Card #1A

The Westchester County Department of Emergency Services has developed this guidebook as a reference for Police, Fire, and EMS agencies in the County. It is intended to provide basic guidelines for first responders to use during an emergency. This guidebook is not intended to replace an agency's standard operating procedure, nor is it intended to affect an individual's judgment. Use of this guide does not substitute the need for the comprehensive training of response personnel.

The material contained in this guide is consistent with the Westchester County's Comprehensive Emergency Management Plan (CEMP) and compliant with the National Incident Management System (NIMS). It is recommended that all first response personnel become familiar with the County's Comprehensive Emergency Plan and the NIMS.

INTRODUCTION

Card # 1B

Dear Emergency Services Professional,

I want to thank you for all your efforts to keep Westchester's residents safe. Your commitment to public service is exemplary. We all realize that in addition to the day-to-day services you provide, you are now confronted with new threats that pose greater challenges than ever before.

Members of the public look to all of us — fire, police, and EMS responders, as well as county agencies — to keep them safe from potential disasters, whether natural or manmade. We all know how important training and preparedness is to providing a successful response and therefore are continually looking to improve on our skills and knowledge.

This guidebook prepared by our county Department of Emergency Services contains information that, fortunately, isn't needed too often, but that you'll want to keep close in hand. Used as a quick reference guide, this book should help prompt you in the effective management and mitigation of many incidents.

As you know, any major event in our county or region will require help from multiple jurisdictions and numerous response agencies. To assure coordination of resources, Westchester has adopted the use of the National Incident Management System (NIMS). This plan assures we will be planning and working together closer than ever before.

It is through training, preparedness, and effective communication that we can best protect ourselves and the citizens we serve. In that vein, I want to thank you for your dedication to our community and for everything you do for us all.

Andrew J. Spano, County Executive

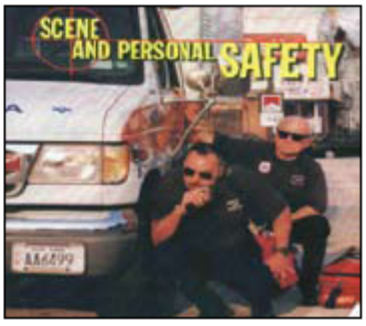
Card #2A

The Safety of First Responders

First responders are faced with a variety of situations everyday, which may, or may not put their lives and health at risk. Integrating certain safety practices into the daily routine of EMS, Fire, and Public Safety workers is essential in keeping ourselves and those around us safe.

Remember:

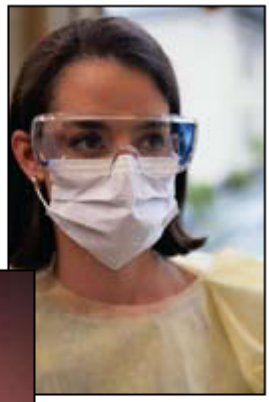
- Establish and maintain scene safety (wait for police if necessary).
- Make sure you utilize the appropriate personal protective equipment (PPE).
- Make sure you identify possible hazards.
- Do not perform duties outside of your specific training and/or protocols.
- Be aware of the possible stressors that come with the job, and if necessary seek help from a professional to help alleviate stress.



THE SAFETY OF FIRST RESPONDERS

Card # 2B

Blood Borne Pathogens



The Occupational Safety and Health Administration (OSHA) defines an exposure to a blood borne pathogen as "a specific eye, mouth, other mucous membrane, non-intact skin, parenteral (piercing mucous membranes or skin barrier through such events as needle sticks, human bites, cuts and/or abrasions) contact with blood or other potentially infectious material that result from the performance of an employee's duties." Emergency Medical Services, Fire, and Public Safety personnel are continuously exposed to a variety of blood borne pathogens. First responders must take every precaution to protect themselves and those around them; to accomplish this, universal precautions must be taken, which include the minimum PPE (gloves, goggles, mask, face shield, etc.). By integrating good PPE practices into your daily routine, first responders can greatly reduce the risk of exposure to blood borne pathogens.

Card # 3A

Diseases of Concern for First Responders

Disease	How Transmitted	Vaccine
AIDS/ HIV	Needle sticks, blood splash on mucous membranes, or blood contact with open skin	NO
Hepatitis A Virus	Needle sticks, blood splash on mucous membranes, or blood contact with open skin, some risk during mouth to mouth CPR	YES
Hepatitis B Virus	Needle sticks, blood splash on mucous membranes, or blood contact with open skin, some risk during mouth to mouth CPR	YES
Hepatitis C Virus	Needle sticks, blood splash on mucous membranes, or blood contact with open skin, some risk during mouth to mouth CPR	NO
Meningitis	Respiratory secretions or Saliva	YES (bacterial)
Tuberculosis (TB)	Airborne aerosolized droplets	NO

DISEASES OF CONCERN FOR FIRST RESPONDERS

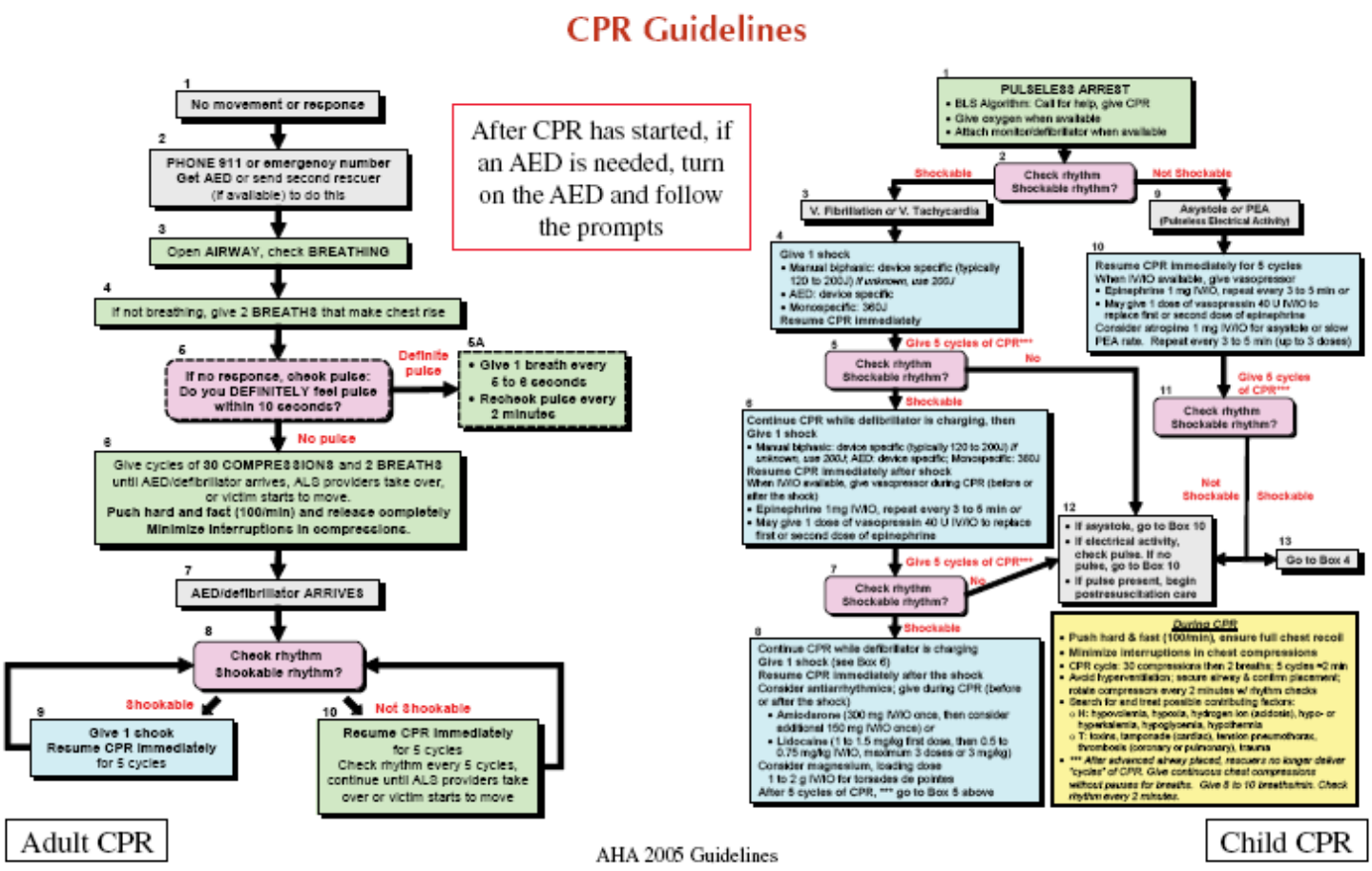
Card # 3B

CPR and AED

Cardiopulmonary resuscitation, or CPR, is a combination of rescue breathing and chest compressions delivered to victims who have gone into cardiac arrest. When cardiac arrest occurs, the heart's internal rhythm is compromised, which hinders the heart from pumping blood effectively throughout the body. CPR allows a small amount of blood flow to the heart and brain to "buy time" until normal rhythm of the heart is restored.

The two most common life threatening rhythms, are ventricular fibrillation (V Fib) and ventricular tachycardia (V Tach). When the heart is in either one of these rhythms the heart more or less "quivers" and does not pump effectively. An Automated External Defibrillator (AED) is used to send an electrical current through the body to hopefully "re-boot" the heart into a natural rhythm.

Card # 4A


CPR Guidelines
1 No movement or response
2 PHONE 911 or emergency number Get AED or send second rescuer (if available) to do this
3 Open AIRWAY, check BREATHING
4 If not breathing, give 2 BREATHS that make chest rise
6 If no response, check pulse: Do you DEFINITELY feel pulse within 10 seconds?
Definite pulse
5A • Give 1 breath every 6 to 8 seconds • Recheck pulse every 2 minutes
No pulse
8 Give cycles of 30 COMPRESSIONS and 2 BREATHS until AED/defibrillator arrives, ALS providers take over, or victim starts to move. Push hard and fast (100/min) and release completely. Minimize interruptions in compressions.
7 AED/defibrillator ARRIVES
8 Check rhythm Shockable rhythm?
Shockable
9 Give 1 shock Resume CPR immediately for 5 cycles
Not Shockable
10 Resume CPR immediately for 5 cycles, Check rhythm every 5 cycles, continue until ALS providers take over or victim starts to move
After CPR has started, if an AED is needed, turn on the AED and follow the prompts
1 PULSELESS ARREST • BLS Algorithm: Call for help, give CPR • Give oxygen when available • Attach monitor/defibrillator when available
2 Check rhythm Shockable rhythm?
Shockable
3 V. Fibrillation or V. Tachycardia
4 Give 1 shock • Manual biphasic: device specific (typically 120 to 200J) If unknown, use 200J • AED: device specific • Monospecific: 360J Resume CPR immediately
5 Give 5 cycles of CPR*** Check rhythm Shockable rhythm?
No
Shockable
6 Continue CPR while defibrillator is charging, then Give 1 shock • Manual biphasic: device specific (typically 120 to 200J) If unknown, use 200J; AED: device specific; Monospecific: 360J Resume CPR immediately after shock When IV/IO available, give vasopressor during CPR (before or after the shock) • Epinephrine 1mg IV/IO, repeat every 3 to 5 min or • May give 1 dose of vasopressin 40 U IV/IO to replace first or second dose of epinephrine
7 Give 5 cycles of CPR*** Check rhythm Shockable rhythm?
No
Shockable
8 Continue CPR while defibrillator is charging Give 1 shock (see Box 6) Resume CPR immediately after the shock Consider antiarrhythmics; give during CPR (before or after the shock) • Amiodarone (300 mg IV/IO once, then consider additional 150 mg IV/IO once) or • Lidocaine (1 to 1.5 mg/kg first dose, then 0.5 to 0.75 mg/kg IV/IO, maximum 3 doses or 3 mg/kg) Consider magnesium, loading dose 1 to 2 g IV/IO for torsades de pointes After 5 cycles of CPR, *** go to Box 5 above
9 Asystole or PEA (Pulseless Electrical Activity)
10 Resume CPR immediately for 5 cycles When IV/IO available, give vasopressor • Epinephrine 1 mg IV/IO, repeat every 3 to 5 min or • May give 1 dose of vasopressin 40 U IV/IO to replace first or second dose of epinephrine Consider atropine 1 mg IV/IO for asystole or slow PEA rate. Repeat every 3 to 5 min (up to 3 doses)
Give 5 cycles of CPR***
11 Check rhythm Shockable rhythm?
Not Shockable
Shockable
12 • If asystole, go to Box 10 • If electrical activity, check pulse. If no pulse, go to Box 10 • If pulse present, begin postresuscitation care
13 Go to Box 4
During CPR
• Push hard & fast (100/min), ensure full chest recoil
• Minimize interruptions in chest compressions
• CPR cycle: 30 compressions then 2 breaths; 5 cycles =2 min
• Avoid hyperventilation; secure airway & confirm placement; rotate compressors every 2 minutes w/ rhythm checks
• Search for and treat possible contributing factors:
o H: hypovolemia, hypoxia, hydrogen ion (acidosis), hypo- or hyperkalemia, hypoglycemia, hypothermia
o T: toxins, tamponade (cardiac), tension pneumothorax, thrombosis (coronary or pulmonary), trauma
• *** After advanced airway placed, rescuers no longer deliver "cycles" of CPR. Give continuous chest compressions without pauses for breaths. Give 8 to 10 breaths/min. Check rhythm every 2 minutes.
Adult CPR
AHA 2005 Guidelines
Child CPR
CPR GUIDELINES

Card # 4B

Mass Casualty Incident

Mass Casualty Incidents are any event involving more than a few victims due to a special hazard, difficult rescue, etc. (e.g., car crash on highway, plane accident, chemical spill at a factory, etc.) that puts stress on local emergency resources.

The three levels of MCIs are as follows:

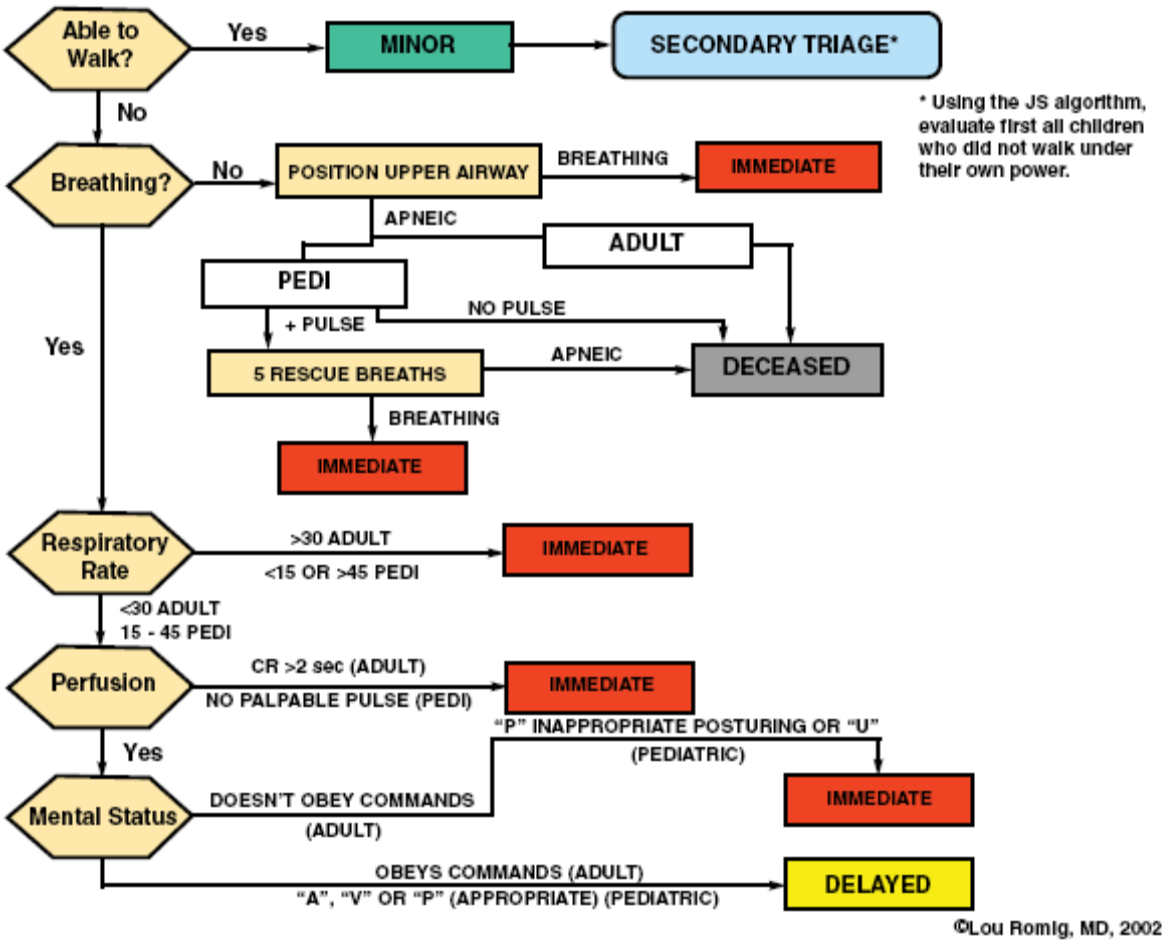
- **Low Impact**: manageable by local emergency personnel
- **High Impact**: stresses local emergency personnel resources
- **Disaster**: Overwhelms regional emergency response resources

Remember: An MCI can be an extreme situation, do not forget to follow general safety practices to keep yourself and those around you safe.

- Make sure scene safety is established and maintained
- Use appropriate PPE
- Identify possible hazards
- Do not perform duties outside of your specific training and/ or protocols
- An MCI can be more stressful and/ or traumatic than other situations, if necessary seek professional help to help alleviate stress

Card # 5A

Combined START/Jump START Triage Algorithm



Card #5B

Helicopter Landing Zone Preparation

Landing Zone Preparation

- ✓ Select a landing site as close and as safely possible to the scene to reduce movement of patient and allow access to emergency equipment located on the helicopter.
- ✓ Landing zones (LZ) should be at least 100' x 100,' unobstructed by wires, trees and free of debris.
- ✓ After arriving in the area, the flight crew will access the LZ from the air. Please notify the flight crew of any potential hazards near the LZ. Also include wind direction and approximate speed. The flight crew may decide to land at an alternate LZ due to conditions unseen from the ground.
- ✓ Night Landing: One flashing beacon or safety cone with flashlight should be placed on each corner of the LZ. NEVER point spotlight directly at the helicopter, this will affect the pilot's night vision. Spotlights can be directed onto wires and poles but away from the flight path of the helicopter.

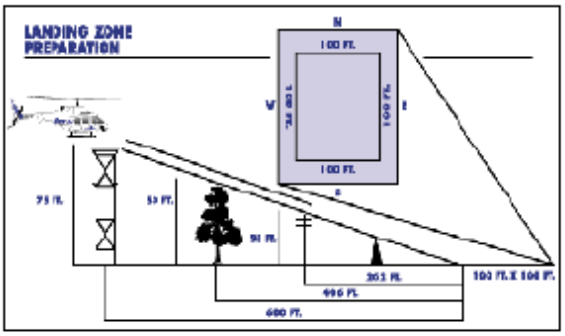
Ground Safety Rules

- ❖ Never approach the helicopter until signaled to do so by the pilot.
- ❖ Do not allow anyone to go behind or to approach the tail rotor area of the helicopter.
- ❖ Protect your crew and patient from rotor wash.
- ❖ Secure all loose clothing and equipment.
- ❖ Always approach from the front. (Never approach from the back.)
- ❖ The flight crew will come directly to the patient. (Do not move the patient to the helicopter until directed.)
- ❖ Do not assist the flight crew in opening or closing aircraft doors.
- ❖ Flight crews are responsible for loading and unloading patients and equipment.

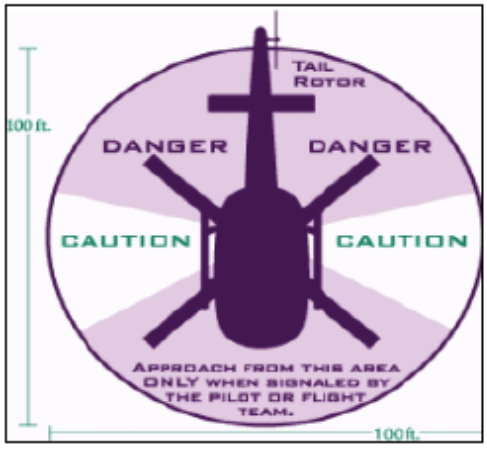
Card #6A

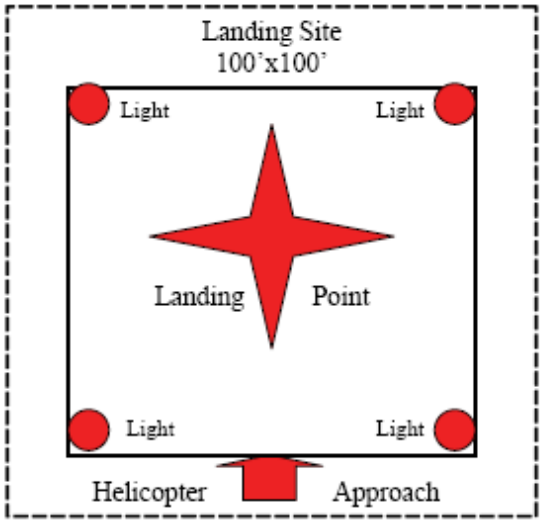
Hot Loading Procedures

There are situations where the patient's condition suggests rapid transport from the LZ. Patients may be loaded and unloaded with the helicopter operational (main and tail rotors turning). The following guidelines will keep all personnel and patients safe:



- ✓ Designate four individuals to carry the patient, one at each corner of the stretcher.
- ✓ Stand up straight, and follow the directions of the flight crew.
- ✓ When the stretcher is on the dock always step away, toward the front of the helicopter.
- ✓ Once the flight crew starts toward the helicopter with the patient, monitor their movement so they do not approach the tail rotor as they load/unload the patient.
- ✓ Once the patient is loaded/unloaded and the flight crew has signaled, move toward the front of the helicopter and depart the landing zone.





Helicopter Landing Zone Preparation

Card # 6B

National Incident Management and Incident Command Systems

The NIMS Integration Center (NIC) was established by the Secretary of Homeland Security to provide supervision of the National Incident Management System (NIMS) which was a part of FEMA's national response plan (NRP). The system is designed to adapt to any incident, allowing for a smooth transaction for acquiring and demobilizing resources.

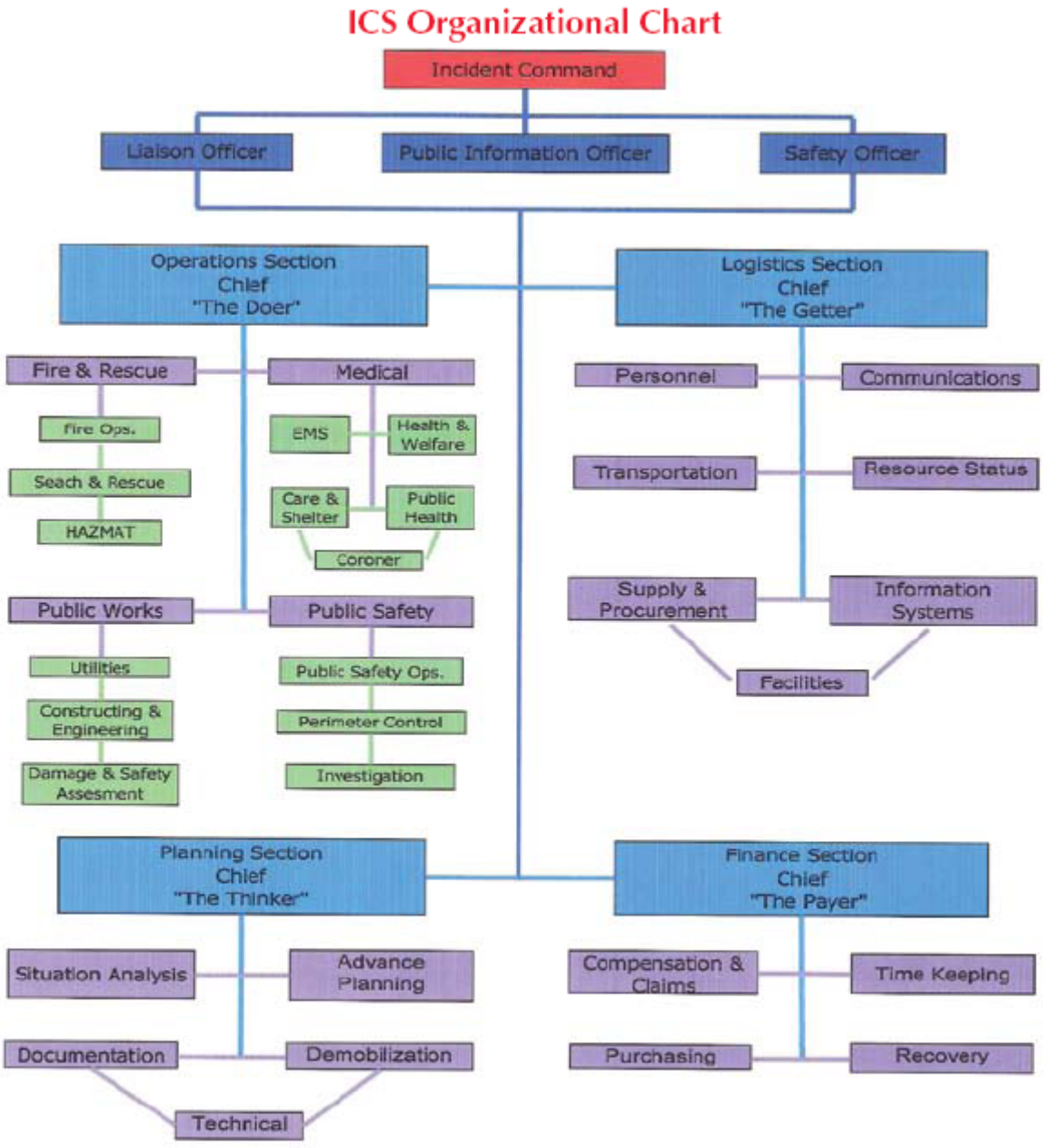
The Incident Command System (ICS) was developed in the 1970s following a series of catastrophic fires in California. The ICS has integrated itself into the NIMS system and is now utilized by a variety of agencies throughout many countries, including Canada and the UK.

Homeland Security directive #5 dictates that all domestic incidents be handled using NIMS. All Westchester County agencies need to become compliant with NIMS regulations.

Things to remember:

- ✓ Safety, for Self, Responders, Victims, and the Public.
- ✓ Communicate to dispatch that your unit is establishing command.
- ✓ Communicate to dispatch the exact location of the incident and a brief description of the incident type.
- ✓ Identify additional resources needed and establish staging areas (Fire, EMS, HAZMAT Team, Public Works, etc.).
- ✓ Identify appropriate level of PPE (A, B, C, D).
- ✓ Establish a primary ground operations radio frequency.
- ✓ Establish communications with Emergency Communications Center.
- ✓ Establish Hot, Warm, and Cold zones.
- ✓ Assess the need to gross decontaminate.
- ✓ Request decontamination teams if necessary.

Card # 7A



NATIONAL INCIDENT MANAGEMENT AND INCIDENT COMMAND SYSTEMS

Card #7B

Hazardous Materials

A hazardous material (HAZMAT) is any solid, liquid, or gas that can cause harm to any living organism, property, or the environment. A hazardous material may be radioactive, flammable, explosive, toxic, corrosive, biologically hazardous, etc. Hazardous Materials are most often released due to an industrial accident or transportation accident.

Before and During Response to a HAZMAT Scene

- ✓ Identify what type of material is involved.
- ✓ Identify where the incident is situated.
- ✓ Plan a route to approach scene from upwind.
- ✓ Obtain weather information (wind direction, speed, precipitation, etc.).

Upon Arrival

- ✓ From a distance, and upwind, use binoculars to look for vehicle placards.
- ✓ Look around for any victims. (If seen, stay away until HAZMAT is known and you establish that the scene is safe.)
- ✓ Obtain as much information as possible from employees, bystanders, etc.
- ✓ Ask for Material Safety Data Sheets (MSDS).
- ✓ Establish decontamination areas if necessary.
- ✓ If you do not have the appropriate PPE and/or training to handle a HAZMAT situation let those who do, address the situation.

Remember: Don't Become a Victim.

Other Types of Paperwork That Can Assist You in Determining Which HAZMAT Is Involved

- ➢ Bill of Lading
- ➢ Way Bill
- ➢ Consist (lists contents of train cars in order)
- ➢ Air Bill or plane manifest
- ➢ Cargo manifest
- ➢ Ship manifest

Card # 8A

Gross Decontamination Setup

To Exclusionary
(Hot) Zone

Disrobe, get triage tag,
bag valuables & clothes here

Engine 1

Engine 2

Truck 1
(Optional)

Analysis
Area

If "clean" receive towel, blanket, and coveralls here

Dressing Area
(Zumro Tent)

If not "clean", proceed to Full Decontamination Area

Card # 8B

Terrorism

Terrorism is defined in the Code of Federal Regulations as "the unlawful use of force and/or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." Since the first World Trade Center bombing in 1993, and various other incidents, terrorism has become a very real issue for the US.

Characteristics of Terrorism

- Violence and/or the threat of violence
- Psychological impact
- Political, religious, and/or an ideological goal
- Deliberate targeting of civilians

The Terrorist

- Terrorists do not perceive themselves as terrorists.
- Common concepts of law, ethics, morality, logic, or religion do not apply to terrorists.

Bombs and other Explosive Devices

Bombs are the most commonly used explosive device used to carryout terrorist attacks. Use extreme caution when dealing with an explosive device. If police have not arrived yet, wait! Do not approach it and wait for the appropriate assistance.

Remember RAIN:

- **R**ecognize characteristics of explosive devices.
- **A**void the hazards of explosive devices.
- **I**solate and evacuate from the hazards of explosive devices.
- **N**otify the appropriate authorities.

Types of Bombs

- Chemical Bomb
- Nuclear Bomb
- Radiological (Dirty) Bomb

Recognizing Explosive Devices

- Pyrotechnics – fireworks, road flares, smoke grenades
- Propellants – black or smokeless powders, jet fuels, and rocket fuels
- Explosives – TNT, C4, and dynamite

Card # 9A

Recognizing Stimuli

- Heat in the form of fire or atmospheric temperature change
- Friction, impact, electrostatic discharge, and shock, can cause accidental detonation
- Radio frequencies within 300 feet of a device can detonate an explosive device
- Pressure from a water fire hose

Recognizing High Category Explosives

- Primary – extremely sensitive, smaller quantities needed (e.g. single salt grain-sized silver azide crystal)
- Secondary – less sensitive than primary (TNT, C4, & Dynamite)
- Tertiary – Ammonium Nitrate based, generally needing initiation from a secondary explosive

Recognizing Improvised Explosive Devices

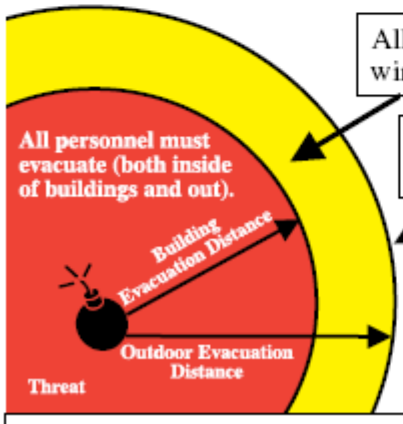
- Potassium Chlorate – white crystal or powder form
- Peroxide based – in dry form, looks similar to crack cocaine
- Ammonium nitrate and aluminum – in powder form looks similar to a common cold pack

Remember: "If you can see it, it can see you"

"Just because you see one device doesn't mean there aren't others." (Be aware of secondary devices.)

Terrorist Bomb Threat Stand-Off

Threat Discription	Explosives Capacity[1] (TNT Equipvalent)	Building Evacuation Distance[2]	Outdoor Evacuation Distance[3]
Pipe Bomb	5 lbs/2.3 kg	70 ft/21 m	850 ft/259 m
Briefcase/Suitcase Bomb	50 lbs/23 kg	150 ft/46 m	1,850 ft/564 m
Compact Sedan	500 lbs/227 kg	320 ft/98 m	1,500 ft/457 m
Sedan	1,000 lbs/454 kg	400 ft/122 m	1,750 ft/534 m
Passenger/Cargo Van	4,000 lbs/1,814 kg	640 ft/195 m	2,750 ft/838 m
Small Moving Van/Delivery Truck	10,000 lbs/4,536 kg	860 ft/263 m	3,750 ft/1,143 m
Moving Van/Water Truck	30,000 lbs/13,608 kg	1,240 ft/375 m	6,500 ft/1,982 m
Semi-Trailer	60,000 lbs/27,216 kg	1,570 ft/475 m	7,000 ft/2,134 m



All personnel must either seek shelter inside a building (with some risk) away from the windows and exterior walls, or move beyond the Outdoor Evacuation Distance.

Preferred area (beyond this line) for evacuation of people in buildings and mandatory for people outdoors.

[1]Based on maximum volume or weight of explosive (TNT equivalent) that could reasonably fit in a suitcase or vehicle.
[2]Governed by the ability of an unstrengthened building to withstand severe damage or collapse.
[3]Governed by the greater of fragment throw distance or glass breakage/falling glass hazard distance. Note that pipe and briefcase bombs assume cased charges which throw fragments farther than vehicle bombs.

Conversion: 300 ft roughly equals the length of a football field

Card # 9 B

Biological Agents

Healthcare providers should be alert to illness patterns and diagnostic clues that might signal a biological agent release. The following clinical and epidemiological clues are suggestive of such a release:

- A rapidly increase in disease incidence
- An unusual increase in the number of people seeking care, especially with fever, respiratory, or gastrointestinal symptoms
- Any suspected or confirmed communicable disease that is **not endemic** in New York (e.g., plague, smallpox, hemorrhagic fever)
- Any unusual age distributions or clustering of disease (e.g., chickenpox or measles in adults)
- Simultaneous outbreaks in human and animal populations
- Any unusual temporal and/or geographic clustering of illness (e.g., persons who attend the same public event)

*Any unusual illness or disease clusters should be reported immediately to the Westchester County Department of Health.

Infection Control Precautions for Biological Agents

Agent	Precaution Category *See other side for explanation of each precaution	Personal Protective Equipment GL=Gloves GO=Gowns M=Mask	Private Room
Anthrax	Standard. Contact precautions for cutaneous and gastrointestinal anthrax if diarrhea is not contained.	GL=when entering the room GO=if likely contact with patient,equipment or environment	No
Botulism	Standard precautions.		No
Brucellosis	Standard precautions.		No
Plague (pneumonic)	Standard. Droplet precautions until on appropriate therapy for 72 hours. Contact precautions if draining buboes present.	GL=when entering the room GO=if likely contact with patient,equipment or environment M=surgical mask	Yes Cohort if necessary
Q Fever	Standard precautions.		No
Smallpox	Standard, contact and airborne precautions.	GL, GO=when entering the room M=N-95 respirator	Yes Negative pressure
Tularemia	Standard. Contact precautions if lesions present.	GL=when entering the room GO=if likely contact with patient,equipment or environment	No
Viral Hemorrhagic Fever	Standard and contact precautions. Airborne precautions, especially in late stages.	GL, GO=when entering the room M=N-95 respirator	Yes Negative pressure
Venezuelan Equine Encephalitis	Standard precautions.		No

Card # 10A

Recognizing and Diagnosing Illnesses Caused by Biological Agents

Disease	Incubation Period	Early Symptoms	Clinical Syndrome	Diagnostic Samples	Diagnostic Tests
Inhalational Anthrax	1-7 days (possibly up to 60 days)	Non-specific: fever, malaise, cough, dyspnea, headache, vomiting, abdominal and chest pain.	Widened mediastinum, pleural effusion on chest x-ray. Rapid onset of severe respiratory distress, respiratory failure, and shock.	Blood, serum, CSF, pleural or ascitic fluids.	Gram stain or Wright stain; blood culture Specialized labs: IHC, serology, DFA, PCR
Cutaneous Anthrax	1-12 days	Painless or pruritic papule	Papule evolves into a vesicular or ulcerative lesion, then forms a black eschar after 3-7 days.	Swab of lesion, skin biopsy, blood.	Gram stain, culture of lesion; blood culture Specialized labs: PCR, serology
Botulism	Foodborne: 12-72 hours range, 2 hours – 8 days Inhalational: 12-80 hours	Usually none. If foodborne, possibly nausea, vomiting, abdominal cramps or diarrhea.	Afebrile, ptosis, diplopia, dysarthria, dysphonia, dysphagia, symmetrical descending paresis or flaccid paralysis. Generally normal mental status. Progresses to airway obstruction and respiratory failure.	Nasal swab (if obtained immediately following inhaled exposure), serum, gastric aspirate, stool, food sample when indicated.	Specialized labs: Mouse bioassay for toxin
Brucellosis	Very variable, 5-60 days	Fever (often intermittent), headache, chills, heavy sweats, arthralgias.	Systemic illness, may become chronic with fever and weight loss. May have suppurative lesions. Bone/joint lesions common.	Blood, serum, bone marrow, tissue.	Culture, serology, PCR
Equine Encephaltides (Eastern, Western, Venezuelan)	2-6 days, Venezuelan 5-15 days, others	Non-specific: Sudden onset of malaise, fever, rigors, severe headache, photophobia, myalgias of legs and back.	Fever, headache, stiff neck, nausea, vomiting, sore throat, diarrhea lasting several days often followed by prolonged period of weakness and lethargy. Central nervous system symptoms may develop.	Serum, CSF	Viral culture, serology, PCR
Pneumonic Plague	1-6 days	Non-specific: high fever, cough, chills, dyspnea, headache, hemoptysis, nausea, vomiting, diarrhea.	Fulminant pneumonia, often with hemoptysis, rapid progression of respiratory failure, septicemia and shock. Presence of hemoptysis may help distinguish from inhalational anthrax.	Blood, sputum, lymph node aspirate, serum.	Gram, Wright, or Wayson stain; culture Specialized labs: Serology, DFA, PCR
Q fever	10-40 days	Fever, headache, chills, heavy sweats, arthralgias.	Self-limited febrile illness lasting 2 days to 2 weeks, may present like atypical pneumonia (Legionella).	Serum, sputum	Serology, Culture difficult
Ricin (toxin from castor bean oil)	18-24 hours	Inhalation: fever, weakness, cough, hypothermia, hypotension, cardiac collapse.	In high doses, short incubation and rapid onset suggestive of chemical agent.	Blood, tissue	Serology, IHC staining of tissue
Smallpox	12 days; range: 7-17 days	Non-specific: fever, malaise, headache, prostration, rigors, vomiting, severe backache.	Maculopapular, vesicular, then pustular lesions all at same developmental stage in any one location. Begins on face, mucous membranes, hands and forearms; may include palms and soles.	Vesicular or pustular fluid, pharyngeal swab, scab material, serum.	Specialized labs: PCR, viral culture, electron or light microscopy, serology
Staphylococcal enterotoxin B	3-12 hours for inhalation. Minutes to hours for ingestion.	Inhalation: Fever, chills, headache, myalgias, cough, nausea. Short incubation and rapid onset suggestive of chemical agent.	Inhalation: Dyspnea, retrosternal pain may develop Ingestion: nausea, vomiting, diarrhea.	Inhalation: serum, urine Ingestion: stool, vomitus	Specialized Labs: Ag-ELISA, Ab-ELISA serology
Tularemia	3-5 days; range: 1-14 days	Non-specific: fever, fatigue, chills, cough, malaise, body aches, headache, chest discomfort, GI symptoms.	Pneumonitis, ARDS, pleural effusion, hemoptysis, sepsis. Ocular lesions, skin ulcers, oropharyngeal or glandular disease possible.	Serum, urine, blood, sputum, pharyngeal washing, fasting gastric aspirate, other.	Gram stain, culture; DFA or IHC staining of secretions, exudates or biopsy specimens
Viral hemorrhagic fevers (Ebola, arenavirus, filoviruses)	2-21 days; varies among viruses	Fever, myalgias, petechiae, easy bleeding, red itchy eyes, hematemesis.	Febrile illness complicated by easy bleeding, petechiae, hypotension, and shock.	Serum, blood	Viral culture, PCR, serology

Card # 10B

Chemical Agents

Adequate planning and regular training is the key to preparedness for a chemical agent release. Health care providers should be alert to illness patterns that might be caused by chemical exposure. The following clinical, epidemiological, and circumstantial clues may suggest a chemical agent release.

- An usual increase in the number of people seeking care, especially with respiratory, neurological, and/or gastrointestinal symptoms
- Any clustering of symptoms or unusual age distribution (e.g. chemical exposure in children)
- Location of release not consistent with a chemical's use
- Simultaneous impact to human, animal and plant populations
- Any unusual clustering of patients in time or location (e.g., persons who attended the same public event)

Any unusual symptoms, illnesses or clusters should be reported immediately. EMS personnel should call their medical control facility and dispatching agency. The Westchester County Department of Health and local Poison Control Center should also be notified.

Types of Chemical Agents

- **Anticoagulants** – poisons that prevent blood from clotting properly
- **Biotoxins** – poisons that come from plants or animals
- **Blister agents** (vesicants) – chemicals that severely blister the eyes, respiratory tract, and skin
- **Blood agents** – poisons that affect the body by being absorbed into the blood
- **Caustics** (acids) – chemicals that burn or corrode people's skin, eyes, and mucus membranes
- **Choking agents** – chemicals that cause severe irritation or swelling of the respiratory tract
- **Incapacitating agents** – drugs that cause an altered state of consciousness (possibly unconsciousness)
- **Metal agents** – consist of metallic poisons (e.g. copper)
- **Nerve agents** – highly poisonous chemicals that affect the nervous system
- **Organic solvents** – agents that damage the tissues of living things by dissolving fats and oils
- **Riot control agents** – highly irritating agents normally used by law enforcement (e.g. tear gas, mace, pepper spray)
- **Toxic alcohols** – poisonous alcohols that can damage the heart, kidneys, and nervous system
- **Vomiting agents** – chemicals that cause nausea and vomiting

Card # 11A

Recognizing, Diagnosing and Treating Health Effects of Chemical Agents

Agent type	Agent names	Mode of Action	Unique characteristics	Signs & symptoms	Treatment	Other patient considerations
Nerve	• Sarin • Soman • Tabun • VX • Some insecticides (cholinest-erase inhibitors)	• Inactivates acetylcholines-terase enzyme, causing both muscarinic and nicotinic effects	• Miosis (pinpoint pupils) • Copious secretions/ sweating • Muscle twitching, fasciculations	• Miosis • Blurred/dim vision • Headache • Nausea, vomiting, diarrhea • Copious secretions/ sweating • Muscle twitching, fasciculations • Dyspnea • Seizures • Loss of consciousness	• Decontaminate • Nerve agent antidote, if available • Atropine, before other measures • Pralidoxime (2-PAM) chloride	• Onset of symptoms from dermal contact with liquid forms may be delayed • Repeated antidote administration may be necessary
Asphyxiant/ blood	• Arsine • Cyanogen chloride • Hydrogen cyanide	• Arsine: causes massive intravascular hemolysis which may lead to anemia, jaundice and renal failure • Cyanogen chloride & Hydrogen cyanide: cyanide binds with iron in cytochrome a3, preventing intracellular oxygen utilization. The cell then uses anaerobic metabo-lism, creating excess lactic acid and metabolic acidosis	• Possible skin color changes: cherry-red (cyanosis or cyanogen chloride); yellow or bronze (arsine) • Possible cyanosis • Possible frostbite	• Confusion • Nausea • Gasping for air, similar to asphyxiation but more abrupt onset • Seizures • Metabolic acidosis (Cyanogen chloride or Hydrogen cyanide)	• Decontamination • Rapid treatment with oxygen • For cyanide, use sodium nitrite, if available, and then sodium thiosulfate • Vigorous supportive care may aid recovery of some patients even without specific antidote • Arsine has no specific antidote	• Arsine and cyanogen chloride may cause delayed pulmonary edema
Choking/ pulmonary	• Chlorine • Hydrogen chloride • Nitrogen oxides • phosgene	• Acids or acid-forming agents which react with cytoplasmic proteins and destroy cell structure	• Chlorine is a greenish-yellow gas with pungent odor • Phosgene gas may smell like newly-mown hay or grass • Possible frostbite	• Eye and skin irritation • Airway irritation • Dyspnea, cough • Sore throat • Chest tightness • Wheezing • bronchospasm	• Decontamination • Fresh air, forced rest • Semi-upright position • If signs of respiratory distress are present, oxygen with or without positive airway pressure may be needed • Maintain adequate oxygenation • No specific antidote	• May cause delayed pulmonary edema, even following a symptom-free period that varies in duration with the amount inhaled • May lead to ARDS (Acute Respiratory Distress Syndrome)
Blistering/ vesicant	• Mustard/ Sulfur mustard (HD, H) • Nitrogen mustard • Lewisite • Phosgene oxime	• Exact mechanisms of biologic activity are unknown • Mustard: forms metabolites that bind to enzymes, proteins and other cellular components • Lewisite: binds to thiol groups in many enzymes • Phosgene oxime: mechanism unknown, but corrosive like strong acids	• Mustard (HD) may have an odor like horse-radish, garlic or mustard • Lewisite (L) may have an odor like geranium • Phosgene oxime (CX) may have a pepper-like or pungent odor	• Skin, eye and mucosal irritation • Skin erythema and blistering • Tearing, conjunctivitis, corneal damage • Mild respiratory distress to marked airway damage	• Decontamination • If dyspneic, give oxygen • Specific antidote: British Anti-Lewisite (BAL) may decrease systemic effects of Lewisite, if available • Mustard and phosgene oxime have no specific antidotes	• Possible pulmonary edema • Mustard has an asymp-tomatic latent period • Lewisite has immediate burning pain, blisters later • Phosgene oxime causes immediate pain • Monitoe electrolyte balance; fluid loss is likely to be less than in comparable thermal burns • Neutropenia and sepsis
Incapacitating/ Behavior altering	• Agent 15/BZ	• Competitively inhibits acetylcholine which disrupts muscarinic transmission in central and peripheral nervous system (atropine-like action)	• May appear as mass drug intoxication with erratic behaviors, shared realistic and distinct hallucinations, disrobing and confusion • Hyperthermia • Mydriasis (dilated pupils)	• Dry mouth and skin • Initial tachycardia • Altered consciousness, delusions, denial of illness, belligerence • Hyperthermia • Ataxia (lack of coordination) • Hallucinations • Mydriasis (dilated pupils)	• Decontamination • Evaluate mental status • Use restraints as needed • Monitor core tempera-ture carefully • Specific antidote: physostigmine may be available	• Hyperthermia and self-injury are greatest risks • Hard to detect because it is an odorless and non-irritating substance • Possible serious arrhythmias
Cytotoxic protein	• Ricin • Abrin	• Inhibit protein synthesis	• Exposure by inhalation or injection causes more pronounced signs & symptoms than expo-sure by ingestion	• Latent period of 4-8 h, followed by flu-like signs, symptoms • Progress within 18-24 h to: nausea, cough, dyspnea, pulmonary edema (inhalation exposure); GI hemorrhage with emesis and diarrhea • Hypovolemic shock, hepatic, splenic & renal failure (ingestion exposure)	• Decontamination • Maintain fluid/electro-lyte imbalance • Maintain adequate oxygenation • Provide pain management • No specific antidote	• Rapid progression of signs and symptoms • Death possible within 36 hours • If patient survives beyond 5 days without complications, recovery is likely

Card # 11B

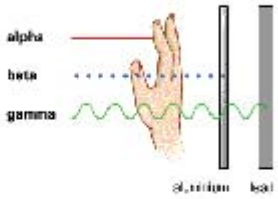
Health Effects Related to Radiation Exposure

Radiation and Exposure

Radiation is energy that moves in the form of particles or waves such as light, heat, radio waves, and microwaves. We live with radiation everyday, it is colorless, odorless, tasteless, and detection equipment is required in determining a radiological release. This guide will provide the first responder with the basic knowledge needed to effectively respond to a radiological situation.

Any unstable atom is considered radioactive. Non-ionizing radiation such as visible light, heat, radio waves etc., do not have sufficient energy to cause ionization. But, such particles as alpha particles and gamma rays do have sufficient energy to create a change in atoms by making them electrically charged causing them to become ionized.

- **Alpha Particle** – an ionized form of particle radiation, with low penetration capabilities.
- **Beta Particle** – an ionized form of high-energy, high-speed particle radiation with higher penetration capabilities.
- **Gamma Ray** – a form of electromagnetic radiation or light emission. Due to the high energy content. These rays have the ability to pass through dense materials such as concrete or lead, therefore being able to cause serious harm to living cells.



- **Neutron Particle** – an ionized (but uncharged) particle that can have higher penetrating capabilities than gamma particles. Sometimes, neutron radiation can become "activated" which gives it the ability to induce radioactivity in most substances it encounters, including body tissue.

Exposure vs. Contamination

External Radiation Exposure: occurs when a person is near a radiation source. Persons exposed to a radiation source do not become radioactive. For example, an x-ray machine is a source of radiation exposure, however you do not become radioactive when you have an x-ray taken.

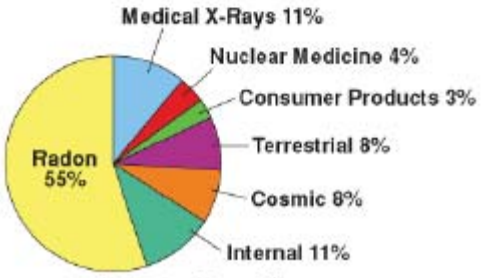
Contamination: Radioactive contamination results when loose particles of radioactive material settle onto surfaces, skin or clothing. Internal contamination may result if these loose particles are inhaled, ingested, or lodged in an open wound. Contaminated people are radioactive and should be decontaminated as quickly as possible. However, the level of radioactive contamination is unlikely to cause health risk to another individual.

Cardinal Rules of External Radiation Exposure:

- Time – The less time you spend near a radiation source, the less exposure you will have.
- Distance – The greater your distance from the source, the less your exposure will be.
- Shielding – External exposure to radiation can be partially blocked by using appropriate shielding (concrete, lead, etc.).

Four Types of Radiation Accident Victims:

- A person who has received a significant dose from an external source
- Internal contamination from inhalation and/or ingestion of radioactive material
- External contamination of the body surface and/or clothing by liquids or particles
- A combination of the above (in this situation, use external contamination as your guide)



Day to Day Exposure

Card # 12A

Chronic Radiation Exposure

Exposure to ionizing radiation over an extended period of time is called chronic exposure. Geographic location and occupation often affect chronic exposure, and also increase the possibility of developing cancer and other illnesses.

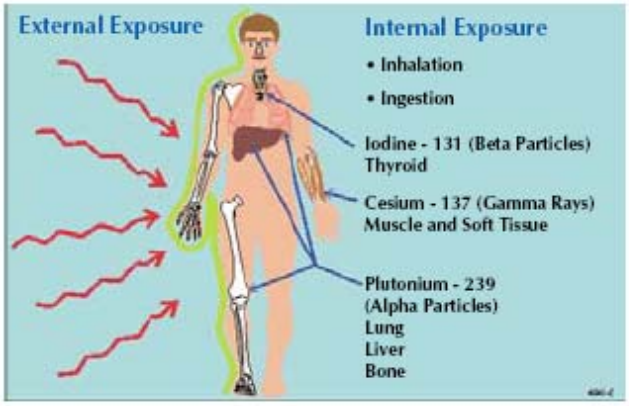
Acute radiation exposure

Acute radiation exposure is an exposure to a high dosage of ionizing radiation during a short period of time. Extreme examples include:

- Instantaneous flashes from nuclear explosions
- Exposure of minutes to hours during handling of highly radioactive sources
- Laboratory and manufacturing accidents
- Intentional and accidental high medical doses

Signs and Symptoms of Radiation Sickness: External vs. Internal Exposure

- Nausea and vomiting
- Diarrhea
- Skin burns (radiodermatitis)
- Weakness
- Low red blood cell count (anemia)
- Loss of appetite
- Inflammation (swelling, redness or tenderness) of tissues
- Bleeding from your nose, mouth, gums or rectum
- Fatigue
- Dehydration
- Fainting
- Hair loss



Medical Management for Radiation Exposure:

- ✓ Use Universal Precautions.
- ✓ Assess and treat life-threatening injuries immediately.
- ✓ Move victims away from the radiation hazard area.
- ✓ Expose wounds and cover with sterile dressings.
- ✓ Flush eyes with sterile water or sterile saline.
- ✓ Victims should be monitored for possible contamination only after being medically treated.
- ✓ Contaminated patients without life-threatening or serious injuries may be decontaminated on site.
- ✓ Move the ambulance to the clean side of the "control line."
- ✓ Before leaving the controlled area, responders should remove protective clothing at the control line.
- ✓ The ambulance is considered contaminated until proven otherwise or decontaminated.
- ✓ Have yourself surveyed and decontaminated as necessary.

Detection Equipment

The potential of a radiological release in Westchester County, whether accidental or intentional, requires that first responders are equipped with the necessary equipment to address such a situation. Several first responder agencies carry Personal Radiation Monitors (Mini-Rad). This device is designed to detect gamma radiation, it measures and displays the radiation dose rate (1.0 uR/hr to 500 R/hr) and total radiation dose (0.1 uR to 999 R).

Instructions on the Use of the Mini-Rad

- On/off – press and hold button to turn unit off or on
- Rate – press to change to the rate mode
- Dose – press to change to the dose mode
- Alarm – press to see the stay time, the number of minutes you can safely stay in the area
- Light – illuminates the display in low light situations
- Clr/Test – in the rate mode, press and hold to enable the display test sequence

Card #12B

Severe Weather

Flooding

- **Flood Forecasts** – Rainfall and/or melting snow may cause rivers, and other waterways to overflow.
- **Flood Warnings or Impending Floods** – Flood warnings or approaching floods describe the affected waterway, the severity of flooding (minor, moderate, major) and when and where the flood will begin.
- **Flash Flood Watches** – Heavy rains may occur, without any visible signs of precipitation causing flash flooding. Be alert to a possible emergency that will require immediate action.
- **Flash Flood Warnings** – Flash flooding is occurring or imminent along certain waterways. Move to higher ground immediately.

Hurricanes

- **Hurricane Watch** – Issued when there is a threat to a specific coastal area, generally within 36 hours.
- **Hurricane Warning** – Issued when there is a threat to a specific coastal area within 24 hours or less. Hurricane conditions include sustained winds of at least 74 mph and/ or dangerous high tides.

Severe Thunderstorms

- **Severe Thunderstorm Watch** – Issued when conditions are most favorable for a severe thunderstorm.
- **Severe Thunderstorm Warning** – Issued when as severe storm has been observed or has been detected by radar.

Tornadoes

- A tornado is a violently rotating column of air which is in contact with a specific type of cloud base as well as the surface of the earth. Tornadoes come in different shapes but typically as a condensation funnel, with the narrow end touching the ground. There are five different categories of Tornadoes they are as follows:

Enhanced Fujita Wind Scale

Category	Winds (mph)	Damage
EF0	65-85	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	86-110	Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off road.
EF2	111-135	Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136-165	Roofs and some walls torn off well-constructed houses, trains overturned; most trees in forest uprooted; heavy cars lifted off ground and thrown.
EF4	166-200	Well-constructed houses leveled; structure with weak foundations blown off some distance; cars thrown and large missiles generated.
EF5	>200	Strong frame houses lifted off foundations and swept away; automobile sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Card # 13A

Winter Storms

- **Winter Weather Advisory** – Issued when winter conditions, such as cold, ice or snow, are expected to delay travel, or create other types of dangerous conditions.
- **Winter Storm Watch** – Usually issued 12 to 36 hours, prior to the potential accumulation of six inches or more of snow or ice (roughly 30% chance).
- **Winter Storm Warning** – Usually issued up to 24 hours before the occurrence of heavy snow, sleet, or freezing rain is expected (about 70% chance).
- **Blizzard Warnings** – Issued when heavy snow, high winds, and dangerously low temperatures are expected. Blizzards can cause severe weather conditions such as zero visibility and life threatening wind chill.
- **Frost bite** – Frostbite causes a loss of feeling and a white or pale appearance in extremities, such as fingers, toes, earlobes, or the tip of the nose. If symptoms are detected **seek medical attention immediately**.
- **Hypothermia** (Low Body Temperature) – Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. **Seek medical attention immediately.** If care is not available, begin warming the person slowly. Get them into dry clothing, warm the torso (core) area first, and wrap them in a blanket covering their head and neck.

Heat

- **Heat Wave** – Is a prolonged period of excessive heat and humidity.
- **Heat Index** – Is a number in degrees Fahrenheit that tells how hot it "really feels," when relative humidity is added to the actual air temperature.
- **Heat Cramps** – Muscular pains and spasms due to heavy exertion. If this occurs stop activity and drink plenty of water.
- **Heat Exhaustion** – Typically occurs when someone over-exerts themselves in a warm humid environment, where body fluids are lost due to heavy sweating. Cease activity, move out of the warm environment, drink plenty of water, and apply cool, wet cloths.
- **Heat Stroke** – ***Is life threatening***. The victim's "temperature control system" has stopped working. **Seek immediate medical attention**. Stop all activity, move to a cooler environment, and cool body starting at the core.

Card #13B

Wind Chill Chart

Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph)

Effective 11/01/01

Heat Index Chart

Temperature \ % Relative Humidity	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90
110	108	112	117	123	130											
105	102	106	108	113	117	122	130									
100	97	98	102	104	107	110	115	120	126	132						
95	91	93	95	96	98	100	104	106	109	113	119	124	130			
90	86	87	88	90	91	92	95	97	98	100	103	106	110	114	117	121
85	81	82	83	84	85	86	87	88	89	90	92	94	96	97	100	102
80	76	77	78	78	79	79	80	81	82	83	84	85	86	87	88	89

Legend

80-89 degrees	Fatigue is possible with prolonged exposure and/or physical activity.
90-104 degrees	Sunstroke, heat cramps and heat exhaustion are possible with prolonged exposure and/or physical activity.
105-129 degrees	Sunstroke, heat cramps and heat exhaustion are likely. Heat stroke is possible with prolonged exposure and/or physical activity.
130+ degrees	Heatstroke/sunstroke is highly likely with continued exposure.