Control and Prevention Strategic National Stockpile
  – Push packs have a delivery time of 12 hours anywhere in the country.

63 Radiologic/Nuclear Devices
(1 of 10)

• Ionizing radiation is emitted in the form of rays, or particles.
• Alpha, beta, gamma (x-ray), and neutron radiation
  – Alpha is the least harmful type.
  – Beta is slightly more penetrating.
  – Gamma rays are faster and stronger.
  – Neutron particles are the most powerful.

64 Radiologic/Nuclear Devices
(2 of 10)

65 Radiologic/Nuclear Devices
(3 of 10)

• Once radiologic material has been used, the remaining material is called radiologic waste.
• These materials can be found at:
  – Hospitals and health care facilities with radiology departments
  – Colleges and universities
  – Nuclear power plants
  – Chemical and industrial sites

66 Radiologic/Nuclear Devices
Radiologic dispersal devices (RDDs)
- Any container designed to disperse radioactive material
- A "dirty bomb" can injure victims with the radioactive or explosive material.
- The dirty bomb is an ineffective WMD.

Radiologic/Nuclear Devices
Nuclear energy is artificially made by altering (splitting) radioactive atoms.
- The result is an immense amount of energy that usually takes the form of heat.
- Nuclear material is used in:
  - Medicine
  - Weapons
  - Naval vessels
  - Power plants

Nuclear weapons
- Kept only in secure facilities
- The likelihood of a nuclear attack is extremely remote.
- The whereabouts of many small nuclear devices are unknown.
  - Special Atomic Demolition Munition (SADM)

Patients exposed to excessive radiation are considered victims of acute radiation toxicity.
Effects of radiation exposure will vary depending on the amount of radiation and the route of entry.
- Radiation can be introduced into the body by all routes of entry.

Being exposed to a radiation source does not make a patient contaminated or radioactive.
- However, when patients have a radioactive source on their body, they must be initially cared for by a HazMat responder.
- After decontamination, you may begin treatment with the ABCs.
- Wear appropriate PPE and place all body fluids in containers for proper disposal.

There is no protective gear designed to completely shield you from radiation.
- The less time that you are exposed to the source, the less the effects will be.
- Make certain that responders are stationed far enough from the incident.
- Always assume it is the strongest form of radiation and use concrete shielding.

Incendiary and Explosive Devices
Incendiary (used to start fires) and explosive devices come in various shapes and sizes.
– It is important to identify an object you believe is a potential device.
– Notify the authorities and safely evacuate the area.
• Always remember that there is the possibility of a secondary device when you respond to the scene.

Incendiary and Explosive Devices (2 of 6)
• Primary blast injury
  – Direct effects of the pressure wave on the body
  – Seen almost exclusively in the hollow organs
  – An injury to the lungs causes the greatest morbidity and mortality.
• Secondary blast injury
  – Penetrating or nonpenetrating injury that results from flying debris

Incendiary and Explosive Devices (3 of 6)
• Tertiary blast injury
  – Whole body displacement and subsequent impact with environmental objects
  – Also includes crush injury
• Quaternary blast injury
  – Any other injury caused by a blast

Incendiary and Explosive Devices (4 of 6)
• The physics of an explosion
  – When a substance is detonated, a solid or liquid is chemically converted into gas under high pressure.
  – This generates a spherical blast wave.
  – Flying debris and high winds commonly cause conventional blunt and penetrating trauma.

Incendiary and Explosive Devices (5 of 6)
• Hollow organs such as the middle ear, lung, and GI tract are most susceptible to pressure changes.
  – The ear is the organ system most sensitive to blast injuries.
  – Primary pulmonary blast injuries occur as contusions and hemorrhages.

Incendiary and Explosive Devices (6 of 6)
• Blast lung is the most common cause of death from blast injury.
• Neurologic injuries and head trauma are also common causes of death from blast injuries.
• Extremity injuries, including traumatic amputations, are common.

Review
1. What type of terrorist group would MOST likely bomb an abortion clinic?
   A. Single-issue group
   B. Technology terrorists
   C. Extremist political group
   D. Violent religious group

Answer: A
Rationale: Single-issue terrorist groups, as their name implies, focus on single issues. They include antiabortion groups, animal rights groups, anarchists, racists, or even ecoterrorists, who threaten violence as a means to protect the environment.
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Review (1 of 2)
1. What type of terrorist group would MOST likely bomb an abortion clinic?
   A. Single-issue group
      Rationale: Correct answer
   B. Technology terrorists
      Rationale: Technology terrorists would attack the technology infrastructure.

Review (2 of 2)
1. What type of terrorist group would MOST likely bomb an abortion clinic?
   C. Extremist political group
      Rationale: An extremist political group seeks political, religious, economic, and social freedom.
   D. Violent religious group
      Rationale: Violent religious groups, also known as doomsday cults, may participate in apocalyptic violence.

Review
2. The term “weaponization” is defined as:
   A. the period of time that a chemical agent will remain on a given surface before it evaporates.
   B. the method or mechanism by which a terrorist or terrorist group delivers a chemical or biologic agent.
   C. the cultivation, synthesis, and/or mutation of an agent in order to maximize the target population’s exposure.
   D. the detonation of an explosive device utilizing an item that is inconspicuous, such as a briefcase or suitcase.

Review
Answer: C
Rationale: Weaponization is the creation of a weapon from a biologic agent generally found in nature that causes disease. The agent is cultivated, synthesized, and/or mutated to maximize the target population’s exposure to the agent.

Review (1 of 2)
2. The term “weaponization” is defined as:
   A. the period of time that a chemical agent will remain on a given surface before it evaporates.
      Rationale: This is persistency and volatility.
   B. the method or mechanism by which a terrorist or terrorist group delivers a chemical or biologic agent.
      Rationale: This is dissemination.

Review (2 of 2)
2. The term “weaponization” is defined as:
   C. the cultivation, synthesis, and/or mutation of an agent in order to maximize the target population’s exposure.
      Rationale: Correct answer
   D. the detonation of an explosive device utilizing an item that is inconspicuous, such as a briefcase or suitcase.
      Rationale: This is not the correct answer.

Review
3. The Department of Homeland Security posts a daily advisory system to keep the public aware of the current terrorist threat level. What does an orange level indicate?
   A. Low: Low risk of terrorist attacks
   B. High: High risk of terrorist attacks
   C. Severe: Severe risk of terrorist attacks
   D. Elevated: Significant risk of terrorist attacks

   **Review**
   Answer: B
   Rationale: According to the Department of Homeland Security (DHS) advisory system, the color orange indicates a high risk of terrorist attacks. Red, the highest level, indicates a severe risk of terrorist attacks. Yellow (elevated) indicates a significant risk of terrorist attacks. Blue (guarded) indicates a general risk of terrorist attacks. Green indicates a low risk of terrorist attacks.

4. You are dispatched to a bombing along with 15 other ambulances. Upon arriving at the scene, you should stage your ambulance:
   A. as close to the bombing site as possible.
   B. upwind and uphill from the bombing site.
   C. downwind and uphill from the bombing site.
   D. upwind and downhill from the bombing site.

   **Review**
   Answer: B
   Rationale: As with any HazMat incident, you should stage your ambulance uphill and upwind from a bombing site. A hazardous chemical may have been released during the bombing; remaining uphill and upwind from the incident site will minimize your risk of exposure.
scene, you should stage your ambulance:
C. downwind and uphill from the bombing site.
   Rationale: You should treat the scene like a HazMat situation; stay upwind.
D. upwind and downhill from the bombing site.
   Rationale: You should remain uphill.

Review

5. A terrorist would MOST likely use a secondary explosive device:
   A. to ensure that a structure is completely destroyed.
   B. in case the primary explosive device fails to detonate.
   C. as a means of dispersing a biologic or chemical agent.
   D. to injure rescuers and gain maximum public attention.

Review

Answer: D
Rationale: A secondary explosive device is usually aimed at injuring or killing rescue workers. It is also designed to be caught on camera by the media, which draws public attention to the terrorist. Biologic or chemical agents can be dispersed by the primary device, the secondary device, or both.

Review (1 of 2)

5. A terrorist would MOST likely use a secondary explosive device:
   A. to ensure that a structure is completely destroyed.
   Rationale: The building will be destroyed by the first explosive device if that is the intention of the terrorist.
   B. in case the primary explosive device fails to detonate.
   Rationale: A secondary explosive device is not usually needed for this reason.

Review (2 of 2)

5. A terrorist would MOST likely use a secondary explosive device:
   C. as a means of dispersing a biologic or chemical agent.
   Rationale: These agents can be dispersed in either a primary or secondary device.
   D. to injure rescuers and gain maximum public attention.
   Rationale: Correct answer

Review

6. When assessing a patient who was exposed to a vesicant agent, you should expect to encounter:
   A. skin blistering.
   B. loss of hearing.
   C. vomiting blood.
   D. profound bradycardia.

Review

Answer: A
Rationale: The primary exposure route of vesicant agents—also called blister agents—is the skin. Vesicants usually cause the most damage to damp or moist areas of the body, such as the armpits, groin, and respiratory tract. Signs of vesicant exposure on the skin include irritation, reddening, and burning; immediate, intense pain; and the formation of large blisters, among others.

Review (1 of 2)

6. When assessing a patient who was exposed to a vesicant agent, you should expect to
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encounter:
A. skin blistering.
   Rationale: Correct answer
B. loss of hearing.
   Rationale: A vesicant agent will cause blindness.

Review (2 of 2)
6. When assessing a patient who was exposed to a vesicant agent, you should expect to encounter:
   C. vomiting blood.
      Rationale: A vesicant agent will cause the patient to cough up blood.
   D. profound bradycardia.
      Rationale: This is incorrect.

Review
7. What does sulfur mustard do to the cells within the body?
   A. It makes the cells retain water until they explode.
   B. It causes the cells to release all their energy, which then causes cellular death.
   C. It makes the cells mutate, which damages and changes the cells and causes cellular death.
   D. It makes the cells release all their fluids and causes severe dehydration until cellular death occurs.

Review
Answer: C
Rationale: Sulfur mustard (agent H) causes the cells to mutate, which changes the structure of the cell so it can no longer perform its functions within the body. This causes cellular death, which can lead to end organ failure.

Review (1 of 2)
7. What does sulfur mustard do to the cells within the body?
   A. It makes the cells retain water until they explode.
      Rationale: Sulfur mustard makes cells mutate.
   B. It causes the cells to release all their energy, which then causes cellular death.
      Rationale: Cellular death occurs due to mutation.

Review (2 of 2)
7. What does sulfur mustard do to the cells within the body?
   C. It makes the cells mutate, which damages and changes the cells and causes cellular death.
      Rationale: Correct answer
   D. It makes the cells release all their fluids and causes severe dehydration until cellular death occurs.
      Rationale: This is incorrect.

Review
8. Pinpoint pupils, vomiting, bradycardia, and excessive salivation are signs of exposure to:
   A. lewisite.
   B. soman.
   C. cyanide.
   D. phosgene.
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Answer: B
Rationale: Soman (GD) is a nerve agent; it can cause death within seconds to minutes of exposure. The mnemonic “DUMBELS” can help you recall the signs and symptoms of nerve agent exposure. It stands for Diarrhea; Urination; Miosis (pinpoint pupils); Bradycardia and bronchospasm; Emesis (vomiting); Lacrimation (excessive tearing); and Salivation, seizures, and sweating.

Review (1 of 2)
8. Pinpoint pupils, vomiting, bradycardia, and excessive salivation are signs of exposure to:
   A. lewisite.
   Rationale: Lewisite produces blister wounds similar to mustard gas.
   B. soman.
   Rationale: Correct answer

Review (2 of 2)
8. Pinpoint pupils, vomiting, bradycardia, and excessive salivation are signs of exposure to:
   C. cyanide.
   Rationale: Cyanide causes tachycardia, tachypnea, and flushed skin.
   D. phosgene.
   Rationale: Phosgene causes nausea, chest tightness, severe cough, and dyspnea upon exertion.

Review
9. You respond to a plastic factory, where numerous people present with shortness of breath, flushed skin, and altered mental status. One of the patients tells you he smelled almonds before he started feeling sick. These people were MOST likely exposed to:
   A. sarin.
   B. bleach.
   C. cyanide.
   D. chlorine.

Answer: C
Rationale: Cyanide is a colorless gas that has the odor of almonds. It is produced in many different industries in the United States such as plastic processing, gold and silver mines, and photography studios. You should suspect a chemical exposure whenever multiple patients present with the same or similar symptoms.

Review (1 of 2)
9. You respond to a plastic factory, where numerous people present with shortness of breath, flushed skin, and altered mental status. One of the patients tells you he smelled almonds before he started feeling sick. These people were MOST likely exposed to:
   A. sarin.
   Rationale: Sarin is colorless and odorless.
   B. bleach.
   Rationale: Bleach will not smell like almonds.

Review (2 of 2)
9. You respond to a plastic factory, where numerous people present with shortness of breath, flushed skin, and altered mental status. One of the patients tells you he smelled almonds before he started feeling sick. These people were MOST likely exposed to:
   C. cyanide.
   Rationale: Correct answer
D. chlorine.
Rationale: Chlorine has a distinct odor of bleach.

10. Factors that have the GREATEST impact on the severity of radiation exposure include:
A. age and overall health.
B. gender and wind speed.
C. the method of dispersal.
D. time, distance, and shielding.

Answer: D
Rationale: The best way to protect yourself from the effects of radiation is to use time, distance, and shielding. Radiation has a cumulative effect; the less time you are exposed, the less the effects will be. Radiation is also limited in how far it can travel; depending on the type of radiation, moving only a few feet may be enough to remove you from immediate danger. The path of all radiation can be stopped by a specific object; alpha rays can be stopped by a newspaper, beta rays by your clothing, and gamma rays by several feet of concrete.

10. Factors that have the GREATEST impact on the severity of radiation exposure include:
A. age and overall health.
Rationale: Radiation can affect anyone, regardless of age.
B. gender and wind speed.
Rationale: Males and females will experience the same effects.

10. Factors that have the GREATEST impact on the severity of radiation exposure include:
C. the method of dispersal.
Rationale: The type of radiation—alpha, beta, or gamma—has the greatest impact on the human body.
D. time, distance, and shielding.
Rationale: Correct answer