

**UNIT TERMINAL OBJECTIVE**

8-1 At the completion of this unit, the paramedic will understand standards and guidelines that help ensure safe and effective ground and air medical transport.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-1.1 Identify current local and state standards which influence ambulance design, equipment requirements and staffing of ambulances. (C-1)
- 8-1.2 Discuss the importance of completing an ambulance equipment/ supply checklist. (C-1)
- 8-1.3 Discuss the factors to be considered when determining ambulance stationing within a community. (C-1)
- 8-1.4 Describe the advantages and disadvantages of air medical transport. (C-1)
- 8-1.5 Identify the conditions/ situations in which air medical transport should be considered. (C-1)

**AFFECTIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-1.6 Assess personal practices relative to ambulance operations which may affect the safety of the crew, the patient and bystanders. (A-3)
- 8-1.7 Serve as a role model for others relative to the operation of ambulances. (A-3)
- 8-1.8 Value the need to serve as the patient advocate to ensure appropriate patient transportation via ground or air. (A-2)

**PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-1.9 Demonstrate how to place a patient in, and remove a patient from, an ambulance. (P-1)

## DECLARATIVE

- I. Ambulance operations
  - A. Ambulance standards
    - 1. Influence ambulance design, equipment, and staffing
      - a. State statutes/ administrative rules
        - (1) KKK specifications
        - (2) Air ambulance standards
        - (3) Operational staffing standards
        - (4) Operational driver standards
        - (5) Operational driving standards
        - (6) Operational equipment standards
        - (7) City/ county/ district ordinance standards
  - B. Checking ambulances
    - 1. Completing an ambulance equipment/ supply checklist is important
      - a. Safety
      - b. Patient care
      - c. Risk management issues
      - d. Scheduled medications
  - C. Ambulance stationing
    - 1. Peak load staffing (cyclic patterns)
      - a. Geographical demands
      - b. Standards of reliability
      - c. Patient demand
      - d. Traffic congestion
      - e. Deployment strategies
  - D. Safe ambulance operation
    - 1. Factors in safe driving
    - 2. Using escorts
    - 3. Adverse environmental conditions
    - 4. Use of lights and sirens
    - 5. Proceeding through intersections
    - 6. Parking at an emergency scene
    - 7. Operate with “due regard for the safety of all others”
    - 8. Safely placing a patient in and removing a patient from an ambulance
- II. Utilizing air medical transport
  - A. Types
    - 1. Rotorcraft
    - 2. Fixed wing
  - B. Advantages
    - 1. Specialized care
      - a. Skills, supplies, equipment
    - 2. Rapid transport
    - 3. Access to remote areas
    - 4. Helicopter hospital helipads
  - C. Disadvantages
    - 1. Weather/ environmental
    - 2. Altitude limitations

3.      Airspeed limitations
4.      Aircraft cabin size
5.      Terrain
6.      Cost
- D.     Activation
  1.     Local and state guidelines exist for air medical activation
    - a.     State statutes
    - b.     Administrative rules
    - c.     City/ county/ district ordinance standards
- E.     Indications for patient transport
  1.     Medical
  2.     Trauma
  3.     Search and rescue
- F.     Patient transfer
  1.     Interacting with flight personnel
  2.     Patient preparation
  3.     Scene safety
    - a.     Securing loose objects
    - b.     Approaching the aircraft

**UNIT TERMINAL OBJECTIVE**

8-2 At the completion of this unit, the paramedic student will be able to integrate the principles of general incident management and multiple casualty incident (MCI) management techniques in order to function effectively at major incidents.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-2.1 Explain the need for the incident management system (IMS)/ incident command system (ICS) in managing emergency medical services incidents. (C-1)
- 8-2.2 Define the term multiple casualty incident (MCI). (C-1)
- 8-2.3 Define the term disaster management. (C-1)
- 8-2.4 Describe essential elements of scene size-up when arriving at a potential MCI. (C-1)
- 8-2.5 Describe the role of the paramedics and EMS systems in planning for MCIs and disasters. (C-1)
- 8-2.6 Define the following types of incidents and how they affect medical management: (C-1)
  - a. Open or uncontained incident
  - b. Closed or contained incident
- 8-2.7 Describe the functional components of the incident management system in terms of the following: (C-1)
  - 1. Command
  - 2. Finance
  - 3. Logistics
  - 4. Operations
  - 5. Planning
- 8-2.8 Differentiate between singular and unified command and when each is most applicable. (C-3)
- 8-2.9 Describe the role of command. (C-1)
- 8-2.10 Describe the need for transfer of command and procedures for transferring it. (C-1)
- 8-2.11 Differentiate between command procedures used at small, medium and large scale medical incidents. (C-1)
- 8-2.12 Explain the local/ regional threshold for establishing command and implementation of the incident management system including threshold MCI declaration. (C-1)
- 8-2.13 List and describe the functions of the following groups and leaders in ICS as it pertains to EMS incidents: (C-1)
  - a. Safety
  - b. Logistics
  - c. Rehabilitation (rehab)
  - d. Staging
  - e. Treatment
  - f. Triage
  - g. Transportation
  - h. Extrication/ rescue
  - l Disposition of deceased (morgue)
  - j. Communications
- 8-2.14 Describe the methods and rationale for identifying specific functions and leaders for these functions in ICS. (C-1)

- 8-2.15 Describe the role of both command posts and emergency operations centers in MCI and disaster management. (C-1)
- 8-2.16 Describe the role of the physician at multiple casualty incidents. (C-1)
- 8-2.17 Define triage and describe the principles of triage. (C-1)
- 8-2.18 Describe the START (simple triage and rapid treatment) method of initial triage. (C-1)
- 8-2.19 Given a list of 20 patients with various multiple injuries, determine the appropriate triage priority with 90% accuracy. (C-3)
- 8-2.20 Given color coded tags and numerical priorities, assign the following terms to each: (C-1)
- a. Immediate
  - b. Delayed
  - c. Hold
  - d. Deceased
- 8-2.21 Define primary and secondary triage. (C-1)
- 8-2.22 Describe when primary and secondary triage techniques should be implemented. (C-1)
- 8-2.23 Describe the need for and techniques used in tracking patients during multiple casualty incidents. (C-1)
- 8-2.24 Describe techniques used to allocate patients to hospitals and track them. (C-1)
- 8-2.25 Describe modifications of telecommunications procedures during multiple casualty incidents. (C-1)
- 8-2.26 List and describe the essential equipment to provide logistical support to MCI operations to include: (C-1)
- a. Airway, respiratory and hemorrhage control
  - b. Burn management
  - c. Patient packaging/ immobilization
- 8-2.27 List the physical and psychological signs of critical incident stress. (C-1)
- 8-2.28 Describe the role of critical incident stress management sessions in MCIs. (C-1)
- 8-2.29 Describe the role of the following exercises in preparation for MCIs: (C-1)
- a. Table top exercises
  - b. Small and large MCI drills

### **AFFECTIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-2.30 Understand the rationale for initiating incident command even at a small MCI event. (A-1)
- 8-2.31 Explain the rationale for having efficient and effective communications as part of an incident command/ management system. (A-1)
- 8-2.32 Explain why common problems of an MCI can have an adverse effect on an entire incident. (A-1)
- 8-2.33 Explain the organizational benefits for having standard operating procedures (SOPs) for using the incident management system or incident command system. (A-1)

## **PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-2.34 Demonstrate the use of local/ regional triage tagging system used for primary and secondary triage. (P-1)
- 8-2.35 Given a simulated tabletop multiple casualty incident, with 5-10 patients: (P-1)
  - a. Establish unified or singular command
  - b. Conduct a scene assessment
  - c. Determine scene objectives
  - d. Formulate an incident plan
  - e. Request appropriate resources
  - f. Determine need for ICS expansion and groups
  - g. Coordinate communications and groups leaders
  - h. Coordinate outside agencies
- 8-2.36 Demonstrate effective initial scene assessment and update (progress) reports. (P-1)
- 8-2.37 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of triage group leader. (P-3)
- 8-2.38 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of treatment group leader. (P-3)
- 8-2.39 Given a classroom simulation of a MCI with 5-10 patients, fulfill the role of transportation group leader. (P-3)

## **DECLARATIVE**

- I. Introduction
  - A. Need for incident command system
    - 1. Used at small "everyday" incidents
    - 2. Expands/ contracts as incident evolves
    - 3. Provides a clear system of command/ control
    - 4. Overcomes jurisdictions and geographic boundaries
  - B. The FEMA incident management or command system
    - 1. National standard for incident management
    - 2. Used by public and by private sectors
    - 3. Flexible system
    - 4. Used for routine and large scale emergencies
  - C. Incident command system elements
    - 1. Define span of control
    - 2. Define multiple casualty incident
    - 3. Define incident management system (IMS)/ incident command system (ICS)
    - 4. Define disaster management

5. Uniform terminology
  6. Geographic and functional components
  7. Define an open or uncontained incident
  8. Define a closed or contained incident
  9. Major functional areas are C-FLOP
    - a. C command
    - b. F finance
    - c. L logistics
    - d. O operations
    - e. P planning
  10. Discuss importance of communications
  11. Define triage
  12. Define transfer of command
  13. Define sectorization
  14. Discuss benefits of using standard operating procedures (SOPs) for ICS
  15. Identify laws or regulations that relate to the incident command system
- D. Need for preplanning
1. Periodic review of plan and updating as needed
  2. Participation in local/ regional planning
- E. Drills and critiques
1. Need to practice the plan
    - a. Drills
    - b. Table top exercises
  2. Critiques
    - a. Drills and exercises
    - b. Actual MCIs and incidents where IMS or ICS model is used
- II. Basic elements of the incident command system (C-FLOP)
- A. Command
1. Responsible for all functions unless delegated
    - a. Oversees incident needs
    - b. Establishes objectives/ priorities
    - c. Develops action plan
    - d. Coordinates with other agencies/ officials
    - e. Identifies appropriate command structure for operation size
    - f. Approves, orders and releases resources
  2. Established at all incidents
    - a. Identify appropriate command structure for size of incident
  3. Singular command
    - a. Single commander responsible for entire operation
    - b. Works well for incidents with limited jurisdictions or responsibilities
    - c. Ideal for short duration limited incidents

- d. Unrealistic in many localities
  - (1) Overlapping responsibilities
  - (2) Overlapping jurisdictions
  - (3) Incident evolution
- 4. Unified command
  - a. EMS-police-fire command personnel unify
  - b. As incident evolves, right agency leads at the right time
  - c. Identification and accessing appropriate agency(ies) or specialized organization, as needed, to complement command (e.g. health department, public works, building department, American Red Cross, Salvation Army, etc.)
  - d. Stimulates cooperation
  - e. Provides for balanced decision making
  - f. Selection of sector leaders and functions
  - g. "Span of control" (supervisor/ worker ratio)
    - (1) 1 to 6 ratio
    - (2) Maintaining unity/ command structure
  - h. Determines need for public information officer and liaison with media
- B. Finance
  - 1. Accounting and administration of the incident
  - 2. Staff support function
    - a. Monitors costs, provides for careful accounting
    - b. Seldom used on small scale incidents
    - c. Essential as incident grows in magnitude and costs
    - d. Not a component used in routine daily incidents
    - e. Finance section responsible for
      - (1) Time accounting
      - (2) Procurement
      - (3) Paying claims
      - (4) Estimating costs
- C. Logistics
  - 1. Procurement and stockpiling of equipment and supplies
  - 2. Staff support function
    - a. Support the logistical needs of the incident
    - b. Logistics appropriate to incident size/ duration
    - c. Seldom used at routine daily incidents
    - d. Logistics section responsible for
      - (1) Supplies/ equipment
      - (2) Facilities
      - (3) Food
      - (4) Communications support

- (5) Medical support for workers
  - D. Operations
    - 1. Carries out the action functions and commands direction
    - 2. Line or actual operational responsibility
    - 3. Major functional area in all operations
      - a. Carries out tactical objectives
      - b. Directs the front end activities
      - c. Participates in planning
      - d. Modifies action plan
      - e. Maintains discipline
      - f. Accounts for personnel
    - 4. EMS operation areas fall under this section
  - E. Planning
    - 1. Staff function to provide past, present and future information about the incident
    - 2. Resource and situation status on a real time basis
- III. Role and functions of command in managing major medical incidents
- A. Establishing command
    - 1. Local threshold as to when command is established
    - 2. Low threshold encourages frequent practice ( > 2 patients)
    - 3. Identify which group/ sector functions or major functional areas need to be implemented for the size and scope of incident
    - 4. Unification of EMS command with fire and police
    - 5. Tactical worksheet used to focus command on SOP
    - 6. Bib or other ID to easily identify command
    - 7. Assumption of a command position and arrival report
  - B. Scene assessment
    - 1. First unit on the scene should make a quick and rapid assessment of the situation
      - a. Windshield assessment
      - b. What is observed as you enter the area (incident scene)
    - 2. Precise and complete assessment should be done as soon as safety and time permit
      - a. Type of incident and potential duration
      - b. Entrapment or special rescue resources needed
      - c. Number of patients in each triage category
      - d. Additional resources needed
    - 3. Continually updated scene assessment
  - C. Communications
    - 1. Command established over radio with communication center/ emergency operations center (EOC)

2. Radio traffic can be very distracting
3. In larger incidents communications aide is used
- D. Obtaining resources
  1. Additional units requested according to the situation
  2. Communications center should have written SOP on mutual aid
  3. Assignment of units consistent with the situation
  4. Additional support services requested as needed for victims, for food, shelter and clothing
- E. Strategic deployment of resources
  1. Command issues instructions as to deployment
  2. Personnel stay with vehicle until given instructions
  3. Staging slows resource deployment and premature commitment
  4. Staging techniques
    - a. Lining vehicles up at scene to facilitate egress
    - b. Staging off of the limited access highway
    - c. Formal staging area with staging officer assigned
  5. Resources deployed more effectively
- F. Strategic development of resources
  1. "Tool box" theory
    - a. Identification of resources ("tools") specific to an incident, utilizing only needed resources
    - b. Issue instruction for deployment of resources
- G. Transferring command
  1. Procedures established for transferring command
  2. Command remains in that position until relieved according to SOP
  3. Limitation of transferring command
- H. Terminating command
  1. Procedures established for de-escalation and relief of units
  2. Procedures for terminating command and the ICS structure
- I. Command procedures at various size events
  1. Small
  2. Medium
  3. Large
- J. Common problems at a multiple casualty incident
  1. Failure to adequately provide widespread notification of the event
  2. Lack of rapid "initial" stabilization of all patients
  3. Failure to move, collect and to organize patients rapidly at a treatment area
  4. Failure to provide proper triage
  5. Overly time consuming care employed
  6. Premature transportation of patients
  7. Improper use of personnel in field

8. Lack of proper distribution of patients to medical facilities
  9. Lack of recognizable EMS command in the field
  10. Lack of proper preplanning and lack of adequate training of all personnel [Alex M. Butman, "Responding to the MCI: A Guide for EMS Personnel", © 1982]
- IV. Group or sector functions
- A. Safety officer
    1. Staff role to monitor safety of workers at incident
    2. Authority to stop unsafe procedures or institute safety procedures
    3. Necessary at large scale incidents
  - B. Logistics
    1. Provides essential equipment and medical supplies
    2. Generally established and pre-positioned during the pre-MCI/ planning phase
    3. Supports the operational needs of the incident
  - C. Rehabilitation
    1. Locates and sets up the rehabilitation area
    2. Rehabilitation area set up
      - a. In safe area with thermal control
      - b. Away from exhaust fumes and crowds
    3. Monitors personnel and assures proper rest and hydration
    4. Work with logistics to assure proper hydration and personnel monitoring supplies
  - D. Staging
    1. Locates and sets up sufficient area to stage equipment/ personnel
      - a. Lining vehicles up to facilitate egress
    2. Formal staging area with staging officer assigned
    3. Assures apparatus is parked to allow egress when deployed
    4. Confers with command about additional resources needed
    5. Releases resources for deployment when ordered by command
    6. Ensures personnel stay with vehicle until deployed
    7. Supervises personnel within sector
    8. Tracks unit arrival and deployment from staging
    9. Prevents premature commitment of resources
  - E. Treatment
    1. Locates and sets up the treatment area according to the situation
    2. Generally away from immediate action area
    3. Provides for treatment areas for priority 1,2,3 patients
    4. Provides for secondary triage of patients as they arrive in treatment
    5. Assures patients receive adequate care in each sub-area
    6. Communicates/ coordinates with command, triage and transportation

7. Moves patients to transportation appropriately
  8. Supervises personnel within the group
- F. Triage
1. Works at the incident or action site
  2. Assures initial primary triage is conducted to minimize re-triage
  3. Determines site treatment needs and assures initial triage/ treatment
  4. Organizes resources to deliver patients to the treatment area
  5. Responsible for supervising safety and treatment of entrapped patients
- G. Transportation
1. Establishes ambulance staging and landing zones if necessary
  2. Determines availability of receiving facilities and treatment capabilities
  3. Coordinates transportation and distribution of patients to appropriate receiving facilities
  4. Tracks patients leaving the site and maintains tracking log with
    - a. Patient ID
    - b. Unit transporting
    - c. Destination facility
- H. Extrication/ rescue
1. Determines type of equipment and resources needed
  2. Identifies the need for specialized equipment and personnel with unique expertise
  3. Assures special safety equipment is available to all personnel (e.g. SCBA, protective clothing, etc.)
  4. Supervises personnel within group
  5. Ensures that support materials (e.g. gasoline, electricity, compressed air, etc.) for extrication equipment and materials are readily available
  6. Works with treatment personnel with extended extrication or special rescue situations
  7. Coordinates with safety officer, staging, and triage
- I. Disposition of deceased
1. Works with medical examiner, coroner, law enforcement and other appropriate agencies to coordinate disposition of deceased (attempt to leave deceased victims in location found, if possible, until a decision and plan for disposition can be determined)
  2. Assists in establishing an appropriate and secure area for a morgue, if needed
  3. Monitors personnel for signs of stress
- J. Communications
1. Modification of communications techniques
    - a. Calm communications (helps sets an orderly tone)

- b. Avoid use of radio codes/ signals
    - c. Plain English and terminology is used
    - d. Need for a common radio channel between command, sectors (groups), divisions
    - e. Radio traffic should be minimized
    - f. Face-to-face communication is encouraged to limit radio traffic
  - 2. Importance of communications at an MCI
  - 3. Communication requirements of command post and emergency operations center
  
- V. On-scene physicians in multiple casualty incident management
  - A. Triage function
    - 1. Increased ability to make difficult triage decisions
    - 2. Use at treatment area to make secondary triage decisions
    - 3. Emergency surgery to facilitate extrication
  - B0 Treatment capabilities
    - 1. On-scene ability to perform specialized invasive procedures
    - 2. More accurate assessment and direction of specific treatments
  - C0 Medical direction
    - 1. On-scene medical direction of paramedics
  
- VI Principles and techniques of triage
  - A0 Primary versus secondary triage
    - 1. Primary triage used at site to rapidly categorize patients condition for treatment
      - a0 Document location of patient and transport needs
      - b0 Triage tape or labels used
      - c0 Focus on speed to sort patients quickly
    - 2. Secondary triage used at treatment area
      - a0 Retriage of patients
      - b0 Usually accomplished at the treatment area
      - c0 Paper tags usually used
      - d0 Not always necessary especially at small incidents
  - B0 START technique of primary triage
    - 1. Developed at Hoag Memorial Hospital, Newport Beach, CA
    - 2. Stands for "simple triage and rapid treatment"
    - 3. Rapidly allows sorting of patients
    - 4. Accurate with practice
    - 5. Focuses on
      - a0 Ability to walk
      - b0 Respiratory effort
      - c0 Pulses/ perfusion

- d0 Neurologic status
- C0 START technique
  - 1 Walking wounded verbally directed to a designated location
  - 2 Initial triage effort is directed to non-walking patients
  - 3 Only treatment effort directed to correction of airway and severe bleeding
  - 4 Respiratory effort assessed
    - a0 No respirations Priority-0 (P-0)
    - b0 Above 30 Priority-1 (P-1)
    - c0 Below 30 Go to next assessment
  - 5 Perfusion assessed
    - a0 Absence of radial pulse Priority-1 (P-1)
    - b0 Radial pulse Go to next assessment
  - 6 Neurologic assessed
    - a0 Unresponsive Priority-1 (P-1)
    - b0 Altered LOC Priority-2 (P-2)
    - c0 Alert Priority-3 (P-3)
  - 7 Walking wounded need to be carefully triaged
- D0 Triage tagging/ labeling
  - 1 International agreement on color coding and priorities
    - a0 Immediate Red Priority-1 (P-1)
    - b0 Delayed Yellow Priority-2 (P-2)
    - c0 Hold Green Priority-3 (P-3)
    - d0 Deceased Black Priority-0 (P-0)
  - 2 Many variations of tags, tape and labels available
  - 3 Purpose of tagging
    - a0 Identify the priority of the patient
    - b0 Prevent re-triage of the same patient
    - c0 Serve as a tracking system during treatment/ transport
  - 4 Tags/ labels should be
    - a0 Easy to use
    - b0 Rapidly identify priority
    - c0 Allow for easy tracking
    - d0 Allow for some documentation
    - e0 Prevent patients from re-triaging themselves
  - 5 Should be used routinely so their use becomes familiar
- E0 Tracking systems for patients
  - 1 Destination log must be maintained by the transportation officer
  - 2 Log and tagging system must be integrated in order to track patients
  - 3 Either name or triage label ID# should be used
  - 4 Tracking log is similar to a shipping manifest with
    - a0 Patient identification
    - b0 Unit transporting

- c0 Priority
    - d0 Destination
  - F0 Transportation of patients
    - 1 Method of transportation driven by triage priority and situation
    - 2 Ambulance (s) are the typical method of transportation
    - 3 Buses should be considered for transporting large numbers of P-3s
    - 4 Air ambulances are often used for transport of critical patients
- VII Critical incident stress and MCIs
  - A0 Critical incident stress in personnel exposed to major events
  - B0 Critical incident stress debriefing should be part of post-incident SOP
  - C0 Access to defusing during the MCI
  - D0 Role of debriefing for an MCI
  - E0 Access to debriefing

**UNIT TERMINAL OBJECTIVE**

- 8-3 At the completion of this unit, the paramedic student will be able to integrate the principles of rescue awareness and operations to safely rescue a patient from water, hazardous atmospheres, trenches, highways, and hazardous terrain.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-3.1 Define the term rescue. (C-1)
- 8-3.2 Explain the medical and mechanical aspects of rescue situations. (C-1)
- 8-3.3 Explain the role of the paramedic in delivering care at the site of the injury, continuing through the rescue process and to definitive care. (C-1)
- 8-3.4 Describe the phases of a rescue operation. (C-1)
- 8-3.5 List and describe the types of personal protective equipment needed to safely operate in the rescue environment to include: (C-1)
  - a. Head protection
  - b. Eye protection
  - c. Hand protection
  - d. Personal flotation devices
  - e. Thermal protection/ layering systems
  - f. High visibility clothing
  - g. Specialized footwear
- 8-3.6 Explain the differences in risk between moving water and flat water rescue. (C-1)
- 8-3.7 Explain the effects of immersion hypothermia on the ability to survive sudden immersion and self rescue. (C-1)
- 8-3.8 Explain the phenomenon of the cold protective response in cold water drowning situations. (C-1)
- 8-3.9 Identify the risks associated with low head dams and the rescue complexities they pose. (C-1)
- 8-3.10 Given a picture of moving water, identify and explain the following features and hazards associated with: (C-2)
  - a. Hydraulics
  - b. Strainers
  - c. Dams/ hydro-electric sites
- 8-3.11 Explain why water entry or go techniques are methods of last resort. (C-1)
- 8-3.12 Explain the rescue techniques associated with reach-throw-row-go. (C-1)
- 8-3.13 Given a list of rescue scenarios, identify the victim survivability profile and which are rescue versus body recovery situations. (C-1)
- 8-3.14 Explain the self rescue position if unexpectedly immersed in moving water. (C-1)
- 8-3.15 Given a series of pictures identify which would be considered "confined spaces" and potentially oxygen deficient. (C-3)
- 8-3.16 Identify the hazards associated with confined spaces and risks posed to potential rescuers to include: (C-1)
  - a. Oxygen deficiency
  - b. Chemical/ toxic exposure/ explosion
  - c. Engulfment
  - d. Machinery entrapment
  - e. Electricity
- 8-3.17 Identify components necessary to ensure site safety prior to confined space rescue attempts. (C-1)
- 8-3.18 Identify the poisonous gases commonly found in confined spaces to include: (C-1)
  - a. Hydrogen sulfide (H<sub>2</sub>S)
  - b. Carbon dioxide (CO<sub>2</sub>)
  - c. Carbon monoxide (CO)

- d. Low/ high oxygen concentrations ( $\text{FiO}_2$ )
  - e. Methane ( $\text{CH}_4$ )
  - f. Ammonia ( $\text{NH}_3$ )
  - g. Nitrogen dioxide ( $\text{NO}_2$ )
- 8-3.19 Explain the hazard of cave-in during trench rescue operations. (C-1)
- 8-3.20 Describe the effects of traffic flow on the highway rescue incident including limited access superhighways and regular access highways. (C-1)
- 8-3.21 List and describe the following techniques to reduce scene risk at highway incidents: (C-1)
- a. Apparatus placement
  - b. Headlights and emergency vehicle lighting
  - c. Cones, flares
  - d. Reflective and high visibility clothing
- 8-3.22 List and describe the hazards associated with the following auto/ truck components: (C-1)
- a. Energy absorbing bumpers
  - b. Air bag/ supplemental restraint systems
  - c. Catalytic converters and conventional fuel systems
  - d. Stored energy
  - e. Alternate fuel systems
- 8-3.23 Given a diagram of a passenger auto, identify the following structures: (C-1)
- a. A, B, C, D posts
  - b. Fire wall
  - c. Unibody versus frame designs
- 8-3.24 Describe methods for emergency stabilization using rope, cribbing, jacks, spare tire, and come-a-longs for vehicles found on their: (C-1)
- a. Wheels
  - b. Side
  - c. Roof
  - d. Inclines
- 8-3.25 Describe the electrical hazards commonly found at highway incidents (above and below ground). (C-1)
- 8-3.26 Explain the difference between tempered and safety glass, identify its locations on a vehicle and how to break it safely. (C-3)
- 8-3.27 Explain typical door anatomy and methods to access through stuck doors. (C-1)
- 8-3.28 Explain SRS or "air bag" systems and methods to neutralize them. (C-1)
- 8-3.29 Define the following terms: (C-1)
- a. Low angle
  - b. High angle
  - c. Belay
  - d. Rappel
  - e. Scrambling
  - f. Hasty rope slide
- 8-3.30 Describe the procedure for stokes litter packaging for low angle evacuations. (C-1)
- 8-3.31 Explain the procedures for low angle litter evacuation to include: (C-1)
- a. Anchoring
  - b. Litter/ rope attachment
  - c. Lowering and raising procedures
- 8-3.32 Explain techniques to be used in non-technical litter carries over rough terrain. (C-1)
- 8-3.33 Explain non-technical high angle rescue procedures using aerial apparatus. (C-1)
- 8-3.34 Develop specific skill in emergency stabilization of vehicles and access procedures and an awareness of specific extrication strategies. (C-1)
- 8-3.35 Explain assessment procedures and modifications necessary when caring for entrapped patients. (C-1)
- 8-3.36 List the equipment necessary for an "off road" medical pack. (C-1)

- 8-3.37 Explain specific methods of improvisation for assessment, spinal immobilization and extremity splinting. (C-1)
- 8-3.38 Explain the indications, contraindications and methods of pain control for entrapped patients. (C-1)
- 8-3.39 Explain the need for and techniques of thermal control for entrapped patients. (C-1)
- 8-3.40 Explain the pathophysiology of "crush trauma" syndrome. (C-1)
- 8-3.41 Develop an understanding of the medical issues involved in providing care for a patient in a rescue environment. (C-1)
- 8-3.42 Develop proficiency in patient packaging and evacuation techniques that pertain to hazardous or rescue environments. (C-1)
- 8-3.43 Explain the different types of "stokes" or basket stretchers and the advantages and disadvantages associated with each. (C-1)

**AFFECTIVE OBJECTIVES**

None identified for this unit.

**PSYCHOMOTOR OBJECTIVES**

At the completion of this lesson, the paramedic student should be able to:

- 8-3.44 Using cribbing, ropes, lifting devices, spare tires, chains, and hand winches, demonstrate the following stabilization procedures: (P-1)
  - a. Stabilization on all four wheels
  - b. Stabilization on its side
  - c. Stabilization on its roof
  - d. Stabilization on an incline/ embankments
- 8-3.45 Using basic hand tools demonstrate the following: (P-1)
  - a. Access through a stuck door
  - b. Access through safety and tempered glass
  - c. Access through the trunk
  - d. Access through the floor
  - e. Roof removal
  - f. Dash displacement/ roll-up
  - g. Steering wheel/ column displacement
  - h. Access through the roof
- 8-3.46 Demonstrate methods of "stokes" packaging for patients being: (P-1)
  - a. Vertically lifted (high angle)
  - b. Horizontally lifted (low angle)
  - c. Carried over rough terrain
- 8-3.47 Demonstrate methods of packaging for patients being vertically lifted without stokes litter stretcher packaging. (P-1)
- 8-3.48 Demonstrate the following litter carrying techniques: (P-1)
  - a. Stretcher lift straps
  - b. "Leap frogging"
  - c. Passing litters over and around obstructions
- 8-3.49 Demonstrate litter securing techniques for patients being evacuated by aerial apparatus. (P-1)
- 8-3.50 Demonstrate in-water spinal immobilization techniques. (P-1)
- 8-3.51 Demonstrate donning and properly adjusting a PFD. (P-1)
- 8-3.52 Demonstrate use of a throw bag. (P-1)

## DECLARATIVE

- I. Role of the paramedic in rescue operations
  - A. Definition of rescue according to Webster - the act of delivery from danger or imprisonment
    - 1. Humans who are traumatized or stranded need rescue
    - 2. No patient - no rescue
    - 3. Rescue is a patient driven event
  - B. Rescue involves both medical and mechanical skills with the correct amount of each applied at the appropriate time
    - 1. Patients must be accessed and assessed for treatment needs
    - 2. Patient treatment must begin at the site
    - 3. Patient must be released from entrapment or imprisonment
    - 4. Medical care must continue throughout the incident
    - 5. There is no army in the world that does not train and deploy medical people into combat
    - 6. Medical and mechanical skills must be carefully balanced to ensure that patients obtain effective treatment and timely extraction
    - 7. Must have a well coordinated effort between medical care and specialized rescue effort
    - 8. Rescue effort must be driven by the patient's medical and physical needs
  - C. Role of the paramedic in rescue operations
    - 1. Have proper training and PPE to allow access and the provision of treatment at the site and continuing throughout the incident
    - 2. As first responders to many incidents
      - a. Understand hazards associated with various environments
      - b. Know when it is safe/ unsafe to gain access or attempt rescue
      - c. Have skills to effect a rescue when safe and necessary
      - d. Understand the rescue process and when certain techniques are indicated or contraindicated
    - 3. Be skilled in specialized patient packaging techniques to allow safe extraction and medical care
  - D. Phases of a rescue operation
    - 1. Arrival and size-up
      - a. Responders must understand the environment and risks
      - b. Establish command and conduct a scene assessment
      - c. Determine the number of patients and triage as necessary
      - d. Determine if situation is a search, rescue or body recovery
      - e. Risk versus benefit analysis
      - f. Request additional resources
      - g. ICS used as a command/ control mechanism
      - h. Make a realistic "time" estimate in accessing and evacuating
    - 2. Hazard control
      - a. Control as many of the hazards as possible
      - b. Manage, reduce and minimize the risks from the uncontrollable hazards
      - c. Make the scene as safe as possible
      - d. Ensure all personnel are in PPE appropriate for the situation
    - 3. Gain access to the patient
      - a. Determine the best method to gain access to the patient
      - b. Deploy personnel to the patient
      - c. Stabilize the physical location of the patient
    - 4. Medical treatment
      - a. Medical treatment provided appropriate to the situation

5. Disentanglement
    - a. Release from physical entrapment
    - b. Methods must be driven by patient's needs
    - c. Risk versus benefit assessment
    - d. Could involve use of specialized equipment and techniques
  6. Patient packaging
    - a. Patient packaged to ensure their medical needs are addressed
    - b. Physically secure to prevent additional injury
  7. Transportation
    - a. Often as simple as carrying the patient to an ambulance
    - b. Could involve air evacuation
    - c. Could involve specialized operations
- II. Rescuer personal protective equipment (PPE)
- A. Rescuer protection
    1. The same PPE is not appropriate in all situations
      - a. PPE must be appropriate for/ to the situation encountered
      - b. PPE may not prevent exposure to infectious disease but it does minimize risk
      - c. Most PPE is not specifically designed for EMS workers
    2. EMS PPE historically has been adapted from other fields
      - a. EMS does not have a national uniform trauma reporting system to identify potential work related exposures
      - b. Risk management and PPE design needs to be driven by data
  - B. Head/ eye/ hearing/ hand/ foot protection
    1. Adequate head protection depends on the environment
      - a. Compact firefighter's helmet meeting NFPA standards adequate for most vehicle/ structural applications
      - b. Climbing helmet used for many confined space and technical rescue applications
      - c. Padded rafting/ kayaking helmet for water rescue
      - d. Must meet safety standards for the appropriate application
    2. Eye protection
      - a. Face shield on most fire helmets is inadequate
      - b. ANSI approved safety glasses/ goggles with side shields is best
    3. Hearing protection
      - a. For high noise areas
      - b. Ear plugs or ear muffs
    4. Hand protection
      - a. Gloves to protect the hands
      - b. Must allow for adequate dexterity
      - c. Protection from cuts/ puncture
    5. Foot protection
      - a. Ankle support to limit range of motion
      - b. Tread to provide traction and prevent slips
      - c. Insulated in some environments
      - d. Steel toe/ shank required to meet some safety requirements
  - C. Flame/ flash protection
    1. Nomex/ PBI/ flame retardant cotton designed to provide limited flash protection
      - a. Turnout clothing
      - b. Jump-suits/ flyers coveralls
    2. Does not provide complete protection from puncture or cuts

3. Thermal protection from turnout clothing increases heat stress
  4. Should be used when danger from fire exists
  - D. Personal flotation devices (PFD)
    1. Meet Coast Guard standards for flotation
    2. Must be used when operating on or around the water
    3. Type III preferred for most rescue work
      - a. Should have whistle and strobe light attached
      - b. Knife for cutting should be attached
  - E. Visibility
    1. Reflective trim should be on all outer-wear
    2. Orange clothing or safety vests should be used when in highway operations
  - F. Extended, remote or wilderness protection
    1. Additional/ different PPE must be considered for bad weather conditions not normally encountered (cold, rain, snow, wind)
    2. Personal drinking water
    3. Personal snacks for a few hours
    4. Possible shelter needs
- III. Surface water rescue
- A. Moving water and common hazards
    1. Hydraulics of moving water change with many variables
      - a. Water depth
      - b. Velocity
      - c. Obstructions to flow
    2. Force of moving water is very deceptive
    3. Rescue using "go" techniques requires special skills
    4. Rescuer perception
      - a. People are drawn to moving water for recreation
      - b. Many underestimate the power of the water
      - c. Unaware rescuers also underestimate the power of the water
      - d. Fail to understand the hazards involved
    5. "Drowning machines"- recirculating currents
      - a. Water moving over a uniform obstruction to flow
      - b. Most commonly found on "low head" dams
      - c. Commonly found on many rivers
      - d. Innocuous in appearance
      - e. Victims caught in the recirculating flow of the current
      - f. Escape very difficult
      - g. Same hydraulic can be created by many other obstructions
      - h. Hazardous rescue
    6. Strainers
      - a. Water moving through obstructions in flood or river
        - (1) Trees
        - (2) Grating/ wire mesh
      - b. Current may move victim into strainer
      - c. Force of water against victim makes escape difficult
      - d. Hazardous rescue
    7. Foot/ extremity pin
      - a. Unsafe to walk in fast moving water over knee depth
      - b. If extremity becomes trapped force of water forces victim under the surface

- c. Extremity must be extricated the same way it went in
    - d. Hazardous rescue
  - 8. Dams, hydroelectric intakes
    - a. Height of dam no indication of the degree of hazard
    - b. Intakes can act as strainers
    - c. Most dams create recirculating currents
    - d. Hazardous rescue
- B. Flat water (slow moving or still water)
  - 1. Most people who drown never planned on being in the water
    - a. PFDs routinely worn and fastened properly when on or around the water save lives
    - b. Having the PFD available but unworn is not enough
  - 2. Alcohol consumption is a contributory factor to many flat water boating incidents
    - a. Alcohol alters mental ability and reason
  - 3. Water temperature and hypothermia can quickly incapacitate and lead to drowning
    - a. Routine use of PFDs decreases the likelihood of drowning
- C. Water temperature
  - 1. Immersion in cold water can rapidly lead to hypothermia
    - a. Any water temperature less than 98 degrees will cause hypothermia
    - b. Cannot maintain body heat in water less than 92 degrees
    - c. Colder water causes a faster rate of heat loss
    - d. Water causes heat loss 25 times faster than air
    - e. A 15-20 minute immersion in 35 degree water is likely to kill
  - 2. Hypothermic patients rapidly lose the ability for self rescue
    - a. Sudden immersion in cold water may trigger laryngospasm
    - b. Hypothermic victims are unable to follow directions
    - c. Hypothermia makes it difficult for a victim to grab anything
    - d. Hypothermia increases the likelihood of drowning
    - e. Victims become incapacitated and unable to help themselves
  - 3. Water temperature varies widely with seasons and run off
    - a. Even on warm days water temperature can be very low
  - 4. PFDs lessen heat loss and energy required for flotation
    - a. If sudden immersion occurs assume HELP position
    - b. If multiple people are in the water huddle to decrease heat loss
- D. Cold protective response
  - 1. Increases the chances of a cold water drowning victim's survival
    - a. Documented saves from cold immersion of up to 45 minutes
    - b. Colder water seems to increase chances of survival
    - c. How long is the head above water during the cooling process
  - 2. Protective physiologic response
    - a. Face immersion causes parasympathetic stimulation
    - b. Heart rate decreases/ bradycardia
    - c. Peripheral vasoconstriction and blood shunted to the core
    - d. Blood pressure drop
  - 3. Survivability profile affected by
    - a. Age
    - b. Posture
    - c. Lung volume
    - d. Water temperature

4. You are never cold and dead - only warm and dead
  - a. Hypothermic patients should be presumed salvageable
  - b. A patient must be re-warmed before an accurate assessment can be made
5. Rescue versus body recovery
  - a. Length of time submerged
  - b. Any known or suspected trauma
  - c. Age and physical condition
  - d. Water temperature and environmental conditions
  - e. Time until rescue or removal
- E. Scenario options for water rescue training
  1. Rescue safety - equipment
    - a. Properly fitting personal flotation device (USGA approved)
    - b. Helmet - for head protection
    - c. Knife - for entanglement protection
    - d. Whistle - for location if in trouble
    - e. Thermal protection
  2. Rescuer safety - training
    - a. Confined water situations - pool, stock tank
    - b. Flat water situations - lakes, ponds, marsh
    - c. Moving water - rivers, streams, creeks
    - d. Fast water - spring runoffs, mountain streams
    - e. Floods and debris flows
    - f. Heavy surf - ocean, Great Lakes
    - g. Man made barriers - dams, piers, weirs
  3. Victim safety - equipment
    - a. Flotation for victim
    - b. Immobilization equipment
    - c. Extrication equipment
    - d. Thermal protection equipment
    - e. Resuscitation equipment
    - f. Transportation equipment
  4. Victim safety - training
    - a. Victim recognition skills
    - b. In-water patient management skills
    - c. Airway management skills
    - d. In-water immobilization skills
    - e. Extrication from water skills
    - f. In-water thermal loss skills
    - g. Resuscitation skills - in-water, land and boat
  5. Factors determining - rescue or recovery
    - a. Number of victims
    - b. Number of trained and equipped rescuers
    - c. Environmental conditions present and expected
    - d. Age of victims
    - e. Length of submersion of victims
    - f. Known trauma to victims
    - g. Temperature and speed of water
  6. Location of submerged victims - witness interviews
    - a. Separate witnesses and have them return to where they were during the incident
    - b. Have each witness locate an object across water to form a line
    - c. Use the point of convergence of lines to locate last seen point

- d0 Use last seen point as “datum” point to begin search
- e0 Search in area where last seen point is center and radius out is equal to depth of water
- 7 In-water spinal immobilization
  - a0 Head-splint technique (rescuer PFD inhibits other techniques)
  - b0 Approach victim from the side
  - c0 Move victim’s arms over their head
  - d0 Hold victim’s head in place by using victim’s arms as a “splint”
  - e0 If victim is face-down, perform steps 1-4, then rotate victim toward rescuer to face-up position
  - f0 Assure open airway
  - g0 Maintain position until C-collar is applied
- 8 C-collar application
  - a0 Second rescuer determine collar size
  - b0 Second rescuer holds open collar under victim’s neck
  - c0 Primary rescuer maintains immobilization and patent airway
  - d0 Second rescuer brings collar up to back of victim’s neck, primary rescuer allows second rescuer to bring collar around victim’s neck and throat while second rescuer maintains airway
  - e0 Second rescuer secures fastener on collar while primary rescuer maintains airway
  - f0 Second rescuer secures victim’s hands at waist of victim
- 9 Back boarding and extrication of victim
  - a0 Submerge board under victim at their waist
  - b0 Never lift the victim to the board, allow the board to float up to the victim (if board does not float, lift it gently to the victim)
  - c0 Secure victim with straps, cravats or other devices
  - d0 Move victim to extrication point at shore or boat
  - e0 Always extricate victim head first, so that body weight will not compress possible spinal trauma
  - f0 Avoid extrication of victim through surf - board could capsize
  - g0 Maintain airway management during extrication
- 10 Overview of rescue techniques
  - a0 Never underestimate the power of moving water
    - (1) Moving water is very deceptive
    - (2) Do not enter without highly specialized training
  - b0 The water rescue model is reach-throw-row-go
  - c0 As a first responder, a shore based rescue attempt (either by talking the victim into self-rescue, reaching or throwing) are the methods of choice
    - (1) Either boat based or go techniques require specialized training
  - d0 Even with shore based rescue techniques a PFD must be worn
    - (1) Reach with a pole or long rescue device
    - (2) Throw a floatation device
    - (3) Become proficient with a water throw bag
  - e0 Self rescue if fallen into flat or moving water
    - (1) Cover mouth/ nose during entry
    - (2) Protect your head and keep face out of the water
    - (3) If flat water assume the HELP position
    - (4) In moving water do not attempt to stand up
    - (5) Float on back with feet downstream and head pointed towards the nearest shore at 45 degree angle

- IV Hazardous atmospheres
  - A0 Oxygen deficient environments/ confined spaces (CFR 1910.146)
    - 1 Defined as a space with limited access/ egress not designed for human occupancy or habitation
    - 2 Has a limited or restricted means for entry or exit and is not designed for continuous employee occupancy
      - a0 Tanks
      - b0 Vessels
      - c0 Silos
      - d0 Storage bins
      - e0 Vaults
      - f0 Pits
    - 3 NIOSH estimates that 60% of the fatalities associated with confined spaces are people attempting a rescue of someone
    - 4 Examples of confined spaces
      - a0 Grain bins and silos
      - b0 Wells and cisterns
      - c0 Storage tanks
      - d0 Manholes, pumping stations
      - e0 Drainage culverts
      - f0 Underground vaults
  - B0 Hazards associated with confined spaces
    - 1 Oxygen deficient atmospheres
      - a0 Oxygen deficient atmospheres are not a visible problem
      - b0 Rescuers often presume an atmosphere is safe
      - c0 Be aware that increased oxygen content can give atmospheric monitoring meters a false reading
    - 2 Chemical/ toxic exposure/ explosion
      - a0 Toxicity of chemicals and the displacement of oxygen
      - b0 Explosion is a hazard in some environments
    - 3 Engulfment
      - a0 Grain, coal or substances that can bury a person
      - b0 Dusts can also create an explosion hazard
    - 4 Machinery entrapment
      - a0 Spaces often have auger/ screws which can entrap
    - 5 Electricity
      - a0 Motors and materials management equipment have power
      - b0 Risk of stored energy
      - c0 Physiology of oxygen deficiency
    - 6 Structural concerns
      - a0 I beams inside space
      - b0 Not all spaces are cylindrical - L, T and X shaped spaces compound extrication pathway
  - C0 Emergencies in confined spaces
    - 1 OSHA requires a permit process before workers may enter a confined space
      - a0 Area must be made safe or workers must don PPE
      - b0 Retrieval devices must be in place
      - c0 Environmental monitoring of the site before entry
    - 2 Non-permitted sites are likely locations for emergencies
      - a0 No atmospheric monitoring is done

- b0 Entrants are likely to encounter oxygen deficient atmosphere
  - 3 Types of emergencies
    - a0 Falls
    - b0 Medical emergencies
    - c0 Oxygen deficiency/ asphyxia
    - d0 Explosion
    - e0 Entrapment
  - 4 Types of gases found in confined spaces
    - a0 Hydrogen sulfide (H<sub>2</sub>S)
    - b0 Carbon dioxide (CO<sub>2</sub>)
    - c0 Carbon monoxide (CO)
    - d0 Low/ high oxygen concentrations
    - e0 Methane (CH<sub>4</sub>)
    - f0 Ammonia (NH<sub>3</sub>)
    - g0 Nitrogen dioxide (NO<sub>2</sub>)
- D0 Safe entry for rescue requires specialized training
  - 1 Safe entry cannot be made without the following
    - a0 Atmospheric monitoring to determine
      - (1) Oxygen concentration
      - (2) Hydrogen sulfide level
      - (3) Explosive limits
      - (4) Flammable atmosphere
      - (5) Toxic air contaminants
    - b0 Lock out/ tag out all power
    - c0 Blank out of all flow into the site
    - d0 Dissipation of stored energy
    - e0 Area is ventilated
  - 2 No rescuers are allowed to make entry until a rescue team has made the area safe
  - 3 Access to confined spaces is often limited making access and extraction difficult
    - a0 SCBA use is usually dangerous
      - (1) Limited air supply
      - (2) Removal of SCBA to make some entries
    - b0 Supplied air breathing apparatus is preferred
    - c0 Rescuer lowering and retrieval system is in place
    - d0 Limited space makes extraction difficult
  - 4 Arriving EMS personnel should
    - a0 Establish a safe perimeter
    - b0 Not allow any additional entry to the space
    - c0 Assist in attempting remote retrieval
    - d0 Determine from permit/ entry supervisor what type of work is being done
    - e0 Determine from entry supervisor how many workers are inside
- E0 Rescue from trenches/ cave ins
  - 1 Most trench collapses occur in trenches less than 12' deep and 6' wide
    - a0 Weight of soils - 1 cubic foot = 100 pounds
    - b0 2 feet of soil on the chest or back = 700-1000 pounds
    - c0 Being buried rapidly leads to asphyxia
  - 2 Reasons for cave in/ collapse
    - a0 Federal law requires either shoring or trench box for excavations deeper than 5'
    - b0 Contractors forsake safety due to increased costs
    - c0 Lip of one or both sides of trench caves in
    - d0 Wall shears way and falls in

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- e0 Spoil pile too close to edge causing collapse
    - 3 Factors contributing to collapse
      - a0 Previously disturbed soil
      - b0 Intersecting trenches
      - c0 Ground vibrations
      - d0 Dirt (spoil) pile too close to edge of trench
      - e0 Water seepage
    - 4 Initial response
      - a0 If collapse has occurred causing burial, secondary collapse is likely to occur
      - b0 Secure the scene, establish command, and secure a perimeter
      - c0 Call for a team specializing in trench rescue
      - d0 Do not allow entry into the trench or cave in area
      - e0 Safe access only when proper shoring is in place
- V Highway operations
- A0 Hazards in highway operations
    - 1 Traffic flow is the largest hazard associated with EMS highway operations
      - a0 Response to limited access highways
      - b0 Response to unlimited access highways
      - c0 Risk of apparatus and rescuers being struck
      - d0 Back-up impedes flow to and from scene
      - e0 EMS must work closely with law enforcement
    - 2 Traffic hazard reduction techniques
      - a0 Staging of unnecessary apparatus off highway
        - (1) Essential on limited access highways
        - (2) Use staging area away from scene
      - b0 Place apparatus in position to protect scene
        - (1) Attempt minimal reduction to traffic flow
        - (2) Have a safe ambulance loading area
      - c0 Use only essential warning lights
        - (1) Too many lights distract/ confuse/ blind drivers
        - (2) Turn off headlights
        - (3) Consider use of amber scene lighting
      - d0 Use traffic cones/ flares to redirect traffic
        - (1) Create a safe zone
        - (2) Move traffic away from workers
        - (3) Caution on use of flares and their proximity to scene
          - (a) Allow flares to burn out
          - (b) Do not extinguish once ignited
      - e0 All rescuers should be in high visibility clothing
        - (1) Orange highway vests
        - (2) High visibility clothing
        - (3) Reflective trim
    - 3 Other scene hazards
      - a0 Fuel/ fire hazards
        - (1) Fuel spilled on the highway increases fire risk
        - (2) Catalytic converters can ignite spilled fuel
      - b0 Alternate fuel systems
        - (1) Natural gas in high pressure cylinders
        - (2) Electrical power and storage cells
      - c0 Sharp metal and glass

- (1) Cut and puncture hazard to patients and rescuers
- d0 Electrical power
  - (1) Downed power lines and contact with underground electrical feeds
- e0 Energy absorbing bumpers
  - (1) When exposed to fire can explode
  - (2) When "loaded" can spring out causing rescuer trauma
- f0 Air bags/ supplemental restraint systems(SRS)
  - (1) Can deploy during rescue operations
  - (2) Must be deactivated prior to mechanical extrication
- g0 Vehicles carrying hazardous cargoes
  - (1) Most hazardous substances travel by road
  - (2) Be suspicious with crashes involving commercial vehicles
  - (3) Look for UN numbers and placarding
- h0 Vehicles in unstable positions
  - (1) On side
  - (2) On roof
  - (3) On incline or unstable area/ terrain
  - (4) Weather conditions
  - (5) On-site spills/ leaks
- B0 Auto anatomy
  - 1 Roof and roof support posts
    - a0 "A" post
    - b0 "B" post
    - c0 "C" post
    - d0 "D" post
    - e0 Cutting the supports interrupts the unibody construction
  - 2 Fire wall
    - a0 Separates engine and occupant compartment
    - b0 Frequently collapses onto occupants legs during high speed head on collisions
  - 3 Engine compartment and power train
    - a0 Battery usually in the engine compartment
  - 4 Under-carriage and unibody versus frame construction
    - a0 Roof posts, floor, firewall, trunk support integral to unibody
    - b0 Most cars are of unibody construction
    - c0 Light trucks are usually of frame construction
  - 5 Safety versus tempered glass
    - a0 Safety glass usually in windshield
      - (1) Glass-plastic laminate-glass
      - (2) Designed to stay intact when shattered/ broken
      - (3) Fractures into long shards
    - b0 Tempered glass
      - (1) Glass with high tensile strength
      - (2) Does NOT stay intact when shattered/ broken
      - (3) Fractures into small pieces when broken
  - 6 Doors
    - a0 Reinforcing bar in most car doors
    - b0 Bar designed to protect occupant in side impact collisions
    - c0 Case hardened steel "Nader" pin designed to prevent car door from opening during collisions
      - d0 If Nader pin/ latch engaged difficult to pry door open
      - e0 Latch must be disengaged first

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- 7 Deactivation of the SRS
    - a0 Power removal
    - b0 Power dissipation
  - C0 Rescue strategies
    - 1 Initial size-up, hazard control
      - a0 Establish command
      - b0 Scene size-up
      - c0 Call appropriate back-up
      - d0 Control the hazards
      - e0 Locate and triage patients
    - 2 Assess degree of entrapment and fastest means of extraction
      - a0 Try all of the doors
      - b0 Considerations for door removal
      - c0 Considerations for roof removal
      - d0 Considerations for dash roll-up maneuver
      - e0 Considerations for door removal and making a new door
    - 3 Inner circle/ outer circle rescue concept
  - VI Hazardous terrain
    - A0 Types of hazardous terrain
      - 1 Steep slope or "low angle" terrain
        - a0 Slope capable of being walked on without using hands
        - b0 Footing may be difficult
        - c0 Difficult to carry a litter even with multiple people
        - d0 Rope used to counteract gravity during litter carry
        - e0 Consequence of error likely to be a fall and tumble
      - 2 Vertical or "high angle" terrain
        - a0 Cliff, building side or terrain so steep hands must be used for balance when scaling it
        - b0 Total dependence on rope or aerial apparatus for litter movement
        - c0 Consequence of error likely to be fatal
      - 3 Flat terrain with obstructions
        - a0 Rocks, scree, creeks etc.
    - B0 Patient access in hazardous terrain
      - 1 Specialized training and equipment required for the high angle environment
        - a0 Rappelling and retrieval of personnel (ascending or raising) once rappelled in
        - b0 Belaying
        - c0 High angle litter evacuation
        - d0 Use of ladders
        - e0 Serious consequence of errors
        - f0 High degree of training required for access and evacuation
      - 2 Low angle environment
        - a0 Access often gained by walking or scrambling
        - b0 Rope sometimes used as a hand line to assist with balance
        - c0 Less severe consequence of error
        - d0 High degree of training required for low angle rope evacuation of litter
        - e0 Hasty rope slide to assist with balance and footing on rough terrain
    - C0 Patient packaging
      - 1 Basket stretcher is the standard for rough terrain evacuation
        - a0 Rigid frame for patient protection
        - b0 Easy to carry with adequate personnel

- c0 Standard EMS patient handling device
- d0 Alternative spinal immobilizers can be used in them (KED, OSS)
- e0 Can be used as a spinal immobilizer by itself as a last resort
- 2 Wire mesh stokes baskets
  - a0 Generally strongest of baskets
  - b0 Better air/ water flow through the basket
  - c0 Inexpensive
  - d0 With flotation, better for water rescue
  - e0 Older "military style" will not accept backboard
- 3 Plastic basket stretchers
  - a0 Generally weaker than steel baskets
  - b0 Provide better patient protection
  - c0 Plastic bottom with steel frame is best
- 4 Most basket stretchers are not equipped with adequate restraints
  - a0 All require additional strapping or lacing for rough terrain evacuation/ extraction
  - b0 Plastic litter shield for patient protection
  - c0 High angle restraint
    - (1) Harness applied to patient
    - (2) Leg stirrups applied
    - (3) Lifters applied to prevent movement
    - (4) Tail of 1 litter line to patient's harness
    - (5) Helmet or litter shield on patient
    - (6) Fluids (IV or PO)
    - (7) Accessibility for BP, suction, distal perfusion assessment
    - (8) Padding is crucial
    - (9) Patient heating/ cooling system
    - (10) Airway clearing system via gravity "tip line"
  - d0 Low angle restraint
    - (1) Same restraint as for high angle
  - e0 Flat rough terrain
    - (1) Lacing or securing to prevent movement
- D0 Patient movement
  - 1 Non-technical/ non-rope evacuation is usually faster
  - 2 Flat rough terrain
    - a0 Litter carrying procedures
    - b0 Leapfrogging
    - c0 Adequate numbers of bearers
    - d0 Load lifting straps to assist with carry
  - 3 Low angle/ high angle evacuation
    - a0 Secure anchors
    - b0 Rope lowering systems
    - c0 Rope hauling systems
    - d0 Specialized knowledge and skill required for use
  - 4 Use of aerial apparatus
    - a0 Tower-ladder or bucket trucks
      - (1) Litter belay during movement to bucket
      - (2) Attachment of litter to bucket
    - b0 Aerial ladders
      - (1) Upper sections not wide enough to slot litter
      - (2) Litter must be belayed if being slid down ladder
    - c0 Ladder or aerial apparatus should not be used as a crane to move a litter

- E0 Use of helicopters in hazardous terrain rescue
  - 1 Difference in mission, crew and capabilities of medical versus rescue and military helicopters
  - 2 Need for constant reassessment of risk of rescue technique involving a helicopter
  - 3 Need for non-aircrew-member rescue training, specific to helicopter rescue techniques
    - a0 Know general safety around helicopters
    - b0 Be familiar with these uses of helicopters for rescue - the advantages, disadvantages, hazards and local restrictions for each of these
      - (1) Boarding, debarking, riding
      - (2) One-skids, hovers, toe-ins
      - (3) Short hauls or sling loads (personnel and equipment)
      - (4) Cable hoists
  
- VII. Vehicle rescue
  - A. Practice initial stabilization of vehicles using cribbing, lifting devices, spare tires, 2 ton come-a-long on (be certain all fluids are drained)
    - 1. Wheels
    - 2. Roof
    - 3. Side
    - 4. Embankments
  - B. Gain access using hand tools through
    - 1. Non-deformed door
    - 2. Deformed door
    - 3. Safety and tempered glass
    - 4. Trunk
    - 5. Floor
  - C. Package and extricate simulated patients
    - 1. Rapid extraction of patients using long spine boards
    - 2. Vertical extrication of patients from vehicles using spineboards
  - D. Observe the following procedures being accomplished using heavy hydraulic equipment
    - 1. Door removal
    - 2. Roof removal
    - 3. Making of a "third door"
    - 4. Dashboard/ firewall "roll-up"
  
- VIII. Assessment procedures
  - A. Environmental issues affecting assessment
    - 1. Weather/ temperature extremes
      - a. Difficulty in completely exposing patients for full assessment and treatment
      - b. Physical examination compromised
      - c. Patients susceptible to hypo/ hyperthermia
      - d. Rescuer mobility restricted due to clothing/ PPE
    - 2. Access to patient may be limited
      - a. Parts may not be accessible for examination
      - b. Cramped space
      - c. Limited lighting
    - 3. Typical street equipment may not be transportable to patient
      - a. Boxes and street "packaging" of equipment
      - b. Downsizing of initial assessment/ management equipment
    - 4. Patient may be entrapped for an extended period of time

5. Rescuer PPE essential but cumbersome
  - a. PPE must be used
  - b. Some must be removed to perform skills
  - c. Reapply as soon as possible
- B. Specific assessment/ management considerations
  1. Equipment considerations
    - a. Must be downsized and capable of being brought to patient
    - b. Capable of being carried hands free
    - c. Have lighting to facilitate assessment/ treatment in dark
    - d. Have the following
      - (1) Airway control
        - (a) OPA/ NPA
        - (b) Manual suction
        - (c) Intubation
      - (2) Breathing
        - (a) Thoracic decompression
        - (b) Small oxygen tank/ regulator
        - (c) Masks/ cannulas
        - (d) Pocket mask/ BVM
      - (3) Circulation
        - (a) Bandages/ dressings
        - (b) Triangular bandages
        - (c) Occlusive dressings
        - (d) IV administration
        - (e) BP cuff and stethoscope
      - (4) Disability
        - (a) Extrication collars
      - (5) Expose
        - (a) Scissors
      - (6) Miscellaneous
        - (a) Headlamp/ flashlight
        - (b) Space blanket
        - (c) SAM splint
        - (d) PPE (leather gloves/ latex gloves/ eye shields)
  2. Exposure of patients
    - a. Cover patient and assure thermal protection
    - b. During extrication place hard protection (spine board)
    - c. Prevent glass shards from contacting patient
  3. ALS skills only if really necessary (good BLS skills are mandatory)
    - a. More wires and tubing complicate the extraction process
    - b. Definitive airway control and volume may be essential
    - c. Continuous oxygenation
  4. Patient monitoring
    - a. In high noise areas take BP by palpation
    - b. Pulse oximetry compact and helpful
    - c. ECG cumbersome during extrication
    - d. Continue talking to patient
    - e. Explain what is being done and answer questions

5. Improvisation
  - a. Upper extremity fractures tied to torso
  - b. Lower extremity fractures tied to uninjured leg
  - c. SAM splints very useful
- C. Pain control
  1. Non-pharmacological management
    - a. Splinting
    - b. Distraction - talking to the patient and asking questions
    - c. Scratching or creating sensory stimuli when doing painful procedure
  2. Pharmacologic agents
    - a. Pain control with isolated extremity trauma
    - b. Pain control with multiple trauma
- D. Crush and compartment syndromes secondary to entrapment
  1. Compartment syndromes can be caused by crushing mechanisms
    - a. Increased pressure in the muscle compartment enclosed by fascia
    - b. Pressure increase causes ischemic muscle damage
    - c. Tissue necrosis and nerve injury can occur
  2. Crush syndrome
    - a. Compressive forces crush and cause prolonged hypoxia
    - b. Prolonged compression 4-6 hours or longer
    - c. May appear stable with compressive forces in place
    - d. Compressive force removed - part is reperfused
    - e. Vascular volume lost into the tissue
    - f. Myoglobin, lactic acid and other toxins released into circulation
    - g. Rapid decompensation may occur
- E. Patient packaging
  1. Stokes basket orientation and practice with
    - a. Types of basket stretchers and their uses
    - b. Patient comfort and packaging
    - c. Patient immobilization and restraint
  2. Other patient devices for rough terrain and practice with
    - a. SKED
    - b. Half-spine devices
  3. High angle-non-technical evacuation using aerial apparatus
  4. Low angle-non-technical evacuation using manpower
  5. Handing a litter over terrain
  6. Litter carry over rough terrain and practice the following
    - a. Litter carry sequence with six people
    - b. Use of litter lifting or load slings
    - c. Passing litter over uneven terrain
  7. It is required that the EMS response team fully understands the capability of the rescue response team thereby circumventing any "turf" issues

**UNIT TERMINAL OBJECTIVE**

8-4 At the completion of this unit, the paramedic student will be able to evaluate hazardous materials emergencies, call for appropriate resources, and work in the cold zone.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-4.1 Explain the role of the paramedic/ EMS responder in terms of the following: (C-1)
  - a. Incident size-up
  - Assessment of toxicologic risk
  - Appropriate decontamination methods
  - Treatment of semi-decontaminated patients
  - Transportation of semi-decontaminated patients
- 8-4.2 Size-up a hazardous materials (haz-mat) incident and determine the following: (C-1)
  - a. Potential hazards to the rescuers, public and environment
  - Potential risk of primary contamination to patients
  - Potential risk of secondary contamination to rescuers
- 8-4.3 Identify resources for substance identification, decontamination and treatment information including the following: (C-1)
  - a. Poison control center
  - Medical control
  - Material safety data sheets (MSDS)
  - Reference textbooks
  - Computer databases (CAMEO)
  - CHEMTREC
  - Technical specialists
  - Agency for toxic substances and disease registry
- 8-4.4 Explain the following terms/ concepts: (C-1)
  - Primary contamination risk
  - Secondary contamination risk
- 8-4.5 List and describe the following routes of exposure: (C-1)
  - a. Topical
  - Respiratory
  - Gastrointestinal
  - Parenteral
- 8-4.6 Explain the following toxicologic principles: (C-1)
  - Acute and delayed toxicity
  - Route of exposure
  - Local versus systemic effects
  - Dose response
  - Synergistic effects
- 8-4.7 Explain how the substance and route of contamination alters triage and decontamination methods. (C-1)
- 8-4.8 Explain the limitations of field decontamination procedures. (C-1)

- 8-4.9 Explain the use and limitations of personal protective equipment (PPE) in hazardous material situations. (C-1)
- 8-4.10 List and explain the common signs, symptoms and treatment for the following substances: (C-1)
- Corrosives (acids/ alkalis)
  - Pulmonary irritants (ammonia/ chlorine)
  - Pesticides (carbarnates/ organophosphates)
  - Chemical asphyxiants (cyanide/ carbon monoxide)
  - Hydrocarbon solvents (xylene, methylene chloride)
- 8-4.11 Explain the potential risk associated with invasive procedures performed on contaminated patients. (C-1)
- 8-4.12 Given a contaminated patient determine the level of decontamination necessary and : (C-1)
- 1)
    - a. Level of rescuer PPE
    - Decontamination methods
    - Treatment
    - Transportation and patient isolation techniques
- 8-4.13 Identify local facilities and resources capable of treating patients exposed to hazardous materials. (C-1)
- 8-4.14 Determine the hazards present to the patient and paramedic given an incident involving hazardous materials. (C-2)
- 8-4.15 Define the following and explain their importance to the risk assessment process: (C-1)
- Boiling point
  - Flammable/ explosive limits
  - Flash point
  - Ignition temperature
  - Specific gravity
  - Vapor density
  - Vapor pressure
  - Water solubility
  - Alpha radiation
  - Beta radiation
  - Gamma radiation
- 8-4.16 Define the toxicologic terms and their use in the risk assessment process: (C-1)
- Threshold limit value (TLV)
  - Lethal concentration and doses (LD)
  - Parts per million/ billion (ppm/ ppb)
  - Immediately dangerous to life and health (IDLH)
  - Permissible exposure limit (PEL)
  - Short term exposure limit (TLV-STEL)
  - Ceiling level (TLV-C)
- 8-4.17 Given a specific hazardous material be able to do the following: (C-1)

- Research the appropriate information about its physical and chemical characteristics and hazards
- Suggest the appropriate medical response
- Determine risk of secondary contamination
- 8-4.18 Determine the factors which determine where and when to treat a patient to include: (C-1)
  - Substance toxicity
  - Patient condition
  - Availability of decontamination
- 8-4.19 Determine the appropriate level of PPE to include: (C-1)
  - a. Types, application, use and limitations
  - Use of chemical compatibility chart
- 8-4.20 Explain decontamination procedures when functioning in the following modes: (C-1)
  - a. Critical patient rapid two step decontamination process
  - Non-critical patient eight step decontamination process
- 8-4.21 Explain specific decontamination procedures. (C-1)
- 8-4.22 Explain the four most common decontamination solutions used to include: (C-1)
  - a. Water
  - Water and tincture of green soap
  - Isopropyl alcohol
  - Vegetable oil
- 8-4.23 Identify the areas of the body difficult to decontaminate to include: (C-1)
  - Scalp/ hair
  - Ears/ ear canals/ nostrils
  - Axilla
  - Finger nails
  - Navel
  - Groin/ buttocks/ genitalia
  - Behind knees
  - Between toes, toe nails
- 8-4.24 Explain the medical monitoring procedures of hazardous material team members to be used both pre and post entry, to include: (C-1)
  - Vital signs
  - Body weight
  - General health
  - Neurologic status
  - ECG
- 8-4.25 Explain the factors which influence the heat stress of hazardous material team personnel to include: (C-1)
  - Hydration
  - Physical fitness
  - Ambient temperature
  - Activity

Level of PPE

Duration of activity

- 8-4.26 Explain the documentation necessary for Haz-Mat medical monitoring and rehabilitation operations. (C-1)
6. The substance
  7. The toxicity and danger of secondary contamination
  8. Appropriate PPE and suit breakthrough time
  9. Appropriate level of decontamination
  10. Appropriate antidote and medical treatment
  11. Transportation method
- 8-4.27 Given a simulated hazardous substance, use reference material to determine the appropriate actions. (C-3)
- 8-4.28 Integrate the principles and practices of hazardous materials response in an effective manner to prevent and limit contamination, morbidity, and mortality

### **AFFECTIVE OBJECTIVES**

None identified for this unit.

### **PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

8-4.29 Demonstrate the donning and doffing of appropriate PPE. (P-1)

8-4.30 Set up and demonstrate an emergency two step decontamination process. (P-1)

8-4.31 Set up and demonstrate an eight step decontamination process. (P-1)

## DECLARATIVE

- I. Role of paramedic in hazardous materials response
  - A. Incident size-up
    - 1. Recognition that incident involves hazardous materials
      - a. Transportation incidents
      - b. Highway crashes
      - c. Storage of materials
      - d. Manufacturing operations
      - e. Acts of terrorism
    - 2. Use of the following to identify the substance
      - a. Department of Transportation (DOT) emergency response guide
      - b. United Nations (UN) numbers
      - c. National Fire Protection Agency (NFPA) 704 placard system
      - d. DOT placards
      - e. Shipping papers
      - f. Material safety data sheets (MSDS)
    - 3. Immediate need for evacuation or other action
    - 4. Immediate action with ambulatory patients
    - 5. Determine zones
      - a. Hot zone - dangerous area
      - b. Warm zone - entry/ decontamination point
      - c. Cold zone - safe area
  - B. Assessment of toxicologic risk
    - 1. Determine type of chemical
    - 2. Actions of chemical
    - 3. Potential for secondary contamination
    - 4. Out-of-hospital medical treatment
  - C. Appropriate decontamination methods
    - 1. Techniques to decontaminate patients
    - 2. Recognition that no patient is completely decontaminated
  - D. Treatment of semi-decontaminated patients
    - 1. Appropriate use of PPE
  - E. Transportation of semi-decontaminated patients
    - 1. Methods to prevent vehicle contamination
  - F. NFPA levels of response
    - 1. All personnel who may arrive first must be trained to an awareness level
    - 2. Paramedics who may transport "semi-decontaminated patients" be trained to the NFPA 473 "Level-1"
    - 3. Paramedics who may have to rapidly "decon" and assist in the decontamination corridor be trained to the 473 "Level-2"
  - G. Monitoring of hazardous materials personnel

- II. Hazardous materials size-up
  - A. High degree of awareness
    - 1. Vehicle crashes
      - a. Commercial vehicles
      - b. Pest control vehicles
      - c. Tankers
      - d. Cars with alternative fuels
      - e. Tractor-trailers
    - 2. Transportation
      - a. Railroads
      - b. Pipelines
    - 3. Storage
      - a. Tanks/ storage vessels
      - b. Warehouses
      - c. Hardware/ agricultural stores
      - d. Agriculture
    - 4. Manufacturing operations
      - a. Chemical plants
      - b. All manufacturing operations
    - 5. Terrorism
      - a. Workplace
      - b. Shopping
      - c. Other public environments
  - B. Recognition of hazard
    - 1. Placarding of vehicles
      - a. Required by law
      - b. Some vehicles not placarded
      - c. Placarding in emergency response guide
    - 2. UN/ DOT placard classifications
      - a. Explosives
      - b. Gasses
      - c. Flammable liquids
      - d. Flammable solids
      - e. Oxidizers and organic peroxides
      - f. Poisonous and etiologic agents
      - g. Radioactive materials
      - h. Corrosives
      - i. Miscellaneous hazardous materials
    - 3. Recognition of UN numbers
    - 4. NFPA 704 System for fixed facilities
      - a. Blue = health hazard

- b. Red = fire hazard
- c. Yellow = reactivity hazard
- C. Identification of substances
  - 1. The "crux" of dealing with a hazardous material
  - 2. Often difficult-especially with unknown substances
  - 3. Material safety data sheets (MSDS)
    - a. Detailed substance information
  - 4. Shipping papers
    - a. Substance ID
  - 5. DOT Emergency Response Guide
    - a. UN numbers
    - b. Names of substances
    - c. Emergency action guide
    - d. Placard facsimiles
    - e. Evacuation/ isolation information
  - 6. Poison control centers
    - a. Detailed toxicology information
    - b. Decontamination methods
    - c. Treatment
  - 7. CAMEO computer database
    - a. Information
    - b. Computer modeling
  - 8. CHEMTREC
    - a. 24 hour toll free hotline
    - b. Product and emergency action information
  - 9. Other reference sources
    - a. Textbooks
    - b. Handbooks
    - c. Technical specialists
  - 10. Monitors and testing for unknown materials
    - a. Air monitoring equipment
    - b. Gas monitoring equipment
    - c. Ph testing
    - d. Chemical testing
    - e. Colormetric tube testing
- D. Hazardous material zones
  - 1. Hot zone
    - a. Contamination actually present
    - b. Site of incident
    - c. Entry with high level PPE
    - d. Entry limited
  - 2. Warm zone

- a. Buffer zone outside of hot zone
      - b. Where decontamination corridor is located
      - c. Corridor has "hot" and "cold" end
    - 3. Cold zone
      - a. Safe area
      - b. Staging for personnel and equipment
      - c. Where medical monitoring occurs
      - d. One end of corridor
  - E. Specific terminology for medical hazardous materials operations
    - 1. Boiling point
    - 2. Flammable/ explosive limits
    - 3. Flash point
    - 4. Ignition temperature
    - 5. Specific gravity
    - 6. Vapor density
    - 7. Vapor pressure
    - 8. Water solubility
    - 9. Alpha radiation
    - 10. Beta radiation
    - 11. Gamma radiation
  - F. Specific toxicologic terms and their use in the risk assessment process
    - 1. Threshold limit value (TLV)
    - 2. Lethal concentration and doses (LD)
    - 3. Parts per million/ billion (ppm/ ppb)
    - 4. Immediately dangerous to life and health (IDLH)
    - 5. Permissible exposure limit (PEL)
    - 6. Short term exposure limit (TLV-STEL)
    - 7. Ceiling level (TLV-C)
- III. Contamination and toxicology review
- A. Types of contamination
    - 1. Primary contamination
      - a. Exposure to substance
      - b. Only harmful to individual
      - c. Little chance of exposure to others
    - 2. Secondary contamination
      - a. Exposure to substance
      - b. Substance easily transferred
      - c. Touching patient results in contamination
      - d. Key concept in hazardous materials medical operations
      - e. Gas exposure rarely results in secondary contamination

- f. Liquid and particulate matter more likely to result in secondary contamination
- B. How poisons are absorbed
  - 1. Topical absorption
    - a. Skin and mucous membranes
    - b. Not all skin absorbs at same rate
    - c. Not all poisons easily absorbed
  - 2. Respiratory inhalation
    - a. Absorption through bronchial tree
    - b. Oxygen deficient atmospheres
  - 3. Gastrointestinal ingestion
    - a. Ingestion of substances
    - b. Factors affecting absorption
  - 4. Parenteral injection
    - a. Injection
    - b. Wound entry
    - c. Invasive medical procedures
- C. Cycle of poison actions
  - 1. Absorption
    - a. Time to delivery into blood stream
  - 2. Distribution
    - a. Distribution to target organs
    - b. Poison or drug binds to tissues/ molecules
    - c. Actions
    - d. Deposits
  - 3. Biotransformation
    - a0 Liver
  - 4. Elimination
    - a0 GI
    - b0 Kidney
    - c0 Respiratory
- D0 Poison actions
  - 1 Acute toxicity
    - a0 Immediate effect from substance
  - 2 Delayed toxicity
    - a0 No immediate effect
    - b0 Symptoms later appear
    - c0 Delayed pathology or disease
  - 3 Local effects
    - a0 Effect immediate site
    - b0 Burn model
    - c0 Progression of effects like burn

- d0 Topical or respiratory
- e0 Skin irritation - acute bronchospasm
- 4 Systemic effects
  - a0 Cardiovascular
  - b0 Neurologic
  - c0 Hepatic
  - d0 Renal
- 5 Dose response
  - a0 Physiologic response to dosage
  - b0 How much to get an effect
  - c0 Essential concept for decontamination
- 6 Synergistic effects
  - a0 Combinations may react synergistically
  - b0 Standard pharmacologic approach
  - c0 Standard treatment can result in synergy
  - d0 Medical control/ poison control reference
- E0 Treatment for commonly encountered hazardous materials
  - 1 Corrosives (acids/ alkalis)
    - a0 Typical exposures
    - b0 Actions
    - c0 Decontamination methods
    - d0 Treatment
    - e0 Transportation precautions
  - 2 Pulmonary irritants (ammonia/ chlorine)
    - a0 Typical exposures
    - b0 Actions
    - c0 Decontamination methods
    - d0 Treatment
    - e0 Transportation precautions
  - 3 Pesticides (carbamates/ organophosphates)
    - a0 Typical exposures
    - b0 Actions
    - c0 Decontamination methods
    - d0 Treatment
    - e0 Transportation precautions
  - 4 Chemical asphyxiants (cyanide/ CO)
    - a0 Typical exposures
    - b0 Actions
    - c0 Decontamination methods
    - d0 Treatment
    - e0 Transportation precautions

- 5 Hydrocarbon solvents (xylene/ methylene chloride)
    - a0 Typical exposures
    - b0 Actions
    - c0 Decontamination methods
    - d0 Treatment
    - e0 Transportation precautions
  - 6 Considerations for performing invasive procedures
    - a0 Risk versus benefit
    - b0 Patient need
- IV Decontamination approaches
- A0 Purpose of decontamination
    - 1 Reduce the patient's dosage of material
    - 2 Decrease threat of secondary contamination
    - 3 Reduce risk of rescuer injury
  - B0 Environmental considerations
    - 1 Major consideration If there are no life-threats
      - a0 Prevent run off of material
    - 2 If there are life-threats, patient comes first
      - a0 Environmental considerations last
  - C0 Methods of decontamination
    - 1 Dilution
      - a0 Lavage with water
      - b0 Water is universal decontamination solution
      - c0 Dilution decreases dose and action
      - d0 Reduction of topical absorption
    - 2 Absorption
      - a0 Use of pads to "blot" up the material
      - b0 Towels to dry the patient after lavage
      - c0 Usually a secondary method to lavage
      - d0 Common for environmental clean up
    - 3 Neutralization
      - a0 Almost never used in patient decontamination
      - b0 Hazard of exothermic reactions
      - c0 Time to determine neutralizing substance
      - d0 Lavage usually dilutes and removes faster
      - e0 More practical with equipment, etc.
    - 4 Disposal/ isolation
      - a0 Removal of clothing
      - b0 Removal of substances which contain substances
  - D0 Decontamination decision making
    - 1 Field considerations

- a0 Flight of walking contaminated to rescuers -"fast break" event - action required now
- b0 Conscious, contaminated people will "self rescue" by walking out of hot zone
- c0 Immediate decontamination often not avoidable
- d0 Speed of hazardous material team response
  - (1) Patients often can't wait that long
  - (2) Patients become impatient and leave
- e0 EMS gross decontamination and treatment
  - (1) All EMS needs gross decontamination capability
  - (2) EMS preparedness for quick decontamination
  - (3) Need for rapid EMS PPE
  - (4) Need quick transport isolation methods
- 2 "Fast break" incident decision making
  - a0 Critical patient - unknown/ life-threatening material
    - (1) Decontamination and treatment simultaneous
    - (2) Remove clothing
    - (3) Treat life-threatening problems
    - (4) Lavage - water universal decontamination solution
    - (5) Contain/ isolate patient
    - (6) Transport
  - b0 Non-critical - unknown/ life-threatening material
    - (1) More contemplative approach
    - (2) Decontamination and treatment simultaneous
    - (3) Remove clothing
    - (4) Treat life-threatening problems
    - (5) Lavage - water universal decontamination solution
    - (6) Contain/ isolate patient
    - (7) Transport
  - c0 Non-critical - substance known
    - (1) Slower approach
    - (2) Environmental/ privacy considerations
    - (3) More thorough decontamination
    - (4) Clothing removal
    - (5) Thorough lavage/ wash
    - (6) Drying/ reclothing PRN
    - (7) Medical monitoring
    - (8) Patient isolation PRN
    - (9) Transport
- 3 Longer duration event decision making
  - a0 Patients in hot zone - non-ambulatory
    - (1) No rescue attempted

- (2) Wait for hazardous material team
- (3) Team will set up decontamination corridor
- b0 Team will not make entry until
  - (1) Medical monitoring of entry team
  - (2) Decontamination corridor established
- c0 Longer duration event
  - (1) Often 60 minutes for team deployment
  - (2) Set up time
- d0 Better opportunity for thorough decontamination
- e0 Better PPE
- f0 Less chance of secondary contamination
- g0 Better environmental protection
- 4 When in doubt - better grossly decontaminated and alive than perfectly decontaminated and dead
  - a0 Deal with patient emergencies first
  - b0 Have some type of chemical PPE

E0 Decontamination methods

- 1 Decontamination and PPE is ideally driven by the substance encountered
  - a0 Sometimes unknown
- 2 Decontamination solutions
  - a0 Do not attempt to neutralize
  - b0 Lavage with copious amounts of water
  - c0 Water is the universal solution
  - d0 Tincture of green soap used to improve wash
  - e0 Isopropyl alcohol is used for some isocyanates
  - f0 Vegetable oil is used for some water reactive substances
- 3 Remove the clothing
  - a0 Also remove rings and jewelry
  - b0 Shoes and socks
  - c0 Cut off clothing PRN
- 4 Thorough wash and rinse
  - a0 Allow fluid to drain away
  - b0 Don't allow them to stay in the run-off
- 5 Rewash and rinse
  - a0 Careful attention to difficult areas
  - b0 Difficult decontamination areas
    - (1) Scalp/ hair
    - (2) Ears/ ear canals/ nostrils
    - (3) Axilla
    - (4) Finger nails
    - (5) Navel
    - (6) Groin/ buttocks/ genitalia

- (7) Behind knees
- (8) Between toes, toe nails
- c0 Post "field decontamination" all patients should be presumed to still have some degree of contamination
- d0 They must be handled accordingly
- 6 Rapid decontamination
  - a0 Two step process described
  - b0 For fast breaking event
- 7 Decontamination corridor - eight step process
  - a0 Entry point at hot end
  - b0 Tool drop and outer glove removal
  - c0 Surface contamination removed
  - d0 SCBA doffed
  - e0 Protective equipment doffed
  - f0 Clothing doffed
  - g0 Thorough wash/ dry
  - h0 Medical evaluation

V Rescuer personal protective equipment/ transport protection

A0 Levels of hazardous materials personal protection

- 1 Level "A" protection
  - a0 Highest level of personal protection
  - b0 High degree of chemical break through time
  - c0 Encapsulated suit
    - (1) Covers everything including SCBA
  - d0 Impermeable
  - e0 Sealed
  - f0 Typically used by hazardous material team for entry into hot zone
- 2 Level "B" protection
  - a0 Level of protection typically worn by decontamination team
    - (1) Decontamination wears one level below entry
  - b0 Usually non-encapsulating protection
    - (1) SCBA worn outside suit
    - (2) Easier entry and SCBA bottle changes
  - c0 Much easier to work in
  - d0 High degree of repellence
- 3 Level "C" protection
  - a0 Non-permeable clothing
  - b0 Eye and hand protection
  - c0 Foot covering
  - d0 Used during transport of patients with potential of secondary contamination

- 4 Level "D" protection
  - a0 Firefighter turnout clothing
- B0 Determining appropriate PPE
  - 1 Ideally the chemical is known
  - 2 A permeability chart is consulted to determine "breakthrough" time
  - 3 Double or triple gloves are used or chemical resistant gloves
  - 4 Nitrile gloves have a high resistance to chemicals
  - 5 If situation is emergent
    - a0 Take maximal barrier precautions
    - b0 Full turnouts or Tvek suit/ gowns
    - c0 Use HEPA filters and eye protection
    - d0 Double or triple glove
    - e0 Remove leather shoes, use rubber boots
  - 6 Ideally at least level "B" protection should be used
  - 7 Ideally use disposable protection
- C0 Transportation of semi-decontaminated patients
  - 1 Use as much disposable equipment as possible
    - a0 Reduces decontamination later
  - 2 Practicality of lining an ambulance interior with plastic
    - a0 Impractical
    - b0 Time consuming
    - c0 If airborne contaminants can permeate cabinets it is unsafe for the driver to operate the ambulance
    - d0 Better to isolate the patient
  - 3 Patient isolation
    - a0 Stretcher decontamination pool
    - b0 Continue decontamination and contain run-off
    - c0 Plastic can be used to cover pool
    - d0 Fits on stretcher
  - 4 Transport to facilities predetermined to handle hazardous materials

- VI Medical monitoring and rehabilitation
  - A0 Entry team/ decontamination team readiness prior to entry
    - 1 Assessment of vital signs and documentation
    - 2 Team members should have normal values on file
    - 3 Documentation flow sheet must be started
      - a0 Blood pressure
      - b0 Pulse
      - c0 Respiratory rate
      - d0 Temperature
      - e0 Body weight
      - f0 ECG

- g0 Mental/ neurologic status
- 4 Rescuer PPE can cause considerable heat stress
- 5 Prehydration prior to entry
  - a0 8-16 ounces of water or sport drink
- B0 After exit personnel should return to the medical sector for "rehab"
  - 1 Re-assessment of vital signs and documentation
  - 2 Documentation flow sheet must be started
    - a0 Blood pressure
    - b0 Pulse
    - c0 Respiratory rate
    - d0 Temperature
    - e0 Body weight
    - f0 ECG
    - g0 Mental/ neurologic status
  - 3 Re-hydration at exit
    - a0 8-16 ounces of water or sport drink
  - 4 Use weight to estimate fluid losses
    - a0 Medical control/ protocol determination
      - (1) PO fluids
      - (2) IV Fluids
  - 5 No re-entry until
    - a0 Vitals back to normal
      - (1) Non-tachycardic
      - (2) Alert
      - (3) Normotensive
      - (4) Body weight within percentage of normal
- C0 Heat stress factors
  - 1 Prehydration of member
  - 2 Degree of physical fitness
  - 3 Ambient air temperature
  - 4 Degree of activity and duration
  - 5 Rescue PPE
    - a0 Suits protect but prevent cooling
    - b0 There is no way to lose heat by
      - (1) Evaporation
      - (2) Conduction
      - (3) Convection
      - (4) Radiation
    - c0 Like being in a sauna

- VII Practice the following
  - A0 Donning and doffing level B and C PPE
  - B0 Set up a rapid 2 step decontamination process
  - C0 Set up 8 step decontamination process
  - D0 Give a simulated chemical determine PPE and decontamination methods
  - E0 Pre-entry medical monitoring and documentation
  - F0 Exit medical monitoring and documentation
  - G0 Preparing a patient and ambulance for transport

**UNIT TERMINAL OBJECTIVE**

8-5 At the completion of this unit, the paramedic student will have an awareness of the human hazard of crime and violence and the safe operation at crime scenes and other emergencies.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-5.1 Explain how EMS providers are often mistaken for the police. (C-1)
- 8-5.2 Explain specific techniques for risk reduction when approaching the following types of routine EMS scenes: (C-1)
  - a. Highway encounters
  - b. Violent street incidents
  - c. Residences and "dark houses"
- 8-5.3 Describe warning signs of potentially violent situations. (C-1)
- 8-5.4 Explain emergency evasive techniques for potentially violent situations, including: (C-1)
  - a. Threats of physical violence.
  - b. Firearms encounters
  - c. Edged weapon encounters
- 8-5.5 Explain EMS considerations for the following types of violent or potentially violent situations: (C-1)
  - a. Gangs and gang violence
  - b. Hostage/ sniper situations
  - c. Clandestine drug labs
  - d. Domestic violence
  - e. Emotionally disturbed people
  - f. Hostage/ sniper situations
- 8-5.6 Explain the following techniques: (C-1)
  - a. Field "contact and cover" procedures during assessment and care
  - b. Evasive tactics
  - c. Concealment techniques
- 8-5.7 Describe police evidence considerations and techniques to assist in evidence preservation. (C-1)

**AFFECTIVE OBJECTIVES**

None identified for this unit.

**PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the paramedic student will be able to:

- 8-5.8 Demonstrate the following techniques: (P-1)
  - a. Field "contact and cover" procedures during assessment and care
  - b. Evasive tactics
  - c. Concealment techniques

**DECLARATIVE**

- I. Hazard awareness control and avoidance
  - A. Determining the need
    - 1. Increasing violence
      - a. Street violence (assault, robbery, etc.)
      - b. Threat groups
      - c. Domestic violence
      - d. Drugs and drug users
    - 2. EMS providers on the street
      - a. Violent crimes require EMS response
      - b. EMS may arrive before police
    - 3. Local issues of concern
  - B. Approach to the scene
    - 1. Approach is part of scene size-up
      - a. Key point - identify and respond to dangers before they threaten
      - b. Safety concerns begin with dispatch information
      - c. Use available resources before arrival
        - (1) Computer aided dispatch (CAD) information
        - (2) You or your partner's prior calls at this location or area
        - (3) Information from other crews and rigs
      - d. Retreat from the scene if the scene cannot be made safe; there is no such thing as dead hero!
      - e. Know local protocols
      - f. Begin observation several blocks before the scene
      - g. Use red lights and siren appropriate for the call
        - (1) Urban scene - excess use could draw a crowd
        - (2) Highway scene - lights required for safety
        - (3) Joint law enforcement agency/ EMS response posturs
          - (a) EMS code 3 but law enforcement agency code 1
          - (b) Need for inter-agency cooperation and understanding
      - h. Remember non-violent dangers such as hazardous materials, power lines, dangerous pets, etc.
      - i. Scene safety considerations must continue throughout the call
        - (1) Violence can resume
        - (2) Crowds gather or turn violent
        - (3) Additional persons can enter the scene
        - (4) Violence may occur even with police present
        - (5) EMS personnel may be mistaken for police
          - (a) Uniform colors
          - (b) Badges
          - (c) Exiting a vehicle with lights and sirens
          - (d) This could cause aggression toward you as an authority figure
        - (6) Others could expect you to intervene in violent situations
        - (7) Remember to include an "escape and strategic escape plan" in your protocols
    - 2. Known violent scenes
      - a. Stage safe distance from the scene until police advise scene "secure"
        - (1) Out of sight of the scene
        - (2) If you can be seen, people will come to you
        - (3) Entering an unsafe scene adds another potential victim

- (4) You may be injured or killed
  - (5) You may become a hostage (hostage negotiations techniques)
  - (6) You may be another patient in a scene which is already an MCI
- C. Specific dangerous scenes
- 1. Approach to residences
    - a. Everyday response - all calls require a certain level of caution
      - (1) Even calls that appear "routine" require size-up
      - (2) Begin assessment of scene even before exiting your vehicle
    - b. Warning signs of danger - residential calls
      - (1) Past history of problems or violence
      - (2) Known drug or gang area
      - (3) Loud noises or items breaking
      - (4) Seeing or hearing fighting
      - (5) Intoxication or drug use
      - (6) Evidence of dangerous pets (droppings, barking, signs)
      - (7) Unusual silence or darkened residence
    - c. Approach - choose tactics that match threat or situation
      - (1) If actual danger is present - retreat and call for police
      - (2) Do not broadcast approach with lights/ sirens
      - (3) Foot approach using unconventional path (i.e. not sidewalk)
      - (4) Do not backlight yourself (getting between rig and residence)
      - (5) Stand to the side of door opposite hinges (doorknob side)
      - (6) Listen for signs of danger before announcing presence
  - 2. Highway encounters
    - a. Danger from vehicular traffic
      - (1) Vehicle positioning to protect scene (fire truck in back - ambulance close to patient)
      - (2) Wear reflective clothing (be aware there is some controversy about use of this clothing)
      - (3) Stay out of traffic flow
      - (4) Beware of speeding and/ or intoxicated drivers
    - b. Danger from violence - application
      - (1) Disabled vehicles
      - (2) "Man slumped over wheel" calls
      - (3) Motor vehicle crashes
      - (4) Occupants may be
        - (a) Intoxicated/ drugged
        - (b) Wanted or fleeing felons
        - (c) Armed
        - (d) Violent/ abusive from altered mental status etiology
        - (e) Warning signs of danger
        - (f) Suspicious movements within vehicle
          - i) Grabbing or hiding items
          - ii) Arguing or fighting between passengers
          - iii) Lack of activity where activity is likely
      - (5) Signs of alcohol or drug use
      - (6) Open or unlatched trunks
        - (a) May occasionally hide people

- c. Approach to vehicles
  - (1) One person approach
  - (2) Drive remains in ambulance which is elevated and provides greater visibility
  - (3) If nighttime, use ambulance lights to illuminate vehicle
  - (4) Notify dispatch of situation, location, license plate number and state
  - (5) Approach passenger side of vehicle
    - (a) Protection from vehicular traffic
    - (b) Not usually expected - police approach to driver's side
  - (6) Do not walk between ambulance and other vehicle
    - (a) Ambulance lights cause backlighting
    - (b) Could be injured if vehicle backs up
    - (c) For EMT to approach passenger side of vehicle, walk around rear of ambulance then to passenger side of vehicle
  - (7) Posts (a, b, c) provide best ballistic protection
  - (8) Observe rear seat; do not move forward of "c" post unless there are no threats in the back seat
    - (a) Observe front seat from behind "b" post
    - (b) Move forward only after assuring safety
  - (9) Retreat at the first sign of violence or problem
- 3. Violent street incidents
  - a. Murder, assault, robbery
    - (1) Involve dangerous weapons
    - (2) Perpetrators may be on-scene or return to scene
    - (3) Even patients may be violent toward EMS
  - b. Dangerous crowds and bystanders
    - (1) Crowds may quickly become large and volatile
    - (2) Violence directed against everything/ everyone in it's path
    - (3) EMS status not immunity from violence
  - c. Warning signs of danger - street scenes
    - (1) Voices become louder
    - (2) Pushing, shoving
    - (3) Hostilities toward any other persons at scene (perpetrator, police, victim, etc.)
    - (4) Rapid increase in crowd size
    - (5) Inability of law enforcement to control crowds
  - d. Safety actions - crowds
    - (1) Constantly monitor crowd
    - (2) Retreat from scene if necessary
    - (3) Take patient with you if possible and safe to do so
      - (a) Prevents return to scene later
      - (b) May require limited or tactical assessment of the patient at the scene
- D. Violent groups and situations
  - 1. Street gang awareness
    - a. Threat groups
      - (1) Crips
      - (2) Bloods
      - (3) Latin Kings (Almighty Latin King Nation)
      - (4) Hell's Angels
      - (5) Outlaws

- (6) Pagans
  - (7) Banditos
  - (8) Other gangs
  - (9) Local variations
  - (10) Drug distribution groups
  - b. Gang characteristics
    - (1) Clothing
      - (a) Unique clothing - specific to group
      - (b) Identifies affiliation and rank within group
      - (c) Defiguring or disrespecting gang colors may provoke violence from member
    - (2) Graffiti
      - (a) Identifies gang presence
      - (b) Marks gang territory
  - c. Safety issues in gang areas
    - (1) Potential for violence
    - (2) We appear to look like law enforcement and, therefore, we must be extremely cautious
2. Clandestine drug labs
- a. Identification
    - (1) Chemical odors
    - (2) Chemistry equipment
      - (a) Glassware
      - (b) Chemical containers
      - (c) Heating mantles, burners
    - (3) Suspicious persons, activities, deliveries
    - (4) Area fits the needs for a clan lab
      - (a) Privacy
      - (b) Utilities
      - (c) Ventilation
    - (5) Types of drug labs
      - (a) Synthesis - creates drugs from chemical precursors (LSD, methamphetamine)
      - (b) Conversion - change drug forms (cocaine HCl to base form)
      - (c) Other types (i.e. tableting, extraction)
  - b. Hazards
    - (1) Toxic inhalation
    - (2) Fire and explosion
    - (3) Booby traps
    - (4) Armed or otherwise violent occupants
    - (5) Actions if lab identified
      - (a) Leave area immediately
      - (b) Notify law enforcement
      - (c) Initiate ICS and hazardous materials procedures
      - (d) Local hazardous materials teams/ fire service
      - (e) Police/ Drug Enforcement Administration
      - (f) Chemist/ chemistry specialists
      - (g) EMS concerns
        - i) Area evacuation?
        - ii) Do not touch anything
        - iii) Never stop any reaction or alter equipment

3. Domestic violence (refer to the abuse and assault unit)
  - a. Definition
    - (1) Violence between persons in a domestic relationship
    - (2) May be spousal, boy/ girlfriend, same-sex relationships
    - (3) Victims may be male or female
    - (4) Violence may be physical, emotional, sexual, verbal, economic
  - b. Indications
    - (1) Apparent fear of household member
    - (2) Different or conflicting accounts by parties at the scene
    - (3) One party preventing another from speaking
    - (4) Patient reluctant to speak
    - (5) Injuries do not match reported mechanism of injury
    - (6) Unusual or unsanitary living conditions or hygiene
  - c. EMS actions
    - (1) Treat the patient
    - (2) Do not be judgmental about the situation
    - (3) Provide phone number for domestic violence hot line or shelter
    - (4) Notify authorities
      - (a) If consistent with policy/ regulations
      - (b) Mandatory reporting may be required
      - (c) Notify ED staff of your concerns

II. Tactical considerations for safety and patient care

- A. Tactics for safety
  1. Avoidance is always preferable to confrontation
    - a. Observation
    - b. Knowledge of warning signs
    - c. Knowledge of proper tactical response
      - (1) To avoid danger
      - (2) To deal with danger when you can't avoid
    - d. Staging - dispatcher learns of danger and advises not to approach scene until danger is handled by appropriate authorities
  2. Tactical retreat
    - a. Leaving the scene when danger is observed
      - (1) Violence or indicators of violence displayed
      - (2) Immediate, decisive actions required
      - (3) Retreat in a calm, safe manner
      - (4) Be aware of the danger which is now behind you
      - (5) Retreat may be on foot or via vehicle (there is nothing in your ambulance that is worth your life!)
      - (6) Choose mode and route of retreat that provides least exposure to danger
    - b. How far to retreat
      - (1) Must protect you from any potential danger
      - (2) Must be out of immediate line of sight
      - (3) Must be protected from gunfire (cover)
      - (4) Must be far enough away to react if danger re-approaches
  3. Retreat - other considerations
    - a. Notify other responding units and agencies of danger
      - (1) EMS agency's SOP
        - (a) Code RED
        - (b) Other

- (2) Law enforcement agency's reaction/ response
    - (a) Their SOPs
    - (b) Inter-agency agreement
  - (3) Document your observations of danger
  - (4) Document your response to danger
    - (a) Who was notified of danger
    - (b) Your actions
    - (c) Time left/ time returned to scene
  - (5) Documentation is key to reducing liability
  - (6) Retreat for appropriate circumstances is not abandonment
4. Cover and concealment
- a. Concealment
    - (1) Hides your body
    - (2) Offers no ballistic protection
    - (3) Examples
      - (a) Bushes
      - (b) Wallboard
      - (c) Vehicle door
  - b. Cover
    - (1) Hides your body
    - (2) Offers ballistic protection
    - (3) Examples
      - (a) Large trees
      - (b) Telephone pole
      - (c) Vehicle engine block
  - c0 Application
    - (1) Be aware of your surroundings
    - (2) Cover/ concealment should be integrated in retreat from danger
    - (3) Cover/ concealment should be used when "pinned down"
    - (4) Cover/ concealment must be used properly
      - (a) Place as much of your body as possible behind cover
      - (b) Constantly look to improve your protection and location
    - (5) Be conscious of reflective clothing that may make you stand out
5. Distraction and evasive tactics
- a0 Use of equipment
    - (1) Wedge stretcher in doorway to block aggressor
    - (2) Throw equipment to trip or slow aggressor
  - b0 Evasion
    - (1) Use unconventional path while retreating
    - (2) Anticipate moves of aggressor
6. Contact/ cover tactics
- a0 Specific evasive techniques for
    - (1) Threats of physical violence
    - (2) Firearms encounters
    - (3) Edged weapons encounters
  - b0 Providers have preassigned roles
    - (1) "Contact" provider
      - (a) Initiates and provides direct patient care
      - (b) Performs patient assessment
      - (c) Handles most interpersonal scene contact

- (2) "Cover" provider
        - (a) In tactical context, main function to "cover" or observe scene for danger while "contact" provider takes care of patient
        - (b) Generally avoids patient care duties that would prevent observation of the scene
        - (c) In small crews "cover" provider likely to have other functions (equipment, etc.)
    - c0 Communication between providers
      - (1) Warning signals
        - (a) Crews should develop methods of alerting other providers to danger without alerting aggressors
        - (b) Verbal and non-verbal signals needed
      - (2) Involve dispatch in danger signal process
        - (a) Code RED
- B0 Tactical patient care
  - 1 Body armor
    - a0 Also known as "bullet-proof vests"
    - b0 Offers protection from
      - (1) Most handgun bullets
      - (2) Most knives
      - (3) Reduction of blunt trauma (i.e. steering wheel in MVC)
    - c0 Does not offer protection
      - (1) High velocity (rifle) bullets
      - (2) Thin or dual-edged weapons (ice pick)
      - (3) When not worn
      - (4) Reduced protection when wet
    - d0 Wearer may feel false sense of security
      - (1) Never do anything you wouldn't do without body armor
      - (2) Body armor doesn't cover all of your body
      - (3) Cavitation even with body armor may be severe (but without penetration)
  - 2 Tactical EMS
    - a0 Providing EMS in violent or tactically "hot" zone
      - (1) Requires special training and authorization
      - (2) Body armor and tactical uniform
      - (3) Compact, functional equipment in small cases
      - (4) May require risks not taken in standard EMS situations
    - b0 Patient care differences
      - (1) Extraction of patient from the area safely is a major concern
      - (2) Frequent care of trauma patients
      - (3) Care may be modified to meet tactical considerations
      - (4) Medical and transport interventions must be coordinated with incident commander
      - (5) Move patient to tactically cold zone for complete patient care and transportation
      - (6) Use of metal clipboard or chemical agent as a defensive tool
    - c0 Local protocols, standing orders, and medical control issues
    - d0 Joint law enforcement agency/ EMS operation
      - (1) Law enforcement agency/ SWAT team member
        - (a) CONTOMS
        - (b) SWAT-Medic
        - (c) EMT-T

- III EMS at crime scenes
  - A0 Crime scenes
    - 1 Definition
      - a0 A location where any part of a criminal act occurred
      - b0 A location where evidence relating to a crime may be found
    - 2 Evidence
      - a0 Prints
        - (1) Fingerprints
          - (a) Ridge characteristics left behind on a surface with oils and moisture from skin
          - (b) Unique - no two people have identical fingerprints
        - (2) Footprints
      - b0 Blood and body fluids
        - (1) DNA and ABO blood typing
        - (2) Blood spatter evidence
      - c0 Particulate evidence
        - (1) Hairs
        - (2) Carpet and clothing fibers
      - d0 EMS provider's observations of the scene
        - (1) Patient (victim) position
        - (2) Patient's injuries
        - (3) Conditions at the scene
          - (a) Lights
          - (b) Curtains
          - (c) Signs of forced entry
        - (4) Statements of persons at the scene
        - (5) Statements of the patient/ victim
        - (6) Dying declarations
    - 3 Preserving evidence
      - a0 Patient care is the ultimate priority (you may be restricted to only one team member entrance)
      - b0 Evidence protection is performed while caring for the patient (carry in only necessary equipment)
      - c0 Evidence preservation techniques
        - (1) Be observant
        - (2) Touch only what is required for patient care
        - (3) If necessary to touch something, remember it and tell police
        - (4) Wear latex gloves
          - (a) Infection control
          - (b) Prevents you leaving your fingerprints
          - (c) Will not prevent you from smudging other fingerprints
        - (5) Report pertinent observations
    - 4 Documentation
      - a0 Note observations objectively, not subjectively
        - (1) Put patient's or bystanders' words in quotes
        - (2) Patient care records are legal documents
        - (3) Avoid opinions not relevant to patient care
        - (4) Patient care records will be used in court

- b0 Mandatory reporting (refer to unit dealing with abuse and assault)
- (1) EMS providers may be required to report certain types of crimes (your protocols, state laws and ethical versus legal considerations)
  - (2) Child abuse and geriatric/ elder abuse/ neglect
  - (3) Domestic violence
  - (4) Certain violent crimes (i.e. rape, gunshot, etc.)
  - (5) Follow local policies and regulations regarding confidentiality