

**UNIT TERMINAL OBJECTIVE**

- 1-1 At the completion of this unit, the EMT-Enhanced student will:
- understand his or her roles and responsibilities within an EMS system, and how these roles and responsibilities differ from other levels of providers.
  - understand the role of medical direction in the out-of-hospital environment.
  - understand and value the importance of personal wellness in EMS and serve as a healthy role model for peers.
  - be able to identify the importance of primary injury prevention activities as an effective way to reduce death, disabilities and health care costs.
  - understand the legal issues that impact decisions made in the out-of-hospital environment.
  - value the role that ethics plays in decision making in the out-of-hospital environment.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-1.1 Define the following terms: (C-1)
- a. EMS Systems
  - b. Certification
  - c. Registration
  - d. Profession
  - e. Professionalism
  - f. Health care professional
  - g. Ethics
  - h. Medical direction
  - i. Protocols
- 1-1.2 Describe the attributes of an EMT-Enhanced as a health care professional. (C-1)
- 1-1.3 Explain EMT-Enhanced licensure/ certification, recertification, and reciprocity requirements in his or her state. (C-1)
- 1-1.4 Describe the benefits of EMT-Enhanced continuing education. (C-1)
- 1-1.5 List current state requirements for EMT-Enhanced education in his/ her state. (C-1)
- 1-1.6 Describe examples of professional behaviors in the following areas: integrity, empathy, self-motivation, appearance and personal hygiene, self-confidence, communications, time management, teamwork and diplomacy, respect, patient advocacy, and careful delivery of service. (C-1)
- 1-1.7 Provide examples of activities that constitute appropriate professional behavior for an EMT-Enhanced. (C-2)
- 1-1.8 Describe how professionalism applies to the EMT-Enhanced while on and off duty.
- 1-1.9 List and explain the primary and additional roles and responsibilities of the EMT-Enhanced. (C-2)
- 1-1.10 Describe the importance and benefits of quality EMS research to the future of EMS. (C-3)
- 1-1.11 Describe the role of the EMS physician in providing medical direction. (C-1)
- 1-1.12 Describe the benefits of medical direction, both on-line and off-line. (C-1)
- 1-1.13 Describe the relationship between a physician on the scene, the EMT-Enhanced on the scene, and the EMS physician providing on-line medical direction. (C-1)
- 1-1.14 Describe the components of continuous quality improvement. (C-1)  
Explain the components of wellness for the EMS provider. (C-2)
- 1-1.15 Discuss the importance of universal precautions and body substance isolation practices and develop strategies to prevent the transmission of diseases. (C-3)
- 1-1.16 Describe the steps to take for personal protection from airborne and blood borne pathogens. (C-1)
- 1-1.17 Explain what is meant by an exposure and describe principles for management. (C-1)
- 1-1.18 Describe the incidence, morbidity and mortality of preventable injury and illness. (C-1)
- 1-1.19 Identify the human, environmental, and socioeconomic impact of preventable injury and illness. (C-1)
- 1-1.20 Describe the feasibility of EMS involvement in illness and injury prevention. (C-2)

- 1-1.21 Develop strategies for the implementation of EMS related illness and injury prevention programs in the community. (C-3)
- 1-1.22 Identify health hazards and potential crime areas within the community. (C-1)
- 1-1.23 Identify local municipal and community resources available for physical and socioeconomic crises. (C-1)
- 1-1.24 Identify the role of EMS in local municipal and community prevention programs. (C-1)
- 1-1.25 Review legal and ethical responsibilities. (C-2)
- 1-1.26 Identify and explain the importance of laws pertinent to the EMT-Enhanced. (C-1)
- 1-1.27 Differentiate between licensure and certification as they apply to the EMT-Enhanced. (C-1)
- 1-1.28 List the specific problems or conditions encountered while providing care that an EMT-Enhanced is required to report, and identify in each instance to whom the report is to be made. (C-1)
- 1-1.29 Review the following terms: (C-1)
  - a. Abandonment
  - b. Advance directives
  - c. Assault
  - d. Battery
  - e. Breach of duty
  - f. Confidentiality
  - g. Consent (expressed, implied, informed, involuntary)
  - h. Do not resuscitate (DNR) orders
  - i. Duty to act
  - j. Emancipated minor
  - k. False imprisonment
  - l. Immunity
  - m. Liability
  - n. Libel
  - o. Minor
  - p. Negligence
  - q. Proximate cause
  - r. Scope of practice
  - s. Slander
  - t. Standard of care
  - u. Tort
- 1-1.30 Differentiate between the scope of practice and the standard of care for EMT-Enhanced practice. (C-3)
- 1-1.31 Discuss the concept of medical direction and its relationship to the standard of care of an EMT-Enhanced. (C-1)
- 1-1.32 Review the four elements that must be present in order to prove negligence. (C-1)
- 1-1.33 Given a scenario in which a patient is injured while an EMT-Enhanced is providing care, determine whether the four components of negligence are present. (C-2)
- 1-1.34 Given a scenario, demonstrate patient care behaviors that would protect the EMT-Enhanced from claims of negligence. (C-3)
- 1-1.35 Explain the concept of liability as it might apply to EMT-Enhanced practice, including physicians providing medical direction and EMT-Enhanced supervision of other care providers. (C-2)
- 1-1.36 Review the legal concept of immunity, including Good Samaritan statutes and governmental immunity, as it applies to the EMT-Enhanced. (C-1)
- 1-1.37 Review the importance and necessity of patient confidentiality and the standards for maintaining patient confidentiality which apply to the EMT-Enhanced. (C-1)
- 1-1.38 Review the steps to take if a patient refuses care. (C-1)
- 1-1.39 Identify the legal issues involved in the decision not to transport a patient, or to reduce the level of care being provided during transportation. (C-1)
- 1-1.40 Review the conditions under which the use of force, including restraint, is acceptable. (C-1)
- 1-1.41 Explain the purpose of advance directives relative to patient care and how the EMT-Enhanced should care for a patient who is covered by an advance directive. (C-1)

- 1-1.42 Discuss the responsibilities of the EMT-Enhanced relative to resuscitation efforts for patients who are potential organ donors. (C-1)
- 1-1.43 Review the importance of providing accurate documentation (oral and written) in substantiating an incident. (C-1)
- 1-1.44 Review the characteristics of a patient care report required to make it an effective legal document. (C-1)
- 1-1.45 Review the premise which should underlie the EMT-Enhanced's ethical decisions in out-of-hospital care. (C-1)
- 1-1.46 Review the relationship between the law and ethics in EMS. (C-3)
- 1-1.47 Identify the issues surrounding the use of advance directives in making an out-of-hospital resuscitation decision. (C-1)
- 1-1.48 Describe the criteria necessary to honor an advance directive in your state. (C-1)

### **AFFECTIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-1.49 Serve as a role model for others relative to professionalism in EMS. (A-3)
- 1-1.50 Value the need to serve as the patient advocate inclusive of those with special needs, alternate life styles and cultural diversity. (A-3)
- 1-1.51 Defend the importance of continuing medical education and skills retention. (A-3)
- 1-1.52 Advocate the need for supporting and participating in research efforts aimed at improving EMS systems. (A-3)
- 1-1.53 Assess personal attitudes and demeanor that may distract from professionalism. (A-3)
- 1-1.54 Advocate the need for injury prevention, including abusive situations. (A-1)
- 1-1.55 Exhibit professional behaviors in the following areas: integrity, empathy, self-motivation, appearance and personal hygiene, self-confidence, communications, time management, teamwork and diplomacy, respect, patient advocacy, and careful delivery of service. (A-2)
- 1-1.56 Advocate the benefits of working toward the goal of total personal wellness. (A-2)
- 1-1.57 Serve as a role model for other EMS providers in regard to a total wellness lifestyle. (A-3)
- 1-1.58 Value the need to assess his/ her own lifestyle. (A-2)
- 1-1.59 Challenge him/ herself to teach wellness concept in his/ her role as an EMT-Enhanced. (A-3)
- 1-1.60 Defend the need to treat each patient as an individual, with respect and dignity. (A-2)
- 1-1.61 Assess his/ her own prejudices related to the various aspects of cultural diversity. (A-3)
- 1-1.62 Improve personal physical well-being through achieving and maintaining proper body weight, regular exercise and proper nutrition. (A-3)
- 1-1.63 Defend the need to respect the emotional needs of dying patients and their families. (A-3)
- 1-1.64 Advocate and practice the use of personal safety precautions in all scene situations. (A-3)
- 1-1.65 Advocate and serve as a role model for other EMS providers relative to body substance isolation practices. (A-3)
- 1-1.66 Value and defend tenets of prevention for patients and communities being served. (A-3)
- 1-1.67 Value personal commitment to success of prevention programs. (A-3)
- 1-1.68 Advocate the need to show respect for the rights and feelings of patients. (A-3)
- 1-1.69 Assess his/ her personal commitment to protecting patient confidentiality. (A-3)
- 1-1.70 Defend personal beliefs about withholding or stopping patient care. (A-3)
- 1-1.71 Defend the value of advance medical directives. (A-3)
- 1-1.72 Reinforce the patient's autonomy in the decision-making process. (A-2)
- 1-1.73 Given a scenario, defend an EMT-Enhanced's actions in a situation where a physician orders therapy the EMT-Enhanced feels to be detrimental to the patient's best interests. (A-3)

### **PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-1.74 Demonstrate the proper procedures to take for personal protection from disease. (P-2)

**DECLARATIVE**

- I. Introduction to foundations of EMT-Enhanced
  - A. EMS systems/ roles and responsibilities
  - B. Medical direction
  - C. Well-Being
  - D. Illness and injury prevention
  - E. Medical/ legal issues
  - F. Ethics
  
- II. EMS systems/ roles and responsibilities of the EMT-Enhanced
  - A. Introduction
    - 1. Role of the EMT-Enhanced quite different today from the “ambulance driver” of yesterday
    - 2. EMT-Enhanced engage in a variety of professional activities
      - a. Enhance their ability to provide quality service
  - B. Review current EMS system
    - 1. Network of coordinated services that provide aid and medical care to the community
    - 2. Work as a unified whole, to meet the emergency care needs of a community
    - 3. Review of local EMS system
  - C. Overview of EMT-Enhanced education
    - 1. Initial education
      - a. Virginia Standard curriculum
        - (1) Competencies
        - (2) Pre- or co-requisites
        - (3) Provided minimum content for a standardized program of study
        - (4) Includes cognitive, psychomotor, affective objectives
        - (5) Clinical requirements
        - (6) Length
          - (a) Minimum hours commitment
      - b. Educational resources
        - (1) Facilities
        - (2) Instructors
        - (3) Equipment
        - (4) Clinical experiences
        - (5) References
        - (6) Texts
        - (7) Other instructional materials
      - c. Local enhancement
        - (1) Meets additional state or local needs
        - (2) Change to reflect current practice
    - 2. Continuing education
      - a. Benefits
        - (1) Maintenance of core or minimal levels of knowledge
        - (2) Maintenance of fundamental technical/ professional skills
        - (3) Expansion of skills and knowledge
        - (4) Cognizance of advances in the profession
  - D. Review the process of certification/ registration
    - 1. Certification
      - a. Grants authority to an individual who has met predetermined qualifications to participate in an activity
      - b. A document certifying fulfillment of requirements for practice in a field
      - c. Usually refers to action of a non-governmental entity

- d. May be required by state or local authorities to practice as an EMT-Enhanced
- e. Unfounded general belief that “licensed professionals” have greater status than those that are “certified” or “registered”
- f. A “certification” granted by a state, conferring a right to engage in a trade or profession, is in fact a “license”
- 2. Registration
  - a. The act of registering
  - b. To enroll one’s name in a “register” or book of record
- 3. State and national certification/ recertification requirements
- E. Professionalism
  - 1. Education should help produce a professional EMT-Enhanced
  - 2. Profession
    - a. The existence of a specialized body of knowledge or expertise
    - b. Generally, self-regulating through licensure or certification verifying competence
    - c. Maintains standards including initial and continuing educational requirements
  - 3. Professionalism
    - a. Professionals follow standards of conduct and performance for the profession
    - b. Adherence to a code of ethics approved by the profession
  - 4. Health care professional
    - a. Conforms to the standards of health care professions
    - b. Provides quality patient care
    - c. Instills pride in the profession
    - d. Strives for high standards
    - e. Earns respect of others
    - f. There are high societal expectations of professionals while on and off duty
    - g. EMS personnel occupy positions of public trust
    - h. Unprofessional conduct hurts the image of the profession
    - i. Commitment to excellence is a daily activity
    - j. Image and behavior
      - (1) How you appear to others and to yourself is important
      - (2) Vital to establishing credibility and instilling confidence
      - (3) Highly visible role model
      - (4) EMT-Enhanced represent a variety of persons
        - (a) Self
        - (b) EMS agency
        - (c) State/ county/ city/ district EMS office
        - (d) Peers
  - 5. Attributes of professionalism applied to the role of the EMT-Enhanced
    - a. Integrity
      - (1) Single most important behavior
      - (2) Honesty in all actions
      - (3) Assumed by public in the role of an EMT-Enhanced
      - (4) Examples of behavior demonstrating integrity
        - (a) Tells the truth
        - (b) Does not steal
        - (c) Complete and accurate documentation
    - b. Empathy
      - (1) Identification with and understanding of the feelings, situations, and motives of others
      - (2) Empathy must be demonstrated to patients, families, and other health care professionals
      - (3) Examples of behavior demonstrating empathy

- (a) Showing caring and compassion for others
- (b) Demonstrating an understanding of patient and family feelings
- (c) Demonstrating respect for others
- (d) Exhibiting a calm, compassionate and helpful demeanor toward those in need
- (e) Being supportive and reassuring of others
- c. Self-motivation
  - (1) Internal drive for excellence
  - (2) Demonstrating self-direction
  - (3) Examples of behavior demonstrating motivation
    - (a) Taking initiative to complete assignments
    - (b) Taking initiative to improve and/ or correct behavior
    - (c) Taking on and following through on tasks without constant supervision
    - (d) Showing enthusiasm for learning and improvement
    - (e) Demonstrating a commitment to continuous quality improvement
    - (f) Accepting constructive feedback in a positive manner
    - (g) Taking advantage of learning opportunities
- d. Appearance and personal hygiene
  - (1) A person's manner of carrying and presenting oneself
  - (2) Examples of behavior demonstrating good appearance and personal hygiene
    - (a) Clothing and uniform is neat, clean and in good repair
    - (b) Demonstrates good personal grooming
- e. Self-confidence
  - (1) Trust or reliance on yourself
  - (2) Having an accurate assessment of your personal and professional strengths and limitations
  - (3) Examples of behavior demonstrating self-confidence
    - (a) Demonstrates the ability to trust personal judgement
    - (b) Demonstrates an awareness of strengths and limitations
- f. Communications
  - (1) The exchange of thoughts, messages and information
  - (2) Ability to convey information to others verbally and in writing
  - (3) The ability to understand and interpret verbal and written messages
  - (4) Examples of behavior demonstrating good communications
    - (a) Speaking clearly
    - (b) Writing legibly
    - (c) Listening actively
    - (d) Adjusting communication strategies to various situations
- g. Time management
  - (1) Organizing tasks to make maximum use of time
  - (2) Prioritizing tasks
  - (3) Examples of behavior demonstrating good time management
    - (a) Is punctual
    - (b) Completes tasks and assignments on time
- h. Teamwork and diplomacy
  - (1) Teamwork is the ability to work with others to achieve a common goal
  - (2) Diplomacy is tact and skill in dealing with people
  - (3) Examples of behavior demonstrating teamwork and diplomacy
    - (a) Places the success of the team above self interest
    - (b) Does not undermine the team

- (c) Helps and supports other team members
    - (d) Shows respect for all team members
    - (e) Remains flexible and open to change
    - (f) Communicates with co-workers in an effort to resolve problems
  - i. Respect
    - (1) To feel and show deferential regard for others
    - (2) Showing consideration and appreciation
    - (3) Examples of behavior demonstrating respect
      - (a) Being polite to others
      - (b) Not using derogatory or demeaning terms
      - (c) Behaving in a manner to bring credit to yourself, your associations, and your profession
  - j. Patient advocacy
    - (1) Acting in the best interest of the patient
    - (2) Accepting others' right to differ
    - (3) Not imposing your beliefs on others
    - (4) Examples of behavior demonstrating patient advocacy
      - (a) Not allowing personal (religious, ethical, political, social, legal) biases to impact patient care
      - (b) Placing the needs of patients above own self-interest
      - (c) Protecting patient confidentiality
  - k. Careful delivery of service
    - (1) Delivers the highest quality of patient care with careful attention to detail
    - (2) Critically evaluates performance and attitude
    - (3) Examples of behavior demonstrating careful delivery of service
      - (a) Mastering and refreshing skills
      - (b) Performing complete equipment checks
      - (c) Careful and safe ambulance operations
      - (d) Following policies, procedures, and protocols
      - (e) Following orders of superiors
- F. Roles and responsibilities of the EMT-Enhanced
  - 1. Primary responsibilities
    - a. Preparation
      - (1) Physical, mental, emotional
        - (a) Positive health practices
      - (2) Appropriate equipment and supplies
      - (3) Adequate knowledge and skill maintenance
    - b. Response
      - (1) Safety
      - (2) Timeliness
    - c. Scene assessment
      - (1) Safety
      - (2) Mechanism
    - d. Patient assessment
    - e. Recognition of injury or illness
      - (1) Prioritization
    - f. Management
      - (1) Following protocols
      - (2) Interacting with medical direction physician, as needed
    - g. Appropriate disposition
      - (1) Treat and transport
        - (a) Ground

- (b) Air
- (2) Selection of the proper receiving facility
  - (a) Requires knowledge of the receiving facilities
  - (b) Hospital designation/ categorization
  - (c) Based on hospital resource capabilities with regard to optimal patient care
  - (d) Clinical capabilities and specialty availability
    - i) Emergency department
    - ii) Operating suite
    - iii) Post-anesthesia recovery room or surgical intensive care unit
    - iv) Intensive care units for trauma patients
    - v) Cardiac
    - vi) Neurology
    - vii) Acute hemodialysis capability
    - viii) Burn specialization
    - ix) Acute spinal cord/ head injury management capability
    - x) Radiological special capability
    - xi) Rehabilitation
    - xii) Clinical laboratory service
    - xiii) Toxicology
      - a) Hazardous materials/ decontamination
    - xiv) Hyperbarics
    - xv) Reperfusion
    - xvi) Pediatrics
    - xvii) Psychiatric facilities
    - xviii) Trauma centers
    - xix) High risk delivery
    - xx) Other
  - (e) Transfer agreements
  - (f) Payors and insurance systems
- (3) Treat and transfer with medical direction
- (4) Treat and refer with medical direction
- h. Patient transfer
  - (1) Acting as patient advocate
  - (2) Briefing hospital staff
- i. Documentation
  - (1) Thorough, accurate patient care reports
  - (2) Completed in timely manner
- j. Returning to service
  - (1) Preparation of equipment and supplies
  - (2) Preparing crew
    - (a) Debriefing
- 2. Additional responsibilities
  - a. Community involvement
    - (1) Role modeling
    - (2) Leader activities
    - (3) Community activities
    - (4) Prevention activities
    - (5) Teaching in the community
      - (a) Helps improve health of the community
        - i) Injury and illness prevention



- ii) Enhances compliance with treatment regimes, etc.
        - (b) Ensures appropriate utilization of resources through public education
          - i) When, where, how to use EMS
        - (c) Improves integration of EMS with other health care and public safety agencies
          - i) Creates cooperative public education efforts
        - (d) Enhances visibility and positive image of EMS providers
      - b. Supporting primary care efforts
        - (1) Some systems may find it beneficial to utilize EMT-Enhanced in a limited role
        - (2) Can help improve the health of the community
        - (3) Prevent injuries and illnesses
        - (4) Enhance compliance with treatment regimes
        - (5) Ensure more appropriate utilization of resources through public education
          - (a) When, where, how to use EMS, or need hospitalization
        - (6) Reduce costs of overall system operation
          - (a) Ensure appropriate utilization of out-of-hospital and other non-EMS health care resources
            - i) Less expensive transportation alternatives
            - ii) Non-hospital ED clinical providers, free standing emergency clinics, etc.
      - c. Advocating citizen involvement in the EMS system
        - (1) Improves EMS system
          - (a) Involvement in establishing needs, parameters
          - (b) Outside, objective view into quality improvement and problem resolution
          - (c) Creates informed, independent advocates for the EMS system
  - G. Importance of EMS research
    - 1. Benefits of research
    - 2. Quality EMS research is beneficial to the future of EMS
      - a. Changes in professional standards, training, equipment, procedures
      - b. Based on empirical data, rather than “great ideas” or “new gadget” models
    - 3. Enhances recognition and respect for EMS professionals
- III. Medical direction
- A. Many services provided by EMT-Enhanced are derived from medical practices
  - B. EMT-Enhanced operate as “physician extension”
  - C. Physicians regarded as the authorities on issues of medical care
  - D. Physicians, properly educated and motivated, are a vital component of EMS
  - E. Role of the EMS physician in providing medical direction
    - 1. Education and training of personnel
    - 2. Participation in personnel selection process
    - 3. Participation in equipment selection
    - 4. Development of clinical protocols, in cooperation with expert EMS personnel
    - 5. Participation in quality improvement and problem resolution
    - 6. Provides direct input into patient care
    - 7. Interfaces between EMS systems and other health care agencies
    - 8. Advocacy within the medical community
    - 9. Serve as the “medical conscience” of the EMS system
      - a. Advocate for quality patient care
    - 10. Types of medical direction

- a. On-line/ direct
  - b. Off-line/ indirect
- F. Benefits of medical direction
  - 1. On-line
    - a. Immediate and patient specific care
    - b. Telemetry
    - c. Continuous quality improvement
    - d. On-scene
  - 2. Off-line
    - a. Prospective
      - (1) Development of protocols/ standing orders, training
      - (2) Selection of equipment, supplies and personnel
    - b. Retrospective
      - (1) Patient care report review
      - (2) Continuous quality improvement
  - 3. Interacting with a physician on the scene
    - a. Origins of medical direction
    - b. Use of standing orders
    - c. Direct field supervision
    - d. The non affiliated on-scene physician
- IV. Improving system quality
  - A. Develop a system for continually evaluating and improving care
  - B. Continuous quality improvement (CQI)
    - 1. Focus on the system and not an individual
    - 2. Fix system problems in areas such as
      - a. Medical direction
      - b. Financing
      - c. Training
      - d. Communication
      - e. Out-of-hospital treatment and transport
      - f. Inter-facility transport
      - g. Receiving facilities
      - h. Specialty care units
      - i. Dispatch
      - j. Public information and education
      - k. Audit and quality assurance
      - l. Disaster planning
      - m. Mutual aid
  - C. Dynamic process
    - 1. Delineate system-wide problems identified
    - 2. Elaborate on the cause(s) of the problem
    - 3. Aid the problem and develop remedy(ies)
    - 4. Lay out plan to correct the problem
    - 5. Enforce the plan of correction
    - 6. Reexamine the problem
  - D. Appropriate EMS research can help enhance quality improvement efforts
- V. The well-being of the EMT-Enhanced
  - A. Introduction
    - 1. Wellness has three components
      - a. Physical well-being
      - b. Mental well-being

- c. Emotional well-being
    - 2. Implementing lifestyle changes can enhance personal wellness
    - 3. Enhancing personal wellness can serve as a role model/ coach for others
  - B. Review preventing disease transmission
    - 1. Occupational Safety and Health Administration (OSHA) and Centers for Disease Control and Prevention (CDC) Guidelines for blood borne pathogens
    - 2. Terminology
      - a. Air/ blood borne pathogens
      - b. Exposure
        - (1) Contact with a potentially infectious body fluid substance
        - (2) Contact with other infectious agent
      - c. Cleaning, disinfection, sterilization
      - d. Body substance isolation, universal precautions
        - (1) Practices designed to prevent contact with body substances
        - (2) Practices designed to reduce contact with other agents
    - 3. Common sources of exposure
      - a. Needle stick
      - b. Broken or scraped skin
      - c. Mucous membranes of the eyes, nose or mouth
    - 4. Protection from air/ blood borne pathogens
      - a. Follow engineering and work practices
        - (1) Puncture resistant containers
        - (2) Laundry
        - (3) Labeling
      - b. Maintain good personal health and hygiene habits
        - (1) Hand washing
        - (2) General cleanliness
      - c. Maintain immunizations
      - d. Periodic tuberculosis screening
      - e. Body substance isolation/ universal precautions
        - (1) Gloves
        - (2) Mask, gown, eye wear
        - (3) Other equipment
      - f. Proper disposal of contaminated supplies
      - g. Cleaning and disinfecting of used materials/ equipment
    - 5. Periodic risk assessment
    - 6. Documenting and managing an exposure
      - a. Wash the area of contact thoroughly and immediately
      - b. Document the situation in which the exposure occurred
      - c. Describe actions taken to reduce chances of infection
      - d. Comply with all required reporting responsibilities and time frames
      - e. Cooperate with incident investigation
      - f. Check tuberculosis/ other screening for exposure
      - g. Proper immunization boosters
      - h. Complete medical follow-up

VI. Illness and injury prevention

A. Epidemiology

- 1. Incidence, morbidity, mortality
  - a. Injury surpassed stroke as third leading cause of death
  - b. Estimated lifetime cost of injuries >\$14 billion
  - c. Estimated 19 hospitalizations and 254 emergency department visits for each

- injury death
- 2. Effects of early release from hospital on EMS services
  - a. Implications are increased access on EMS services for supportive care and intervention
- 3. Related terminology
  - a. Injury
    - (1) Defined as intentional or unintentional damage to the person resulting from acute exposure to thermal, mechanical, electrical or chemical energy or from the absence of such essentials as heat or oxygen
  - b. Injury risk
    - (1) Defined as real or potential hazardous situations that put individuals at risk for sustaining an injury
  - c. Injury surveillance
    - (1) Defined as ongoing systematic collection, analysis and interpretation of injury data essential to the planning, implementation and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know
    - (2) The final link in the surveillance chain is the application of these data to prevention and control
  - d. Primary injury prevention
    - (1) Defined as keeping an injury from ever occurring
  - e. Secondary and tertiary prevention
    - (1) Defined as care and rehabilitation activities (respectively) that are preventing further problems from an event that has already occurred
  - f. Teachable moment
    - (1) Defined as the time after an injury has occurred when the patient and observers remain acutely aware of what has happened and may be more receptive to teaching about how the event or illness could be prevented
  - g. Years of productive life
    - (1) Defined as the calculation by subtracting age of death from 65
- B. Feasibility of EMS involvement
  - 1. EMS providers are widely distributed amid the population
  - 2. EMS providers often reflect the composition of the community
  - 3. In a rural setting, the EMS provider may be the most medically educated individual
    - a. More than 600,000 EMS providers in the United States
  - 4. EMS providers are high-profile role models
  - 5. EMS providers are often considered as champion of the customer
  - 6. EMS providers are welcome in schools and other environments
  - 7. EMS providers are considered authorities on injury and prevention
- C. Implementation of prevention strategies
  - 1. Patient care considerations
    - a. Recognize signs/ symptoms of suspected abuse
      - (1) Recognition of abusive situations
      - (2) Resolving conflict without violence
  - 2. Recognize signs/ symptoms of exposure to
    - a. Hazardous materials
    - b. Temperature extremes
    - c. Vector
    - d. Communicable disease
    - e. Assault, battery
    - f. Structural risks
  - 3. Recognizing need for outside resource

- a. Municipal
- b. Community
- c. Religious
- 4. Education
  - a. On-scene education
    - (1) Recognize/ sense possible recurrence
      - (a) Effective communications
      - (b) Recognizing the teachable moment
      - (c) Non-judgmental
      - (d) Objective
      - (e) Sense of timing
      - (f) Consideration of ethnic, religious and social diversity considerations
    - (2) Informing individuals how they can prevent recurrence
    - (3) Informing individuals on use of protective devices
  - b. Community education
    - (1) Population served
      - (a) Ethnic
      - (b) Cultural
      - (c) Religious
      - (d) Language
      - (e) Learning disabled
      - (f) Physically challenged
- 5. Resources identified for
  - a. Devices
  - b. Child protective services
  - c. Sexual abuse
  - d. Spousal abuse
  - e. Elder abuse
  - f. Food, shelter, clothing
  - g. Employment
  - h. Counseling
  - i. Alternative health care
    - (1) Free clinic
  - j. Alternative means of transportation
  - k. After-care services
  - l. Rehabilitation
  - m. Grief support
  - n. Immunization programs
  - o. Vector control
  - p. Disabled
  - q. Day care
  - r. Alternative modes of education
  - s. Work-study programs
  - t. Mental health resources and counseling

VII. Medical/ legal issues

A. Review

- 1. Legal duties and ethical responsibilities
  - a. Legal duties are to the patient, medical director, and public
    - (1) Set by statutes and regulations
    - (2) Based on generally accepted standards

- b. Ethical responsibilities as a professional
  - (1) Principles that identify conduct deemed morally desirable
  - (2) Ethical responsibilities include
    - (a) Responding to the physical and emotional needs of every patient with respect
    - (b) Maintaining mastery of skills
    - (c) Participating in continuing education/ refresher training
    - (d) Critically reviewing performance and seeking improvement
    - (e) Reporting honestly and respecting confidentiality
    - (f) Working cooperatively and with respect for other emergency professionals
  - (3) NAEMT Code of Ethics exemplifies ethical guidelines for the EMT-Enhanced
- 2. Failing to perform the job appropriately can result in civil or criminal liability
- 3. The best legal protection is provision of appropriate assessment and care coupled with accurate and complete documentation
- 4. Laws differ from state to state and area to area - get competent legal advice
- B. Review of the legal system
  - 1. Types of law
    - a. Legislative law
      - (1) Enacted at federal, state and local levels by legislative branches of government
      - (2) Product of Congress, city councils, district boards, and general assemblies
    - b. Administrative law
      - (1) Regulations developed by a governmental agency
      - (2) Agency has the authority to enforce rules, regulations, and statutes
    - c. Common law
      - (1) "Case" or "judge-made" law
      - (2) Derived from society's acceptance of customs or norms over time
    - d. Criminal law
      - (1) Area of law in which the federal, state, or local government prosecutes individuals on behalf of society for violating laws designed to safeguard society
      - (2) Violation punished by fine, imprisonment or both
    - e. Civil (tort) law
      - (1) Area of law dealing with private complaints brought by a plaintiff against a defendant for an illegal act or wrongdoing (tort)
      - (2) Enforced by bringing a civil lawsuit in which the plaintiff requests the court to award damages
  - 2. How laws affect the EMT-Enhanced
    - a. Scope of practice
      - (1) Range of duties and skills an EMT-Enhanced is allowed and expected to perform when necessary
      - (2) Usually set by state law or regulation and by local medical direction
    - b. Medical direction
      - (1) Required for EMT-Enhanced practice
      - (2) May be off-line or on-line, depending on state and local requirements
      - (3) Each system should have a policy to guide EMT-Enhanced in dealing with on-scene physician
    - c. Medical practice act
      - (1) Legislation that governs the practice of medicine; varies from state to

- state
        - (2) May prescribe how and to what extent a physician may delegate authority to an EMT-Enhanced to perform medical acts
    - d. Licensure and/ or certification
      - (1) Certification
        - (a) Grants recognition to an individual who has met predetermined qualifications to participate in an activity
        - (b) Usually granted by a certifying agency or professional association, not necessarily a government agency
      - (2) Licensure
        - (a) A process of occupational regulation
        - (b) Governmental agency, such as state medical board, grants permission to an individual who meets established qualifications to engage in the profession or occupation
      - (3) Either or both may be required by state or local authorities to practice as an EMT-Enhanced
    - e. Motor vehicle laws
      - (1) Motor vehicle code varies from state to state
      - (2) Set standards for equipping and operating an emergency vehicle
    - f. Mandatory reporting requirements
      - (1) Vary from state to state, but often include
        - (a) Child abuse and neglect; elderly abuse; spouse abuse
        - (b) Sexual assault
        - (c) Gunshot and stab wounds
        - (d) Animal bites
        - (e) Communicable diseases
      - (2) Content of report and to whom it must be made is set by law, regulation or policy
    - g. Protection for the EMT-Enhanced
      - (1) Infectious disease exposure notification
      - (2) Immunity statutes
        - (a) Governmental immunity
        - (b) Good Samaritan laws
      - (3) Special crimes against an EMT-Enhanced
        - (a) Assault or battery to EMT-Enhanced while performing duties
        - (b) Obstruction of EMT-Enhanced activity
- C. Legal accountability of the EMT-Enhanced
  - 1. Responsible to act in a reasonable and prudent manner
  - 2. Responsible to provide a level of care and transportation consistent with education/ training
  - 3. Negligence can result in legal accountability and liability
    - a. Components of negligence
      - (1) Duty to act
        - (a) May be a formal contractual or an informal duty
        - (b) Duty may be undertaken voluntarily by beginning to care for a patient
        - (c) Duties include
          - i) Duty to respond and render care
          - ii) Duty to obey laws and regulations
          - iii) Duty to operate emergency vehicle reasonably and prudently
          - iv) Duty to provide care and transportation to the expected

- v) standard
- v) Duty to provide care and transportation consistent with the scope of practice and local medical protocols
- vi) Duty to continue care and transportation through to its appropriate conclusion
- (2) Breach of duty
  - (a) Standard of care
    - i) Exercising the degree of care, skill, and judgement which would be expected under like or similar circumstances by a similarly trained, reasonable EMT-Enhanced in the location involved
    - ii) Standard of care is established by court testimony and reference to published codes, standards, criteria and guidelines applicable to the situation
  - (b) Breach of duty may occur by
    - i) Malfeasance - performing a wrongful or unlawful act
    - ii) Misfeasance - performing a legal act in a manner which is harmful or injurious
    - iii) Non-feasance - failure to perform a required act or duty
  - (c) In some cases, negligence may be so obvious that it does not require extensive proof
    - i) Res ipsa loquitur - the injury could only have been caused by negligence
    - ii) Negligence per se - negligence is shown by the fact that a statute was violated and injury resulted
- (3) Damage to patient or other individual (i.e., the plaintiff)
  - (a) Proof that the plaintiff suffered compensable physical or psychological damages, such as
    - i) Medical expenses
    - ii) Lost earnings
    - iii) Conscious pain and suffering
    - iv) Wrongful death
  - (b) Punitive (punishing) damages could be awarded
    - i) Awarded to punish gross negligence or willful and wanton misconduct
    - ii) Punitive damages are usually not covered by malpractice insurance
- (4) Proximate cause
  - (a) The action or inaction of the EMT-Enhanced was the cause of or worsened the damage
  - (b) The fact that the EMT-Enhanced's act or inaction would result in the damage must have been reasonably foreseeable by the EMT-Enhanced
  - (c) Usually established by expert testimony
- b. Defenses to negligence
  - (1) Good Samaritan laws
    - (a) Do not generally protect providers from acts of gross negligence, reckless disregard, or willful or wanton conduct
    - (b) Do not generally prohibit the filing of a lawsuit
    - (c) May provide coverage for paid or volunteer providers
    - (d) Varies from state to state
  - (2) Governmental immunity



- (a) Trend is toward limiting protection
      - (b) May only protect governmental agency, not provider
      - (c) Varies from state to state
    - (3) Statute of limitations
      - (a) Limit the number of years after an incident during which a lawsuit can be filed
      - (b) Set by law and may differ for cases involving adults and children
      - (c) Varies from state to state
    - (4) Contributory negligence
      - (a) Plaintiff may be found to have contributed to his or her own injury
      - (b) Damages awarded may be reduced or eliminated based on the plaintiff's contribution to his or her injury
    - (5) Liability insurance
  - 4. Special liability concerns
    - a. Liability of the EMT-Enhanced medical director
      - (1) On-line
        - (a) Direct supervision regarding patient care
      - (2) Off-line
        - (a) Provided by use of protocols, including standing orders
        - (b) Indirect supervision
    - b. Liability for "borrowed servants"
      - (1) Liability for actions of EMT-Basic supervised by the EMT-Enhanced
      - (2) Depends on degree of supervision and control given to the EMT-Enhanced
    - c. Civil rights
      - (1) May not discriminate in providing service to a patient by reason of race, color, sex, national origin, or, in some cases, ability to pay
      - (2) Patients should be provided with appropriate care regardless of disease condition (e.g., AIDS/ HIV, other communicable disease, etc.)
    - d. Off-duty EMT-Enhanced
      - (1) May not have authority to perform EMT-Enhanced procedures which require delegation from a physician
      - (2) Varies from state to state
  - 5. Protection against negligence claims
    - a. Appropriate education/ training and continuing education
    - b. Appropriate medical direction, on- and off-line
    - c. Accurate, thorough documentation
    - d. Professional attitude and demeanor
- D. Patient relationships
  - 1. Confidentiality
    - a. Confidential information
      - (1) Patient history
      - (2) Assessment findings
      - (3) Treatment rendered
    - b. Release of information
      - (1) Requires written permission from patient or legal guardian
      - (2) Permission not required for release of select information
        - (a) To other providers with a need to know in order to provide care
        - (b) When required by law
        - (c) When required for third party billing
        - (d) In response to a proper subpoena
    - c. Improper release of information or release of inaccurate information can result in

- liability
  - (1) Invasion of privacy
    - (a) Release, without legal justification, of information on a patient's private life which might reasonably expose the individual to ridicule, notoriety or embarrassment
    - (b) The fact that the information is true is not a defense
  - (2) Defamation - making an untrue statement about someone's character or reputation without legal privilege or consent of the individual
    - (a) Libel
      - i) False statements about a person made in writing or through the mass media
      - ii) Made with malicious intent or reckless disregard for the falsity of the statements
    - (b) Slander
      - i) False verbal statements about a person
      - ii) Made with malicious intent or reckless disregard for the falsity of the statements
- 2. Consent
  - a. Conscious, competent patients have the right to decide what medical care and transportation to accept
    - (1) Patient must be of legal age and able to make a reasoned decision
    - (2) Patient must be properly informed
      - (a) Nature of the illness or injury
      - (b) Treatment recommended
      - (c) Risks and dangers of treatment
      - (d) Alternative treatment possible and the risks
      - (e) Dangers of refusing treatment (including transport)
    - (3) Conscious, competent patient can revoke consent at any time during care and transport
  - b. Types of consent
    - (1) Expressed consent
      - (a) Patient directly agrees to treatment and gives permission to proceed
      - (b) Consent can be expressed non-verbally by action or allowing care to be rendered
    - (2) Informed consent - consent given based on full disclosure of information
    - (3) Implied consent
      - (a) Consent assumed from a patient requiring emergency intervention who is mentally, physically or emotionally unable to provide expressed consent; sometimes called emergency doctrine
      - (b) Is effective only until patient no longer requires emergency care or regains competence to make decisions
    - (4) Involuntary consent
      - (a) Treatment allowed in certain situations granted by authority of law
      - (b) Patients held for mental health evaluation or as directed by law enforcement personnel who have the patient under arrest
  - c. Special consent situations
    - (1) Minors
      - (a) In most states, a person is a minor until age 18, unless emancipated

- (b) Emancipation may include
  - i) Minors who are married, parents, or in the armed services
  - ii) Individual living independently and self-supporting (e.g., college student not living at home or receiving financial aid from parents)
- (c) Unemancipated minors are not able to give or withhold consent - consent of parent, legal guardian or court-appointed custodian is usually required
- (d) Emergency doctrine applies to minors when parent or guardian cannot be contacted
- (2) Mentally incompetent adults
  - (a) If there is a legal guardian, consent may be given or withheld by the guardian
  - (b) Emergency doctrine applies if no one legally able to give consent can be contacted
- (3) Prisoners or arrestees
  - (a) Court or police who have custody may authorize emergency treatment
  - (b) Usually limited to care needed to save life or limb
- (4) Refusal of care or transport
  - (a) Patient must be conscious and able to make a reasonable decision
  - (b) Make multiple attempts to convince the patient to accept care
  - (c) Enlist the help of others to convince the patient
  - (d) Assure that the patient is informed about the implication of the decision and potential for harm
  - (e) Consult medical direction
  - (f) Request patient and a disinterested witness to sign a "release from liability" form
  - (g) Advise the patient that he or she may call again for help if needed
  - (h) Attempt to get family or friends to stay with the patient
  - (i) Document situation and actions thoroughly on patient care report
- (5) Decisions not to transport
  - (a) Involve medical direction
  - (b) Thoroughly document reasons for decision
- d. Legal complications related to consent
  - (1) Abandonment
    - (a) Terminating care when it is still needed and desired by the patient, and without assuring that appropriate care continues to be provided by another qualified provider
    - (b) May occur in the field or when a patient is delivered to the emergency department
  - (2) False imprisonment
    - (a) May be charged by a patient who is transported without consent or who is restrained without proper cause or authority
    - (b) May be a civil or criminal violation
  - (3) Assault
    - (a) Threatening, attempting or causing fear of offensive physical contact with a patient or other individual (for example, threatening to restrain a patient unless he or she quiets down)

- (b) May be a civil or criminal violation
      - (4) Battery
        - (a) Unlawful touching of another person without consent (for example, drawing a patient's blood without permission)
        - (b) May be a civil or criminal violation
    - 3. Use of force
      - a. Unruly or violent patients
      - b. Use of restraints
      - c. Involve law enforcement, if possible
      - d. Use only force considered to be "reasonable" to prevent harm to the patient or others
      - e. Must never be punitive
    - 4. Transportation of patients
      - a. Level of care during transportation
        - (1) Level of personnel attending the patient
        - (2) Complications resulting from changing the level of care delivered
      - b. Use of emergency vehicle operating privileges
        - (1) Must operate in conformity to laws, regulations and policies
        - (2) Must operate in a manner which safeguards the patient, crew and public
  - E. Resuscitation issues
    - 1. Withholding or stopping resuscitation
      - a. Procedure should be established by local protocols
      - b. Role of medical direction should be clearly delineated
    - 2. Advance directives
      - a. Status depends on state laws and local protocols
      - b. Written patient statements of preference for future medical treatment
        - (1) Living will
        - (2) Durable power of attorney for health care
        - (3) Do not resuscitate (DNR) orders
      - c. Authority granted in part by the Patient Self-Determination Act of 1990
      - d. Medical direction must establish and implement policies for dealing with advance directives
        - (1) Policy should specify EMT-Enhanced care for the patient with an advance directive
        - (2) Must provide for reasonable measures of comfort to the patient and emotional support to family and loved ones
    - 3. Potential organ donation
      - a. Identify the patient as a potential donor
      - b. Establish communication with medical direction
      - c. Provide emergency care that will help maintain viable organs
    - 4. Death in the field
      - a. Follow state or local protocols
      - b. Consult medical direction for guidance
  - F. Documentation
    - 1. Importance
      - a. If it is not written down, it was not done
      - b. Memory is fallible - claims may not be filed until years after an event
    - 2. Maintained at least for extent of statute of limitations
- VIII. Ethics
- A. Introduction
    - 1. Ethical dilemmas are present in out-of-hospital care

- 2. Ethical dilemma today may be decided by law tomorrow
- B. Ethics review
  - 1. Ethics defined
    - a. Socrates: "How should one live?"
    - b. Larger issue than EMT-Enhanced practice
      - (1) Morals relate to social standards
      - (2) Ethics relate to personal standards
  - 2. Answering ethical questions
    - a. Emotion should not be a factor
    - b. The question should be answered with reason
    - c. Answer must not be based on what people think is wrong or right
      - (1) The individual must answer the question for him/ her self
    - d. Never do what is morally wrong
  - 3. The need for an out-of-hospital ethical code
  - 4. How ethics impact individual practice
    - a. A personal code
    - b. The importance of reflecting on one's own practice
      - (1) "An unexamined life is not worth living"
  - 5. How ethics impact institutional practice
- C. Ethical tests in healthcare
  - 1. Fundamental question
    - a. What is in the patient's best interest?
    - b. Determining what the patient wants
      - (1) Patient statement
      - (2) Written statement
      - (3) Family input
    - c. The role of "good faith" in making ethical decisions
  - 2. Global concepts
    - a. Provide patient benefit
    - b. Avoid harm
    - c. Recognize patient autonomy
  - 3. Resolving ethical dilemmas when global concepts are in conflict
    - a. Within healthcare community
      - (1) Establishment of norms (standards of care)
      - (2) Research and treatment protocols
      - (3) Prospective and retrospective reviews of decisions
    - b. Within the public
      - (1) Creation of laws protecting patient rights
      - (2) Use of advance directives, etc. to make patient wishes known
- D. Ethical issues in contemporary EMT-Enhanced practice
  - 1. Decisions surrounding resuscitation
    - a. What the patient really wants
    - b. When in doubt, resuscitate
    - c. Resuscitation after an advance directive is found
  - 2. Confidentiality
    - a. A fundamental right
    - b. Ethics and confidential information
      - (1) Legally required
        - (a) Does this supersede ethical considerations?
        - (b) What if the public health would benefit?
  - 3. Consent
    - a. Patient right to make decisions regarding health care

- (1) "Fundamental element of the patient-physician relationship"
    - (2) AMA code of medical ethics
  - b. Ethics of implied consent
    - (1) Does the patient understand the issues at hand?
    - (2) Can the patient make an informed decision in his/ her best interest
- 4. Applications of ethical principles to patient care situations
  - a. Care in futile situations
    - (1) Defining futile
    - (2) Who makes the decision?
  - b. Obligation to provide care
    - (1) Good Samaritan
    - (2) Inability to pay
    - (3) Isn't in the "health plan"
    - (4) Patient "dumping"
    - (5) Economic triage
  - c. Advocacy
  - d. EMT-Enhanced accountability
    - (1) Patient
    - (2) Physician medical director
    - (3) System/ HMO protocols
  - e. Role as physician extender
    - (1) The physician orders something which
      - (a) The EMT-Enhanced believes is contraindicated
      - (b) The EMT-Enhanced believes is medically acceptable but not in the patient's best interests
      - (c) The EMT-Enhanced believes is medically acceptable but morally wrong

## REFERENCES

Keuhl, S, 1994,*Prehospital Systems and Medical Oversight*, 2nd edition, NAEMSP.

Bledsoe, Bryan E., *EMT-Intermediate Emergency Care*, 2nd edition, Prentice-Hall Inc.

S. Scott Polsky, MD, FACEP, *Continuous Quality Improvement in EMS*, 1992, ACEP.

Committee on Trauma American College, *Resource for Optimal Care of the Injured Patient: 1993*.

Steering Committee Project, *Consensus Statement on The Role of Emergency Medical Services in Primary Injury Prevention*, 1993, NHTSA/ MCHB/ NAEMSP.

*NHTSA's Air Medical Crew National Standard Curriculum*, 1988, ASHBEAMS

*Emergency Medical Technician EMT-Intermediate Course Curriculum and Reference Guide*, 2nd edition, Oregon Health Division - Emergency Medical Services and Systems.

Menegazzi, J. J. (1993). *Research: The Who, What, Why, When, and How*. Ferno-Washington, Inc.

Centers for Disease Control, 1991

Consensus Statement on the role of Emergency Medical Services in Primary Injury Prevention, February 1996

**UNIT TERMINAL OBJECTIVE**

1-2 At the completion of this unit, the EMT-Enhanced student will be understand basic anatomy and physiology and how it relates to the foundations of medicine.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-2.1 Define anatomy, physiology, and pathophysiology. (C-1)
- 1-2.2 Name the levels of organization of the body from simplest to most complex, and explain each. (C-1)
- 1-2.3 Define homeostasis. (C-1)
- 1-2.4 State the anatomical terms for the parts of the body. (C-1)
- 1-2.5 Identify terminology to describe the location of body parts with respect to one another. (C-1)
- 1-2.6 Review the body cavities and the major organs within each. (C-1)
- 1-2.7 Identify the anatomical planes. (C-1)
- 1-2.8 Identify areas of the abdomen and underlying organs. (C-1)
- 1-2.27 Discuss the regulator processes of hormonal secretion. (C-1)
- 1-2.28 State the functions of hormones. (C-1)
- 1-2.29 State the function of the hormones of the pancreas. (C-1)
- 1-2.30 State the functions of epinephrine and norepinephrine and explain their relationship to the sympathetic division of the autonomic nervous system. (C-1)
- 1-2.31 Describe the characteristics of blood and its composition. (C-1)
- 1-2.32 Explain the function of red blood cells, white blood cells and platelets. (C-1)
- 1-2.33 State the importance of blood clotting. (C-1)
- 1-2.34 Describe the location of the heart. (C-1)
- 1-2.35 Describe the function of the pericardium. (C-1)
- 1-2.36 Identify the major vessels and chambers of the heart. (C-1)
- 1-2.37 Identify the valves of the heart, and explain their functions. (C-1)
- 1-2.38 Describe coronary circulation, and explain its purpose. (C-1)
- 1-2.39 Describe the cardiac cycle. (C-1)
- 1-2.40 Explain how heart sounds are created. (C-1)
- 1-2.42 Explain the relationship between stroke volume, heart rate, and cardiac output. (C-1)
- 1-2.43 Explain how the nervous system regulates heart rate and force of contraction. (C-1)
- 1-2.44 Describe the structure of arteries and veins, and relate their structure to function. (C-1)
- 1-2.45 Describe the structure of capillaries, and explain the exchange processes that take place in capillaries.(C-1)
- 1-2.46 Describe the pathway and purpose of pulmonary circulation. (C-1)
- 1-2.47 Describe the pathway and purpose of systemic circulation. (C-1)
- 1-2.48 Define blood pressure. (C-1)
- 1-2.49 Explain the factors that maintain and regulate blood pressure. (C-1)
- 1-2.60 Describe the water compartments and the name for the fluid in each. (C-1)
- 1-2.61 Explain how water moves between compartments. (C-1)
- 1-2.62 Explain the regulation of the intake and output of water. (C-1)

**AFFECTIVE OBJECTIVES**

After the completion of this unit, the EMT-Enhanced student will be able to:

- 1-2.67 Appreciate how anatomy and physiology are the foundation of medicine. (A-2)

**PSYCHOMOTOR OBJECTIVES**

None identified for this unit.



**DECLARATIVE**

- I. Introduction
  - A. Define
    - 1. Anatomy
    - 2. Physiology
    - 3. Pathophysiology
  
- II. Organization of the body
  - A. Cells
  - B. Tissues
  - C. Organs
  - D. Organ systems
    - 1. Integumentary system
    - 2. Skeletal system
    - 3. Muscular system
    - 4. Nervous system
    - 5. Respiratory system
    - 6. Circulatory system
    - 7. Lymphatic system
    - 8. Digestive system
    - 9. Excretory system
    - 10. Endocrine system
    - 11. Reproductive system
  - E. Homeostasis
  - F. Anatomical terminology
    - 1. Descriptive terms for body parts and areas
    - 2. Normal anatomical position
    - 3. Body cavities
      - a. Cranial cavity
      - b. Spinal cavity
      - c. Thoracic cavity
      - d. Abdominal cavity
      - e. Pelvic cavity
    - 4. Body planes
      - a. Frontal/ coronal plane
      - b. Sagittal plane
      - c. Transverse plane
    - 5. Abdominal quadrants
      - a. Right upper (RUQ)
        - (1) Liver
        - (2) Gallbladder
      - b. Left upper (LUQ)
        - (1) Liver
        - (2) Spleen
        - (3) Stomach

- c. Right lower (RLQ)
  - (1) Intestines
- d. Left lower (LLQ)
  - (1) Intestines

~~III. Cells~~

~~IV. Tissues~~

~~V. Integumentary system~~

~~VI. Skeletal system~~

~~VII. The muscular system~~

~~VIII. The nervous system~~

IX. The endocrine system

- A. Regulation of hormonal secretion
- B. Function of hormones
- C. Pancreatic hormones
  - 1. Insulin
  - 2. Glucagon
- D. Adrenal hormones
  - 1. Epinephrine
  - 2. Norepinephrine

X. Blood

- A. Characteristics of blood
  - 1. Amount
  - 2. Color
  - 3. pH
  - 4. Viscosity
- B. Plasma
- C. Blood cells
  - 1. Red blood cells
    - a. Function
    - b. Production and maturation
    - c. Blood types
  - 2. White blood cells
    - a. Functions
  - 3. Platelet
    - a. Site of production
    - b. Function
  - 4. Blood clotting

XI. The heart

- A. Location
- B. Pericardial membranes
  - 1. Parietal pericardium
  - 2. Visceral pericardium/ epicardium

- 3. Serous fluid
  - C. Chambers, vessels, and valves
    - 1. Right atrium
      - a. Vena cavae
        - (1) Superior vena cava
        - (2) Inferior vena cava
      - b. Tricuspid valve
    - 2. Left atrium
      - a. Pulmonary veins
      - b. Mitral valves/ bicuspid
    - 3. Right ventricle
      - a. Pulmonary artery
      - b. Pulmonary semilunar valve
    - 4. Left ventricle
      - a. Aorta
      - b. Aortic semilunar valve
    - 5. Coronary vessels
  - D. The cardiac cycle
    - 1. Systole
    - 2. Diastole
  - E. Heart sounds
    - 1. Point of Maximum Impulse (PMI) , Apical Pulse**
    - 2. S1, S2**
  - ~~F. Cardiac conduction pathway~~
  - G. Cardiac output
    - 1. Heart rate
      - a. Baroreceptor
      - b. Chemoreceptor
    - 2. Stroke volume
      - a. Starling's law of the heart
    - 3. Neural regulation of heart function
      - a. Parasympathetic
      - b. Sympathetic
- XIII. The vascular system
- A. Arteries
  - B. Veins
    - 1. Valves
  - C. Capillaries
  - D. Exchange in the capillaries
    - 1. Gas exchange
    - 2. Fluid exchange
  - E. Pathways of circulation
    - 1. Pulmonary circulation
    - 2. Systemic circulation
  - F. Blood pressure

1. Maintenance of systemic blood pressure
2. Regulation of blood pressure

~~XIII. The lymphatic system and immunity~~  
~~XIV. Respiratory system~~  
~~XV. The digestive system~~

- XVI. Fluids and electrolytes
- A. Water compartments
    1. Intracellular
    2. Extracellular
    3. Interstitial
    4. Intravascular
    5. Extravascular
  - B. Fluid balance
  - C. Electrolytes
    1. Intake
    2. Output
    3. Regulation
  - ~~D. Acid base balance~~

### **UNIT TERMINAL OBJECTIVE**

1-3 At the completion of this unit, the EMT-Enhanced student will be able to understand the basic principles of pharmacology and be able to develop a drug profile for common emergency medications.

### **COGNITIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-3.1 Review the specific anatomy and physiology pertinent to pharmacology. (C-1)
- 1-3.2 Discuss the standardization of drugs. (C-1)
- 1-3.3 Differentiate among the chemical, generic (nonproprietary), and trade (proprietary) names of a drug. (C-3)
- 1-3.4 List the four main sources of drug products. (C-1)
- 1-3.5 Describe how drugs are classified. (C-1)
- 1-3.6 List the authoritative sources for drug information. (C-1)
- 1-3.7 Discuss special consideration in drug treatment with regard to pregnant, pediatric and geriatric patients. (C-1)
- 1-3.8 Discuss the EMT-Enhanced's responsibilities and scope of management pertinent to the administration of medications. (C-1)
- 1-3.9 List and describe general properties of drugs. (C-1)
- 1-3.10 List and describe liquid, solid, and gas drug forms. (C-1)
- 1-3.11 List and differentiate routes of drug administration. (C-3)
- 1-3.12 Differentiate between enteral and parenteral routes of drug administration. (C-3)
- 1-3.13 Describe mechanisms of drug action. (C-1)
- 1-3.14 List and differentiate the phases of drug activity, including the pharmaceutical, pharmacokinetic, and pharmacodynamic phases. (C-3)
- 1-3.15 Describe pharmacokinetics, pharmacodynamics, theories of drug action, drug-response relationship, factors altering drug responses, predictable drug responses, iatrogenic drug responses, and unpredictable adverse drug responses. (C-1)
- 1-3.16 Discuss considerations for storing drugs. (C-1)
- 1-3.17 List the components of a drug profile. (C-1)
- 1-3.18 List and describe drugs which the EMT-Enhanced may administer in a pharmacological management plan according to local protocol. (C-1)
- 1-3.19 Discuss procedures and measures to ensure security of controlled substances the EMT-Enhanced may administer. (C-1)

### **AFFECTIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-3.20 Defend medication administration by an EMT-Enhanced to effect positive therapeutic affect. (A-3)

### **PSYCHOMOTOR OBJECTIVES**

None identified for this unit.

## DECLARATIVE

- 1) Names of drugs
  - a) Drugs - chemical agents used in the diagnosis, treatment, or prevention of disease
  - b) Pharmacology - the study of drugs and their actions on the body
  - c) Chemical name - a precise description of the drug's chemical composition and molecular structure
  - d) Generic name or non-proprietary name
    - i) Official name approved by the FDA
    - ii) Usually suggested by the first manufacturer
  - e) Trade or proprietary name - the brand name registered to a specific manufacturer or owner
  - f) Official name - the name assigned by USP
  
- 2) Sources of drugs
  - a) Plants
    - i) Alkaloids
    - ii) Glycosides
    - iii) Gums
    - iv) Oils
  - b) Animals and humans
  - c) Minerals or mineral products
  - d) Chemical substances made in the laboratory
  
- 3) Drug classification
  - a) By body system
  - b) Class of agent
  - c) Mechanism of action
  
- 4) Sources of drug information
  - a) AMA Drug Evaluation
  - b) Physician's Desk Reference (PDR)
  - c) Hospital Formulary (HF)
  - d) Drug inserts
  - e) Other texts, sources
  
- 5) Standardization of drugs
  - a) Standardization is a necessity
  - b) Techniques for measuring a drug's strength and purity
    - i) Assay
    - ii) Bioassay
  - c) The United States Pharmacopeia (USP)
    - i) Official volumes of drug standards
  - d) Other reference books and guides
  
- 6) Special considerations in drug therapy
  - a) Pregnant patients
    - i) Before using any drug during pregnancy, the expected benefits should be considered against the possible risks to the fetus
    - ii) The FDA has established a scale (Categories A, B, C, D, and X) to indicate drugs that may have documented problems in animals and/ or humans during pregnancy
    - iii) Many drugs are unknown to cause problems in animals and/ or humans during pregnancy
    - iv) Pregnancy causes a number of anatomical and physiological changes
    - v) Drugs may cross the placenta or through lactation

- b) Pediatric patients
    - i) Based on the child's weight or body surface area
    - ii) Special concerns for neonates
    - iii) Length-based resuscitation tape
  - c) Geriatric patients
    - i) The physiological effects of aging can lead to altered pharmacodynamics and pharmacokinetics
- 7) The scope of management
- a) EMT-Enhanced are held responsible for safe and therapeutically effective drug administration
  - b) EMT-Enhanced are personally responsible - legally, morally, and ethically - for each drug they administer
  - c) EMT-Enhanced
    - i) Use correct precautions and techniques
    - ii) Observe and document the effects of drugs
    - iii) Keep their knowledge base current to changes and trends in pharmacology
    - iv) Establish and maintain professional relationships
    - v) Understand pharmacology
    - vi) Perform evaluation to identify drug indications and contraindications
    - vii) Seek drug reference literature
    - viii) Take a drug history from their patients including
      - (1) Prescribed medications
        - (a) Name
        - (b) Strength
        - (c) Daily dosage
      - (2) Over-the-counter medications
      - (3) Vitamins
      - (4) Drug reactions
    - ix) Consult with medical direction
- 8) Nervous system components
- a) Central nervous system
  - b) Peripheral nervous system
    - i) Peripheral nervous system characteristics
  - c) Somatic system
  - d) Autonomic nervous system (ANS)
    - i) Autonomic nervous system characteristics
      - (1) Parasympathetic and sympathetic characteristics
      - (2) Autonomic antagonists
      - (3) Physiological antagonism between sympathetic and parasympathetic discharge - organ responses
  - e) Sympathetic branch of ANS
  - f) Parasympathetic branch of ANS
  - g) Direction of sympathetic influences
  - h) Altering neurotransmission with drugs
    - i) Modification of chemical transmission by drugs
  - i) Receptor location and selective drug action
    - i) Autonomic neurotransmitters
    - ii) Acetylcholine (cholinergic) receptor locations
    - iii) Norepinephrine (adrenergic) receptor locations
  - j) Biological model systems and receptor characterization
  - k) Receptor structure

- l)        Synaptic control mechanisms
  
- 9)        General properties of drugs
  - a)        Drugs do not confer any new functions on a tissue or organ in the body, they only modify existing functions
  - b)        Drugs in general exert multiple actions rather than a single effect
  - c)        Drug action results from a physiochemical interaction between the drug and a functionally important molecule in the body
  - d)        Drugs that interact with a receptor to stimulate a response are known as agonists
  - e)        Drugs that attach to a receptor but do not stimulate a response are called antagonists
  - f)        Drugs that interact with a receptor to stimulate a response, but inhibit other responses are called partial agonists
  - g)        Once administered, drugs go through four stages
    - i)        Absorption
    - ii)       Distribution
    - iii)      Metabolism
    - iv)      Excretion
  
- 10)      Drug forms
  - a)        Liquid drugs
    - i)        Solutions
    - ii)      Tinctures
    - iii)     Suspensions
    - iv)      Spirits
    - v)       Emulsions
    - vi)     Elixirs
    - vii)    Syrups
  - b)        Solid drug forms
    - i)        Pills
    - ii)      Powders
    - iii)     Tablets
    - iv)      Suppositories
    - v)       Capsules
  - c)        Gas forms
  
- 11)      Overview of the routes of drug administration
  - a)        The mode of drug administration affects the rate at which onset of action occurs and may affect the therapeutic response that results
  - b)        The choice of the route of administration is crucial in determining the suitability of a drug
  - c)        Drugs are given for either their local or systemic effects
  - d)        The routes of drug administration are categorized as
    - i)        Drugs administered by the inhalation route
      - (1)      Nebulized medications
    - ii)      Enteral (drugs administered along any portion of the gastrointestinal tract)
      - (1)      Sublingual
      - (2)      Buccal
      - (3)      Oral
      - (4)      Rectal
      - (5)      Nasogastric
    - iii)     Parenteral (any medication route other than the alimentary canal)
      - (1)      Subcutaneous
      - (2)      Intramuscular



- (3) Intravenous
  - (4) Intrathecal
  - (5) Pulmonary
  - (6) Intralingual
  - (7) Intradermal
  - (8) Transdermal
  - (9) Umbilical
  - (10) Intraosseous
  - (11) Nasal
  - iv) Endotracheal
- 12) Mechanisms of drug action
- a) To produce optimal desired or therapeutic effects, a drug must reach appropriate concentrations at its site of action
  - b) Molecules of the chemical compound must proceed from point of entry into the body to the tissues with which they react
  - c) The magnitude of the response depends on the dosage and the time course of the drug in the body
  - d) Concentration of the drug at its site of action is influenced by various processes, which are divided into three phases of drug activity
    - i) Pharmaceutical
      - (1) Disintegration of dosage form
      - (2) Dissolution of drug
    - ii) Pharmacokinetic
      - (1) Absorption
      - (2) Distribution
      - (3) Metabolism
      - (4) Excretion
    - iii) Pharmacodynamic
      - (1) Drug-receptor interaction
- 13) Pharmacokinetics
- a) Passive transport
  - b) Active transport
  - c) Absorption
    - i) Variables that affect drug absorption
      - (1) Nature of the absorbing surface
      - (2) Blood flow to the site of administration
      - (3) Solubility of the drug
      - (4) pH
      - (5) Drug concentration
      - (6) Dosage form
      - (7) Routes of drug administration
      - (8) Bioavailability
    - ii) Mechanisms involved in absorption
      - (1) Diffusion
      - (2) Osmosis
      - (3) Filtration
  - d) Distribution
    - i) Drug reservoirs
      - (1) Plasma protein binding
      - (2) Tissue binding

- ii) Barriers to drug distribution
    - (1) Blood-brain barrier
    - (2) Placental barrier
  - e) Biotransformation
    - i) Active metabolites
    - ii) Inactive metabolites
  - f) Excretion
    - i) Organs of excretion
      - (1) Kidneys
      - (2) Intestine
      - (3) Lungs
      - (4) Sweat and salivary glands
      - (5) Mammary glands
- 14) Pharmacodynamics
- a) Theories of drug action - most drugs produce their effects by one of the following ways
    - i) Drug-receptor interaction
      - (1) Agonists
      - (2) Antagonists
      - (3) Affinity
      - (4) Efficacy
      - (5) Types of receptors
        - (a) Beta
        - (b) Alpha
        - (c) Dopaminergic
        - (d) Others
    - ii) Nonspecific drug interaction
  - b) Drug-response relationship
    - i) Plasma level profile of a drug
    - ii) Biologic half-life
    - iii) Therapeutic threshold or minimum effective concentration
    - iv) Therapeutic index
  - c) Factors altering drug responses
    - i) Age
    - ii) Body mass
    - iii) Sex
    - iv) Environmental milieu
    - v) Time of administration
    - vi) Pathologic state
    - vii) Genetic factors
    - viii) Psychologic factors
  - d) Predictable responses
    - i) Desired action
    - ii) Side effects
  - e) Iatrogenic responses
  - f) Unpredictable adverse responses
    - i) Drug allergy (medications frequently implicated in allergic reactions)
    - ii) Anaphylactic reaction
    - iii) Delayed reaction ("serum sickness")
    - iv) Hypersensitivity
    - v) Idiosyncrasy
    - vi) Tolerance

- vii) Cross tolerance
  - viii) Cumulative effect
  - ix) Drug dependence
  - x) Drug interaction
  - xi) Drug antagonism
  - xii) Summation (addition or additive effect)
  - xiii) Synergism
  - xiv) Potentiation
  - xv) Interference
- 15) Drug interactions
- a) Variables influencing drug interaction include
    - i) Intestinal absorption
    - ii) Competition for plasma protein binding
    - iii) Drug metabolism or biotransformation
    - iv) Action at the receptor site
    - v) Renal excretion
    - vi) Alteration of electrolyte balance
  - b) Drug-drug interactions
  - c) Other drug interactions
    - i) Drug-induced malabsorption of foods and nutrients
    - ii) Food-induced malabsorption of drugs
    - iii) Alteration of enzymes
    - iv) Alcohol consumption
    - v) Cigarette smoking
    - vi) Food-initiated alteration of drug excretion
  - d) Drug incompatibilities - occur when drugs are mixed before administration
- 16) Drug storage
- a) Certain precepts should guide the manner in which drugs are secured, stored, distributed, and accounted for
  - b) Refer to local protocol
  - c) Drug potency can be affected by
    - i) Temperature
    - ii) Light
    - iii) Moisture
    - iv) Shelf life
  - d) Applies also to diluents
- 17) Security of controlled substances
- a) Procedures and measures to ensure the security of controlled substances
  - b) Local protocols, requirements, and documentation
- 18) Components of a drug profile
- a) Drug names
  - b) Classification
  - c) Mechanisms of action
  - d) Indications
  - e) Pharmacokinetics
  - f) Side/ adverse effects
  - g) Routes of administration
  - h) How supplied

- i) Dosages
  - j) Contraindications
  - k) Considerations for pediatric patients, geriatric patients, pregnant patients, and other special patient groups
  - l) Other profile components
- 19) Drugs used in pharmacological management plans (drugs appear in generic name)
- a) Acetylsalicylic acid
    - i) Drug names
    - ii) Classification
    - iii) Mechanism of actions
    - iv) Pharmacokinetics
    - v) Indications
    - vi) Contraindications
    - vii) Side/ adverse effects
    - viii) Routes of administration
    - ix) How supplied
    - x) Dosages
    - xi) Special considerations
  - ~~b) Adenosine~~
  - ~~c) Atropine sulfate~~
  - d) Bronchodilators (Beta 2 agonists)
    - i) Suggested commonly administered medications
      - (1) Albuterol
      - (2) Ipratropium
      - (3) Isoetharine
      - (4) Metaproterenol
      - (5) Salmeterol
      - (6) Terbutaline
      - (7) Triamcinolone
      - (8) Others
    - ii) Commonly administered adjunctive medications to bronchodilator therapy
      - (1) Dexamethasone
      - (2) Methylprednisolone
      - (3) Others
    - iii) Classification
    - iv) Mechanism of actions
    - v) Pharmacokinetics
    - vi) Indications
    - vii) Contraindications
    - viii) Side/ adverse effects
    - ix) Routes of administration
    - x) How supplied
    - xi) Dosages
    - xii) Special considerations
  - e) 50% dextrose
    - i) Drug names
    - ii) Classification
    - iii) Mechanism of actions
    - iv) Pharmacokinetics
    - v) Indications
    - vi) Contraindications

- vii) Side/ adverse effects
- viii) Routes of administration
- ix) How supplied
- x) Dosages
- xi) Special considerations
- f) ~~Diazepam~~
- g) Epinephrine (1:1000)
  - i) Drug names
  - ii) Classification
  - iii) Mechanism of actions
  - iv) Pharmacokinetics
  - v) Indications
  - vi) Contraindications
  - vii) Side/ adverse effects
  - viii) Routes of administration
  - ix) How supplied (**Vial, Epi-pen, Ana-Kit**)
  - x) Dosages
  - xi) Special considerations
- h) ~~Epinephrine (1:10,000)~~
- i) ~~Furosemide~~
- j) ~~Lidocaine HCl 2%~~
- k) ~~Morphine sulfate~~
- l) Naloxone
  - i) Drug names
  - ii) Classification
  - iii) Mechanism of actions
  - iv) Pharmacokinetics
  - v) Indications
  - vi) Contraindications
  - vii) Side/ adverse effects
  - viii) Routes of administration
  - ix) How supplied
  - x) Dosages
  - xi) Special considerations
- m) Nitroglycerin
  - i) Drug names
  - ii) Classification
  - iii) Mechanism of actions
  - iv) Pharmacokinetics
  - v) Indications
  - vi) Contraindications
  - vii) Side/ adverse effects
  - viii) Routes of administration
  - ix) How supplied
  - x) Dosages
  - xi) Special considerations

20) Other medications used under local jurisdiction

**A. Diphenhydramine (Benedryl)**

**B. Glucagon**

**UNIT TERMINAL OBJECTIVE**

- 1-4 At the completion of this unit, the EMT-Enhanced student will be able to safely and precisely access the venous circulation and administer medications.

**COGNITIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-4.1 Review the specific anatomy and physiology pertinent to medication administration. (C-1)
- 1-4.2 Review mathematical principles. (C-1)
- 1-4.3 Review mathematical equivalents. (C-1)
- 1-4.5 Discuss formulas as a basis for performing drug calculations. (C-1)
- 1-4.6 Calculate oral and parenteral drug dosages for all emergency medications administered to adults, infants and children. (C-2)
- 1-4.7 Calculate intravenous infusion rates for adults, infants, and children. (C-2)
- 1-4.8 Discuss legal aspects affecting medication administration. (C-1)
- 1-4.9 Discuss the "six rights" of drug administration and correlate these with the principles of medication administration. (C-1)
- 1-4.10 Discuss medical asepsis and the differences between clean and sterile techniques. (C-1)
- 1-4.11 Describe use of antiseptics and disinfectants. (C-1)
- 1-4.12 Describe the use of universal precautions and body substance isolation (BSI) procedures when administering a medication. (C-1)
- 1-4.13 Describe the indications, equipment needed, techniques utilized, precautions, and general principles of peripheral venous cannulation. (C-1)
- 1-4.15 Describe the indications, equipment needed, techniques utilized, precautions, and general principles of administering medications by the inhalation route. (C-3)
- 1-4.16 Differentiate among the different dosage forms of oral medications. (C-3)
- 1-4.17 Describe the equipment needed and general principles of administering oral medications. (C-3)
- 1-4.19 Differentiate among the different parenteral routes of medication administration. (C-3)
- 1-4.20 Describe the equipment needed, techniques utilized, complications, and general principles for the preparation and administration of parenteral medications. (C-1)
- 1-4.21 Differentiate among the different percutaneous routes of medication administration. (C-3)
- 1-4.23 Describe disposal of contaminated items and sharps. (C-1)
- 1-4.24 Synthesize a pharmacologic management plan including medication administration. (C-3)
- 1-4.25 Integrate pathophysiological principles of medication administration with patient management. (C-3)

**AFFECTIVE OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-4.26 Comply with EMT-Enhanced standards of medication administration. (A-1)
- 1-4.27 Comply with universal precautions and body substance isolation (BSI). (A-1)
- 1-4.28 Defend a pharmacologic management plan for medication administration. (A-3)
- 1-4.29 Serve as a model for medical asepsis. (A-3)
- 1-4.30 Serve as a model for advocacy while performing medication administration. (A-3)
- 1-4.31 Serve as a model for disposing of contaminated items and sharps. (A-3)

**PSYCHOMOTOR OBJECTIVES**

At the completion of this unit, the EMT-Enhanced student will be able to:

- 1-4.32 Use universal precautions and body substance isolation (BSI) procedures during medication administration. (P-2)
- 1-4.33 Demonstrate cannulation of peripheral veins. (P-2)
- 1-4.35 Demonstrate clean technique during medication administration. (P-3)

- 1-4.36 Demonstrate administration of medications by the inhalation route. (P-2)
- 1-4.37 Demonstrate administration of oral medications. (P-2)
- 1-4.39 Demonstrate preparation and administration of parenteral medications. (P-2)
- 1-4.41 Perfect disposal of contaminated items and sharps. (P-3)

**DECLARATIVE**

- I. Review of mathematical principles
  - A. Multiplication and division
  - B. Roman numerals
  - C. Fractions
  - D. Decimal fractions
  - E. Proportions
  - F. Percent
  
- II. Mathematical equivalents used in pharmacology
  - A. The metric system
  - B. Fahrenheit scale for temperature reading
  - C. Celsius (centigrade) scale for temperature reading
  
- III. Calculating drug dosages
  - A. Calculation methods {Select appropriate method for program use}
    - 1. Fraction method
    - 2. Ratio method
    - 3. Desired dose over available concentration method
  - B. Calculating dosages
    - 1. Oral medications
      - a. Capsules and tablets
      - b. Liquids
    - 2. Parenteral medications
      - a. Quantity (typically weight)
      - b. Volume
      - c. Units (i.e. insulin)
    - 3. Intravenous infusions
      - a. Flow rates
      - b. Flow rates for infants and children
    - 4. Calculating dosages for infants and children
      - a. Body weight
      - b. Use of tables, charts, and other adjuncts
      - c. Length-based resuscitation tapes
  
- IV. Medical direction
  - A. Medication administration is bound by the EMT-Enhanced's on-line or off-line medical direction
  - B. Role of the medical director
  - C. Patient management protocols
    - 1. Written standing orders
  - D. Legal considerations - policies and procedures which specify regulations of medication administration
  
- V. Principles of medication administration
  - A. Local drug distribution system - policies which establish stocking and supply of drugs
  - B. EMT-Enhanced's responsibility associated with the drug order
    - 1. Verification of the drug order
  - C. The "six rights" of medication administration
    - 1. "Right" patient
    - 2. "Right" drug
    - 3. "Right" dose
    - 4. "Right" route



5. "Right" time
  6. "Right" documentation
- VI. Medical asepsis
- A. Clean technique versus sterile technique
  - B. Sterilization
  - C. Antiseptics
  - D. Disinfectants
- VII. Universal precautions and body substance isolation (BSI) in medication administration
- VIII. Venous access
- A. Peripheral intravenous cannulation
    1. General principles
    2. Indications
    3. Precautions
    4. Equipment
    5. Technique
      - a. Extremity
        - (1) Indications
        - (2) Precautions
        - (3) Equipment
        - (4) Procedure
      - b. ~~External jugular~~
  - B. ~~Intraosseous needle placement and infusion~~
- IX. Medications administered by the inhalation route
- A. Bronchodilator (beta agonist) medications
    1. Other medications
  - B. Equipment
    1. Oxygen or compressed air source
    2. Small volume nebulizer (SVN)
      - a. Other inhaler equipment
      - b. Other adapter equipment
      - c. Modified inhaler equipment
  - C. Administering medications by the inhalation route
    1. Indications
    2. Techniques
    3. Precautions
    4. General principles for administering medications by the inhalation route
- X. Enteral medication administration
- A. Oral administration of medications
    1. Dosage forms of solid-form and liquid-form oral medications
      - a. Capsules
      - b. Time-released capsules
      - c. Lozenges
      - d. Pills
      - e. Tablets
      - f. Elixirs
      - g. Emulsions

- h. Suspensions
      - i. Syrups
    - 2. Equipment
      - a. Souffle cup (**paper**)
      - b. Medicine cup (**graduated**)
      - c. Medicine dropper
      - d. Teaspoons
      - e. Oral syringes
      - f. Nipples
    - 3. General principles for administration of solid-form and liquid-form oral medications
  - ~~B. Rectal administration of medications~~
- XI. Parenteral administration of medications
  - A. Parenteral routes used by EMT-Enhanced
    - 1. Subcutaneous
    - 2. Intramuscular
    - 3. Intravenous bolus
    - ~~4. Intraosseous~~
    - 5. Sublingual
  - B. Reasons for parenteral administration of medications
  - C. Equipment used in parenteral administration of medications
    - 1. Syringes
      - a. Calibration of the syringe
      - b. Prefilled syringes
    - 2. Needles
      - a. Parts of the needle
    - 3. Selection of the syringe and needle
    - 4. Packaging of syringes and needles
    - 5. Packaging of parenteral medications
      - a. Ampules
      - b. Vials
      - c. Prefilled syringes
      - d. Other
    - 6. Intravenous (IV) administration sets
      - a. Various types
      - b. Macrodrip chamber-type
      - c. Microdrip chamber-type
      - d. Variety of extensions and other pieces of equipment
      - e. Some IV administration sets are manufacturer specific
    - 7. Intravenous (IV) solutions
      - a. Types of containers
      - b. Variety of volumes
    - 8. Volume control intravenous set (**Demonstration or informational only**)
      - a. Various brands
  - D. Preparation of parenteral medication
    - 1. Equipment needed for preparing a parenteral medication
    - 2. Standard procedures for preparing all parenteral medications
    - 3. Guidelines for preparing medications
      - a. Prefilled syringes
      - b. To prepare a medication from an ampule
      - c. Removal of a volume of liquid from a vial
      - ~~d. Preparing a drug from a mix-o-vial~~

- 
- E. Administration of medication by the subcutaneous route
1. Subcutaneous route - injections are made into the loose connective tissue between the dermis and muscle layer
  2. Equipment needed for administration of a medication by the subcutaneous route
  3. Locate anatomical sites
    - a. Upper arms
    - b. Anterior thighs
    - c. Abdomen
    - d. Sublingual injection
  4. Technique for administration of medication by the subcutaneous route
  5. Precautions
- F. Administration of medication by the intramuscular route
1. Intramuscular route - injections are made by penetrating a needle through the dermis and subcutaneous tissue into the muscle layer
  2. Equipment needed for administration of a medication by the intramuscular route
  3. Locate anatomical sites for adults and children
    - a. Vastus lateralis muscle
    - b. Rectus femoris muscle
    - c. Gluteal area
    - d. Deltoid muscle
  4. Technique for administration of medication by the intramuscular route
  5. Precautions
- G. Administration of medication by intravenous bolus
1. Intravenous route
    - a. Places the drug directly into the bloodstream
    - b. Bypasses all barriers to drug absorption
  2. Drugs are administered by direct injection with a needle and syringe into an established peripheral IV line
  3. Dosage forms for IV administration
  4. General principles of IV medication administration
  5. Steps in performing administration of medications into an established IV line
  6. Steps in performing administration of medication by a heparin/saline lock
  7. Steps in changing to the next container of IV solution
  8. ~~Steps in administering medication by a venous access device~~
  9. Complications
    - a. Phlebitis or infection
    - b. Extravasation
    - c. Air in tubing
    - d. Circulatory overload and pulmonary edema
    - e. Allergic reaction
    - f. Pulmonary embolism
    - g. Failure to infuse properly
- H. ~~Administration of medication by the intraosseous route~~
- I. Administering medications by the sublingual route
1. Places where medications are commonly applied
    - a. Under the tongue (sublingual)
    - b. Against the cheek (buccal)
    - c. Dosage forms
      - (1) Tablets
      - (2) Liquid/Spray

XII. ~~Obtaining a blood sample~~

XIII. Disposal of contaminated items and sharps

A. Follow local protocol for disposal of contaminated items and sharps