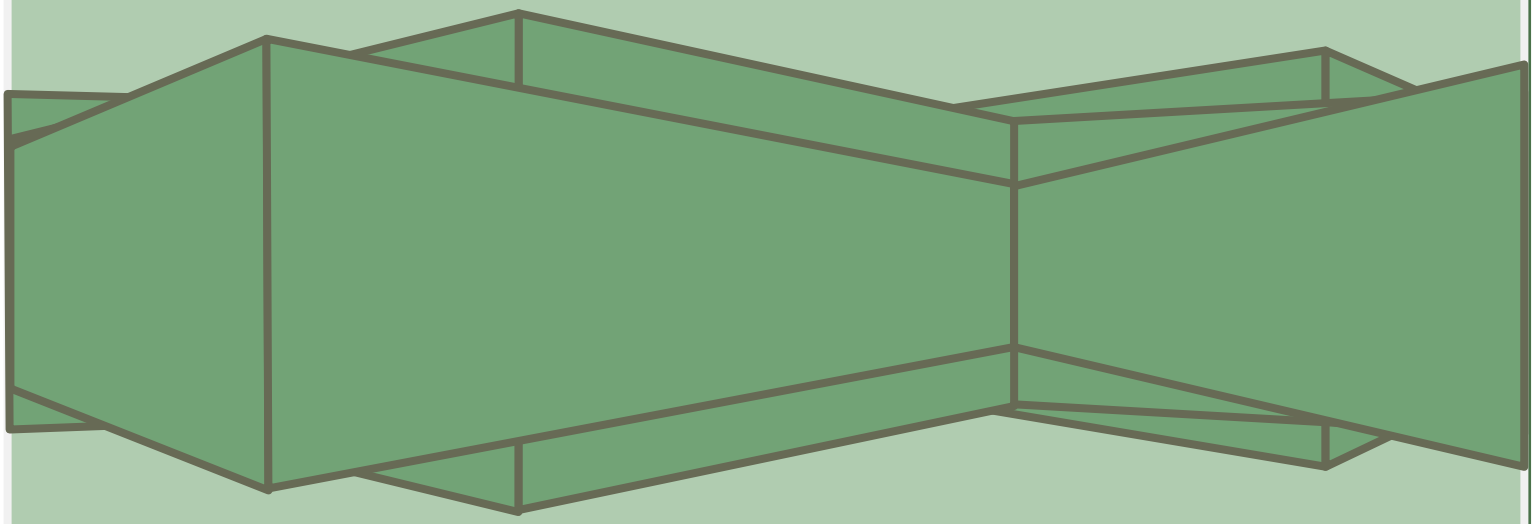
Wisconsin Standardized Advanced EMT Curriculum

December 2011

Wisconsin Department of Health Services



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2011 – Wisconsin Advanced EMT Curriculum

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0.0 – Introduction

0.1 – Wisconsin Advanced EMT Program Outcomes

Upon successful completion of a Wisconsin Advanced EMT program, the student should be able to:

1. Prepare for incident response and EMS operations.
2. Integrate pathophysiological principles and assessment findings for a variety of patient encounters.
3. Demonstrate Advanced EMT skills associated with established standards and procedures for a variety of patient encounters.
4. Communicate effectively with others.
5. Demonstrate professional behavior.
6. Meet state and national competency requirements for Advanced EMT credentialing.

0.2 – Curriculum Background and EMS Training Center Adaptation

The Wisconsin 2011 Advanced EMT Curriculum was adapted from the January 2009 "National Emergency Medical Services Education Standards – Advanced EMT Instructional Guidelines" as published by the National Highway Traffic Safety Administration, under the United States Department of Transportation.

It is recognized that the educational standards included as a part of this curriculum are not all-inclusive and additional content may be added at the discretion of the EMS Training Center to meet local needs or requirements.

Objectives are divided into Cognitive, Psychomotor, and Affective domains, denoted by a C, P, and A, respectively, before the objective number.

0.3 – Program Prerequisites / Presumption of Prerequisite Education

The objectives and educational standards contained herein are designed specifically for initial Advanced EMT training. To participate in such training, the student must already have completed an Emergency Medical Technician course. The presumption is that the student has previously met all objectives at the Emergency Medical Technician level. As a result, to alleviate redundancy, competencies previously covered within the Emergency Medical Technician course are typically not incorporated into this curriculum. (Stated another way, the objectives and educational standards within this Advanced EMT curriculum are considered "over and above" those previously instilled through a state-approved Emergency Medical Technician course.)

If prerequisite knowledge remediation is required or questions arise with regard to the objectives or educational standards covered within the Emergency Medication Technician course, Advanced EMT instructors should reference the Wisconsin Emergency Medical Technician Curriculum.

0.4 – Wisconsin 2011 Advanced EMT Curriculum Committee Members

Advanced EMT Committee Members (Alphabetical)
Rick Anderson (Mid State Technical College)
Michelle Bourget (Waukesha County Technical College)
Courtney Carlson (Waukesha Country Technical College)
Mike Forrester (Western Technical College)
Charles Happel (DHS)
Frederick T. Hornby II (DHS)
Gary Leyer (Gateway Technical College)
Kristina Jordan (Blackhawk Technical College)
Mary Pilling (retired from Mid-State Technical College)

0.5 – Course Structure and Topical Hour Guidelines

While the curriculum contained within this document is structured as provided in the Educational Standards, the following topic progression and associated hours are recommended:

Topic	Didactic	Laboratory	Total
Preparatory			
EMS Systems Research Workforce Safety and Wellness Documentation EMS Communication System Therapeutic Communication Medical/Legal Issues Medical Terminology Public Health	12	0	12
A & P and Pathyophys			
Anatomy and Physiology	4	0	4
Pathophysiology	4	0	4
Life Span Development	2	0	2
Pharmacology			
Principles of Pharmacology Medication Administration Emergency Medications	8	12	20
Patient Assessment			
Scene Survey Primary Assessment History Taking Secondary Assessment Monitoring Devices Reassessment	0	4	4
Medicine			
Respiratory Airway Management, Respiration, Art Vent	6	6	12
Cardiovascular Hematology	4	4	8
Neurology Endocrine Disorders Toxicology Psychiatric	4	4	8

Topic	Didactic	Laboratory	Total
Abdominal and Gastrointestinal Disorders Genitourinary/Renal	2	2	4
Immunology	2	2	4
Infectious Disease Non-Traumatic Musculoskeletal Disorders Diseases of the Eyes, Ears, Nose and Throat	2	2	4
Shock and Resuscitation			
Shock and Resuscitation	2		2
Trauma			
Trauma Overview Bleeding Chest Trauma Abdominal and Genitourinary Trauma Orthopedic Trauma Soft Tissue Trauma Head, Facial, Neck and Spine Trauma Nervous System Trauma Special Considerations in Trauma Environmental Emergencies Multiple-System Trauma	14	4	18
Special Patient Populations			
Obstetrics/GYN Neonatal Care Pediatrics Geriatrics Patients with Special Challenges	4	4	8
EMS Operations			
Principles of Safely Operating an Ambulance Incident Management EMS Operations Multiple Casualty Incidents Air Medical Vehicle Extrication Hazardous Materials Awareness Mass Casualties (Terrorism and Disaster)	6	0	6
Total Lecture/Lab Hours	**76 hrs**	**44 hrs**	**120 hrs**
Recommended Clinical Hours			**50 hrs**
Total Hour Recommendation			**170 hrs**

0.6 – Clinical and Field Experiences, Minimum Hours and Competency Requirements

Wisconsin recognizes that the focus of Advanced EMT education is to produce safe, competent Advanced EMT providers. Clinical and field experiences are of tremendous importance in ensuring Advanced EMT students become safe field practitioners. With that being said, Wisconsin also recognizes that different students obtain minimal competence in various techniques and skills at different rates. Additionally, accumulating hours in clinical and field experiences does not guarantee an increased number of productive patient contact experiences as the EMS training center cannot proactively generate live patient experiences at its affiliated clinical and field sites.

With that in mind, the following minimum competency guidelines are proposed as a part of this curriculum. So long as an Advanced EMT student successfully completes the Technical Skills Assessment (available through the Wisconsin Technical College System) and is determined to be competent in the competency categories denoted below by a state-approved EMS training center, the number of hours spent in clinical and field experiences is of diminished importance. Therefore no specific minimum hours requirement for clinical and field experiences is mandated within this curriculum.

Clinical and field experiences should count toward the student's competency requirements only after the student demonstrates requisite competence in the didactic and laboratory components pertinent to the respective competency. Training centers may increase the minimum competency guidelines if necessary or desired given local needs.

In instances where "simulation" is denoted, such simulation need only be "low fidelity" (non-scenario based, skills check-off) and any applicable clinical, field, or HPS experiences over and above the minimum stipulated requirements for that category may be used to meet the simulation requirements for that category.

If "HPS" (Human Patient Simulator) is denoted, up to one-half of the listed competency requirement may be obtained through a scenario-based, high fidelity simulation. Before HPS experiences can be used in such fashion, the EMS training center must obtain prior approval by the DHS EMS Section.

EMS Clinical and Field Training - Minimum Competencies/Expectations

	Committee Recommendations for AEMT	
Medication Administration	The student must demonstrate the ability to safely perform all steps of each procedure and properly administer medications using the following routes:	
	IV Bolus	10 Clinical/Field/HPS
	IM/Sub Q	2 Simulation; 3 Clinical/Field/HPS
	Hand Held Nebulizer	1 Clinical/Field/HPS
	Face Mask Nebulizer	1 Simulation
	CPAP** (new addition)	1 Simulation
Venous Access	The student must demonstrate the ability to gain venous access using the following routes:	
	Intravenous	5 Simulation; 15 Clinical/Field/HPS
	Pediatric Intraosseous	3 Simulation
Airway Management	The student must demonstrate the ability to safely perform each of the following airway management procedures:	
	Airway Management	2 Simulation/HPS (1 adult/1 infant)
	Endotracheal Intubation	N/A
Assessment & Treatment Plans	During clinical or field experience, the student must demonstrate the ability to perform a comprehensive assessment and participate in the formulation and implementation of a treatment plan for patients with the following complaints/conditions:	
	Cardiac	2 Clinical/Field/HPS
	Respiratory	2 Clinical/Field/HPS
	Neurological/ALOC	2 Clinical/Field/HPS
	Abdominal/GI/GU	2 Clinical/Field/HPS
	Diabetic	2 Clinical/Field/HPS
	Trauma with ALS Interventions	2 Clinical/Field/HPS
	Trauma (no ALS Interventions required)	
	Pediatric (from above list)	2 Clinical/Field/HPS
Assessment Only	During the clinical or field experiences, the student must demonstrate the ability to perform a comprehensive assessment of patients with the following complaints/conditions:	
	Diabetic	N/A
	Abdominal/GI/GU	N/A
	Obstetric	N/A
	Psychiatric	N/A
	Pediatric (other)	N/A
Field	The student must participate in various roles during actual ambulance service provider responses (at the appropriate level). Simulation is not allowed unless specifically stipulated below.	
	Observation	1 Clinical/Field or HPS/Simulation Team Leader Assessment in each of the areas listed above. (Cardiac, Respiratory, Neuro/ALOC, Abd/GI/GU, Diabetic, Trauma, Pediatric)
	Team Member	
	Team Leader	

Definitions / Guidance:

Affirmative Airway Management

Airway management occurs when a student manages the airway of a patient who is unable to manage or maintain his or her own airway. Manual airway maneuvers, suctioning, insertion of non-visualized advanced airways (i.e., Combitube, King LTS-D), endotracheal intubation, or mechanical respirations via bag-valve-mask, pocket mask, or other approved ventilator device would constitute airway management if, without such interventions, the patient's own respirations would be inadequate or absent. Manual airway positioning or utilizing an oral or nasal airway, in and of itself, does not qualify as affirmative airway management unless accompanied with mechanical ventilatory support. Suctioning a conscious patient when secured to a long board does not constitute airway management. Administering supplemental oxygen, CPAP, or a nebulizer treatment is not considered affirmative airway management.

Cardiac

Cardiac complaints include symptomatic cardiac arrhythmias, pulseless-nonbreathers, and chest pain of suspected cardiac origin. Chest wall pain related to a traumatic injury or event would only be cardiac in nature if the assessment revealed potential injury to the patient's heart (i.e., pericardial tamponade, aortic dissection, etc.).

Respiratory

Respiratory complaints include shortness of breath, dyspnea on exertion, paroxysmal nocturnal dyspnea, COPD, pneumonia, asthma, pleuritic chest pain, or any time the patient's complain involves a respiratory component.

Neurological / ALOC

Neurological complaints include stroke, TIA, seizure, hypoglycemia (if not seeking credit for a diabetic assessment and treatment plan), alcohol intoxication (if there is no underlying psychological issue related to the intoxication), syncope, and acute confusion. A patient suffering from a decreased in their level of consciousness or a specific neurological compliant is a neurological / ALOC patient.

Abdominal / GI / GU

Abdominal / GI / GU complaints include nausea, vomiting, abdominal pain, kidney stones, hematemesis, menaturia, melena, or other abdominal / pelvic complaint not related to pregnancy.

Trauma

A trauma assessment and treatment plan encompasses the patient who was involved in an incident where a traumatic injury was sustained. Regardless of the severity of the traumatic injury, the student should consider the need for ALS interventions such as IV, medications, needle decompression, airway management, cricothyrotomy, or RSI.

Diabetic

A diabetic patient is one with an undiagnosed new onset of hyperglycemia, hypoglycemia, DKA, HHNK, or is a known diabetic suffering from complications related to his or her diabetes.

Obstetric

Obstetric patients are pregnant or perinatal (within one month postpartum) with complaints related to the pregnancy.

Psychiatric

A psychiatric patient suffers from a behavioral emergency, such as depression, suicidal ideation, suicide attempt, drug/alcohol addiction, or any other psychotic event. (A "typical" intoxicated patient does not qualify as a psychiatric patient.)

Pediatric

Pediatric patients are defined as 17 years of age or younger.

Team Leader

To function as and receive credit for being a team leader, the student must demonstrate the ability to perform a comprehensive assessment as well as both formulate and implement an appropriate treatment plan at the Advanced EMT level. The student must request evaluation for team leadership prior to arrival on scene to receive credit for a "Team Leader" patient contact. A student may receive "Team Member" credit if the Team Leader attempt is deemed to be inadequate by the preceptor.

Team Member

"Team Member" credit is awarded for field contacts where the student performs all or some of the Advanced EMT duties on a field patient contact. The expectation is that the student must demonstrate the ability to make patient care decisions based upon all elements gathered to form a general impression of the patient and a working diagnosis upon which to provide treatment. This category applies to the patient who receives an ALS evaluation in which critical thinking skills are utilized to gather, weigh, and synthesize patient information in order to formulate a diagnosis and treatment plan for the patient, even though the patient may be deemed stable for transport by a BLS unit.

Observation

Observation field experiences are designed for students to observe. Students should focus on learning where equipment is stored, what protocols are utilized, and how current-licensed Advanced EMT s perform their duties without the pressure of performing patient care. This also provides time for the preceptor to acquire familiarity with the student.

1.0 – Preparatory

Applies fundamental knowledge of the EMS system, safety/well-being of the AEMT, medical/legal and ethical issues to the provision of emergency care.

1.1 – EMS Systems

Objective	Educational Standard
1.1.1 - Quality Improvement	
C 1.1.1.1 Discusses the process of quality improvement	A. System for Continually Evaluating and Improving Care B. Continuous Quality Improvement (CQI) C. Dynamic Process
1.1.2 - Patient Safety	
C 1.1.2.1 Identify situations affecting patient safety	A. Significant – One of the most Urgent Health Care Challenges B. Incidence – 1. IOM Report "To Err Is Human" 2. Up to 98,000 patients die due to medical errors C. High Risk Activities 1. Hand Off 2. Communication issues 3. Medication issues 4. Airway issues 5. Dropping patients 6. Ambulance crashes 7. Spinal immobilization D. How Errors Happen 1. Skill based failure 2. Rules based failure 3. Knowledge based failure E. Preventing Errors 1. Environmental a. Clear protocols b. Light c. Minimal interruptions d. Organization and packaging of drugs 2. Individual a. Reflection in action b. Constantly question assumptions c. Reflection bias d. Use of decision aids e. Ask for help
1.1.3 - Education	
C 1.1.3.1 Discuss all levels of EMS Training and Licensure	A. Levels of EMS Licensure B. National EMS Education Agenda for the Future: A Systems Approach
1.1.4 - Authorization to Practice	
C 1.1.4.1 Identify agencies responsible for	A. Legislative Decisions on Scope of Practice

certification and licensure. ***C 1.1.4.2 Describe how medical direction of an EMS system works and the AEMT's role in the process.***	B. State EMS Office Oversight C. Medical Oversight 1. Clinical a. Offline protocols b. Online protocols c. Standing orders 2. Quality Improvement 3. Administrative D. Local Credentialing E. Employer Policies and Procedure
1.1.5 - Integration with Other Professionals and Continuity of Care	
C 1.1.5.1 Describe partnerships in healthcare delivery	A. Medical Personnel B. Law Enforcement C. Emergency Management D. Home Healthcare Providers E. Other Responders F. Other Caregivers
1.1.6 - Maintenance of Certification and Licensure	
C 1.1.6.1 Describe the requirements for recertification and licensure as defined in Administrative Rule.	A. Personal Responsibility B. Continuing Education C. Skill Competency Verification D. Criminal Implications E. Fees

AFFECTIVE OBJECTIVES:

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

- Assess personal practices relative to the responsibility for personal safety, the safety of the crew, the patient, and bystanders. (A-3)
- Serve as a role model for others relative to professionalism in EMS. (A-3)
- Value the need to serve as the patient Justify inclusive of those with special needs, alternate life styles and cultural diversity. (A-3)
- Describe the importance of continuing medical education and skills retention. (A-3)
- Assess personal attitudes and demeanor that may distract from professionalism. (A-3)
- Value the role that family dynamics plays in the total care of patients. (A-3)
- 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)

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

1.2 – Research

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
1.2.1 - Data Collection and Evidence Based Decision Making	
C 1.2.1.1 Review the practice of data collection and evidence based decision making as taught at the EMT level.	N/A

AFFECTIVE OBJECTIVES:

- Justify the need for supporting and participating in research efforts aimed at improving EMS systems. (A-3)

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

1.3 – Workforce Safety and Wellness

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
1.3.1 - Standard Safety Precautions	
C 1.3.1.1 Review the Standard Safety Precautions as taught at the EMT level.	N/A
1.3.2 - Personal Protective Equipment	
C 1.3.2.1 Review the equipment available in a variety of adverse situations for self-protection, including body substance isolation steps for protection from airborne and bloodborne pathogens.	N/A
1.3.3 - Stress Management	
C 1.3.3.1 Review the Types of Stress Reactions	N/A
C 1.3.3.2 Review the defense mechanisms and techniques of how to manage stress	N/A
C 1.3.3.3 Recall the stages of the grieving process related to death and dying.	N/A
1.3.4 - Prevention of Work-Related Injuries	
C 1.3.4.1 Review ways to prevent EMS work-related injuries as discussed at the EMT level.	N/A
1.3.5 - Lifting and Moving Patients *C*	
1.3.5.1 Differentiate proper from improper body mechanics for lifting and moving patients in emergency and nonemergency situations as discussed at the EMT level.	N/A
1.3.6 - Disease Transmission	
C 1.3.6.1 Review means of disease transmission and precautions to prevent such transmission.	N/A
1.3.7 - Wellness Principles	
C 1.3.7.1 Recall wellness principles employed to enhance the physical and mental wellbeing of the Advanced EMT as discussed at the EMT level.	N/A

AFFECTIVE OBJECTIVES:

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

- Justify the benefits of working toward the goal of total personal wellness. (A-2)
- Serve as a role model for other EMS providers in regard to a total wellness lifestyle. (A-3)
- Value the need to assess his/her own lifestyle. (A-2)
- Challenge his/herself to each wellness concept in his/her role as an Advanced EMT . (A-3)
- Defend the need to treat each patient as an individual, with respect and dignity. (A-2)
- Improve personal physical well being through achieving and maintaining proper body weight, regular exercise and proper nutrition. (A-3)
- Promote and practice stress management techniques. (A-3)
- Defend the need to respect the emotional needs of dying patients and their families. (A-3)
- Justify and practice the use of personal safety precautions in all scene situations. (A-3)
- Justify and serve as a role model for other EMS providers relative to body substance isolation practices. (A-3)

PSYCHOMOTOR OBJECTIVES

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

- Demonstrate the proper procedures to take for personal protection from disease and other potential exposures. (P-2)

1.4 – Documentation

Objective	Educational Standard
1.4.1 - Principles of Medical Documentation and Report Writing	
C 1.4.1.1 - Identify minimum data to be included on a patient care report.	A. Patient information gathered by the paramedic 1. Chief complaint 2. Initial Assessment 3. Vitals signs 4. Patient demographics B. Administrative information / response information 1. Time incident reported 2. Time unit notified 3. Time of arrival at patient 4. Time unit left scene 5. Time of arrival at destination 6. Time of transfer of care
C 1.4.1.2 - Discuss the functions and uses of the prehospital care report	A. Functions 1. Continuity of care 2. Legal Document 3. Educational 4. Administrative a. Billing b. Service statistics 5. Research 6. Evaluation and continuous quality improvement B. Uses 1. Types a. Traditional written form with check boxes and a section for narrative b. Computerized version where information is filled in by means of an electronic device or over the internet 2. Sections a. Run data b. Patient data c. Check boxes d. Narrative section i. Systems documentation ii. SOAPE format 3. Confidentiality 4. Distribution 5. Health Information Portability and Accountability Act of 1996 C. Falsification Issues D. Correction of errors 1. Errors discovered while the report form is being hand written 2. Errors discovered after a handwritten report form is submitted 3. Errors discovered while/after completing an electronic report

C 1.4.1.3 Discuss considerations for proper documentation of a patient refusal of care and/or transport.	A. Before leaving the scene 1. Document patient's ability to make a rational, informed decision 2. Inform the patient why he should go and what may happen to him if he does not 3. Consult medical direction as directed by local protocol 4. Document any assessment 5. Obtain appropriate witness signature 6. Complete the prehospital care report a. Care patient refused b. Statement that the EMT explained to the patient the possible consequences of failure to accept care, including potential death c. Offer alternative methods of gaining care d. State willingness to return
C1.4.1.4 Discuss state and/or local special reporting requirements, such as for MCIs, exposures, injury/accident.	A. Multiple casualty incidents ("MCI") 1. When there is not enough time to complete the form before the next call, the EMT will need to fill out the report later 2. The local MCI plan should have some means of recording important medical information temporarily 3. The standard for completing the form in an MCI is not the same as for a typical call B. Special situation reports 1. Used to document events that should be reported to local authorities, or to amplify and supplement primary report. 2. Should be submitted in timely manner and should include the names of all agencies, people, and facilities involved 3. The report, and copies if appropriate, should be submitted to the authority described by the protocol 4. Exposure 5. Injury 6. Goal should be to provide a report prior to departing from the hospital 7. The EMT should keep a copy of this transfer report for use as a reference during the primary prehospital care report and should submit the copy with the final prehospital care report.

AFFECTIVE OBJECTIVES:

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

- Justify among peers the relevance and importance of properly completed documentation. (A-3)

- Develop philosophy to resolve the common negative attitudes toward the task of documentation. (A-3)

PSYCHOMOTOR OBJECTIVES:

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

- Demonstrate the completion of a patient care report.

1.5 – EMS System Communication

Objective	Educational Standard
1.5.1 - EMS Communication System	
C 1.5.1.1 – Identify EMS communication system components.	A. Base station B. Mobile radios (transmitter/receivers) 1. Vehicular mounted device 2. Mobile transmitters usually transmit at lower power than base stations (typically 20 to 50 watts) 3. Typical transmission range is 10 to 15 miles over average terrain C. Portable radios (transmitter/receivers) 1. Handheld device 2. Typically have power output of one to five watts, limiting their range D. Repeater/base station E. Digital radio equipment F. Cellular telephones
C 1.5.1.2 – Describe proper radio communications between EMS providers and dispatch.	A. Radio frequencies B. Response to scene 1. The dispatcher needs to be notified that the call was received 2. Dispatch needs to know that the unit is en route C. Arrival at the scene (dispatcher must be notified) D. Depart the scene 1. Dispatcher must be notified 2. Prolonged on scene times with absence of communications E. Arrival at the receiving facility or rendezvous point (dispatcher must be notified) F. Arrival for service after patient transfer (dispatcher must be notified)
1.5.2 - Communicating with Other Health Care Professionals	
C 1.5.2.1 – Explain factors related to effective communications with medical control.	A. Medical control is at the receiving facility; medical control is at a separate site B. Advanced EMT s may need to contact medical control for consultation and to obtain orders for administration of medications C. Advanced EMT s must be accurate D. After receiving an order for a medication or procedure, repeat the order back word-for-word E. Orders that are unclear or appear to be inappropriate should be questioned or clarified for the paramedic
C 1.5.2.2 – Explain the importance of proper communication with receiving facilities.	A. Patient reporting concepts 1. When communicating with medical direction, or the receiving facility, the essential elements of the verbal report should be given in an efficient and effective manner.
C 1.5.2.3 – Describe principles of	A. Radio checks

communication system maintenance.	B. Planning for failures C. Technology and new equipment
C 1.5.2.4 – Identify current and emerging technology used to collect and exchange patient and/or scene information electronically.	Phone/wireless communications
1.5.3 Team Communication and Dynamics	
C 1.5.3.1 – Identify the components of interpersonal communication transmission.	N/A

AFFECTIVE OBJECTIVES:

At the end of this unit, the Advanced EMT student will be able to:

- Value the importance of effective communications with EMS Crew members, other public safety personnel and receiving hospital personnel. (A-2)

PSYCHOMOTOR OBJECTIVES:

At the end of this unit, the Advanced EMT student will be able to:

- Demonstrate how to make a simulated, concise radio transmission with dispatch. (P-1)

1.6 – Therapeutic Communication

Objective	Educational Standard
1.6.1- Principles of Therapeutic Communication	
C 1.6.1.1 – Identify principles of communicating with patients in a manner that achieves a positive relationship.	A. Dealing with difficult patients B. Most patients are more than willing to talk 1. Difficult interviews 2. Techniques to use a. Start the interview in the normal manner b. Attempt to use open-ended questions c. Provide positive feedback d. Make sure the patient understands the questions e. Continue to ask questions 3. Interviewing a hostile patient 4. Hearing impaired patients 5. Patients under the influence of street drugs or alcohol 6. Sexually aggressive patients

AFFECTIVE OBJECTIVES:

At the end of this unit, the Advanced EMT student will be able to:

- Appreciate the special considerations in communicating with geriatric and pediatric patients, hearing impaired patients, visually impaired patients, non-English speaking patients, and other patient presentations. (A-2)

PSYCHOMOTOR OBJECTIVES: None identified for this unit

1.7 – Medical/Legal and Ethics

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
1.7.1 - Consent/Refusal of Care	
C 1.7.1.1 – Define consent to care.	A. Nature of illness B. Treatment recommendations C. Risks and refusals D. Alternatives
C 1.7.1.2 – Review types of consent.	A. Expressed consent B. Informed consent C. Implied consent D. Involuntary consent E. Minors F. Medical restraint and use of force doctrine G. Legal complications related to consent 1. Abandonment 2. False imprisonment 3. Assault 4. Battery
C 1.7.1.3 – Review the considerations for a patient's refusal of care and/or transportation.	A. Patient must be alert and oriented to person, place, and time B. Patient must be informed of the risks of refusing care (e.g., death) C. Patient must be informed if problems return / persist they should call EMS D. Against medical advice
1.7.2 - Confidentiality	
C 1.7.2.1 – Discuss the obligation to protect patient information.	N/A
C 1.7.2.2 – Discuss HIPAA, its provisions, and its applicability/impact on EMS.	N/A
C 1.7.2.3 – Describe privileged communications.	A. Need to know (healthcare providers) B. Education C. Legally mandated 1. Child abuse reported 2. Subpoena D. Third-party billing E. Release of medical information
C 1.7.2.4 – Explain possible repercussions for a breach of confidentiality.	A. Libel B. Slander
A 1.7.2.5 – Demonstrate HIPAA compliance.	N/A
A 1.7.2.6 – Demonstrate confidentiality.	N/A
1.7.3 - Advanced Directives	
C 1.7.3.1 – Recall advanced directives and how they impact patient care.	A. Patient Self-Determination Act 1. Do not resuscitate (DNR) 2. Living wills 3. Durable power of attorney B. (WI) Equivalent provisions

1.7.4 - Tort and Criminal Actions	
C 1.7.4.1 – Describe specific crimes and their associated elements as related to EMS.	A. Breaches of conduct 1. Assault 2. Battery 3. Kidnapping B. Mandatory reporting requirements 1. Abuse and assault 2. Criminality
C 1.7.4.2 – Describe the elements of negligence, possible defenses to a claim, and potential limitations to civil liability.	A. Concept of negligence B. Elements of negligence 1. Duty to act 2. Breach of duty 3. Proximate causation 4. Damages to plaintiff a. Physical (e.g., lost earnings) b. Psychological (e.g., pain and suffering) c. Punitive 5. Defenses a. Good Samaritan b. Governmental immunity c. Statute of limitations d. Contributory/comparative negligence 6. Protection from liability a. Professionalism b. Standard of care c. Liability insurance
1.7.5 - Mandatory Reporting	
C 1.7.5.1 – Identify when Advanced EMT s are legally compelled to notify the authorities.	A. Abuse B. Neglect
C 1.7.5.2 – Recall how reporting requirement arises from special relationship with patient.	
C 1.7.5.3 – Review legal liability for failure to report.	
1.7.6 Ethical Principles/Moral Obligations	
C 1.7.6.1 – Define morals.	Concepts of right and wrong
C 1.7.6.2 – Define ethics.	A. Branch of philosophy B. Study of morality
C 1.7.6.3 – Discuss the application of ethics and the use of ethical values.	N/A
C 1.7.6.4 – Examine ethical conflicts.	A. Futility of care (cardiac arrest in the wilderness) B. Allocation of limited resources (medical rationing), such as use of triage C. Professional misconduct, such as patient abuse D. Economic triage, such as patient-dumping

AFFECTIVE OBJECTIVES:

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

- Justify the need to show respect for the rights and feelings of patients. (A-3)
- Assess his/her personal commitment to protecting patient confidentiality. (A-3)
- Given a scenario involving a new employee, explain the importance of obtaining consent for adults and minors. (A-2)
- Defend the value of advance medical directives. (A-3)
- Value the patient's autonomy in the decision-making process. (A-2)
- Given a scenario, defend or challenge a Advanced EMT's actions concerning a patient who is treated against his/her wishes. (A-3)
- Given a scenario, defend an Advanced EMT's actions in a situation where a physician orders a therapy the Advanced EMT feels to be detrimental to the patient's best interests. (A-3)

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

1.8 – Medical Terminology

Uses foundational anatomical and medical terms and abbreviations in written and oral communication with colleagues and other health care professionals.

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
1.8.1 - Medical Terminology	
C 18.1.1 Explain the impact of utilizing proper medical terminology in both written and oral communications with colleagues and other health care professionals to ensure quality patient care.	A. Importance B. Basic rules and elements C. Wood roots, prefixes, and suffixes D. Literal meanings from medical terms based on word construction E. Define common abbreviations and interpret common symbols F. Body structure G. Body systems

AFFECTIVE OBJECTIVES: None identified for this unit

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

1.9– Public Health

Use simple knowledge of the principles of the role of the EMS during public health emergencies.

Objective	Educational Standard
1.9.1 - Basic Principles of Public Health	
C 1.9.1.1 – Discuss role of public health in our society.	A. Many definitions B. Public health mission and functions C. Public health differs from individual patient care D. Review accomplishments of public health 1. Widespread vaccinations 2. Clean drinking water and sewage systems 3. Declining infectious disease 4. Fluoridated water 5. Reduction in use of tobacco products 6. Prenatal care 7. Others
C 1.9.1.2 – Discuss public health laws, regulations, and guidelines.	N/A
C 1.9.1.3 Examine how EMS interfaces with public health.	A. Health prevention and promotion 1. Primary prevention (preventing disease development) a. Vaccination b. Education 2. Secondary prevention (preventing the complications and/or progression of disease) 3. Health screenings B. Disease surveillance 1. EMS providers are first-line care providers 2. Patient care reports may provide information on epidemics of disease C. Injury prevention 1. Safety equipment 2. Education a. Car seat safety b. Seat belt use c. Helmet use d. Driving under the influence e. Falls f. Fire g. Injury surveillance

AFFECTIVE OBJECTIVES:
At the completion of this unit, the Advanced EMT student will be able to:

- Appreciate the importance of understanding the role of public health resources in the community.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

2. 0 – Anatomy and Physiology

Integrates complex knowledge of the anatomy and physiology of the airway, respiratory and circulatory systems to the practice of EMS.

Instructor Note: *This content can be taught as a separate unit or integrated into the specific content areas.*

2.1 – Anatomy and Physiology

Objective	Educational Standard
2.1.1 – Anatomical Terms	
2.1.2 – Planes and Sections of the Body	
C 2.1.2.1 – Identify the planes and sections of the body.	A. Frontal or coronal plane B. Sagittal plane or lateral plane C. Transverse plane or axial plane
2.1.3 – Anatomical Topography	
C 2.1.3.1 – Identify abdominal quadrants and regions.	A. Right upper quadrant ("RUQ") B. Left upper quadrant ("LUQ") C. Right lower quadrant ("RLQ") D. Left lower quadrant ("LLQ")
2.1.4 – Organ Systems	
C 2.1.4.1 – Distinguish between body organ systems.	A. Skeletal 1. Components a. Skull b. Face c. Vertebral column d. Thorax e. Pelvis f. Upper extremities g. Lower extremities 2. Joints 3. Function B. Muscular 1. Types a. Skeletal b. Smooth c. cardiac 2. Function C. Respiratory System 1. General Function of the respiratory system a. upper respiratory tract b. lower respiratory tract 2. Structure and function of the nasal cavities and pharynx a. Nasal Cavities i. Nose ii. Nasal cavities iii. Nasal septum iv. Nasal mucosa

v. Olfactory receptors
vi. Paranasal sinuses
b. Pharynx
i. Nasopharynx
ii. Soft palate
iii. Oropharynx
iv. laryngopharynx
3. Structure and function of the larynx and the speaking mechanism
a. Voice box
b. Thyroid cartilage
c. Epiglottis
d. Vocal cords
e. glottis
4. Structure and function of the trachea and bronchial tress
a. Trachea
b. Primary bronchi
c. Bronchial Tree
d. Right and left main-stem bronchi
e. Bronchioles
5. Lungs
a. Location and function
b. Pleural membranes
i. Parietal pleura
ii. Visceral pleura
iii. Serous fluid
c. Hilus
6. Structure and function of the alveoli and pulmonary capillaries
7. Mechanism of breathing
a. Mechanical Ventilation
i. Mechanism of inhalation
a) Inspiration
b) Phrenic nerve
c) Intercostals nerves
d) Respiration
e) Ventilation/perfusion disturbance
f) Diaphragm
g) External intercostal muscles
h) Internal intercostal muscles
i) pressures
ii. Changes in air pressure that occur within the thoracic cavity during respiration
a) Atmospheric
b) Intrapleural
c) intrapulmonic
b. Role of the visceral and parietal pleura in respiration
c. Mechanics of exhalation

D. Circulatory
1. Blood
a. Composition and function of blood
b. Composition and function of blood plasma
i. Amount

ii. Color
iii. pH
iv. viscosity
v. plasma

c. Primary hemopoietic tissue
d. Function of red blood cells
e. Red blood cell production in hypoxic state
f. Red blood cell and hemolglobin destruction
g. ABO group and Rh factor blood types
h. Function of white blood cells (leukocytes)
i. Platelets

2. The heart
   a. Location and features of the heart
      i. Mediastinum
      ii. Pericardial membranes
      iii. Fibrous pericardium
      iv. Parietal pericardium
      v. epicardium
   b. Chambers of the heart
      i. Myocardium
      ii. Endocardium
      iii. Right and left atria
      iv. Right and left ventricles
   c. Valves of the heart and their function
      i. Tricuspid valve
      ii. Bicuspid valve (mitral valve)
      iii. Aortic valve
      iv. Pulmonary semilunar valve
   d. Cardiac cycle
   e. Coronary arteries
   f. Major blood vessels
   g. Stroke volume, cardiac output, and Starling's law of the heart
   h. Nervous system regulation of the function of the heart
3. Blood Vessels and Circulation
   a. Structure and function of the blood vessels, arteries, veins and capillaries
   b. Arterial and venous anastomosis
   c. Structure of capillaries
   d. Exchange of gases that occurs at the capillary level
   e. Mechanism that regulate blood flow through arteries, capillaries and veins
   f. Pathway and purpose of the pulmonary circulation
   g. Pathway of the systemic circulation
   h. Pathway and purpose of the hepatic portal circulation
   i. Branches of the aorta and their distributions
   j. Major systemic arteries and the parts of the body they nourish
   k. Major systemic veins and the parts of the body they drain of blood
   l. Hemodynamics

i. Blood pressure
   a) Venous return
   b) Pulse pressure
   c) Peripheral resistance
ii. Factors that maintain systemic blood pressure
   a) Heart rate and force of contraction
   b) Vessel elasticity
   c) Blood viscosity
   d) Hormones
   e) Peripheral resistance
iii. Osmosis
iv. Diffusion
v. Facilitated diffusion
vi. Active transport
vii. Hydrostatic pressure
viii. Oncotic pressure

m. Regulation of blood pressure by the heart and kidneys
n. Medulla and autonomic nervous system regulation of the diameter of the blood vessels
o. Coordination of the cardiac, vasomotor, and respiratory centers to control blood flow through the tissue

E. Nervous System
1. Structural division
   a. Central Nervous System (CNS)
      i. Brain
      ii. Spinal cord
   b. Peripheral Nervous System (PNS)
2. Functional
   a. Autonomic
      i. Sympathetic
      ii. parasympathetic
3. Functions of the nervous system
   a. Consciousness
      i. Cerebral hemispheres
      ii. Reticular activating system (center of consciousness)
   b. Sensory function
   c. Motor function
   d. Fight or flight response

F. Integumentary (skin) System
1. Structures
   a. Epidermis
   b. Dermis
   c. Subcutaneous layer
2. Functions of the skin
   a. Protection
   b. Temperature control

G. Digestive System
1. Structures
   a. Esophagus
   b. Stomach

	c. Intestines d. Liver e. pancreas H. Endocrine System 1. Structures a. Pancreas b. Adrenal Glands i. Epinephrine ii. norepinephrine 2. Function a. Control of blood glucose level b. Stimulate sympathetic nervous system I. Renal System 1. Structures a. Kidneys b. Bladder c. urethra 2. Function a. Blood filtration b. Fluid balance c. Buffer J. Reproductive System 1. Male a. Structures i. Testicles ii. penis b. Functions i. Reproduction ii. Urination iii. hormones 2. Female a. Structures i. Ovaries ii. Fallopian tubes iii. Uterus iv. vagina b. Functions i. Reproduction ii. Hormones
C 2.1.4.2 Understand the fundamental elements of the life support chain	A. Fundamental Elements 1. Oxygenation a. Alveolar/capillary gas exchange b. Cell/capillary gas exchange 2. Perfusion a. Oxygen b. Glucose c. Removal of carbon dioxide and other waste products 3. Cell Environment a. Aerobic metabolism i. High atp (energy) production ii. Byproduct of water and carbon dioxide b. Anaerobic metabolism i. Low atp (energy) production

	ii. Byproduct of lactic acid B. Issues Affecting Fundamental Elements 1. Composition of ambient air 2. Patency of the airway 3. Mechanics of ventilation 4. Regulation of respiration 5. Ventilation/perfusion ratio 6. Transport of gases 7. Blood volume 8. Effectiveness of the heart as a pump 9. Vessel size and resistance (systemic vascular resistance) 10. Effects of acid on cells and organs
C 2.1.4.3 Determine age related variations for pediatrics and geriatrics	A. See special patient populations

AFFECTIVE OBJECTIVES:

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

- Justify the correlation of anatomy and physiology to patient assessment and treatment. (A-2)

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

3.0 – Pathophysiology

Applies comprehensive knowledge of the pathophysiology of respiration and perfusion to patient assessment and management.

3.1 – Pathophysiology

Objective	Educational Standard
3.1.1 – Introduction – Correlation of Pathophysiology with Disease Process	
C 3.1.1.1 – Discuss the correlation of pathophysiology with disease processes.	A. Cells appear similar to multicellular "social" organism B. Cells communicate electrochemically
3.1.2 – Basic Cellular Review	
Describe major classes of cells	
C 3.1.2.1 – Describe chief cellular functions.	A. Differentiation or maturation B. Perform one function or act in concert with other cells to perform a more complex task
C 3.1.2.2 – Describe cellular components, their structures, and functions.	A. Structure and function B. Three main components
3.1.3 – Alterations in Cells and Tissues	
C 3.1.3.1 – Describe the ways in which cellular injury occurs.	A. Hypoxic injury 1. Most common 2. May result from a. Decreased amounts of oxygen b. Loss of hemoglobin or hemoglobin function c. Decreased number of red blood cells d. Respiratory or cardiovascular system disease e. Loss of cytochromes
3.1.4 – The Cellular Environment	
C 3.1.4.1 – Describe the distribution of body fluids.	A. Intracellular fluid ("ICF") B. Extracellular fluid ("ECF") 1. Interstitial fluid 2. Intravascular fluid 3. Other C. Total body water ("TBW")
C 3.1.4.2 – Discuss cell transport mechanisms for maintaining homeostasis.	A. Osmosis B. Diffusion C. Facilitated Diffusion D. Active Transport
C 3.1.4.3 – Describe the acid-base balance within the body.	A. Hydrogen ion and pH B. Buffer systems 1. Carbonic acid-bicarbonate buffering 2. Protein buffering 3. Renal buffering

	4. Other buffers C. Acid-based imbalances 1. Metabolic acidosis i. Pathophysiology ii. Clinical presentation iii. Evaluation and treatment 2. Metabolic alkalosis (rare) i. Pathophysiology ii. Clinical presentation iii. Evaluation and treatment 3. Respiratory acidosis i. Pathophysiology ii. Clinical presentation iii. Evaluation and treatment 4. Respiratory alkalosis i. Pathophysiology ii. Clinical presentation iii. Evaluation and treatment
3.1.5 – Hypoperfusion	
C 3.1.5.1 – Describe the pathogenesis of hypoperfusion.	A. Decreased cardiac output B. Compensatory mechanisms 1. Catecholamine release a. Epinephrine and norepinephrine b. Increase in systemic vascular resistance c. Increased blood volume d. Vasoconstriction e. Increased stroke volume f. Increased heart rate g. Increased preload
C 3.1.5.2 – Differentiate between the types of shock, their pathophysiology, evaluation, and treatment.	A. Cardiogenic shock ***different*** 1. Defined 2. Pathophysiology 3. Evaluation and treatment B. Hypovolemic shock 1. Defined 2. Pathophysiology 3. Evaluation and treatment C. Neurogenic shock 1. Defined 2. Pathophysiology 3. Evaluation and treatment D. Anaphylactic shock 1. Defined 2. Pathophysiology 3. Evaluation and treatment E. Septic shock 1. Defined 2. Pathophysiology 3. Evaluation and treatment
C 3.1.5.3 – Describe the cellular metabolism impairment that occurs as a result of hypoperfusion.	A. Oxygen impairment 1. Anaerobic metabolism 2. Increased lactate 3. Metabolic acidosis 4. Decreased oxygen affinity for hemoglobin

5. Decreased ATP
6. Changes in cellular electrolytes
7. Cellular edema
8. Release of lysosomal enzymes

B. Impaired glucose use

AFFECTIVE OBJECTIVES:

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

- Justify the correlation of pathophysiology to patient assessment findings and treatment. (A-2)

PSYCHOMOTOR OBJECTIVES None identified for this unit.

4.0 – Life Span Development

Applies fundamental knowledge of life span development to patient assessment and management.

Instructor Note: This is a review of the EMT Curriculum

4.1 – Life Span Development

Objective	Educational Standard
4.1.1 – Infancy (Birth to One Year)	
C 4.1.1.1 – Review the physiological and psychosocial characteristics of infants.	A. Physiology B. Weight C. Pulmonary System D. Immune System E. Nervous System F. Growth and Development in infants
4.1.2 – Toddler (12 Months to 36 Months) and Pre-School Age (Three to Five Years)	
C 4.1.1.2 - Review the physiological and psychosocial characteristics of toddlers and pre-school age children.	A. Physiological B. Psychosocial C. Physical Development D. Cognitive Development E. Implications for the Healthcare Provider
4.1.3 – School Age Children (Six to 12 years)	
C 4.1.3.1 - Review the physiological and psychosocial characteristics of school age children.	A. Physiological B. Psychosocial C. Physical Development D. Cognitive Development E. Implications for the Healthcare Provider
4.1.4 – Adolescence (13 to 18 Years)	
C 4.1.4.1 - Review the physiological and psychosocial characteristics of adolescents.	A. Physiological B. Psychosocial C. Physical Development D. Cognitive Development E. Implications for the Healthcare Provider
4.1.5 – Early Adulthood (20 to 40 Years)	
C 4.1.5.1 - Review the physiological and psychosocial characteristics of individuals in early adulthood.	A. Physiological B. Psychosocial
4.1.6 – Middle Adulthood (41 to 60 Years)	
C 4.1.6.1 - Review the physiological and psychosocial characteristics of individuals in middle adulthood.	A. Physiological B. Psychosocial
4.1.7 – Late Adulthood (61+ Years)	
C 4.1.7.1 - Review the physiological and	A. Physiological

psychosocial characteristics of individuals in late adulthood.	B. Psychosocial

AFFECTIVE OBJECTIVES:

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

- Justify for the appropriate interactions for infants and children that conveys an understanding of their developmental stage. (A-3)

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

5.0 – Pharmacology

Applies (to patient assessment and management) fundamental knowledge of the medications carried by AEMTs that may be administered to a patient during an emergency.

5.1 – Principles of Pharmacology

Objective	Educational Standard
5.1.1 – Medication Safety	
C 5.1.1.1 – Describe the importance of medication safety in providing quality EMS care.	N/A
5.1.2 – Medication Legislation	
C 5.1.2.1 – Describe legislative acts controlling drug use and abuse in the United States.	A. Pure Food and Drug Act B. Federal Food, Drug, and Cosmetic Act C. Harrison narcotic Act D. Controlled Substances Act 1. Schedule I 2. Schedule II 3. Schedule III 4. Schedule IV 5. Schedule V E. Drug Enforcement Agency F. Development of Pharmaceuticals 1. Food and Drug Administration approval process 2. Special considerations a. Pregnancy b. Pediatrics c. Geriatrics G. Drug Forms a. Liquids b. Solids c. Gases
5.1.3 – Naming	
C 5.1.3.1 – Differentiate between the chemical, generic (nonproprietary), official (USP), and trade (proprietary) names of a drug.	A. Chemical B. Generic C. Proprietary/Trade D. Official
C 5.1.3.2 – List authoritative sources of drug information.	A. United States Pharmacopeia (“USP”) B. Physician’s Drug Reference (“PDR”) C. Drug Package Inserts D. Drug Handbook
5.1.4 – Classifications	
C 5.1.4.1 – List the classifications of drugs based upon either mechanism of action or the body system affected.	A. Body system B. Class of agent C. Classification by body system 1. Central nervous system a. Autonomic pharmacology i. Cholinergics

- ii. Anticholinergics
- iii. Adrenergics
- iv. Antiadrenergic (alpha and beta)

b. Analgesics
- i. Opiod agonists
- ii. Opiod antagonists
- iii. Non steroidal anti-inflammatory drugs

c. Sedative/hypnotic
- i. Benzodiazepines
- ii. barbituates

d. Anticonvulsants
e. Stimulants

2. Cardiovascular drugs
   a. Anti-dysrhythmia
   b. Cardiac glycosides
   c. Antihypertensives
   d. Antianginal drugs
3. Drugs affecting the blood
   a. Anticoagulants
   b. Fibrinolytics
   c. Antihemophilic agents
   d. Hemostatic agents
   e. Antihyperlipidemic agents
4. Psychiatric medications
5. Respiratory system
   a. Mucolytics
   b. Cholinergic antagonists
   c. Sympathomimetics
   d. Xanthine derivatives
   e. Cough suppressants
   f. Nasal decongestants
   g. Antihistamines
6. Endocrine system
   a. Insulin preparations
   b. Oral hypoglycemic agents
   c. Hyperglycemic agents
7. Herbal preparations
   a. Potential Implications
      - i. Interaction with pharmaceuticals
      - ii. Idiosyncratic reactions
      - iii. Manufacturing error
      - iv. Contamination
      - v. Substitution
   b. Adulteration
      - i. Incorrect preparation
      - ii. Incorrect labeling
8. Over-the-counter medications
   a. Drugs affecting the central nervous system
      - i. Sedatives
      - ii. Stimulants
      - iii. Hallucinogenic (dextromethorophan)
   b. Drugs affecting the respiratory system

	i. Asthma treatment products ii. Cold and allergy products c. Supplements i. Herbs ii. Vitamins iii. Minerals iv. others
5.1.5 – Drug Storage and Security	
C 5.1.5.1 – Discuss considerations for storing and securing medications and controlled substances.	A. Factors affecting Drug Potency 1. Temperature 2. Light 3. Moisture 4. Shelf Life B. Locking and Double Locking of Medications
5.1.6 – Drug Terminology	
C 5.1.6.1 – Define pertinent terms related to EMS utilization and administration of drugs.	A. Antagonism B. Bolus C. Contraindications D. Cumulative action E. Depressant F. Habituation G. Hypersensitivity H. Idiosyncrasy I. Indication J. Potentiation K. Refractory L. Side effects M. Stimulant N. Synergism O. Therapeutic action P. Tolerance Q. Untoward effect
5.1.7 – Pharmacological Concepts *C 5.1.7.1*	
– Discuss the processes of pharmacokinetics and pharmacodynamics.	A. Pharmacokinetics 1. Absorption 2. Distribution 3. Biotransformation 4. Metabolism and excretion – Organs of elimination a. Kidneys b. Intestine c. Lungs d. Exocrine glands B. Pharmacodynamics 1. Mechanism of action a. Drug receptor interaction i. Agonists ii. Antagonists iii. Affinity iv. Efficacy b. Drug enzyme interaction 2. Medication response relationship a. Plasma levels

	b. Biologic half-life c. Therapeutic threshold d. Therapeutic index e. LD 50 f. Factors altering drug response i. Age ii. Gender iii. Body mass index iv. Pathologic state v. Genetic factors vi. Time of administration vii. Psychological factors viii. Predictable responses a) Tolerance b) Cross tolerance ix. Iatrogenic responses x. Drug allergy xi. Anaphylactic reaction xii. Delayed reaction ("serum sickness") xiii. Hypersensitivity xiv. Idiosyncrasy xv. Cumulative effect xvi. Drug dependence xvii. Drug antagonism xviii. Summation (addition or additive effect) xix. Synergism xx. Potentiation xxi. Interference xxii. Toxicity

AFFECTIVE OBJECTIVES:

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

- Defend the safe administration of drugs by an Advanced EMT to affect positive therapeutic effect. (A-3)
- Justify drug education through identification of drug classifications. (A-3)
- Appreciate the predictable and unpredictable responses a drug may create.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

5.2 – Medication Administration

Applies (to patient assessment and management) fundamental knowledge of the medications carried by AEMTs that may be administered to a patient during an emergency.

Objective	Educational Standard
5.2.1 – Routes of Administration	
C 5.2.1.1 – Differentiate between the percutaneous and parenteral routes of medication administration.	A. Alimentary tract 1. Oral 2. Sublingual B. Parenteral 1. Subcutaneous 2. Intramuscular 3. Intravenous 4. Intraosseous 5. Inhalational 6. Intranasal
P.5.2.1.2 – Apply vascular access procedures.	A. Peripheral initiation B. IV solutions 1. D5W 2. Normal Saline (0.9% NaCl) 3. Lactated ringers C. Intraosseous initiation (adult and pediatric) D. Venous blood sampling (optional)
5.2.2 – Administration of Medication to a Patient	
C 5.2.2.1 – Identify the six "rights" of drug administration.	A. Right patient (prescribed to the patient) B. Right medication (patient condition) C. Right route (patient condition) D. Right dose (prescribed to patient) E. Right time (within expiration date) F. Right documentation
P 5.2.2.2 – Demonstrate proficiency in calculating drug dosages.	A. System of weights and measures – Metric system B. Drug calculations 1. Desired dose 2. Concentration on hand 3. Volume on hand C. Calculate 1. Volume-based bolus 2. IV drip rate
C 5.2.2.3 – Explain the proper technique for administering medications via various routes (include advantages and disadvantages associated with each route).	A. Peripheral venous cannulation B. Intraosseus C. Intramuscular (manual) D. Subcutaneous (manual) E. Aerosolized F. Nebulized G. Sublingual H. Intranasal
C 5.2.2.4 – Explain the need for patient reassessment after medication administration.	A. Data (indications for medication) B. Action (Medication administered) C. Response (effect of medication)

C 5.2.2.5 – Describe the need for proper documentation of medication administration activities.	N/A

AFFECTIVE OBJECTIVES:

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

- Comply with universal precautions and body substance isolation (BSI). (A-1)
- Defend a pharmacological management plan for medication administration. (A-3)
- Justify safe medication administration. (A-3)
- Comply with the proper disposal of contaminated items and sharps. (A-3)

PSYCHOMOTOR OBJECTIVES:

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

- At the completion of this unit, the Advanced EMT student will be able to:
- Use universal precautions and body substance isolation (BSI) procedures during medication administration. (P-2)
- Demonstrate cannulation of peripheral veins. (P-2)
- Demonstrate intraosseous needle placement and infusion. (P-2)
- Demonstrate clean technique during medication administration. (P-3)
- Demonstrate administration of medications via the following enteral route: oral (P-2)
- Demonstrate administration of medications via the following parenteral routes: sublingual, inhalation, intranasal, intramuscular, subcuntaneous, intravenous, and intraosseous routes. (P-2)
- Demonstrate administration of mediation via a small-volume nebulizer or a metered dose inhaler.
- Demonstrate preparation and administration of parenteral medications, including accurate dose calculation and fluid administration rates. (P-2)
- Demonstrate preparation and techniques for obtaining a blood sample. (P-2)
- Perfect disposal of contaminated items and sharps. (P-3)

5.3 – Emergency Medications

The AEMT must know (to a fundamental depth) the names, mechanism of action, indications, contraindications, complications, routes of administration, side effects, interactions, doses, and any specific administration considerations, for all of the following emergency medications and intravenous fluids. (Individual training programs have the authority to add any medication used locally by AEMTs.)

Objectives	Educational Standard
5.3.1 – Specific Medications	
C 5.3.1.1 – List the names, mechanism of action, indications, contraindications, complications, routes of administration, side effects, interactions, doses, and any specific administration considerations for medications and intravenous fluids available for administration within the Advanced EMT scope of practice.	A. Albuterol B. Aspirin C. Dextrose D. Epinephrine E. Glucagon F. Intravenous Fluids 1. Dextrose 5% in water 2. Normal saline 3. Lactated ringer's G. Ipratropium H. Naloxone I. Nitroglycerin 1. Spray 2. Tablets J. Nitrous Oxide (optional) K. Oxygen

AFFECTIVE OBJECTIVES: None identified for this unit.

PSYCHOMOTOR OBJECTIVES:
At the completion of this unit, the Advanced EMT student will be able to:

- Demonstrate safe administration of all medications associated with the AEMT Scope of Practice (with the exception of Nitrous Oxide).

6.0 – Patient Assessment

Applies scene information and patient assessment findings (scene size-up, primary and secondary assessment, patient history, reassessment) to guide emergency management.

Instructor Note: This is a review of the EMT Curriculum

6.1 – Scene Size-Up

Objective	Educational Standard
6.1.1 – Scene Safety	
C 6.1.1.1 – Identify common scene hazards encountered by Advanced EMT s.	A. Environmental B. Hazardous substances 1. Chemical 2. Biological C. Violence 1. Patient 2. Bystanders 3. Crime scenes D. Rescue 1. Motor vehicle collisions a. Extrication hazards b. Roadway operation dangers 2. Special situations
C 6.1.1.2 – Discuss the process of evaluating a scene for safety.	A. Scene Safe – Establish patient contact and proceed with patient assessment B. Scene is not safe – Is it possible to quickly make the scene safe? 1. Yes – Assess patient 2. No – Do not enter any unsafe scene until minimizing hazards C. Request specialized resources immediately
6.1.2 – Scene Management	
C 6.1.2.1 – Discuss the impact of the environment on patient care.	A. Medical 1. Determine the nature of illness 2. Hazards at medical emergencies B. Trauma 1. Determine mechanism of injury 2. Hazards at the trauma scene C. Environmental considerations 1. Weather or extreme temperatures 2. Toxins and gases 3. Secondary collapse and falls 4. Unstable conditions
C 6.1.2.2 – Discuss techniques the Advanced EMT could employ to address scene hazards.	A. Protect the patient 1. After making the scene safe for the paramedic, the safety of the patient becomes the next priority 2. If the Advanced EMT cannot alleviate the conditions that represent a health or safety threat to the patient, move the patient to a safer environment

	B. Protect the bystanders 1. Minimize conditions that represent a hazard for bystanders 2. If the Advanced EMT cannot minimize the hazards, remove the bystanders from the scene C. Request additional resources needed at the scene immediately 1. Multiple patients (additional ambulances) 2. Fire hazard (fire department) 3. Traffic or violence issues (law enforcement) D. Scan the scene for information related to: 1. Mechanism of injury 2. Nature of illness
C 6.1.2.3 – Discuss means by which the Advanced EMT can protect himself or herself from on-scene violence.	A. Advanced EMT s should not enter a scene or approach a patient if the threat of violence exists B. Park away from the scene and wait for the appropriate law enforcement officials to minimize the danger
C 6.1.2.4 – Discuss instances in which additional or specialized resources may be necessary to mitigate on-scene hazards.	A. A variety of specialized protective equipment and gear is available for specialized situations 1. Chemical and biological suits can provide protection against hazardous materials and biological threats of varying degrees 2. Specialized rescue equipment may be necessary for difficulty or complicated extrications 3. Ascent or descent gear may be necessary for specialized rescue situations B. Only specially trained responders should wear or use the specialized equipment
C 6.1.2.5 – Review standard precautions utilized to protect patients and responders alike from transmissible infectious agents.	A. Overview 1. Based on the principle that all blood, body fluids, secretions, excretions (except sweat), non-intact skin, and mucous membranes may contain transmissible infectious agents 2. Include a group of infection prevention practices that apply to all patients, regardless of suspected or confirmed infection status, in any healthcare delivery setting 3. Universal precautions were developed for protection of healthcare personnel 4. Standard precautions focus on protection of patients B. Implementation – The extent of standard precautions used is determined by the anticipated blood, body fluid, or pathogen exposure 1. Handwashing 2. Gloves 3. Gowns 4. Masks 5. Protective eyewear C. Personal protective equipment

	1. Personal protective equipment includes clothing or specialized equipment that provides some protection to the wearer from substances that may pose a health or safety risk 2. Wear PPE appropriate for the potential hazard a. Steel-toe boots b. Helmets c. Heat-resistant outerwear d. Self-contained breathing apparatus e. Leather gloves

AFFECTIVE OBJECTIVES:

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

- Explain the rationale for crew members to evaluate scene safety prior to entering. (A-2)

PSYCHOMOTOR OBJECTIVES:

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

- Observe various scenarios and identify potential hazards. (P-1)
- Demonstrate the scene-size-up. (P-2)

6.2 – Primary Assessment

Objective	Educational Standard
6.2.1 – Primary Survey/Primary Assessment	
C 6.2.1.1 – List the criteria to be evaluated during the primary survey/assessment of a patient.	A. Initial general impression (based on the patient's age-appropriate appearance) 1. Appears stable 2. Appears stable, but potentially unstable 3. Appears unstable B. Level of consciousness 1. Alert 2. Responds to verbal stimuli 3. Responds to painful stimuli 4. Unresponsive (no gag or cough) C. Airway status 1. Unresponsive patient a. Open the airway b. Clear any obstructions 2. Responsive patient – Is the patient talking or crying? a. Yes – Assess for adequacy of breathing b. No – Open airway D. Breathing status 1. Patient responsive a. Breathing is adequate (rate and quality) b. Breathing is too fact (>24 breaths per minute) c. Breathing is too slow (<8 breaths per minute) d. Breathing is absent (choking) 2. Patient unresponsive a. Breathing is adequate (rate and quality) b. Breathing is inadequate c. Breathing is absent E. Circulatory status 1. Radial pulse present (rate and quality) a. Normal rate b. Fast c. Slow d. Irregular rate 2. Radial pulse absent – Assess carotid pulse 3. Assess if major bleeding is present 4. Perfusion status a. Skin color b. Skin temperature c. Skin moisture d. Capillary refill (as appropriate) F. Disability (brief neurological evaluation) G. Exposure (patient completely undressed) H. Identifying life threats I. Assessment of vital functions
C 6.2.1.2 Identify necessary treatment/procedures needed to preserve	N/A

life and their integration into patient care.
6.2.2 – Evaluating Priority of Patient Care and Transport
C 6.2.2.1 – Discuss the assignment of priority of patient care and transport based upon primary survey/assessment findings. A. Stable B. Potentially unstable C. Unstable

AFFECTIVE OBJECTIVES:

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

- Explain how patient situations affect your evaluation of mechanism of injury or illness. (A-3)
- Explain the importance of forming a general impression of the patient. (A-1)
- Explain the value of performing a primary assessment. (A-2)
- Demonstrate a caring attitude when performing an assessment. (A-3)

PSYCHOMOTOR OBJECTIVES:

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

- Demonstrate the techniques for assessing mental status. (P-2)
- Demonstrate the techniques for assessing the airway. (P-2)
- Demonstrate the techniques for assessing if the patient is breathing. (P-2)
- Demonstrate the techniques for assessing if the patient has a pulse. (P-2)
- Demonstrate the techniques for assessing the patient for external bleeding. (P-2)
- Demonstrate the ability to prioritize patients. (P-2)
- Using the techniques of examination, demonstrate the assessment of a medical patient. (P-2)
- Demonstrate the patient care skills that should be used to assist with a patient who is unresponsive with no known history. (P-2)
- Demonstrate the patient care skills that should be used to assist with a patient who is unresponsive or has an altered mental status. (P-2)

6.3 – History Taking

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
6.3.1 – Components of the Patient History	
C 6.3.1.1 – Describe the purpose of obtaining a patient history.	A. Statistical and Demographic 1. Obtain correct dates 2. Accurately document all times 3. Identifying data (age, sex, race) B. Past Medical History (pertinent to the medical event) C. Current Health Status (pertinent to the medical event) 1. Focuses on present state of health 2. Environmental conditions 3. Individual factors 1. Current medications 2. Allergies 3. Tobacco use 4. Alcohol, drugs, related substances 5. Diet 6. Screening tests 7. Immunizations 8. Environmental hazards 9. Use of safety measures 10. Family history
C 6.3.1.2 – Discuss potential barriers to and techniques for obtaining a patient history.	A. Factors influencing communication B. Language barriers C. Listening D. Techniques of questioning 1. Open-ended questions 2. Direct questions 3. Leading questions
6.3.2 – Interviewing Techniques *C*	
6.3.2.1 – Identify strategies for developing rapport with the patient ("setting the stage").	A. The environment 1. Proper environment enhances communication 2. Personal space B. Interviewer demeanor and appearance 1. Just as the interviewer is watching the patient, the patient will be watching the interviewer 2. Messages of body language C. Note taking 1. Difficult to remember all details 2. Most patients are comfortable with note taking
C 6.3.2.2 – Discuss interviewing techniques to assist in learning about the patient's present illness.	A. Greeting the patient 1. Greet by name 2. Deter from the use of unfamiliar or demeaning terms, such as granny, honey, etc. B. Opening questions 1. Find out why the patient is seeking medical

	care of advice 2. Use a general, open-ended question 3. Follow the patient's leads a. Facilitation i. The interviewer's posture, actions, or words should encourage the patient to say more ii. Making eye contact or saying phrases such as "go on" or "I'm listening" may help the patient to continue b. Reflection i. Repetition of the patient's words that encourage additional responses ii. Typically does not bias the story or interrupt the patient's train of thought c. Clarification – used to clarify ambiguous statements or words d. Empathetic responses – use techniques of therapeutic communication to interpret feelings and your response e. Confrontation – some issues or responses my require you to confront the patient about their feelings f. Interpretation – goes beyond confrontation, requires you to make an inference C. Obtaining more information – Attributes of a symptom 1. Location a. Where is it b. Does it radiate 2. Quality 3. Severity a. How bad is it b. Attempt to quantify the pain 4. Timing a. When did it start b. How long does it last 5. The setting in which it occurs a. Emotional response b. Environmental factors 6. Factors that make it better or worse 7. Associated manifestations
C 6.3.2.3 – Discuss the purpose of direct questions and the techniques employed in asking direct questions.	A. To gather additional information, direct questions may be required B. Should not be leading questions C. Ask one question at a time D. Use language that is (age) appropriate
C 6.3.2.4 – Discuss considerations in obtaining a history pertaining to sensitive topics.	A. Alcohol and drugs B. Physical abuse or violence C. Sexual history D. Special Challenges

	1. Silent Patient 2. Overly talkative patient 3. Patient with multiple symptoms 4. Anxious patient 5. Angry and hostile patient 6. Intoxicated patient 7. Crying patient 8. Depressed patient 9. Patient with confusing behavior or history 10. Patient with limited cognitive abilities 11. EMT-patient language barrier 12. Patient with hearing problem 13. Patient with visual impairment 14. Talking with family and friends of the patient
6.3.3 – Age-Related Considerations	
C 6.3.3.1 – Discuss considerations when obtaining a history for a pediatric patient.	A. History may be taken from parent or responsible adult B. Present problem or illness C. Past medical history
C 6.3.3.2 – Discuss considerations when obtaining a history for a geriatric patient.	A. Sensory issues (hearing and vision) may require Advanced EMT to interview at eye-level so patient can read lips B. The interview may need to be slowed down if the patient is stable C. Multiple underlying chronic illnesses may confound the history D. Disease symptoms may be less dramatic in the older patient E. All symptoms may be vague and non-specific
6.3.4 – Integration of Therapeutic Communication, History Taking Techniques, Patient Presentation, and Assessment Findings (Development of Field Impression)	
C 6.3.4.1 – Discuss the fundamental elements of critical thinking for Advanced EMT s to develop a field impression of the patient given the integration of therapeutic communication, history taking techniques, patient presentation, and assessment findings.	N/A

AFFECTIVE OBJECTIVES:

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

- Demonstrate the importance of empathy when obtaining a health history. (A-1)
- Demonstrate the importance of confidentiality when obtaining a health history. (A-1)
- Differentiate between relevant and less relevant patient history questions.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

6.4 – Secondary Assessment

Instructor Note: This is a review of the EMT Curriculum

Objective	
6.4.1 – Techniques of Physical Exam: General Survey	
C 6.4.1.1 – Review the techniques used in conducting a general survey physical examination.	A. Examine the patient systematically B. Place special emphasis on areas suggested by the present illness and chief complaint C. Keep in mind that most patients view a physical exam with apprehension and anxiety D. Maintain professionalism throughout the physical exam while displaying compassion towards your patient
6.4.2 – Examination by Anatomical Region or System	
C 6.4.2.1 – Discuss the examination of the Respiratory System to include normal findings, abnormal findings, and the significance of any abnormal findings.	A. Expose the chest as appropriate for the environment B. Chest shape and symmetry C. Respiratory effort 1. Accessory muscle usage 2. retractions D. Auscultation
C 6.4.2.2 – Discuss the examination of the Cardiovascular System to include normal findings, abnormal findings, and the significance of any abnormal findings.	A. Pulse 1. Rate 2. Rhythm 3. Predictable 4. Adjust timing for irregularity 5. Strength 6. location B. Perfusion 1. Blood pressure a. Equipment size b. Placement of cuff c. Position of patient
C 6.4.2.3 – Discuss the examination of the Neurovascular System to include normal findings, abnormal findings, and the significance of any abnormal findings.	A. Appearance and Behavior 1. Assess level of consciousness (AVPU) a. Alert b. Response to verbal stimuli i. Drowsiness ii. Stupor c. Response to painful stimuli d. Unresponsive i. State of profound unconsciousness ii. Absence of spontaneous eye movements

	iii. No response to verbal or painful stimuli iv. Patient cannot be aroused by any stimuli 2. Observe posture and behavior 3. Facial expression i. Anxiety ii. Depression iii. Anger iv. Fear v. Sadness vi. pain B. Speech and Language 1. Rate 2. Appropriateness a. Slurred b. Garbled c. aphasia C. Mood 1. Nature 2. Intensity 3. Suicidal intention D. Thought and Perception 1. Assess thought processes a. Logic b. Organization 2. Assess thought content a. Unusual thoughts b. Unpleasant thoughts 3. Assess perceptions a. Unusual b. Hearing things c. Seeing things E. Memory and Attention 1. Person 2. Place 3. Time 4. Purpose
C 6.4.2.4 – Discuss the examination of the Musculoskeletal System to include normal findings, abnormal findings, and the significance of any abnormal findings.	A. Pelvic Region 1. Symmetry 2. Tenderness B. Lower Extremities 1. Overview a. Symmetry b. Surface findings 2. General physical findings a. Range of motion b. Sensory

	c. Motor function d. Circulatory function 3. Peripheral vascular system a. Tenderness b. Temperature of lower legs c. Distal pulses C. Upper Extremities 1. Overview a. Symmetry b. Strength c. Surface findings 2. General physical findings a. Range of motion b. Sensory c. Motor function d. Circulatory function e. Arm drift D. Back 1. Overview a. Symmetry b. Contour c. Surface findings 2. General physical findings a. Flank tenderness b. Spinal column tenderness
C 6.4.2.5 – Discuss the examination of all other Anatomical Regions to include normal findings, abnormal findings, and the significance of any abnormal findings.	A. Head 1. Scalp 2. Skull 3. Face a. Symmetry of expression b. Appropriateness facial expression 4. Eyes a. Pupil size, shape and response b. Conjunctiva color and hydration 5. Ears - fluids 6. Nose a. Symmetry b. Fluid in nares 7. Mouth and pharynx a. Odor b. Hydration c. Condition of teeth B. Neck 1. Physical findings 2. Symmetry

	3. Masses 4. Arterial pulses C. Chest 1. Overview a. Expose appropriately b. Chest shape and symmetry c. Respiratory effort d. Surface findings - inspection 2. Auscultation a. Technique – medical versus trauma b. Lung sounds i. Presence of breath sounds – wheezes ii. Absence of breath sounds 3. Anterior chest a. Auscultation findings – lungs b. Intercostal muscle use c. retraction 4. Posterior chest a. Auscultation b. Spinal column D. Abdomen 1. Overview a. Position patient for examination b. Shape and size c. Palpation method i. Four quadrants ii. Palpate affected area last 2. Physical findings a. Symmetry b. Masses c. Organ margins d. Contour e. Softness f. Tenderness g. Findings associated with pregnancy – physical changes of contour and shape
P 6.4.2.6 – Demonstrate an appropriate secondary assessment/survey of a patient.	*N/A*
6.4.3 - Assessment of Lung Sounds	
C 6.4.3.1 - Discuss techniques and findings for auscultation of lung sounds.	A. Expose the chest as appropriate for the environment B. Auscultation 1. Technique a. Medical versus trauma b. Anterior chest

	2. Lung Sounds a. Vesicular b. Bronchovesicular c. Bronchial sounds d. Adventitious sounds e. Absence of breath sounds 3. Inspiratory versus expiratory phase
6.4.4 - Special Considerations for Pediatric and Geriatric Patients	
C 6.4.4.1 Identify considerations for special patient populations.	A. Normal Vital Signs by Age B. See special patient population section
6.4.5 – Modifying the Assessment for the Patient with a Life-Threatening Emergency	
C 6.4.5.1 – Discuss how the assessment process is modified when a patient has a life-threatening emergency.	

AFFECTIVE OBJECTIVES:

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

- Demonstrate a caring attitude when performing physical examination skills. (A-3)
- Discuss the importance of a professional appearance and demeanor when performing physical examination skills. (A-1)
- Appreciate the limitations of conducting a physical exam in the out-of-hospital environment. (A-2)

PSYCHOMOTOR OBJECTIVES:

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

- Demonstrate how to perform a full body scan and a focused assessment
- Demonstrate the examination of the arterial pulse including location, rate, and rhythm. (P-2)
- Demonstrate measurement of the blood pressure
- Demonstrate the technique for auscultating lung sounds
- Integrate findings of the scene size-up, primary and secondary assessments, and patient history to formulate an overall impression of the patient's condition and make transport decisions.

6.5 – Monitoring Devices

Objective	Educational Standard
6.5.1 – Continuous ECG Monitoring	
C 6.5.1.1 – Discuss purpose, indications, procedures, and limitations of continuous ECG monitoring.	A. Purpose B. Indications 1. Patient's presenting with cardiac-related signs and symptoms or potential signs and symptoms of illness with cardiac impact 2. Used as advanced monitoring in pre-hospital care C. Procedures D. Limitations – Non-interpretive
6.5.2 – 12-Lead ECG	
C 6.5.2.1 – Discuss the purpose, indications, and procedures of 12-lead ECG	A. Purpose 1. Shorten door to treatment time 2. May assist in field care of patient with pharmacological intervention B. Indications C. Procedures D. Limitations – (acquire, not-interpretive)
6.5.3 – ETCO2 Monitoring	
C 6.5.3.1 – Discuss the purpose, indication, procedure, and limitations of carbon dioxide monitoring.	A. Capnometry (colorimetric) 1. Purpose 2. Indications 3. Procedures 4. Limitations a. Essentially a "yes/no" confirmation of device placement b. Rapidly becomes inactivated with use, therefore must be periodically replaced for continuous monitoring B. Capnography 1. Purpose 2. Indications 3. Procedures 4. Limitations 5. Interpretation (see Medical Emergency: Respiratory)
6.5.4 – Blood Glucose Determination	
C 6.5.4.1 – Discuss the purpose, indications, procedures, and limitations of blood glucose determination.	A. Blood glucometer 1. Purpose 2. Indications a. Known diabetic b. Unconscious patient, for unknown reason c. General malaise/weakness, for unknown reason 3. Procedures 4. Limitations a. Appropriateness of use b. Accuracy of reading
6.5.5 – Other Monitoring Devices	

C 6.5.5.1 – Discuss other monitoring devices available for use at the AEMT level.	As additional monitoring devices become recognized as the "standard of care" in the out-of-hospital setting, those devices should be incorporated into the primary education of those who will be expected to use them in practice. State regulatory processes may elect to expand, delete, or modify from the monitor devices in this section.

AFFECTIVE OBJECTIVES:
At the completion of this unit, the Advanced EMT student will be able to:

PSYCHOMOTOR OBJECTIVES:
At the completion of this unit, the Advanced EMT student will be able to:

- Demonstrate acquisition of an ECG recording (3, 4 or 5 lead)
- Demonstrate acquisition of a 12 lead ECG.
- Demonstrate acquisition of venous blood sampling
- Demonstrate the use of a pulse oximetry device to evaluate the effectiveness of oxygenation in a patient

6.6 – Reassessment

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
6.6.1 – How and When to Reassess	
C 6.6.1.1 – Discuss how and when to reassess a patient.	N/A
C6.6.1.2 Review intervals at which point a patient should be reassessed.	A. Unstable Patient B. Stable Patient
6.6.2 – Patient Evaluation: Reassessment	
C 6.6.2.1 – Discuss components of a reassessment.	A. Primary Assessment B. Vital Signs C. Chief Complaint D. Interventions
C 6.6.2.2 – Re-evaluate the effectiveness of treatment plan(s) (modify as necessary based upon re-evaluation).	N/A
C 6.6.2.3 - Compare reassessment findings to the status of the baseline	N/A
C 6.6.2.4 – Identify age-related considerations for reassessing pediatric and geriatric patients.	A. Pediatrics B. Geriatrics

AFFECTIVE OBJECTIVES:

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

- Explain the value of performing an on-going assessment. (A-2)
- Explain the value of trending assessment components to other health professionals who assume care of the patient. (A-2)

PSYCHOMOTOR OBJECTIVES:

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

- Evaluate reassessment findings to identify changes within the patient's condition.

7.0 – Airway Management, Respiration, and Artificial Ventilation

Applies knowledge (fundamental depth, foundational breadth) of upper airway anatomy and physiology to patient assessment and management in order to assure a patent airway, adequate mechanical ventilation, and respiration for patients of all ages.

7.1 – Airway Management

Objective	Educational Standard
7.1.1 – Airway Anatomy	
C 7.1.1.1 – Describe the anatomy of the respiratory system.	A. Sinuses B. Upper airway tract 1. Nose a. Warm and humidify air b. turbinate 2. Mouth and oral cavity a. Lips b. Teeth c. Tongue d. Soft palate – uvula e. Tonsils and adenoids 3. Jaw a. Facial bones (maxilla, mandible) 4. Pharynx a. Nasopharynx b. Oropharynx c. Hypopharynx d. Laryngopharynx 5. Larynx a. Cartilages i. Epiglottis ii. Arytenoid cartilage iii. Vocal cords iv. Thyroid cartilage v. Cricoid ring b. Bone C. Jugular notch D. Lower airway tract 1. Trachea (spatial relationship to esophagus) 2. Carina (Angle of Louis) 3. Bronchi 4. Lungs a. Bronchioles i. Bronchial smooth muscle ii. $Beta_2$ adrenergic receptors b. Pulmonary cilia c. Alveoli (surfactant) E. Support structures 1. Chest cage a. Ribs

	b. Muscles of respiration i. Intercostal muscles ii. Diaphragm c. Pleura i. Parietal pleura ii. Visceral pleura 2. Phrenic nerve 3. Mediastinum
7.1.2 – Airway Assessment	
C 7.1.2.1 – Describe assessment of the airway and the respiratory system.	A. Purpose 1. Identify inadequate airway 2. Identify an unstable airway 3. Identify potentially difficult airways B. Procedure 1. Gag reflex 2. Airway obstruction a. Soft tissue obstruction b. Foreign bodies c. Complete and incomplete d. Upper versus lower 3. Work of breathing 4. Laryngospasm 5. Laryngeal edema 6. Penetrating injuries
7.1.3 – Techniques of Assuring a Patent Airway	
C 7.1.3.1 – Describe indications, contraindications, advantages, disadvantages, complications, equipment and techniques used to ensure a patent airway.	A. Manual airway maneuvers B. Mechanical airway devices C. Relief of foreign body airway obstruction 1. Refer to current American Heart Association guidelines 2. Removal of foreign body airway obstructions using direct laryngoscopy a. Purpose b. Indications c. Contraindications d. Complications e. Procedure f. Limitation D. Upper airway suctioning 1. Review and elaborate on upper airway suctioning material from EMT level. 2. Procedure for lower airway suctioning of the previously intubated patient. a. Purpose b. Indications c. Contraindications d. Complications e. Procedure f. limitation E. Blind insertion airway devices 1. Esophageal Obturation (e.g. Combitube, PTL, Easytube, King LTG) a. Purpose

	b. Indications c. Contraindications d. Complications e. Procedure f. limitation 2. Supraglottic devices (e.g. LMA, COBRA) a. Purpose b. Indications c. Contraindications d. Complications e. Procedure (including confirmation techniques)
7.1.4 – Consider Age-Related Variations in Pediatric and Geriatric Patients	

7.2 – Respiration

Objective	Educational Standard
7.2.1 – Anatomy of the Respiratory System	A. Includes all airway anatomy covered in the airway management section B. Additional respiratory system anatomy C. Chest Cage 1. Ribs 2. Muscles of respiration a. Intercostals muscles b. Diaphragm 3. Pleura a. Parietal pleura b. Visceral pleura D. Phrenic Nerve E. Mediastinum
7.2.2 – Physiology of Respiration	
C 7.2.2.1 – Explain the mechanics of respiration.	A. Pulmonary ventilation 1. Movement of the thoracic wall 2. Intrathoracic pressure gradients 3. Phases of ventilation a. Active phase b. Passive phase 4. Lung volumes and capacities a. Volumes i. Tidal volume ii. Minute volume iii. Residual volume iv. Dead space volume b. Capacities i. Total lung capacity ii. Vital capacity c. Maximum inspiratory force d. Maximum expiratory force e. Significance of pulmonary volumes and capacities 5. Gas exchange 6. Oxygenation 7. Respiration a. Internal versus external respiration b. Diffusion of gases through respiratory membrane c. Diffusion of gases from capillaries to cells 8. Lung compliance
7.2.3 – Pathophysiology of Respiration	
C 7.2.3.1 – List reasons for interruption of pulmonary ventilation.	A. Interruption of nervous control 1. Drugs 2. Trauma 3. Muscular dystrophy B. Structure damage to the thorax C. Bronchoconstriction D. Disruption of airway patency 1. Infection

	2. Trauma/burns 3. Foreign body obstruction 4. Allergic reaction 5. Unconscious (loss of airway tone)
C 7.2.3.2 – List reasons for inadequate respiration.	A. External 1. Deficiencies due to environmental factors a. Altitude b. Closed environments c. Toxic or poisonous environments 2. Carbon dioxide retention B. Internal 1. Pathology typically related to changes in alveolar-capillary gas exchange 2. Typical disease processes a. Emphysema b. Pulmonary edema c. Pneumonia d. Environmental/occupational exposure e. Drowning 3. Cellular
C 7.2.3.3 – Discuss disruptions in oxygen transport associated with diminished oxygen carrying capacity.	A. Anemia B. Blood loss
C 7.2.3.4– List causes for disruption in effective circulation.	A. Shock 1. Blood loss 2. Diminished peripheral resistance 3. Cardiac failure B. Emboli C. Increased capillary permeability
C 7.2.3.5– Identify disruptions that can occur at the cellular level to impede adequate respiration.	A. Acid-base balance B. Poisons/toxins C. Blood sugar changes D. Hormone effects E. Drugs F. Hypoxia
7.2.4 – Management of Adequate and Inadequate Respiration	
C 7.2.4.1 – Discuss the maintenance of adequate respiration given a respiratory compromise.	A. Assure an adequate airway B. Review supplemental oxygen therapy C. Continuous Positive Airway Pressure (“CPAP”) / Bi-Level Positive Airway Pressure (“BiPAP”) 1. Definitions/purpose a. CPAP – Device to provide continuous positive airway pressure in the spontaneously breathing patient b. BiPAP – Device to provide differential positive airway pressure in the spontaneously breathing patient i. Higher positive pressure during inspiration (e.g., 10 cm water pressure) ii. Lower positive pressure during expiration (e.g., 5 cm water

	pressure) iii. Augments patient's spontaneous breathing with positive pressure ventilation during inspiration c. Increase lung compliance d. Reduce alveolar collapse e. Increase laminar airflow f. Decrease intubation rates 2. Indications a. CHF/acute pulmonary edema b. COPD/asthma c. Near drowning d. Similar equipment may be used for home treatment of sleep apnea 3. Contraindications – Inability to tolerate mask 4. Complications a. Requires adequate tidal volume b. Patient must be alert and able to follow instructions c. Patient must tolerate mask d. Gastric insufflation e. Vomiting and aspiration risk f. Barotrauma g. Facial hair h. Dysmorphic faces 5. Procedure D. Assisted positive pressure ventilations 1. Purpose/definition 2. Indications 3. Contraindications 4. Complications 5. Procedure
7.2.5 – Supplemental Oxygen Therapy	
C 7.2.5.1 – Review Oxygen delivery devices used by EMTs.	A. Purpose B. Indications C. Contraindications D. Complications E. Procedures
7.2.6 – Age-Related Variations in Pediatric and Geriatric Patients	
C 7.2.6.1 – Describe special considerations in airway management and ventilation for pediatric patients.	N/A

7.3 – Artificial Ventilation

Objective	Educational Standard
7.3.1 – Comprehensive Ventilation Assessment	
C 7.3.1.1 – Explain the purpose of conducting a comprehensive ventilation assessment.	N/A
C 7.3.1.2 – Describe the procedures inherent in conducting a comprehensive ventilation assessment.	N/A
C 7.3.1.3 – Define minute volume.	N/A
C 7.3.1.4 – Define alveolar volume.	N/A
C 7.3.1.5 – Describe the process of, and tools used in, evaluating the effects of artificial ventilation.	A. Pulse oximetry 1. Purpose 2. Indications 3. Contraindications 4. Complications 5. Procedure
7.3.2 – Management of Inadequate Ventilation	
C 7.3.2.1 – Discuss artificial ventilation devices.	A. Bag-Valve Mask with Reservoir 1. Advantages 2. Disadvantages B. Manually triggered ventilation device 1. Advantages a. Allows a single rescuer to use both hands to maintain a mask-to-seal while providing positive pressure ventilation to a patient b. Reduces rescuer fatigue during extended transport times 2. Disadvantages a. Difficult to maintain adequate ventilation without assistance b. Typically used on adult patients only c. Requires special unit and additional training for use in pediatric patients d. Rescuer s unable to easily assess lung compliance e. High ventilator pressures may damage lung tissue C. Automatic Transport Ventilator/Resuscitator 1. Advantages 2. Disadvantages a. May require an external power source b. Must have bag-valve mask device available c. May interfere with timing of chest compressions during CPR d. Must monitor to assure full exhalation

	e. barotrauma
7.3.3 – Assisting Patient Ventilations	
C 7.3.3.1 – Discuss the techniques utilized by EMRs, EMTs, and AEMTs to ventilate an apneic patient.	A. Purpose B. Indications C. Contraindications D. Complications E. Procedures
C 7.3.3.2 – Discuss the techniques utilized by EMRs, EMTs and AEMTs to ventilate a patient with a protected airway.	A. Purpose B. Indications C. Contraindications D. Complications E. Procedures
7.3.4 - Normal vs Positive Pressure Ventilation	
C 7.3.4.1 - Discuss differences between normal and positive pressure ventilations	A. Air Movement 1. Normal ventilation a. Negative intrathoracic pressure b. Air is sucked into the lungs 2. Positive pressure ventilation B. Blood Movement 1. Normal ventilation a. Blood return from the body happens naturally b. Blood is pulled back to the heart during normal breathing 2. Positive pressure ventilation a. Venous return is decreased during lung inflation b. Amount of blood pumped out of the heart is reduced. C. Airway Wall Pressure 1. Normal ventilation 2. Positive pressure ventilation a. Walls are pushed out of normal anatomical shape. b. More volume is required to have the same effect as normal breathing. D. Esophageal Opening Pressure 1. Normal ventilation 2. Positive pressure ventilation a. Air is pushed into the stomach during ventilation. b. Gastric distention may lead to vomiting E. Over Ventilation (either by rate or volume) 1. Hypotension 2. Gastric distention 3. Other unintended consequences
7.3.5 – Age-Related Variations in Pediatric and Geriatric Patients	
C 7.3.5.1 – Identify age-related variations in providing artificial ventilations to pediatric and geriatric patients.	N/A

8.0 – Medicine

Applies fundamental knowledge to provide basic and selected advanced emergency care and transportation based on assessment findings for an acutely ill patient.

8.1 – Medical Overview

Objective	Educational Standard
8.1.1 – Assessment Factors	
C 8.1.1.1 – Summarize assessment factors to considered in developing a comprehensive treatment / disposition plan for a patient with a medical complaint.	A. Scene safety ***be*** B. Environment C. Chief complaint 1. Primary reason for EMS response 2. Verbal or non-verbal 3. Possibly misleading D. Life threatening conditions E. Non-life threatening conditions F. Distracting injuries G. Tunnel vision H. Patient cooperation I. EMT attitude
8.1.2 – Major Components of the Patient Assessment	
C 8.1.2.1 – Identify the major components of a patient assessment.	A. Standard precautions B. Scene size-up C. General impression D. Initial Assessment 1. Airway 2. Ventilation 3. Respiration 4. Circulation E. SAMPLE history 1. Importance of a thorough history a. Primary component of the overall assessment of the medical patient b. Requires a balance of knowledge and skill to obtain a thorough and accurate history c. Helps to ensure the proper care will be provided for the patient 2. Unresponsive patient – May be obtained from evidence at the scene a. Pill containers b. Medical jewelry c. Family members d. Bystanders 3. Responsive patient a. Obtained directly from the patient b. Focused on the patient's chief complaint c. Additional history may be obtained from evidence at the scene

i. Pill containers
ii. Medical jewelry
iii. Family members
iv. Bystanders

F. OPQRST mnemonic for evaluation of pain
   1. O – Onset
      a. Focuses on what the patient was doing when the problem began
      b. Question(s): What was the patient doing when the problem began?
   2. P – Provoke
      a. Focuses on what might provoke the problem for the patient
      b. Question(s): Does anything the patient does make the problem better or worse?
   3. Q – Quality
      a. Focuses on the patient's own description of the problem
      b. Question(s):
         i. Can the patient describe the pain/discomfort?
         ii. What does it feel like?
         iii. Is it sharp? Dull?
         iv. Is it steady or does it come and go?
   4. R – Region/Radiate
      a. Focuses on the specific area of the pain/discomfort
      b. Questions(s):
         i. Can the patient point with one finger to the location of the pain/discomfort?
         ii. Does the pain/discomfort radiate to any other areas of the body?
   5. S – Severity
      a. Focuses on the severity of the pain/discomfort
      b. Question(s):
         i. On a scale of 0 to 10, with 10 being the worst pain the patient has ever felt, how would the patient rate the pain right now?
         ii. How would the patient rate the pain when it first began?
         iii. Has there been any change since it first began?
   6. T – Time
      a. Focuses on the duration of the problem/pain/discomfort
      b. Question(s): When did the problem/pain/discomfort first begin?

G. Baseline vital signs
H. Secondary assessment
   1. May not be appropriate to perform a complete secondary assessment on all

medical patients

2. Designed to identify any signs or symptoms of illness that may not have been revealed during the initial assessment
    a. Head/scalp
        i. Pain
        ii. Symmetry
    b. Face
        i. Pain
        ii. Symmetry of facial muscles
    c. Eyes
        i. Pupil size
        ii. Equality and reactivity to light
        iii. Pink, moist conjunctiva
    d. Ears
        i. Pain
        ii. Drainage
    e. Nose
        i. Pain
        ii. Nasal flaring
    f. Mouth
        i. Foreign body
        ii. Loose dentures
        iii. Pink and moist mucosa
    g. Neck
        i. Pain
        ii. Accessory muscle use
        iii. Jugular vein distention
        iv. Medical jewelry
        v. Stoma
    h. Chest
        i. Pain
        ii. Equal rise and fall
        iii. Guarding
        iv. Breath sounds
        v. Retractions
        vi. Scars
    i. Abdomen
        i. Pain
        ii. Rigidity
        iii. Distention
        iv. Scars
    j. Pelvis/genital
        i. Pain
        ii. Incontinence
    k. Arms
        i. Pain
        ii. Distal circulation
        iii. Sensation
        iv. Motor function
        v. Track marks
        vi. Medical jewelry
    l. Legs
        i. Pain
        ii. Distal circulation

	iii. Sensation iv. Motor function v. Track marks vi. Medical jewelry m. Back i. Pain ii. Scars I. Continued assessment J. When practical, transport the patient in the recovery position to help ensure a patient airway K. Consider the need for ALS transport
8.1.3 – Forming a Field Impression	
C 8.1.3.1 – Discuss the process of forming a field impression based upon assessment findings.	A. Formation of differential diagnosis 1. Integration of history and physical assessment findings 2. Past experience 3. "Gut instinct" B. Differentiation of the underlying cause of the patient's condition from other possible causes C. Patient presentation often leads to a recognizable pattern common to multiple conditions with similar presentations D. Assess for clues to determine minor differences in patient presentation E. Determine field differential diagnosis based on available information F. Realize the differential diagnosis may change as the patient condition changes or additional information becomes available

8.2 – Respiratory

Objective	Educational Standard
8.2.1 – Introduction	
C 8.2.1.1 – Discuss the epidemiology of pulmonary diseases and conditions.	A. Mortality/morbidity B. Risk factors 1. Intrinsic factors that increase the risk of developing respiratory disease
C 8.2.1.2 – Identify the structures (and respective functions) of the pulmonary system	A. Upper airway 1. Functions 2. Structures a. Nose b. Pharynx c. Larynx B. Lower airway 1. Functions 2. Structures a. Trachea b. Bronchi c. Bronchioles d. Cilia C. Gas exchange interface 1. Functions 2. Structures a. Alveoli b. Interstitial space c. Pulmonary capillary bed D. Chest wall 1. Functions 2. Structures a. Diaphragm is the major muscle of respiration b. Intercostal muscles c. Accessory muscles d. Pleural space E. Neurologic control of breathing 1. Functions 2. Structures a. Medulla b. Phrenic nerve c. Spinal nerves d. Hering-Breuer reflex
8.2.2 – General System Pathophysiology, Assessment, and Management	
C 8.2.2.1 – Discuss the pathophysiology of specific respiratory emergencies/conditions.	A. Obstructive/Restrictive Lung Diseases 1. Emphysema a. Changes in respiratory tact b. Changes in gas exchange c. Long term effects d. Decompensated states 2. Chronic Bronchitis a. Changes in respiratory tract b. Changes in gas exchange c. Long term effects

	d. Decompensated states 3. Asthma a. Changes in respiratory tract b. Changes in gas exchange c. Long term effects d. Decompensated states B. Infectious Lung Disease 1. Pneumonia C. Assessment 1. Impact of Disease on Prehospital Assessment a. Pertinent historical questions b. Pertinent physical findings i. Breath sounds a. course crackles b. fine crackles c. ronchi d. wheezes i. diffuse ii. continuous f. stridor g. pleural rub c. Inspiratory vs Expiratory ratios 2.Finding Associated With Specific Diseases a. Emphysema b. Chronic Bronchitis c. Asthma d. Pneumonia
C8.2.2.2 – Discuss potential assessment findings for a patient suffering from a respiratory emergency/condition.	
C 8.2.2.3 - Discuss the prehospital management of a patient suffering from a respiratory emergency/condition	A. Oxygenation and Ventilation Requirements B. Use of Inhaled Beta-Agonist C. IV Fluid Therapy in Respiratory Illness D. Non-pharmacological (CPAP) E. Monitoring and devices used in pulmonary care 1. Pulse oximetry 2. Capnometry or capnography F. Age-Related Considerations 1. Pediatrics a. dosage considerations b. fluid considerations 2. Geriatrics a. drug interaction considerations b. fluid considerations
8.2.3 – Consider Age-Related Variations	
C 8.2.3.1 – Discuss differences in respiratory emergencies/conditions affecting pediatric and geriatric patients.	A. Pediatrics 1. Variations in symptomatology 2. Variations in physical presentation a. asthma b. types of pneumonia

8.2.4 – Communication and Documentation for Patients with a Respiratory Condition or Emergency
C8.2.4.1– Discuss communication and documentation considerations for patients with respiratory emergencies/conditions.
8.2.5 – Transport Decisions
C 8.2.5.1 – Discuss transport considerations for patients with respiratory emergencies/conditions.

8.3 – Cardiovascular

Objective	Educational Standard
8.3.1 – Anatomy of the Cardiovascular System	
C 8.3.1.1 – Describe the anatomy of the cardiovascular system.	A. Layers 1. Myocardium 2. Endocardium 3. Pericardium a. Visceral (epicardium) b. Parietal c. Pericardial fluid B. Chambers 1. Atria 2. Ventricles C. Valves 1. Atrioventicular (AV) valves a. Tricuspid (right) b. Mitral (left) 2. Semilunar valves a. Pulmonic (right) b. Aortic (left) D. Myocardial blood supply 1. Arteries 2. Veins E. Electrical and conduction system 1. Myocardial muscle cells 2. Specialized electrical cells 3. Automaticity 4. Autonomic Control a. sympathetic b. parasympathetic F. Vessels 1. Aorta 2. Arteries 3. Arterioles 4. Capillaries 5. Venules 6. Veins 7. Vena cava G. Blood 1. Red blood cells 2. White blood cells 3. Platelets 4. Plasma
8.3.2 – Physiology	
C 8.3.2.1 – Describe the physiology of the cardiovascular system.	A. Cardiac cycle 1. Systole 2. Diastole B. Pulses 1. Peripheral pulses 2. Central pulse C. Blood Pressure 1. Systolic

	2. Diastolic D. Blood Circulation Through a Double Pump 1. Respiratory system a. Deoxygenated blood to lungs b. Oxygenated blood back to heart 2. Body E. Cardiac Output F. Perfusion 1. Function of red blood cells in oxygen delivery 2. Factors governing adequate perfusion a. Rate b. Pump c. Volume G. Oxygenation of Tissues 1. Delivery of oxygenated blood 2. Removal of tissue wastes
8.3.3 – Primary Survey for Cardiovascular Assessment	
C 8.3.3.1 – Discuss the primary survey as applied to a cardiovascular assessment.	A. Level of responsiveness B. Airway/breathing 1. Labored breathing may or may not be present C. Circulation 1. Peripheral Pulse a. quality b. rhythm 2. Peripheral perfusion a. Changes in skin color b. Changes in skin temperature c. Changes in skin moisture
8.3.4 – History of the Present Illness/SAMPLE History	
C 8.3.4.1 – Discuss the history and physical/SAMPLE format as applied to a cardiovascular assessment.	A. Chief complaint 1. Typical – sudden onset of discomfort, usually of brief duration lasting three to five minutes, maybe five to 15 minutes: never 30 minutes to 2 hours 2. Typical – usually relieved by rest and/or medication 3. Epigastric pain or discomfort 4. Atypical B. Denial C. Contributing history 1. Initial recognized event 2. Recurrent event 3. Increasing frequency and/or duration of event
8.3.5 – Secondary Survey for Cardiovascular Assessment	
C 8.3.5.1 – Discuss the findings for the secondary survey.	A. Airway B. Breathing 1. May or may not be labored 2. Breath sounds a. may be clear to auscultation b. may be congested in the bases

	C. Circulation 1. Alterations in heart rate and rhythm may occur 2. Peripheral pulses are usually not affected 3. Blood pressure may be elevated during the episode and normalize afterwards
8.3.6 – Acute Coronary Syndrome	
8.3.7 – Acute Myocardial Infarction/Angina	
C 8.3.7.1 - Discuss the precipitating causes, morbidity/mortality, pathophysiology, assessment findings, management, and communication strategies associated with acute myocardial infarction/angina.	A. Epidemiology B. Precipitating causes (as with angina) 1. Atherosclerosis 2. Persistent angina 3. Occlusion 4. Non-traumatic 5. Traumatic C. Morbidity/Mortality 1. Sudden death 2. Extensive myocardial damage 3. May result in ventricular fibrillation D. Primary Survey Findings 1. Airway/breathing 2. Circulation a. Peripheral pulses i. Quality ii. rhythm b. Peripheral perfusion i. changes in skin color ii. changes in skin temperature iii. changes in skin moisture E. History of the Present Illness/Sample History 1. Chief complaint a. Typical onset of discomfort, usually of long duration, over 30 minutes b. Typically unrelieved by rest and/o nitroglycerin preparation c. Epigastric pain or discomfort d. Atypical 2. Contributing history a. First time b. Recurrent c. Increasing frequency and/or duration d. Denial F. Secondary Survey Findings 1. Airway 2. Breath Sounds a. May be clear to auscultation b. Congestion in bases may be present 3. Circulation a. Skin i. pallor during the episode ii. temperature may vary iii. diaphoresis is usually present b. Alterations in heart rate and rhythm

	may occur c. Peripheral pulses are usually not affected d. Blood pressure may be elevated or lowered H. Management 1. Refer to American Heart Association guidelines a. oxygen b. aspirin c. nitroglycerin d. nitrous oxide 2. Transport criteria for rapid transport a. no relief with medications b. hypotension/hypoperfusion
8.3.8 – Heart Failure	
8.3.8.1 - Discuss the precipitating causes, morbidity/mortality, pathophysiology, assessment findings, management, and communication strategies associated with heart failure.	A. Epidemiology B. Precipitating causes 1. Left-sided failure 2. Right-sided failure 3. Myocardial infarction 4. Pulmonary embolism 5. Hypertension C. Related terminology 1. Preload 2. Afterload 3. Congestive heart failure 4. Chronic versus acute a. First time event b. Multiple events D. Morbidity/mortality 1. Pulmonary Edema 2. Respiratory failure 3. Death E. Primary survey 1. Airway/breathing 2. Circulation a. Peripheral pulses i. Quality ii. Rhythm b. Peripheral perfusion – Changes in skin color (color, temperature, and moisture) F. History of present illness/SAMPLE history – Chief complaint 1. Progressive or acute SOB 2. Progressive accumulation of edema 3. Weight gain over short period of time 4. Episodes of paroxysmal nocturnal dyspnea 5. Prescribed medication history a. Compliance b. Non-compliance c. Borrowed d. Over-the-counter e. Home remedies

6. Home oxygen use

G. Secondary survey findings
   1. Level of consciousness
      a. Unconscious
      b. Altered levels of consciousness
   2. Airway/breathing
      a. Dyspnea
      b. Productive cough
      c. Labored breathing
         i. Most common, often with activity
         ii. Paroxysmal nocturnal dyspnea ("PND")
         iii. Tripod position
         iv. Adventitious sounds
         v. Retraction
   3. Circulation
      a. Heart rate/rhythm
         i. Any tachycardia with ectopy
         ii. Any bradycardia with ectopy
         iii. Atrial arrhythmias
      b. Changes in skin
         i. Color
         ii. Temperature
         iii. Moisture
      c. Peripheral pulses
         i. Quality
         ii. Rhythm
      d. Edema
         i. Pitting versus non-pitting
         ii. Extremities
            a) Localized in ankles
            b) To the midcalf
            c) To the knees
            d) Obliteration of pulses
         iii. Ascites
         iv. Sacral

H. Complications – Pulmonary edema (signs and symptoms)
   1. Tachypnea
   2. Wheezing/ronchi
   3. Crackles/rales at both bases
   4. Frothy sputum
   5. Elevated jugular venous pressure
   6. Pulsus paradoxus
   7. Rapid "thread" pulse
   8. Pulsus alternans
   9. Cyanosis in advanced stages
   10. Abnormalities of apical pulse
      a. Due to displaced cardiac apex
      b. Abnormal bulges

I. Management
   1. Position of comfort
   2. Refer to ILCOR Consensus for treatment
   3. Transport
      a. Refusal

	b. No other indications for no-transport J. Support and communications strategies 1. Explanation for patient, family, and significant others 2. Communications and transfer of data to the physician

8.4 – Neurology

Objective	Educational Standard
8.4.1 – Introduction (Overview of Neurological Conditions)	
8.4.2 – Central Nervous System	
C 8.4.2.1 – Discuss the anatomy and physiology of the nervous system.	A. Brain and Cerebral Blood Vessels B. Spinal cord C. Autonomic and peripheral nervous system
8.4.3 – Neurological Assessment (Normal and Abnormal Findings)	
C 8.4.3.1 – Discuss potential findings from a neurological assessment of a patient.	A. General appearance B. Confused, dizzy, weak C. Decreasing or increasing level of consciousness D. Combative or uncooperative or restless E. Facial drooping, inability to swallow, tongue deviation F. Double vision or blurred vision G. Difficulty speaking or absence of speech H. Decreased or absent movement of one or more extremities I. Headache J. Decreased or absent sensation in one or more extremities or other areas of body K. Coma L. Stroke Alert Criteria – Cincinnati Prehospital Stoke Scale
8.4.4 – General Management Considerations	
C 8.4.4.1 – Discuss general management conditions for patients with a neurological emergency.	A. Scene Safety and Standard Precautions B. ABC's and positioning C. Oxygen and suctioning D. Pulse Oximetry E. Emotional support F. Transport decisions
8.4.5 – Neurological Conditions	
C 8.4.5.1 – Discuss the epidemiology, pathophysiology, potential assessment findings, and management of commonly encountered neurological emergencies.	A. Altered mental status 1. AEIOUTIPS 2. Assessment findings and symptoms for AMS B. Stroke, intracranial hemorrhage, and transient ischemic attack ("TIA") 1. Incidence, mortality, morbidity, and complications 2. Types a. Occlusive stroke i. Embolic ii. Thrombotic b. Hemorrhagic 3. Transient ischemic attack 4. Assessment findings and symptoms a. Stroke assessment scales/scores b. Stroke alerts/protocols C. Seizures

	1. Incidence, mortality, morbidity, and complications 2. Types a. Generalized tonic-clonic i. Aura ii. Tonic iii. Clonic iv. Postictal v. Pseudo seizures b. Partial i. Simple partial ii. Complex partial c. Status epilepticus 3. Assessment findings and symptoms a. Spasms, muscle contractions b. Bite tongue, increased secretions c. Sweating d. Cyanosis e. Unconscious, gradually increasing level of consciousness f. May have shaking or tremors and no loss of consciousness g. Incontinent a. Amnesia of event D. Management 1. Safety of patient/position 2. ABC's, consider nasopharyngeal airway 3. Oxygen and suction 4. Pulse oximetry 5. Emotional support E. Headache 1. As a symptom 2. As a Neurological Condition 3. Assessment findings and symptoms 4. Management
8.4.6 – Age-Related Variations	
C 8.4.6.1 – Identify differences in neurological emergencies affecting pediatric and geriatric patients.	A. Pediatrics 1. Epidemiology 2. Anatomic and physiologic differences in children 3. Pathophysiology 4. Causes of altered mental status in children 5. Assessment a. History b. Physical findings 6. Meningitis 7. Seizures 8. Altered mental status 9. Management B. Geriatrics – Stroke risk high in this age group
8.4.7 – Communication and Documentation	
C 8.4.7.1 – Discuss communication and	

documentation considerations for patients with neurolo,qical emer,qencies.
8.4.8- Transport Decisions C
8.4.8.1 -Discuss transport considerations for patients with neurolo,qical emer,qencies.

8.5 – Abdominal and Gastrointestinal Disorders

Objective	Educational Standard
8.5.1 – Introduction	
8.5.2 – General Pathophysiology, Assessment, and Management	
C 8.5.2.1 – Discuss the anatomy and pathophysiology of Acute Abdomen.	A. Stomach B. Intestines C. Esophagus D. Spleen E. Urinary Bladder F. Liver G. Gall Bladder H. Pancreas I. Kidney J. Reproductive Organs
C 8.5.2.2 – Discuss assessment findings as related to the patient with an acute abdominal.	A. Assessment and Symptoms-Techniques 1. Inspection 2. Palpation B. Normal Findings-Soft Non-Tender C. Abnormal Findings 1. Nausea/vomiting a. Excessive b. Hematemesis 2. Change in bowel habits/stool a. Constipation b. Diarrhea c. Dark tarry stool 3. Urination a. Pain b. Frequency c. Color d. Odor 4. Weight loss 5. Belching/flatulence 6. Concurrent chest pain 7. Pain, tenderness, guarding, distension 8. Other
C 8.5.2.3 – Discuss the management and treatment of patients with an acute abdominal.	A. Scene Safety and Standard Precautions B. Airway and ventilator support 1. Maintain an open airway 2. High-concentration oxygen C. Circulatory support 1. IV fluid administration based on assessment for fluid loss D. Non-pharmacologic interventions 1. Nothing by mouth 2. Monitor level of consciousness 3. Monitor vital signs 4. Position of comfort E. Transport consideration (gentle, but rapid transport) F. Psychological/Emotional support

8.5.3 – Specific Acute Abdominal Conditions: Definitions, Causes, Assessment Findings, and Symptoms, Complications, and Specific Prehospital Management.	
C 8.5.3.1 – Discuss the pathophysiology, potential assessment findings, and management of commonly encountered abdominal and gastrointestinal emergencies.	A. Acute and Chronic Gastrointestinal Hemorrhage B. Peritonitis C. Ulcerative Diseases
8.5.4 – Consider Age-Related Variations	
C 8.5.4.1 - Identify differences in abdominal emergencies affecting pediatric and geriatric patients.	A. Pediatrics 1. Anatomic and physiologic differences in children 2. Pathophysiology 3. Assessment a. History b. Physical findings i. Vomiting causes dehydration ii. Appendicitis common in children iii. Abdominal pain from constipation iv. Vomiting v. GI Bleeding 4. Management B. Geriatrics 1. AAA more common 2. May not exhibit rigidity or guarding 3. Abdominal pain related to cardiac conditions
8.5.5 – Communication and Documentation	
C 8.5.5.1 - Discuss communication and documentation considerations for patients with abdominal and gastrointestinal emergencies.	
8.5.6 – Transport Decisions	
C 8.5.6.1 - Discuss transport considerations for patients with abdominal emergencies.	

8.6 – Immunology

Objective	Educational Standard
8.6.1 – Introduction	
C 8.6.1.1 - Discuss the morbidity/mortality, preventative strategies, and pathophysiology of immunology conditions.	A. Allergic reaction and anaphylaxis B. Risk Factors and Common Allergens
8.6.2 – Pathophysiology	
C 8.6.2.1 – Discuss the pathophysiology of immunology emergencies.	A. Basic Immune Systems Response to Allergens 1. The purpose of the response 2. The type of response(Local vs Systemic) 3. The speed of the response B. Allergic reaction 1. Antigens 2. Antibodies 3. Mast cells and basophils 4. Histamine, leukotrienes, and other mediators 5. Local reactions 6. Reactions
8.6.3 – Assessment	
C 8.6.3.1 – Discuss the assessment of a patient suffering from an allergic reaction.	A. Mild allergic reaction 1. Cutaneous 2. Other B. Moderate allergic reaction 1. Upper airway 2. Lower airway 3. Cardiovascular 4. Cutaneous 5. Gastrointestinal 6. Neurological C. Severe allergic reaction/anaphylaxis 1. Upper airway 2. Lower airway 3. Cardiovascular 4. Cutaneous 5. Gastrointestinal 6. Neurological
8.6.4 – Managing an Allergic Reaction *C*	
8.6.4.1 – Discuss the management of a patient suffering from an allergic reaction.	A. Provide treatment specific to assessment findings and severity of reaction. B. Remove allergen if possible C. Protect the airway D. Ventilate if needed 1. Apneic Patient 2. Dyspneic Patient 3. Patient with airway edema E. Medication Administration 1. Epinephrine administration 2. Bronchodilation 3. Oxygen F. Fluid Administration/ IV Access
8.6.5 – Consider Age-Related Variations in Pediatric and Geriatric Patients	

C 8.6.5.1 - Identify differences in immunology emergencies affecting pediatric and geriatric patients.	A. Pediatric Epinephrine Dosing B. Use of Epinephrine in the Geriatric Patient
8.6.6 – Communication and Documentation	
C 8.6.6.1 - Discuss communication and documentation considerations for patients with immunology emergencies.	
8.6.7 – Transport Decisions	
C 8.6.7.1 - Discuss transport considerations for patients with immunology emergencies.	

8.7 – Infectious Diseases

Objective	Educational Standard
8.7.1 – Pathophysiology of Infectious Disease	
C 8.7.1.1 – Discuss the pathophysiology of infectious disease.	A. Bacteria B. Viruses C. Fungi D. Protozoa E. Helminths (worms)
8.7.2 – Standard Precautions, Personal Protective Equipment, and Cleaning and Disposing of Equipment and Supplies	
C 8.7.2.1 – Discuss techniques employed by paramedics to limit or prevent the spread of infectious diseases.	A. Principles of standard precautions B. Current hand washing guidelines C. Current recommendations for standard precautions D. Current recommendations for cleaning or sterilization of equipment E. Current recommendations for disposing of contaminated linens and supplies, including sharps F. Recommendations for Decontaminating the Ambulance
P 8.7.2.2 – Demonstrate use of personal protective equipment.	
P 8.7.2.3 – Protect self and others from blood borne pathogens and infectious disease.	
8.7.3 – Specific Diseases and Conditions	
C 8.7.3.1 - Discuss the pathophysiology, potential assessment findings, and management of commonly encountered infectious disease emergencies	A. HIV and AIDS 1. Incidence, morbidity, mortality, risk factors, and modes of transmission 2. Pathophysiology 3. Body systems affected 4. Progression of disease, including opportunistic infections 5. Healthcare worker susceptibility and transmission 6. Assessment findings and symptoms a. Often asymptomatic b. Non-specific febrile illness c. Sore throat, fatigue d. Swollen spleen and lymph glands e. Weight loss f. Opportunistic infections 7. Management for a patient with HIV or AIDS-related conditions a. Prehospital care is supportive b. Manage airway and support ventilation c. IV if needed d. Respiratory isolation if coughing 8. Immunization and treatment of exposure

	B. Hepatitis 1. Pathophysiology, incidence, types, causes, risk factors, methods of transmission, and complications 2. General assessment findings and symptoms a. Asymptomatic b. Non-specific febrile illness c. Light-colored stools d. Dark urine e. Fatigue f. Nausea/vomiting g. Abdominal pain/tenderness h. Jaundice i. Fulminant acute hepatitis 3. Treatments for exposure/prevention; immunizations 4. Types a. Hepatitis A b. Hepatitis B c. Hepatitis C d. Hepatitis D e. Hepatitis E f. Hepatitis G g. Other 5. Management for a patient with hepatitis a. Prehospital care is supportive b. Manage airway and support ventilation c. IV if needed
8.7.4 – Consider Age-Related Variations in Pediatric and Geriatric Patients	
C 8.7.4.1 - Identify differences in infectious disease emergencies affecting pediatric and geriatric patients.	
8.7.5 – Communication and Documentation for a Patient with a Communicable or Infectious Disease	
C 8.7.5.1 - Discuss communication and documentation considerations for patients with infectious disease emergencies.	
8.7.6 – Transport Decisions Including Special Infection Control Procedures	
C 8.7.6.1 - Discuss transport considerations and procedures for patients with infectious disease emergencies.	
8.7.7 – Legal Requirements Regarding Reporting Communicable or Infectious Diseases/Conditions	
C 8.7.7.1 – Discuss the legal requirements for reporting of communicable or infectious diseases or conditions.	A. Exposure of health care provider 1. Current recommended treatment modalities and follow-up

2. Prevention of exposure or immunizations/vaccines B. Required reporting to the health department or other health care agency

8.8 – Endocrine Disorders

Objective	Educational Standard
8.8.1 – Overview of Endocrine Conditions	
8.8.2 – Pathophysiology, Causes, Incidence, Morbidity, and Mortality, Assessment Findings, Management for Endocrine Conditions	
C 8.8.2.1 - Discuss the morbidity/mortality, preventative strategies, pathophysiology, assessment findings, and management of endocrine emergencies.	A. Diabetic Emergencies 1. Related Anatomy of the Pancreas and Organs Supporting Blood Sugar Regulation 2. Physiology of the Pancreas 3. Hormones Related to Blood Sugar Regulation 4. Pathophysiology of Diabetes Mellitus a. Long-term complications b. Types of diabetes i. Type I ii. Type II iii. Gestational 5. Drugs to Manage Diabetes a. Insulin i. types ii. delivery methods b. Oral antihyperglycemics B. Assessment 1. Impact of Disease on Prehospital Assessment 2. Alterations of Findings in Long-Term Diabetes 3. Hypoglycemia a. Physical findings b. Blood sugar level c. Causes 4. Hyperglycemia/DKA a. Physical findings b. Blood sugar level c. Causes 5. Treatment a. Oxygenation and ventilation requirements b. Blood glucose determination c. Oral glucose d. Glucagon administration e. IV placement and fluid therapy for i. hyperglycemia ii. hypoglycemia f. D50 Administration 6. Reassessment and Evaluation for Other Underlying Acute Illness in the Hyperglycemic Patient
8.8.3 – Consider Age-Related Variations	
C 8.8.3.1 - Identify differences in endocrine emergencies affecting pediatric and	A. Pediatric 1. Usually Type 1 diabetes

geriatric patients.	2. Late stages of hyperglycemia may have cerebral edema 3. Prone to seizures 4. Prone to dehydration in hyperglycemia B. Geriatric 1. Masking of illness through changes in pain perception 2. Prone to dehydration and infections
8.8.4 – Communication and Documentation	
C 8.8.4.1. - Discuss communication and documentation considerations for patients with endocrine emergencies.	
8.8.5 – Transport Decisions	
C 8.8.5.1 - Discuss transport considerations for patients with endocrine emergencies.	

8.9 – Psychiatric

Objective	Educational Standard
8.9.1 – Introduction	
C 8.9.1.1 – Discuss the prevalence of behavioral and psychiatric disorders, the medical legal considerations for the management of patients with such disorders, and the importance of ensuring safety (patient, providers, and others) while assisting these patients.	A. Prevalence B. Medical legal considerations 1. Types of Restraints 2. Transport Against Patients Will C. Safety D. Epidemiology of Psychiatric Disorders E. Assessment 1. General Appearance 2. Speech 3. Skin 4. Posture/Gait 5. Mental Status 6. Mood, Thought, Perception, Judgment, Memory, and Attention
8.9.2 – Understanding Behavior	
C 8.9.2.1 – Define different causes for a patients behavior.	A. Factors That May Alter a Patient's Behavior-May Include Situational Stresses, Medical Illnesses, Psychiatric Problems, and Alcohol or Drugs B. Common Causes of Behavioral Alteration 1. Low blood sugar 2. Lack of oxygen 3. Hypoperfusion 4. Head trauma 5. Mind altering substances 6. Psychogenic – resulting in psychotic thinking, depression or panic 7. Excessive cold 8. Excessive heat 9. Meningitis 10. Seizure disorders 11. Toxic ingestions – overdose 12. Withdrawal of drugs or alcohol
8.9.3 – Acute Psychosis	
C 8.9.3.1 – Discuss the pathophysiology, signs and symptoms, and pre-hospital management of acute psychosis.	A. Assessment for Suicide Risk 1. Depression 2. Risk Factors/signs or symptoms a. Ideation or defined lethal plan of action which has been verbalized and/or written b. Alcohol and substance abuse c. Purposelessness d. Anxiety, agitation, unable to sleep or sleeping all the time e. Feeling trapped, no way out f. Hopelessness g. Withdrawal from friends, family and society h. Anger and/or aggressive tendencies i. Recklessness or engaging in risky

	activities j. Dramatic mood changes k. History of trauma or abuse l. Some major physical illness(cancer, CHF, etc.) m. Previous suicide attempt n. Job or financial loss o. Relational or social loss p. Easy access to lethal means q. Lack of social support and sense of isolation r. Certain cultural and religious beliefs B. Important Questions 1. How does the patient feel? 2. Determine suicidal tendencies 3. Is patient threat to self or others? 4. Is there a medical problem? 5. Is there trauma involved? 6. Interventions?
8.9.4 – Agitated Delirium	
C 8.9.4.1 – Discuss the pathophysiology, risk factors, signs and symptoms, and management of agitated delirium.	A. Emergency medical care 1. Scene size-up, personal safety 2. Establish rapport a. engage in active listening b. supportive and empathetic c. limit interruptions d. respect patient's territory, limit physical touch 3. Airway, respiration and ventilation threatening actions, statements and questions 4. approach slowly and purposefully B. Patient Assessment 1. intellectual functioning 2. orientation 3. memory 4. concentration 5. judgment 6. thought content a. disordered thoughts b. delusions, hallucinations c. unusual worries, fears 7. language a. speech pattern and content b. garbled and unintelligible 8. mood a. anxiety, depression, elation, agitation b. level of alertness, distractibility i. appearance, hygiene, dress ii. psychomotor activity 9. Calm the patient – do not leave the patient along, unless unsafe situation: consider need for law enforcement 10. Restrain if necessary

	11. Transport 12. If overdose, bring medication or drugs found to the medical facility
8.9.5 – Specific Behavioral/Psychiatric Disorders	A. Behavior B. Psychiatric Disorder C. Airway, respiration and ventilatory emergency
8.9.6 – Providing Empathetic and Respectful Management	
8.9.7 – Consider Age-Related Variations in Pediatric and Geriatric Patients	
C 8.9.7.1 - Identify differences in behavioral emergencies affecting pediatric and geriatric patients.	A. Pediatric Behavioral Emergencies 1. Teenage suicide concerns 2. Aggressive behavior may be a symptom of an underlying disorder or disability B. Geriatrics
8.9.8 – Communication to Medical Facility and Documentation	
C 8.9.8.1 - Discuss communication and documentation considerations for patients with behavioral emergencies.	
8.9.9 – Transport Decisions	
C 8.9.9.1 - Discuss transport considerations for patients with behavioral emergencies.	

8.10 – Toxicology

Objective	Educational Standard
8.10.1 – Epidemiology of Toxicology Emergencies	
C 8.10.1.1 – Discuss the epidemiology of toxicology, including types of emergencies, pharmacokinetics, and routes of exposure.	A. Introduction 1. Define Toxicology, Poisoning, Overdose 2. National Poison Control Center 3. Routes of Absorption a. Ingestion b. Inhalation c. Injection d. Absorption B. Poisoning by Ingestion 1. Examples 2. Assessment Findings 3. General Management Considerations C. Poisoning by Inhalation 1. Examples 2. Assessment Findings 3. General Management Considerations D. Poisoning by Injection 1. Examples 2. Assessment Findings 3. General Management Considerations E. Poisoning by Absorption 1. Examples 2. Assessment Findings 3. General Management Considerations
8.10.2 – Toxic Syndromes (Toxidromes) Including Drugs of Abuse	
C 8.10.2.1 – Discuss the pathophysiology, incidence, risk factors, methods of transmission, complications, assessment findings, and patient management considerations associated with toxic syndromes.	A. Pathophysiology, incidence, toxic agents, risk factors, methods of transmission, and complications B. Cholinergics 1. Common causative agents – Pesticides (organophosphates, carbonates) and nerve agents (Sarin, Soman) 2. Assessment findings and symptoms for patients with exposure to cholinergics a. Headache, dizziness, weakness, and nausea b. SLUDGE (salivation, lacrimation, urination, defecation, GI upset, emesis) c. Bradycardia, wheezing, bronchoconstriction, myosis, coma, and convulsions d. Diaphoresis, seizures 3. Management for a patient with exposure to cholinergics a. Decontamination b. Airway, ventilation, and circulation C. Anticholinergic 1. Common causative agents 2. Assessment findings and symptoms for patients with exposure to anticholinergics a. Delirium, flushed skin, dilated pupils, and

	urinary retention b. Memory loss, seizures 3. Management for a patient with exposure to anticholinergics a. Airway and ventilation D. Common Causative Agents, Assessment Findings and Symptoms, Management 1. Cannabis 2. Hallucinogens 3. Stimulants 4. Barbiturates/sedatives/hypnotics a. Airway, ventilation and circulation E. Opiates 1. Common causative agents a. Heroin, morphine, methadone b. Codeine, meperidine, propoxyphene c. Fentanyl, lortab, oxycotin 2. Assessment findings and symptoms for patients with exposure to/use of opiates a. CNS – Euphoria, decreased level of consciousness, sedation b. Hypotension c. Respiratory depression/arrest d. Nausea, pinpoint pupils e. Seizures and coma 3. Management for a patient with exposure to/use of opiates a. Airway, ventilation, and circulation
8.10.3 – Alcoholism	
C 8.10.3.1 - Discuss the pathophysiology, incidence, risk factors, morbidity/mortality, complications, assessment findings, and patient management considerations associated with alcoholism.	A. Overview of alcoholism including long term effects B. Alcohol abuse 1. CNS changes – agitation to sedation to altered level of consciousness 2. Respiratory depression 3. Nausea and vomiting 4. Uncoordination C. Alcohol withdrawal 1. Tremors, sweating, weakness 2. Hallucinations and seizures D. Assessment findings and symptoms for patients with alcohol abuse and alcohol withdrawal E. Management for a patient using alcohol or withdrawing from alcohol. 1. Airway 2. ventilation 3. circulation
8.10.4 – Household Poisons	
C 8.10.4.1 - Discuss potential agents, assessment findings and symptoms, and management considerations associated with household poison/chemical exposures.	A. Scene Safety Issues B. Common causative agents, assessment findings and symptoms, management 1. Pesticides 2. Chemicals 3. Household Cleaning poisonings 4. Poisonous Plants

8.10.5 – Medication Overdose (Introduction: Pathophysiology, Incidence, Toxic Agents, Risk Factors, and Complications)	
C 8.10.5.1 - Discuss the pathophysiology, incidence, risk factors, complications, assessment findings, and patient management considerations associated with a medication overdose.	A. Definition of toxic syndrome (toxidrome) B. Incidence of opiate abuse C. Opiate Intoxication/Poisoning 1. Common causative agents a. heroin, morphine, methadone b. codeine, meperidine, propoxyphene c. fentanyl, lartab, oxycontin D. Assessment findings specific to opiate intoxication/poisoning 1. CNS—Level of consciousness/behavior a. euphoria b. decreased level of consciousness c. sedation d. pin-point pupils a. seizures b. coma 2. Respiratory a. decreased respiratory rate and effort b. apnea 3. Gastrointestinal a. nausea b. vomiting
8.10.6 – General Treatment Modalities for Poisonings	
C 8.10.6.1 – Discuss general treatment modalities for poisoning emergencies.	A. Airway/Breathing support 1. oxygenation requirements 2. ventilatory requirements a. considerations in use of oral pharyngeal airways b. bag-valve mask c. consideration of use of advanced airway in the opiate overdose patient B. Circulatory Support 1. causes of hypotension in the opiate overdose 2. IV access 3. Pharmaceutical interventions C. Other considerations in the care of opiate overdose 1. underlying chronic illness a. HIV/AIDS b. hepatitis c. malnutrition d. sepsis 2. family interaction and social issues 3. chronic pain patients a. drug dependency b. consequences of narcotic antagonist use in the chronic pain patient
8.10.7 – Communication and Documentation for Patients with	

Toxicological Emergencies	
C 8.10.7.1 – Discuss communication and documentation considerations for patients with toxicological emergencies.	A. Documentation of the Opiate Overdose Specific Patient B. Communication 1. Hospital Personnel 2. Family 3. Law enforcement personnel
8.10.8 – Transport Decisions with Toxicological Emergencies	
C 8.10.8.1 – Discuss transport considerations for patients with toxicological emergencies.	
8.10.9– Age-Related Variations for Pediatric and Geriatric Patients	
C 8.10.9.1 - Identify differences in toxicological emergencies affecting pediatric and geriatric patients.	A. Pediatric 1. Toddler-age prone to ingestion of toxic substance 2. Adolescent prone to experimentation with drugs of abuse B. Geriatric 1. Alcoholism is common in elderly 2. drug dependency 3. consequences of narcotic antagonist use in the chronic pain patient

8.11 – Hematology

Objective	Educational Standard
8.11.1 – Introduction	
C 8.11.1.1 – Discuss the incidence and morbidity/mortality of hematological emergencies.	A. Incidence B. Morbidity/mortality
C 8.11.1.2 – Describe the anatomy and physiology of the circulatory system as it relates to hematology.	A. Blood B. Plasma C. Blood-forming organs D. Normal red cell production, function, and destruction
8.11.2 – General Assessment Findings and Symptoms	
8.11.3 – Sickle Cell Disease	
C 8.11.3.1. – Discuss the pathophysiology, mortality/morbidity, and management of a sickle cell crisis.	A. Types of emergent presentations 1. Vaso-occlusive crisis a. Description b. Signs and symptoms c. Implications 2. Acute chest syndrome a. Description b. Signs and symptoms c. Implications 3. Acute splenic sequestration syndrome (pediatric) a. Description b. Signs and symptoms c. Implications B. Patient management 1. Administer high-concentration oxygen 2. Initiate IV therapy (administer IV fluids to hydrate) 3. Maintain nomothermic 4. Rest 5. Pain management
8.11.4 Discuss potential assessment findings for a patient suffering from Sickle Cell Disease	A. Types of Presentation B. Specific signs and symptoms
8.11.5 Discuss the pre-hospital management of a patient suffering from Sickle Cell Disease	A. Airway and Oxygenation Requirements B. IV Access
8.11.6 – Consider Age-Related Variations in Pediatric and Geriatric Patients	
C 8.11.6.1 – Identify differences in hematological conditions or emergencies affecting pediatric and geriatric patients.	A. Types o f Crisis Specific to the Pediatric Patient B. Special Considerations in Treatment

8.12 – Genitourinary/Renal

Objective	Educational Standard
8.12.1 – Introduction	
C 8.12.1.1 – Describe the general anatomy and functions of the urinary system.	A. General anatomy 1. Structure of the kidneys, ureters, bladder, and urethra 2. Structure and function of the nephron B. Functions of the urinary system 1. Regulating water and electrolytes 2. Regulating acid-base 3. Excreting waste products and foreign chemicals 4. Regulating arterial blood pressure 5. Producing red blood cells 6. Producing glucose
8.12.2 – Renal Diseases	
C 8.12.2.1 – Discuss the pathophysiology, incidence, morbidity/mortality, assessment findings, symptoms, and management of renal disease emergencies.	A. Renal Calculi (kidney stones) 1. Calculi formation 2. Consequences of renal calculi B. Types of renal failure 1. Acute 2. Chronic C. End-stage renal disease 1. Definition 2. Causes D. Dialysis 1. Definition of dialysis 2. Process of dialysis 3. Types of dialysis 4. Complications/adverse effects of dialysis a. Hypotension b. Muscle cramps c. Nausea/vomiting d. Altered mentation, loss of consciousness e. Hemorrhage from shunt f. Air embolism g. Myocardial ischemia h. Infection i. Electrolyte imbalance 5. Consequences of missed dialysis treatment a. Electrolyte excesses b. Weakness c. Pulmonary edema E. Assessment 1. Findings in renal calculi 2. Findings in renal failure a. Acute b. Chronic c. End-Stage F. Management 1. Renal calculi patient a. Oxygen requirement

	b. IV access c. Fluid administration consideration 2. Renal failure patients a. Oxygen and ventilation requirements b. IV access i. hypotensive patient ii. pulmonary edema patient
8.12.3 – Communication and Documentation	
C 8.12.3.1 – Discuss communication and documentation considerations for patients with genitourinary/renal conditions or emergencies.	
8.12.4 – Transport Decisions	
C 8.12.4.1 – Discuss transport considerations for patients with genitourinary/renal conditions or emergencies.	

8.13 – Gynecology

Instructor Note: This is a review from the Basic Curriculum.

Objective	Educational Standard
8.13.1 – Introduction	
C 8.13.1.1 – Review the female reproductive system anatomy.	
8.13.2 – Physiology	
C 8.13.2.1 – Review the female menstrual and ovarian cycles.	
8.13.3 – Symptoms and Assessment Findings	
C 8.13.3.1 – Review potential symptoms and assessment findings related to a gynecological examination.	A. Abdominal and/or vaginal pain B. Vaginal bleeding C. Vaginal discharge D. Fever E. Nausea and vomiting F. Syncope
8.13.4 – General Management	
C 8.13.4.1 – Review the general management of a patient with a gynecological condition or emergency.	A. Protect privacy and modesty B. Communication techniques C. Consider pregnancy and/or sexually transmitted diseases D. Oxygen and IV fluids if needed
8.13.5 – Specific Gynecological Emergencies	
C 8.13.5.1 – Review the pathophysiology, assessment findings, and management of a female patient with a gynecological emergency.	A. Vaginal Bleeding B. Sexual Assault – Legal Issues C. Infections – Pelvic Inflammatory Disease D. Sexually Transmitted Diseases
8.13.6 – Age-Related Variations	
C 8.13.6.1 – Review differences in gynecological conditions or emergencies affecting pediatric and geriatric patients.	A. Pediatrics – Menarche could be cause of bleeding. B. Geriatrics – Menopausal women can get pregnant.
8.13.7 – Communication and Documentation	
C 8.13.7.1 – Review communication and documentation considerations for patients with gynecological conditions or emergencies.	
8.13.8 – Transport Decisions	
C 8.13.8.1 – Review transport considerations for patients with gynecological conditions or emergencies.	

8.14 – Obstetrics

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
8.14.1 - Anatomy and Physiology	
C 8.14.1.1 – Review the anatomy and physiology of the female reproductive system.	A. Anatomy and Physiology 1. Uterus 2. Cervix 3. Ovaries 4. Vagina 5. Breasts B. Female reproductive cycle C. Cultural values affecting pregnancy D. Special considerations of adolescent pregnancy
8.14.2 – Physiology	
C 8.14.2.1 – Discuss the physiology of pregnancy.	A. Normal anatomical, physiological, and psychological changes in pregnancy 1. Reproductive system 2. Respiratory system 3. Cardiovascular system 4. Musculoskeletal system B. Identify normal events of pregnancy C. Conception and fetal development 1. Ovulation 2. Fertilization 3. Implantation 4. Embryonic stage 5. Fetal stage D. Functions of the placenta
8.14.3 – General System Physiology, Assessment, and Management of the Obstetrical Patient	
C 8.14.3.1 – Discuss the signs, stages, assessment, and management of labor and delivery.	A. Premonitory signs of labor 1. Lightening 2. Braxton Hicks 3. Cervical changes 4. Bloody show 5. Rupture membrane 6. Other B. Stages of labor and delivery 1. First stage 2. Second stage a. Spontaneous birth b. Positional changes of the fetus 3. Third stage a. Placental separation b. Placental delivery C. Antepartum and Intrapartum Assessment Findings 1. Airway, breathing, circulation 2. Initial assessment

	3. SAMPLE history 4. Vital signs 5. Obstetrical history 6. Physical examination a. Fetal movement b. Inspect for crowning D. Management of a normal delivery obstetrical patient – Treatment modalities 1. Oxygen 2. Non-pharmacological intervention a. Positioning b. IV access c. Cardiac monitor E. Postpartum care 1. Fundal massage 2. Signs of hemorrhage
8.14.4 – Complications Related to Pregnancy	
C 8.14.4.1 – Discuss pathophysiology, assessment, and management of complications related to pregnancy.	A. Abuse B. Substance abuse C. Diabetes mellitus D. Bleeding related to pregnancy 1. Pathophysiology 2. Assessment 3. Management 4. Abortion i. Elective abortion ii. Spontaneous abortion 5. Ectopic pregnancy E. Placental problems 1. Pathophysiology 2. Assessment 3. Management 4. Abruption placenta 5. Placenta previa F. Hypertensive disorders 1. Pathophysiology 2. Assessment 3. Management 4. Pregnancy induced hypertension 5. Preeclampsia 6. Eclampsia
8.14.5 – High Risk Pregnancy: Pathophysiology, Assessment, Complications, and Management	
C 8.14.5.1 – Discuss the pathophysiology, assessment, complications, and management of high-risk pregnancies.	1. Precipitous labor and birth 2. Post term pregnancy 3. Meconium staining 4. Multiple gestation 5. Intrauterine fetal death
8.14.6 – Complications of Labor: Pathophysiology, Assessment, Complications, and Management	

C 8.14.6.1 – Discuss the pathophysiology, assessment, complications, and management of complicated labor.	1. Premature rupture of membranes 2. Preterm labor
8.14.7 – Complications of Delivery: Pathophysiology, Assessment, Complications, and Management	
C 8.14.7.1 – Discuss the pathophysiology, assessment, complications, and management of complicated deliveries.	1. Cephalic presentation 2. Breech 3. Nuchal cord 4. Prolapse of cord 5. Postpartum complications a. Pathophysiology b. Assessment c. Complications d. Management e. Hemorrhage i. Early ii. Late f. Embolism g. Post partum depression

8.15 – Non-Traumatic Musculoskeletal Disorders

Instructor Note: This is a review from the EMT Curriculum.

Objective	Educational Standard
8.15.1 – Introduction	
C 8.15.1.1 – Review the incidence and morbidity/mortality of non-traumatic musculoskeletal disorders.	A. Bones B. Muscles C. Tendons and ligaments
8.15.2 – General Assessment Findings and Symptoms	
C 8.15.2.1. – Review general assessment findings and symptoms associated with non-traumatic musculoskeletal disorders.	A. Pain or tenderness B. Swelling C. Abnormal or loss of movement D. Sensation changes E. Circulatory changes F. Deformity
8.15.3 – General Management for a Patient with a common or Major Non-Traumatic Musculoskeletal Disorder	
C 8.15.3.1 – Review the general management of a patient with a non-traumatic musculoskeletal disorder or emergency.	A. Airway, ventilation, and circulation B. Non-pharmacological C. Transport considerations D. Psychological/communication strategies
8.15.4.– Consider Age-Related Variations in Pediatric and Geriatric Patients	
C 8.15.4.1. – Review differences in non-traumatic musculoskeletal conditions or emergencies affecting pediatric and geriatric patients.	A. Pediatric – Slipped femoral epiphysis juvenile arthritis B. Geriatric - Osteoporosis

8.16 – Diseases of the Eyes, Ears, Nose, and Throat

Instructor Note: This is a review from the EMT Curriculum.

Objective	Educational Standard
8.16.1 – Introduction	
C 8.16.1.1 – Review the Anatomy and physiology of the eyes, ears, nose and throat.	A. Eye B. Ear C. Nasal bones and nasopharynx D. Mouth, oral cavity, oropharynx, and larynx
8.16.2 – General Assessment Findings and Symptoms	
C 8.16.2.1 – Discuss general assessment findings and symptoms for diseases affecting the eyes, ears, nose, and throat.	A. Pain or tenderness B. Swelling C. Bleeding from the nose D. Vomits swallowed blood E. Can block airway if patient is unresponsive
8.16.3 – General Management	
C 8.16.3.1. – Discuss the general pre-hospital management of patients with diseases affecting the eyes, ears, nose, and throat.	A. Airway, ventilation, and circulation B. Transport considerations

9.0 – Shock and Resuscitation

Applies fundamental knowledge to provide basic and selected advanced emergency care and transportation based on assessment findings for a patient in shock, respiratory failure or arrest, cardiac failure or arrest and post resuscitation management.

9.1 – Shock and Resuscitation

Objective	Educational Standard
9.1.1 – Ethical Issues in Resuscitation	
C 9.1.1.1 – Discuss ethical issues in resuscitation.	A. Withholding resuscitation attempts 1. Irreversible death 2. Do not resuscitate orders B. Providing emotional support for family C. Organ and tissue donation
9.1.2 – Anatomy and Physiology Review	
C 9.1.2.1 – Discuss the anatomy and physiology of the respiratory and cardiovascular systems.	E. Respiratory System F. Cardiovascular System
9.1.3 – Cardiac Arrest	
C 9.1.3.1 – Discuss the pathophysiology of cardiac arrest.	A. Pathophysiology 1. If the heart stops contracting, no blood will flow 2. The body cannot survive when the heart stops a. Organ damage begins quickly after the heart stops b. Brain damage i. Begins four to six minutes after the patient suffers cardiac arrest ii. Becomes irreversible in eight to ten minutes. 3. Cardio-pulmonary resuscitation (CPR) a. Artificial Ventilation b. External Chest Compressions c. Oxygenated blood is circulated to the brain and other vital organs. B. General Reasons for the heart to stop beating 1. Sudden death and heart disease 2. Breathing stops, especially in infants and children 3. Medical emergencies 4. Trauma
9.1.4 – Resuscitation	
C 9.1.4.1 – List system components to maximize survival for a patient suffering from a cardiac arrest.	A. Early access 1. Public education and awareness a. Rapid recognition of a cardiac emergency b. Rapid notification before CPR starts ("phone first") 2. 911 pre-arrival instructions and dispatcher-

	directed CPR B. Early CPR 1. Lay public a. Family b. Bystanders 2. Emergency medical responders C. Early defibrillation D. Early advanced care
C 9.1.4.2 – Describe basic life support interventions (refer to current AHA guidelines).	A. Adult CPR and foreign body airway obstruction B. Child CPR and foreign body airway obstruction C. Infant CPR and foreign body airway obstruction D. Neonatal sequence E. Alternative CPR techniques (i.e., interposed abdominal compression)
C 9.1.4.3 – Describe airway control and ventilation interventions.	A. Airway adjuncts 1. Basic adjuncts 2. Advanced adjuncts (as defined by scope of practice) B. Ventilation 1. Hazards of over-ventilation a. Reduces blood return to the right side of the heart b. Reduces the overall blood flow that can be generated with CPR 2. Devices to assist ventilation
C 9.1.4.4 – Discuss the delivery of effective chest compressions.	A. Factors that decrease effectiveness 1. Compressions that are too shallow 2. Slow compression rate 3. Sub-maximum recoil 4. Frequent interruptions B. Devices to assist circulation 1. Active compression-decompression CPR 2. Impedance threshold device 3. Mechanical piston device 4. Load-distributing band or vest CPR
9.1.5 – Automated External Defibrillation (Refer to Current AHA Guidelines)	
C 9.1.5.1 – List the steps involved in administering automated external defibrillation to a patient suffering from a cardiac arrest (refer to current AHA guidelines).	A. Adult sequence B. Child sequence C. Infant sequence D. Special situations 1. Pacemaker/implanted cardioverter/defibrillator 2. Wet victims 3. Transdermal medication patches
9.1.6 – Advanced Life Support (Refer to Current AHA Guidelines)	
C 9.1.6.2 – Describe ALS intravenous access as pertinent to treating cardiac arrest.	
9.1.7 – Postresuscitation Support (Refer to the Current AHA Guidelines)	
C 9.1.7.1 – Discuss postresuscitation	A. Temperature regulation (induced hypothermia)

support after the return of spontaneous circulation ("ROSC"). (Refer to current AHA guidelines.)	B. Glucose control C. Organ-specific support 1. Respiratory system (ventilation rates) 2. Cardiovascular system a. Monitor b. Leave AED pads in place 3. Central nervous system
9.1.8 – Shock	
C 9.1.8.1 – Define shock.	A. Perfusion is the passage of blood and oxygen and other essential nutrients to the body's cells B. While delivering these essentials to the body's cells, the circulatory system is also removing waste such as carbon dioxide from the cells C. Shock is a state of hypoperfusion, or inadequate perfusion of blood through body tissues D. Hypoperfusion can lead to death if not corrected
C 9.1.8.2 – Discuss anatomy and physiology as related to shock.	A. Heart/blood vessels B. Physiology of respiration 1. Gas exchange a. Alveolar level b. Tissue level 2. Circulation a. Pulmonary b. systemic
C 9.1.8.3 – Discuss the essential components for normal perfusion.	A. Functioning pump/heart 1. Stroke volume 2. Cardiac output 3. Blood pressure a. Mean arterial pressure b. Pulse pressure 4. Baroreceptors 5. Nervous control of heart a. Sympathetic nervous system b. Parasympathetic nervous system B. Adequate volume 1. Formed elements 2. Plasma C. Intact container/vessels 1. Arteries 2. Arterioles 3. Capillary beds 4. Sphincters 5. Venules 6. Veins 7. Capacity of each vessel 8. Sympathetic nervous system control of each vessel 9. Blood flow controlled by cellular tissue demands 10. Sphincter control
C 9.1.8.4 – Discuss tissue hypoperfusion.	A. Inadequate fluid volume B. Inadequate pump C. Inadequate container size
C 9.1.8.5 – Discuss the physiologic response	A. Cellular

to shock.	1. Fick principle 2. Waste removal 3. Aerobic metabolism/glycolosis 4. Anaerobic metabolism B. Sympathetic nervous system and endocrine implications
C 9.1.8.6 – Discuss the stages of shock.	A. Compensated shock B. Decompensated shock C. Irreversible shock
C 9.1.8.7 – Discuss specific types of shocks.	A. Hypovolemic 1. Hemorrhage classifications a. Hemostasis b. Vascular phase c. Platelet phase d. Coagulation phase e. Tension lines f. Factors affecting clotting/coagulation 2. Stages of hemorrhage a. Class I b. Class II c. Class III d. Class IV B. Distributive 1. Neurogenic 2. Anaphylactic 3. Septic 4. Psychogenic (vasovagal) C. Cardiogenic 1. Intrinsic causes a. Heart muscle damage i. Physiology ii. Signs/symptoms iii. Assessment iv. Management 2. Extrinsic causes a. Cardiac tamponade b. Tension pneumothorax D. Respiratory
C 9.1.8.8 – Discuss complications associated with shock.	A. Multiple organ dysfunction syndrome (“MODS”) 1. Sepsis 2. Death of organs 3. Death of organism
C 9.1.8.9 – Discuss the assessment of a patient suffering from shock.	A. Scene size-up B. Perform a primary assessment C. Obtain a relevant history D. Perform a secondary assessment E. Perform a reassessment
C 9.1.8.10 – Discuss the management of a patient suffering from shock.	A. Manual in-line spinal stabilization, as needed B. Comfort, calm, and reassure the patient C. Do not give food or drink D. Airway control E. Breathing 1. Assist ventilation, as needed 2. Oxygen administration (high concentration)

	F. Circulation 1. Attempt to control obvious external bleeding 2. Patient position 3. Keep patient work (attempt to maintain normal body temperature) G. Pneumatic anti-shock garment ("PASG") application H. Fluid resuscitation 1. Controllable external hemorrhage 2. Uncontrollable external hemorrhage 3. Internal hemorrhage I. Begin transport at the earliest possible moment J. Treat any additional injuries that might be present
C 9.1.8.11 – Identify differences in pediatric patients suffering from shock.	A. Common causes of shock 1. Trauma 2. Fluid loss 3. Neurological injury 4. Anaphylaxis 5. Heart disease 6. infection B. Presentation 1. Cardiovascular 2. Skin signs 3. Mental status 4. Decreased fluid output 5. Vital signs C. Anatomical and physiologic implications 1. Unreliable indicators 2. Indicators of shock a. Tachycardia for age b. Weak distal pulses c. Delayed capillary refill time d. Cool mottled extremities e. Altered mental status D. Management 1. Inline spinal stabilization, as needed 2. Suction, as needed 3. High concentration oxygen 4. Control bleeding 5. Positioning 6. Maintain body temperature 7. Fluid replacement E. Transport
C 9.1.8.12 – Identify differences in geriatric patients suffering from shock.	A. Assessment 1. Body system changes affecting presentation of shock a. Nervous system b. Cardiovascular i. Difficulty tolerating hypotension from hemorrhage ii. Beta-blocker and calcium channel blockers can alter physiologic response to hemorrhage

c. Respiratory
d. Integumentary
e. Renal
f. Gastrointestinal

2. Vital signs changes
   a. Altered mental status
      i. Sudden onset
      ii. Other causes
   b. Hypoxia
3. Airway
   a. Decreased cough reflex
   b. Cervical arthritis
   c. Loose dentures
4. Breathing
   a. Higher resting respiratory rate
   b. Lower tidal volume
   c. Less elasticity/compliance of chest wall
5. Circulation
   a. Higher resting heart rate
   b. Irregular pulses
6. Skin
   a. Dry, less elastic
   b. Cold
   c. Fever, not common
   d. Hot

B. Management
   1. Inline spinal stabilization
   2. Suction, as needed
   3. High flow oxygen
   4. Control bleeding
   5. Positioning
   6. Maintain body temperature

C. Transport

10.0 – Trauma

Applies fundamental knowledge to provide basic and selected advanced emergency care and transportation based on assessment findings for an acutely injured patient.

10.1 – Trauma Overview

Objective	Educational Standard
10.1.1 – Identification and Categorization of Trauma Patients	
C 10.1.1.1 – Discuss the identification and categorization of trauma patients as defined by the National Trauma Triage Protocol.	A. Centers for Disease Control and Prevention Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage. MMWR 2008:58 RR-1:1-35. B. http://cdc.gov/fieldtriage contains the National Trauma Triage Protocols and additional instructional materials.
10.1.2 – Types of Injury	
C 10.1.2.1 – List different types of traumatic injuries.	A. Blunt trauma 1. Non-bleeding 2. Multiple forces and conditions can cause blunt trauma B. Penetrating trauma 1. High velocity 2. Medium velocity 3. Low velocity
10.1.3 – Trauma Assessment	
C 10.1.3.1– List the major components of the trauma patient assessment.	A. Standard precautions B. Scene size-up C. General impression D. Mechanism of injury E. Primary assessment F. Baseline vital signs G. History H. Secondary assessment I. Reassessment
C 10.1.3.2 – Differentiate between significant and non-significant mechanisms of injury ("MOI").	A. Significant MOI (including, but not limited to): 1. Multiple body systems injured 2. Vehicle crashes with intrusion 3. Falls from heights 4. Pedestrian versus vehicle collision 5. Motorcycle crashes 6. Death of an occupant in the same vehicle B. Non-significant MOI 1. Isolated trauma to a body part 2. Falls without loss of consciousness (adult) 3. Falls without loss of consciousness (pediatric) C. Pediatric considerations 1. Falls > 10 feet without loss of consciousness 2. Falls < 10 feet with loss of consciousness 3. Bicycle collision

	4. Medium to high-speed vehicle collision (>25 mph) D. Reevaluating the MOI E. Special considerations 1. Spinal precautions must be initiated as soon as practical based on the MOI 2. When practical, log roll the supine patient on their side to allow for an appropriate assessment of the posterior body 3. Consider ALS backup
C 10.1.3.3 – Describe the primary assessment of a trauma patient.	A. Airway 1. Clear airway (chin-lift, suction, finger sweep) 2. Protect airway a. Decrease LOC B. Breathing 1. Assess ventilation capability 2. Oxygenation (100%) 3. Check thorax and neck a. Deviated trachea b. Tension pneumothorax c. Chest wounds and chest wall motion d. Sucking chest wound e. Neck and chest crepitation f. Multiple broken ribs g. Fractured sternum 4. Listen for breath sounds C. Circulation 1. Apply pressure to sites of external exsanguinations 2. Establish two large bore IVs a. Fluid bolus b. Consider IO c. Consider catheter site location 3. Radial and carotid pulse locations, blood pressure determination 4. Jugular venous distention D. Hypovolemia E. Disability 1. Brief neurological exam 2. Pupil size and reactivity 3. Limb movement 4. Glasgow coma scale F. Exposure 1. Completely remove all clothes 2. Logroll as part of inspection
10.1.4 – Management of the Trauma Patient	
C 10.1.4.1 – Discuss management of the trauma patient	A. Rapid Transport and Destination Issues 1. Scene time 2. Air versus ground B. Destination Selection C. Trauma System Components 1. Hospital Categorizations 2. Levels and qualifications

D. Transport Considerations

10.2 – Bleeding

Objective	Educational Standard
10.2.1 – Fluid Resuscitation in Bleeding and Shock	
C 10.2.1.1 – Discuss the pathophysiology of shock.	A. Cardiac control in homeostasis of blood pressure 1. Changes in function in hemorrhagic shock a. Rate b. Volume circulated c. Preload d. Afterload e. Starling's law f. Cardiac output 2. Loss of ability to compensate B. Neurological/Autonomic control in homeostasis 1. Vasoconstriction a. Peripheral b. Central c. Chemoreceptors d. baroreceptors 2. Loss of ability to compensate C. Blood vessels in homeostasis of blood 1. Neurovascular control a. Chemoreceptors b. baroreceptors 2. Clotting 3. Loss of ability to compensate
C 10.2.1.2 –Discuss blood volume and the different stages of shock.	A. Class I 1. Definition 2. Estimated blood loss 3. Assessment findings B. Class II 1. Definition 2. Estimated blood loss 3. Assessment findings C. Class III 1. Definition 2. Estimated blood loss 3. Assessment findings D. Class IV 1. Definition 2. Estimated blood loss 3. Assessment findings
C 10.2.1.3 – Discuss the management of bleeding and shock using fluid resuscitation.	A. Review of fluid physiology and special considerations in shock. 1. Oncotic Pressure 2. Hydrostatic pressure 3. Osmosis 4. Diffusion B. Review of IV skills and special considerations in shock 1. Vascular anatomy 2. Catheter Selection a. Diameter impact

	b. Length impact 3. Other Considerations a. Tubing length and extension tubing b. Impact of saline locks on IV flow C. General principles of shock management 1. Scene safety 2. Body substance isolation 3. Rapid transport without unnecessary scene delays 4. Airway 5. Breathing a. Hyperventilation is contraindicated b. Monitor oxygen saturation to maintain above 90% 6. Circulation a. Control the external bleeding i. Start 2 large bore IVs enroute ii. Fluid replacement with warmed isotonic solution up to 30 mL/kg in 250-500 mL increments with frequent reassessments iii. Monitor response to therapy b. Internal bleeding and non-compressible bleeding i. Position the patient to maximize perfusion ii. Consider PASG by protocol iii. Start two large bore IVs en route iv. Fluid replacement with warmed isotonic solution up to 20-30 ml/kg in boluses of 250-500 mL v. Maintain blood pressure between 70 mm/Hg and 90 mm/Hg. D. Reassessment of fluid therapy after initial treatment 1. Rapid return to normal vitals and vitals remain normal a. Slow IV to TKO rate b. Reassess often 2. Inconsistent responses to initial treatment with initial improvement followed by slow deterioration. a. Indicates ongoing uncontrolled blood loss b. Maintain blood pressure between 70-90 mm/Hg depending on local protocol.
10.2.2 – Special Considerations in Fluid Resuscitation	
C 10.2.2.1 – Discuss special considerations to be aware of during fluid resuscitation concerning pediatric patients, geriatric patients and obstetrical patients.	A. Permissive Hypotension B. Reperfusion Injury C. Pediatrics 1. Temperature control is critical in maintaining perfusion. 2. Use of IV is for known required fluid

replacement
3. Consider use of IO if peripheral vein is not accessible and patient is in need of immediate need of fluid.
    a. Keep normal vital signs by age on hand
    b. Infuse up to 20 cc/kg of warmed isotonic solution
    c. Consider a second infusion of 20 cc/kg if there is no response to the first.
    d. Second infusion should be done keeping in mind that the patient needs rapid restoration of red blood cells while awaiting definitive care if shock is due to non-compressible hemorrhage.
    e. A third infusion of 20 cc/kg may be considered in patients with controlled hemorrhage.
    f. The use of continuous infusion in uncontrolled hemorrhage should be done to maintain adequate perfusion levels of critical organs enroute to the hospital.
4. Ventilation – Adequate minute volume
    a. Hyperventilation contraindicated
    b. Monitor via oxygenation level
5. Oxygenation
    a. Maintain SaO_2 between 90% and 92%
    b. Unable to maintain 90%+, investigate cause (tension pneumothorax)

D. Geriatrics
1. Patients with chronic hypertension may have higher blood pressure value needs to achieve the same level of end organ perfusion than other patients.
    a. Patient may be in shock with blood pressure above 100.
    b. Modest amounts of blood loss can lead to shock
        i. Reduced blood volume
        ii. Possible anemia
    c. Patient is less able to tolerate excessive fluids.
        i. Possible anemia
        ii. Possible electrolyte alterations

E. Obstetrical Patients
1. Shock states lead to shunting of blood away from the fetus.
2. The closer the maternal blood pressure is to normal, the better the fetal perfusion

10.3 – Chest Trauma

Objective	Educational Standard
10.3.1 – Traumatic Aortic Disruption	
C 10.3.1.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with a traumatic aortic disruption.	A. Pathophysiology 1. Role of deceleration and speed as MOI 2. Partial tear 3. Complete tear – Fatality likely on arrival B. Specific assessment considerations 1. Mechanism of injury 2. High percent have no signs of external chest trauma 3. Hypotension 4. Signs of shock 5. Chest pain (tearing in nature) 6. Suspicion raises with chest wall injury 7. Unusual pulses or blood pressure in upper extremities 8. Voice changes a. Hoarseness b. Stridor 9. Difficulty swallowing C. Management considerations 1. Review knowledge from previous levels 2. AIRWAY, RESPIRATION AND VENTILATION management 3. High index of suspicion based upon MOI 4. Do not overhydrate
10.3.2 – Pulmonary Contusions	
C 10.3.2.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with a pulmonary contusion.	A. Pathophysiology 1. Blunt trauma with associated injuries (rib fractures) 2. Capillary leakage into alveoli prevents gas exchange 3. Decrease lung compliance 4. V/Q mismatch 5. Slowly developing process 6. Diffuse versus localized B. Assessment considerations 1. Respiratory distress symptoms 2. Hemoptysis 3. Chest pain from blunt trauma 4. Cough 5. Rales or rhonchi 6. Hypoxia 7. High index of suspicion based on MOI C. Management considerations 1. AIRWAY, RESPIRATION AND VENTILATION management 2. IV fluid administration (over hydration is contraindicated; see Trauma: Bleeding)
10.3.3 – Blunt Cardiac Injury	
C 10.3.3.1 – Discuss the pathophysiology, assessment considerations, and	1. Pathophysiology a. Cardiac arrhythmias sometimes occur

management of a patient with a blunt cardiac injury.	b. Heart failure may occur i. Review of right-sided heart failure ii. Review of left-sided heart failure 2. Assessment considerations a. High index of suspicion with anterior blunt chest trauma b. Clinical signs vary due to injury location in heart (vessels, muscle mass, or conduction system) c. Tachycardia d. May not exhibit external chest discoloration e. Chest pain (retrosternal, MI type pain) 3. Management considerations a. High index of suspicion b. AIRWAY, RESPIRATION AND VENTILATION management c. Limit fluids if signs of heart failure are present i. Lung crackles ii. Jugular venous distension d. Be prepared for deteriorations in patients with rapid or irregular pulses
10.3.4 – Hemothorax	
C 10.3.4.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with a hemothorax.	A. Pathophysiology 1. Tears in lung parenchyma 2. Penetrating wounds (puncture great vessels or heart) 3. Intercostal vessel wounds 4. Clotting in the chest may release fibrolysins (continue bleeding process) 5. Loss of circulating blood in vessels B. Specific assessment considerations 1. Shock 2. Unequal breath sounds 3. Dullness on percussion 4. JVD assessment a. Proper patient positioning for jugular venous assessment b. Flat with hypovolemia c. Distended if increased intrathoracic pressure C. Management considerations 1. AIRWAY, RESPIRATION AND VENTILATION Management 2. Fluid bolus and continued hypovolemia assessment (see Trauma: Bleeding) 3. Rapid transport to appropriate facility
10.3.5 – Pneumothorax	
C 10.3.5.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with an open, simple, or tension pneumothorax.	A. Open 1. Pathophysiology a. Open wound to the chest wall b. Underlying organ and vessel injuries c. Fracture of chest wall structure d. Hypoxia

e. Loss of lung adhesion to chest wall due to lass of surface tension, collapse of lung

2. Specific assessment considerations
   a. AIRWAY, RESPIRATION AND VENTILATION assessment
   b. Chest assessment
      i. Inspection
      ii. Auscultation
      iii. Percussion
   c. Subcutaneous emphysema
   d. Hypovolemic signs
   e. Cardiac dysrhythmia
3. Specific management considerations
   a. Management may vary depending upon organs injured in the chest
   b. Airway
   c. Ventilation
      i. Inspect chest
         a) Cover open wounds with non-porous dressing
         b) Excessive pressure ventilation can cause tension pneumothorax
      ii. Excessive pressure ventilation can cause tension pneumothorax
   d. Oxygenation
   e. Pneumothorax complications

B. Simple
1. Pathophysiology
   a. Defect in chest wall allows air to enter plural space
   b. Most common from gunshot wound
   c. Some low velocity wounds self-seal (not allow atmospheric air into the chest, but air from inspiration in the chest can occur in the same patient)
   d. If chest wall hole is 2/3 the size of the trachea, more air will enter from the atmosphere (sucking sound will be present)
   e. With large holes, air enters both the trachea and the hole, rapidly collapsing the lung
   f. Delayed or improper treatment will lead to tension pneumothorax with large open wounds
2. Specific assessment considerations
   a. Review knowledge from previous levels
   b. AIRWAY, RESPIRATION AND VENTILATION Assessment
   c. Chest Assessment
      i. Inspection – immediately cover open wounds with nonporous dressings
      ii. Auscultation – unequal breath

sounds
iii. percussion
d. Subcutaneous emphysema
e. Hypovolemia signs
f. Cardiac dysrhythmia
3. Specific management considerations
a. Airway, respiration and ventilation management
b. Inspect chest
i. Cover open wounds with non-porous dressing
ii. Excessive pressure ventilation can cause tension pneumothorax
c. Pneumothorax complications

C. Tension
1. Pathophysiology
a. Formation of one-way valve (air from either lungs or atmosphere)
b. Increased pleural pressure (shift of mediastinal structures to contralateral side; causes kinking of great veins, decreasing cardiac output)
c. May be closed (untreated rupture of alveolar sac)
d. May be open (penetrating trauma; injury to bronchus or bronchi)
2. Specific assessment considerations
a. Severe respiratory distress
b. Jugular vein distention
c. Deviation of the trachea (difficult to assess)
i. Almost never seen in the pre-hospital environment
ii. More easily seen on x-ray.
d. Tachycardia
e. Narrow pulse pressure
f. Absent breath sounds on affected side
g. Unequal chest rise
3. Specific management considerations
a. Airway, respiration and ventilation management
b. Inspect chest
i. Cover open wounds with non-porous dressing
ii. Excessive pressure ventilation can cause tension pneumothorax
c. Pneumothorax complications

10.3.6 – Cardiac Tamponade

C 10.3.6.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with a cardiac tamponade.

A. Pathophysiology
1. Mechanism of Injury
a. Penetrating trauma
b. Much more rare in blunt trauma
2. Blood in pericardial sac

	a. Perforation of heart muscle b. Amount of blood dependent in where blood originates c. Sac is not elastic – no stretching d. Small amounts (55cc) can cause reduction in cardiac output e. Increased sac pressure puts pressure on coronary arteries B. Specific assessment considerations 1. Jugular vein distention (increase in CVP) 2. Increased diastolic pressure 3. Narrowed pulse pressure C. Specific management considerations in cardiac tamponade 1. Airway, respiration and ventilation management 2. Inspect Chest a. Cover open wounds with non-porous dressing b. Excessive pressure ventilation can cause tension pneumothorax 3. Rapid IV fluid bolus
10.3.7 – Rib Fractures	
C 10.3.7.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with rib fractures.	A. Pathophysiology B. Assessment C. Management
10.3.8 – Flail Chest	
C 10.3.8.1 – Discuss the pathophysiology, assessment considerations, and management of a patient with a flail chest.	A. Pathophysiology B. Assessment C. Management
10.3.9 – Commotio Cordis	
C 10.3.9.1. – Discuss the pathophysiology, assessment considerations, and management of a patient with commotio cordis.	A. Pathophysiology B. Assessment C. Management

10.4 – Abdominal and Genitourinary Trauma

Objective	Educational Standard
10.4.1 – Incidence	
C 10.4.1.1 – Describe the morbidity and mortality of abdominal and genitourinary trauma, including prevention strategies.	A. Morbidity/mortality B. Prevention strategies
10.4.2 – Anatomy and Physiology	
C 10.4.1.2 – Review anatomy and physiology of the abdomen and genitourinary systems.	A. Anatomy 1. Quadrants and boundaries of the abdomen 2. Surface anatomy of the abdomen 3. Intraperitoneal structures 4. Retroperitoneal structures 5. Reproductive organs B. Physiology 1. Solid organs 2. Hollow organs 3. Vascular structures
10.4.3 – Specific Injuries	
C 10.4.3.1 – Discuss the specific injuries associated with abdominal and genitourinary injuries.	A. Closed abdominal trauma 1. Mechanism of Injury 2. Signs and Symptoms 3. Assessment 4. Management B. Penetrating/open abdominal trauma 1. Low velocity penetration – knife wound, tear of abdominal wall, consider injury to underlying organ 2. Medium velocity penetration –shot gun wound 3. High velocity penetration – gunshot wound 4. Signs and symptoms of penetrating abdominal trauma a. Bleeding b. Puncture wounds – entrance and exits c. Many signs and symptoms of closed abdominal wounds could also be present along with a puncture wound. 5. Assessment a. Clothing removal b. Inspection – look for exit wounds including posterior c. Noting position of patient 6. Management a. Cover wounds b. Use non-porous dressing if chest may be involved c. Treat for shock d. Oxygen e. Transport decision C. Considerations in abdominal trauma 1. Hollow organ injuries a. Stomach b. Small bowel

	c. Large bowel d. Gall bladders e. Urinary bladder f. Considerations of signs and symptoms of hollow organ injuries i. Pain – may be intense with open wounds to the stomach or small bowel ii. Infection – delayed complication which may be fatal iii. Air in peritoneal cavity 2. Solid organ injuries a. Blood in the abdomen does not acutely produce abdominal pain b. Abdominal pain from solid organ penetration or rupture is of slow onset c. Liver i. Largest organ ii. Very vascular leading to hypo-perfusion iii. Injured with lower right rib fractures or penetrating trauma d. Spleen i. Injured in auto crashes, falls, bicycle accidents, motorcycles ii. Injured with lower left rib fractures or penetrating trauma iii. Left shoulder pain e. Pancreas f. Kidney i. Vascular ii. Blood in urine g. Diaphragm i. Abnormal respiratory sounds ii. Shortness of breath h. Retroperitoneal structures
10.4.4 – General Assessment	
C 10.4.4.1 – Discuss general assessment strategies for assessing trauma to the abdomen and genitourinary systems.	A. High Index of suspicion B. Pain with abdominal trauma is often masked due to other injuries C. Airway patency D. External and internal hemorrhage E. Identification and management of life threats F. Spinal immobilization G. Physical exam 1. Inspection 2. Auscultation 3. Palpation H. Associated trauma I. Recognition and prevention of shock J. PASG for Pelvic Fracture Stabilization K. Transportation Decisions to Appropriate Facility
10.4.5 – General Management	
C 10.4.5.1 – Discuss the general	A. Scene Safety/Standard Precautions

management strategies for treating abdominal and genitourinary trauma.	B. Airway Management C. Oxygenation and Ventilation D. Spinal Immobilization Considerations E. Control External Hemorrhage F. Identification of Life Threatening Injury G. Application and Inflation of PASG for Pelvic Fracture Stabilization H. Abdominal Trauma may be masked by other body system trauma I. Transportation to appropriate facility 1. No transport decisions 2. Transport to acute care facility 3. Transport to trauma center 4. ALS mutual aid J. Communication and documentation
10.4.6 – Age-Related Variations	
C 10.4.6.1 – Discuss age-related variations for Pediatric and Geriatric patient assessment and management.	A. Pediatric 1. Mechanism of Injury as pedestrian 2. Use of PASG (fracture stabilization) B. Geriatric
10.4.7 – Special Considerations	
C 10.4.7.1 – Discuss special considerations for abdominal trauma.	A. Sexual Assault 1. Criminal implications and evidence management 2. Patient confidentiality 3. Treat wounds as other soft tissue injuries B. Vaginal bleeding due to trauma 1. May be due to penetrating or blunt trauma 2. Assess to determine pregnancy 3. Apply sterile absorbent vaginal pad 4. Determine mechanism of injury 5. Do not insert gloved fingers or instruments into vagina

10.5 – Orthopedic Trauma

Objective	Educational Standard
10.5.1 – Amputations	
C 10.5.1.1 – Discuss the pathophysiology and assessment and management considerations for amputations.	A. Pathophysiology 1. Tear, retraction and spasm of blood vessel 2. Amputated extremity 3. Re-implantation opportunities B. Special assessment findings 1. Location of amputation 2. Tearing versus cutting amputations 3. Assessment of amputated part C. Special management considerations 1. Tourniquet 2. Fluid replacement
10.5.2 – Pelvic Fractures	
C 10.5.2.1 – Discuss the pathophysiology and assessment and management considerations for pelvic fractures.	A. Anatomy of the Pelvic Girdle B. Pathophysiology 1. Type I Fractures a. Avulsion fractures b. Fracture of pubis or ischium c. Fracture of iliac wing d. Fracture of sacrum e. Fracture of coccyx 2. Type II Fractures a. Single fracture of pelvic ring b. Unilateral fractures of both pelvic rami c. Subluxation of the symphysis pubis d. Fracture near the sacroiliac joint 3. Type III Fractures 4. Type IV Fractures 5. Associated Injuries a. Potential blood loss amounts b. Retroperitoneal space potential blood loss amounts 6. Significance of posterior fractures C. Special Assessment Findings 1. Pelvic instability 2. Pain 3. Rectal bleeding D. Management Considerations 1. Stabilize with PASG and longboard to minimize movement 2. Specialized pelvic immobilization devices 3. Management of blood loss
10.5.3 – Compartment Syndrome	
C 10.5.3.1 – Discuss the pathophysiology, assessment considerations, and management of compartment syndrome.	A. Pathophysiology 1. Locally increased pressure compromises local circulation and neuromuscular function 2. Occur with crush injuries 3. Burns 4. Tight casts as part of fracture management 5. Occlusion of arterial blood supply 6. Snake bites

7. Rhabdomyolysis

B. Special assessment findings
   1. Severe limb pain
   2. Muscle compartment extremely tight
   3. Decreased sensation to touch
   4. Parathesia
   5. Loss of distal circulation
   6. Paralysis

C. Special management considerations
   1. Removal of plaster casts
   2. Elevation
   3. Ice
   4. Rapid transport to appropriate facility
   5. Treatment of academia
   6. Treatment of rhabdomyolysis
   7. Pain management

10.6 – Soft Tissue Trauma

Objective	Educational Standard
10.6.1 – Incidence of Soft Tissue Injury	
C 10.6.1.1 – Describe the morbidity and mortality of soft tissue trauma.	
10.6.2 – Anatomy and Physiology of Soft Tissue Injury	
C 10.6.2.1 – Discuss the anatomy and physiology of soft tissue injury.	A. Layers of the skin B. Function of the skin
10.6.3 – Closed Soft Tissue Injury	
C 10.6.3.1 – Discuss types of closed soft tissue injuries and their associated signs and symptoms, assessment and management strategies.	A. Types of Injuries 1. Contusion 2. Hematoma 3. Crush Injuries B. Signs and Symptoms 1. Discoloration 2. Swelling 3. Pain C. Assessment 1. Mechanism of injury, suspect underlying organ trauma/injury 2. Diffuse or generalized soft tissue trauma can be critical 3. Pulse, movement, sensation D. Management 1. Ice 2. Splinting if necessary
10.6.4 – Open Soft Tissue Injury	
C 10.6.4.1 - Discuss types of open soft tissue injuries and their associated complications and signs and symptoms.	A. Types of injuries 1. Abrasions 2. Lacerations 3. Avulsions 4. Bites 5. Impaled Objects 6. Amputations 7. Blast injuries/High Pressure 8. Penetrating/Punctures B. Complications of Soft Tissue Injuries 1. Blood loss – review bleeding and shock 2. Infection a. Mechanism of infections b. Risk factors C. Signs and Symptoms of Open Soft Tissue Injuries 1. Bleeding and Shock (chest trauma and other sections in trauma discuss many of the signs and symptoms of injuries to those areas that also include a soft tissue injury.) 2. Pain 3. Hemorrhage 4. Contaminates Wounds 5. Impaled Objects 6. Loss of extremity

	7. Entrance and exit wounds 8. Flap of skin attached
10.6.5 – Assessment and Management of Soft Tissue Injuries	
C 10.6.5.3 – Discuss the general assessment findings and management considerations for soft tissue injuries.	A. Assessment 1. Safety of Environment/Standard Precautions 2. Airway Patency 3. Respiratory Distress 4. Concepts of Open Wound Dressing/Bandaging a. Sterile b. Non-sterile c. Occlusive d. Non-occlusive e. Wet f. Dry g. Tourniquet h. Complications of dressings/bandages 5. Hemorrhage Control a. Severity of injury b. Elevation c. Pressure dressing d. Pressure points e. Tourniquets 6. Associated Injuries a. Airway b. Face c. Neck B. Management 1. Airway Management 2. Control Hemorrhage 3. Prevention of shock 4. Prevent infection 5. Transportation to the appropriate facility 6. Communication and documentation 7. Bites a. Control hemorrhage b. Cat and human bites often lead to serious infection 8. Avulsions a. Never remove skin flap regardless of size b. Complete avulsion often has serious infection concerns c. Place skin in anatomic position if flat avulsion
10.6.5 – Burns	
C 10.6.5.1 – Discuss the incidence of burn injuries.	A. Morbidity/Mortality B. Risk Factors
C 10.6.5.2 – Discuss the anatomy and physiology of burns.	A. Types of Burns 1. Thermal 2. Inhalation 3. Chemical 4. Electrical

	B. Complications of Burns 1. Thermal a. Exposure time b. Enclosed space vs open c. Scalds with unusual history patterns may be abuse 2. Inhalation a. Airway closure due to swelling may be very rapid b. Carbon monoxide inhalation 3. Chemical a. Acid and alkali are different b. Solutions and powders are different 4. Electrical a. Skin inspection may not indicate seriousness of burn b. Entrance and exit wounds c. Current across chest may cause cardiac arrest d. Lightning strikes may cause cardiac arrest C. Depth Classification of Burns 1. Superficial 2. Partial-thickness 3. Full-thickness D. Body surface area of burns 1. "rule of nines" 2. "rule of ones" E. Severity of burns 1. Minor 2. Moderate 3. Severe
C 10.6.5.3 – Discuss complications of burn injuries.	A. Infection B. Vasoconstriction C. Hypoxia D. Hypothermia E. Hypovolemia F. Complications with Circumferential Burns G. Pediatric/Geriatric Abuse
C 10.6.5.4 – Discuss assessment and management considerations of burn injuries.	A. Assessment Considerations 1. Safety/Standard Precautions 2. Airway Patency 3. Respiratory Distress 4. Hemorrhage Control 5. Classification of Burn Depth 6. Percentage of Body Surface Area Affected 7. Severity B. Management Considerations 1. Stop the Burning 2. Airway management 3. Respiratory distress 4. Circulatory 5. Dry, sterile, non-adherent dressing 6. Parkland Formula for fluid replacement in

	burns 7. Remove jewelry and clothing 8. Prevent shock 9. Prevent hypothermia 10. Transportation to appropriate facility a. ALS mutual aid unit b. Criteria for burn unit 11. Pediatric considerations 12. Geriatric considerations
10.6.6 – Specific Burn Management Considerations	
C 10.6.6.1 – Discuss management of thermal, inhalation, chemical and electrical burns.	A. Thermal 1. Complete general management 2. May be associated with an inhalation injury 3. Large BSB also have hypovolemia and hypothermia 4. Cool small or those remaining hot 5. Dry dressing help prevent infection and provide comfort 6. Time in contact with heat increases damage B. Inhalation 1. Complications are related to chemicals within inhaled air 2. Edema of mucosa of airway can be rapid – need ALS backup if signs and symptoms of edema are present, such as voice change, singed nasal hairs, etc. 3. Percent of oxygen in ambient air is different so hypoxia, and carbon monoxide or other chemicals may enter the blood 4. Burns in enclosed spaces without ventilation cause inhalation injuries C. Chemical 1. Some burns are liquid and need copious amounts of flushing with water 2. Some burns are powders and need brushed off to remove chemicals 3. Chemical burns treatments can be specific to the burning agent and labels should be read 4. Burns at industrial sites may have experts available on scene. D. Electrical 1. The type of electrical current, amperage and volts have effect on seriousness of burn 2. No patient should be touched while in contact with current 3. Sometimes electric current crosses the chest and causes cardiac arrest or arrhythmias 4. Many underlying injuries to organs and the nervous system may be present 5. Radiation burns require special rescue techniques.
10.6.7 – Age-Related Variations	
C 10.6.7.1 – Discuss age-related variations	A. Pediatric

for pediatric and geriatric patients.	**1. Percentage of surlace area in a bum patient** 2. Alteration in calculating the burned area **B. Geriatric**

10.7 – Head, Face, Neck, and Spine Trauma

Objective	Educational Standard
10.7.1 –Facial Fractures	
Discuss the types of facial fractures.	A. Soft tissue injuries B. Fractures of facial bones C. Eye injuries D. Oral/dental injuries 1. Mandibular fractures 2. Maxillary fractures
C 10.7.1.1 – Discuss the pathophysiology, assessment considerations, and management of unstable facial fractures.	A. Pathophysiology 1. Categories of unstable facial fractures a. Le Forte I (fracture separates hard palate and lower maxilla from remainder of skull) b. Le Forte II (fracture separates the nasal and lower maxilla from the facial skull and remainder of the cranial bones) c. Le Forte III (craniofacial disjunction; fracture separates the entire midface from the cranium) 2. Blunt trauma to the facial area most frequent cause B. Specific assessment considerations 1. Facial instability 2. Epistaxis 3. Edema 4. Pain C. Specific management considerations 1. Simple airway maneuvers are difficult 2. Intubation is method of choice for airway protection 3. Ventilation without intubation is difficult 4. Manual in-line intubation 5. Bleeding into the oral cavity; suction 6. Soft tissue bleeding D. Signs/Symptoms 1. Soft tissue injuries are similar to others, but swelling may be more severe 2. Facial bones may fracture causing airway and ventilation complications 3. Eye injuries suffer soft tissue type injuries, abrasions, lacerations, punctures, chemical burns, etc 4. Eye injuries may cause vision disturbances 5. Eyes injured with chemicals need flushing with copious amounts of water 6. Excessive pressure on the eye may "blow out" bones in the orbit 7. Nasal fractures may cause bleeding 8. Oral injuries may cause airway management complications
10.7.2 – Facial and Eye Injuries	
C 10.7.2.1 – Discuss the assessment and	A. Assessment

management of facial and eye injuries.	1. Inspection a. Open wounds b. Swelling c. Deformity of bones d. Eye clarity without foreign objects e. Eye symmetry f. Bone alignment in anatomical position 2. Palpation 3. Eye Examination a. Follows finger up, down, lateral b. Can read regular print c. No blood visible in iris area d. Ice to reduce edema B. Management 1. Airway must remain open throughout care 2. Nasopharyngeal airways are contraindicated 3. Suctioning may be frequent 4. Broken teeth need to be brought to the hospital with the patient 5. Eyes with chemical burns may need to be flushed with copious amounts of water 6. Simple nose bleeds can be controlled by pinching nostrils 7. Eye injuries require patching of both eyes 8. Impaled objects in the eye must be stabilized 9. Impaled objects in the cheek may be removed 10. Patients with these injuries may be more comfortable sitting up 11. Bandaging should not occlude the mouth
10.7.3 – Laryngeotracheal Injuries	
C 10.7.3.1 – Discuss the pathophysiology, assessment considerations, and management of laryngeotracheal injuries.	A. Pathophysiology 1. Trauma directly to structures 2. Edema 3. Hemorrhage B. Specific assessment considerations 1. Swelling 2. Voice changes 3. Hemoptysis 4. Subcutaneous emphysema 5. Structural irregularity C. Specific management considerations 1. Airway, respiration, ventilation a. Airway obstruction common b. May need surgical airway 2. Careful two-person ventilation with bag valve mask a. May need multiple people to maintain an effective seal b. May need frequent suctioning c. May need immediate surgical intervention at the hospital, do not delay transport 3. Consider advanced airway in apnea

4. **Combative patients**
   a. **Increased intracranial pressure**
   b. hypoxia

10.8 – Nervous System Trauma

Objective	Educational Standard
10.8.1 – Incidence	
C 10.8.1.1 – Describe the morbidity and mortality of nervous system trauma, including prevention strategies.	A. Morbidity/mortality B. Prevention strategies
10.8.2 – Traumatic Brain Injury	
C 10.8.2.1 – Discuss the pathophysiology, assessment considerations, and management of traumatic brain injuries.	A. Anatomy 1. Review of major structures of the brain 2. Review of circulation in the brain B. Physiology – review of function of the brain C. Pathophysiology 1. Normal oxygen demand of the brain a. Limited oxygen storing capacity b. Consequences of oxygen loss 2. Role of gas concentrations in vascular diameter a. Carbon dioxide and vasodilation b. Oxygen and vasoconstriction 3. Brain injury categories a. Primary brain injury b. Secondary brain injury c. Coup/contra-coup pattern 4. Increasing intracranial pressure a. Definition b. Effects c. Role of mean arterial pressure in maintaining perfusion 5. Coma a. Definition b. Posturing (decerebrate, decorticate) c. Normal intracranial pressure (2-12 mmHg) 6. Brain herniation a. Definition b. Effects (Cushing's triad) 7. Types of brain injuries a. Concussion b. Diffuse axonal injury c. Contusion d. Subdural hematoma e. Epidural hematoma f. Subarachnoid hemorrhage g. Intra-cerebral hemorrhage h. Penetrating brain trauma 8. Associated injuries a. Linear b. Depressed c. Open d. Basilar D. Specific assessment considerations 1. Level of Consciousness a. Signs of increasing intracranial pressure

b. Cerebral function
c. Cerebellar function
d. Cranial nerve function
    i. Pupil changes
    ii. Doll's eyes
e. Peripheral/motor function

2. Airway, respiration and ventilation
    a. Alterations to respiratory and ventilatory effort
    b. Spinal concerns
3. Vital sign irregularities – BP changes (early, late)
4. Posturing
    a. Types
    b. significance
5. CSF Presence
    a. Causes
    b. significance
6. Coma assessment
    a. Glasgow coma scale
    b. Neurological exam
        i. Pupils
        ii. reflexes

E. Special management considerations
1. Airway, respirations and ventilation management with spinal precautions/immobilization
2. Ventilate/assist to maintain PaO_2 of 90 mm Hg
    a. Cheyne-stokes respirations
    b. Irregular or slow respirations
3. Seizure precautions
4. Fluid management
    a. Isolated head trauma
    b. Multisystem trauma with hypovolemia
    c. Role of fluids in managing ICP
5. Role of hypothermia in coma

10.9 – Special Considerations in Trauma

Objective	Educational Standard
10.9.1 – Trauma in Pregnancy	
C 10.9.1.1 – Discuss the incidence, pathophysiology, assessment considerations, and management of traumatic injury given a pregnant patient.	A. Incidence 1. Mortality/morbidity 2. Risk factors 3. Prevention B. Anatomy and Physiology 1. Review of anatomical changes in pregnancy a. Organ displacement b. Organs of pregnancy c. Stages of fetal development/size 2. Review of physiological changes in pregnancy a. Respiratory b. Cardiovascular C. Pathophysiology 1. Shock in pregnancy a. Effects on mother i. Shunting ii. Increased volume requirements iii. Changes in usual findings b. Effects on fetus 2. Traumatic abruption placenta a. Mechanisms of injury b. Effects on mother c. Effects on fetus 3. Abdominal injuries a. Mechanisms of injury b. Effects on mother c. Effects on fetus 4. Pelvic fracture a. Mechanisms of injury b. Effects on mother c. Effects on fetus 5. Seat belt injuries a. Mechanisms of injury b. Effects on mother c. Effects on fetus 6. Sexual assault a. Mechanisms of injury b. Effects on mother c. Effects on fetus D. Special considerations in assessment 1. Increased heart rate is not an early sign of hypovolemic shock 2. Significant blood loss may not be reflective of usual signs of shock 3. Respiratory rate less than 20 should not be considered adequate ventilation 4. Loss of landmarks for chest compressions in arrest 5. MOI and signs of abruption placentae 6. Estimate gestational age of baby

	a. Palpate uterine fundus b. Attempt to listen to fetal heart tones (4 o'clock position, about 2" from mother umbilicus) E. Special considerations in management 1. Airway, respiration, ventilation a. Restriction of diaphragm in mother i. Fetal size ii. Maternal position 2. Circulation a. Fetal pressure on great vessels i. Impact on spinal precautions ii. Impact on fluid replacement requirements b. IV and fluid replacement i. The closer the maternal blood pressure is to normal, the better the fetal perfusion ii. Normal blood pressure varies by trimester 3. Traumatic Arrest a. Treatment decisions b. Transport decisions c. Alterations to CPR i. Increased airway pressures ii. Decreased diaphragm excursion iii. Effects on airway management a) BVM Management b) Advanced airway management
10.9.2 – Pediatric Trauma	
C 10.9.2.1 – Discuss the incidence of pediatric trauma.	A. Mortality/morbidity 1. Accidental 2. Intentional B. Risk factors C. Prevention
C 10.9.2.2 – Review the anatomy and physiological differences in pediatric patients.	A. Anatomy A. Review of anatomical differences by age a. Newborn b. Infant c. Child i. Preschool ii. School-age iii. adolescent B. Review of impact of differences on care B. Physiology 1. Review of physiological differences by age a. Cardiac differences b. Catecholamine regulation c. Review of impact of differences on care
C 10.9.2.3 – Discuss the unique aspects, pathophysiology, assessment considerations, and management of traumatic injuries in pediatric patients.	A. Pathophysiology 1. Alterations to response of shock in the child 2. Alterations to response of head injury in the newborn/child

3. Alterations to response of spine to injury in the child (i.e. Spinal cord injury without radiographic abnormality)
4. Alterations to response to chest injury in the child
    a. Very compliant
    b. Injury requires great force
    c. Sudden impact of blunt force to the chest resulting in cardiac dysfunction, even death
    d. Alterations to response to abdominal injuries in the child
    e. Relatively larger solid organs
    f. Less protection from ribs
    g. Weaker abdominal muscles

B. Special considerations in assessment
1. Airway, breathing, and circulation
    a. Review of pediatric airway
    b. Review of normal ventilatory effort in the child
    c. Review of signs of respiratory distress in the child
2. Circulation
    a. Hypotension appears late, use other signs of inadequate circulation
    b. Inadequate oxygenation cause bradycardia
    c. Capillary refill may be helpful
    d. LOC may indicate inadequate circulation
    e. Blood pressure estimated as 80 + 2 times the age
    f. Appropriate blood pressure cuff size
    g. 80 ml/kg blood loss can cause shock
3. Neurological
    a. Glascow coma scale less than 8 means increased ICP
    b. Beware of shaken baby syndrome
4. Head
    a. Very vascular, even scalp laceration can cause shock
    b. Falls less than five feet are significant
5. Chest
    a. Significant internal injury can be present without any external signs
    b. Tension-pneumothorax is difficult to evaluate
6. Abdomen
    a. Spleen most common injured
    b. Cullen's sign
    c. Kehr's sign

C. Special considerations in management
1. Airway, breathing, and circulation (improper management is the most common cause of preventable pediatric death)
    a. High-concentration oxygen and

	saturation b. Proper advanced airway tube selection 2. Circulation a. IV selection in the pediatric trauma patient i. Site selection ii. Access type – peripheral iii. Keep normal vitals signs by age on hand iv. Infuse up to 20 cc/kg of warmed isotonic solution v. Consider a second infusion of 20cc/kg if there is no response to the first vi. Second infusion should be done keeping in mind that the patient needs rapid restoration of red blood cells while awaiting definitive care if shock is due to non-compressible hemorrhage vii. Third infusion of 20cc/kg may be considered in patients with controlled hemorrhage viii. Use of continuous infusion in uncontrolled hemorrhage should be done to maintain and adequate perfusion levels of critical organs enroute to the hospital ix. Maintain body heat to prevent rapid deterioration. b. Fluid replacement
10.9.3 – Geriatric Trauma	
C 10.9.3.1 – Discuss the incidence of geriatric trauma.	A. Mortality/morbidity 3. Accidental 4. Intentional B. Risk factors C. Prevention
C 10.9.3.2 – Review the anatomy and physiological differences in geriatric patients.	A. Review of anatomical changes of aging B. Review of physiological differences by age 1. Respiratory a. Chest wall less compliant b. Less vital capacity c. Decrease in ciliary action 2. Cardiovascular a. Heart rate and stroke volume decrease b. Dysrhythmia changes 3. Neurological System a. Neuron mass reduction b. Velocity of impulses c. Mentation changes d. Thermoregulation changes
C 10.9.3.3 – Discuss the special considerations in assessment and management of traumatic injuries in	A. Special considerations in assessment 1. History a. Unreliable historians

geriatric patients.	b. Underlying disease can change normal baseline for patient i. Mentation, dementia ii. Family members as historians B. Special considerations in management 1. Airway, breathing, and circulation a. Mask seal with toothless patient b. Cervical kyphosis c. Oxygen saturation can quickly deteriorate 2. Circulation a. Patients with chronic hypertension may have higher blood pressure value needs to achieve the same level of end organ perfusion than other patients b. Patient may be in shock with blood pressure above 100 mm/Hg c. Modest amounts of blood loss can lead to shock i. Reduced blood volume ii. Possible anemia d. Patient is less able to tolerate excessive fluids i. Possible anemia ii. Possible electrolyte alterations
10.9.4 – Cognitively Impaired Patient	
C 10.9.4.1 – Discuss the incidence of trauma in cognitively impaired patients.	A. Mortality/morbidity 1. Accidental 2. Intentional B. Risk factors C. Prevention
C 10.9.4.2– Discuss the unique challenges, and assessment considerations of traumatic injuries in cognitively impaired patients.	A. Unique challenges with cognitively impaired patients 1. Ability of individual to communicate complaints 2. Unreliable historian 3. Unusual presentation of common disorders 4. Reduced pain threshold 5. Consent to treat complications B. Special considerations in assessment 1. Level of development i. 5th or 6th grade level is common ii. Use open-ended questions to assess development iii. Particular difficulty with time and causality concepts 2. Use family and caregivers as part of history gathering i. How does patient normally communicate? ii. How aware are they of environment? iii. What are usual motor skills and level of activity? iv. What are the patient's usual sleep

pattern and appetite?
3. Assess/determine hearing and sight problems
4. Take vital signs when patient is calm
5. Typically helpful to have a caregiver present during physical exam

10.10– Environmental Emergencies

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
10.10.1 – Temperature Regulation	
C 10.10.1.1 – Discuss temperature regulation and temperature-related illnesses	A. Incidents – emergencies include localized injuries and systemic illness 1. Temperature-related injuries and illness a. Cold exposure i. Localized cold injury ii. hypothermia b. Heat exposure i. Heat cramps ii. Heat exhaustion iii. Hyperthermia – high body core temperature B. Mechanisms for regulating temperature – maintenance of normal body temperature range critical for body's chemistry to work efficiently 1. Sweating 2. Radiation of body heat into atmosphere
10.10.2 - Cold Exposure	
C 10.10.2.1 - Discuss methods and contributing factors of heat loss, local cold injuries and management considerations.	A. Heat loss methods 1. Radiation 2. Convection 3. Conduction 4. Evaporation 5. respiration B. Contributing factors to heat loss 1. Environmental factors a. Ambient temperatures b. Wind speed c. moisture 2. Age of patient a. Geriatrics i. Low income may prohibit adequate heat in home ii. Elderly may have less muscle mass and subcutaneous tissue iii. Elderly may have chronic illnesses and failing body systems iv. May have poor diets v. Many medications may contribute to hypothermia vi. Decreased activity b. Pediatrics i. Infants and young children are small with large surface area ii. Small muscle mass, so shivering is poor in children and not at all in infants iii. Less body fat

	iv. Younger children need help to protect self. Cannot put on or take off own clothes. 3. Inadequate clothing 4. Duration of exposure 5. Alcohol or other medication ingestion 6. Attempted suicide 7. Immersion 8. Activity level 9. Pre-existing injury or illness a. Shock b. Head injury c. Burns d. Generalized infection e. Spinal cord injury f. Hypoglycemia g. Altered mental status from any cause C. Local cold injuries 1. Impaired local blood flow 2. Ice crystals form within soft tissue 3. Typically involves exposed fingers, toes, ears, nose and face 4. Tissue damage 5. Signs and symptoms D. Management of cold injuries 1. Remove the patient from the environment 2. Protest the cold injured extremity from further injury 3. Administer oxygen if not already done as part of the primary assessment. 4. Remove wet or restrictive clothing 5. Treat injuries 6. If delayed transport, proceed with active rewarming
10.10.3 – Hypothermia	
C 10.10.3.1 – Discuss considerations in patients exhibiting hypothermia.	A. Core body temperature falls below 95 degrees F 1. Vital organs malfunction 2. Body loses ability to regulate temperature and to generate heat B. Environmental conditions of cold exposure 1. Obvious exposure 2. Subtle exposure a. Ethanol ingestion b. Underlying illness c. Overdose/poisoning d. Major trauma e. Outdoor resuscitation f. Ambient temperature decreased. 3. Signs and Symptoms a. Decreased level of consciousness i. Correlates with the degree of hypothermia ii. Poor judgment exhibited (patient may actually remove clothing)

iii. Memory disturbances
iv. Mood changes

b. Impaired motor function
i. Rigidity
ii. Altered balance and poor coordination
iii. Reduces loss of sensation to touch
iv. Dizziness
v. Speech difficulty

c. Shivering
d. Breathing
i. Early – rapid breathing
ii. Late – shallow, slow or even absent breathing

e. Pulse
iii. Early – rapid
iv. Late – slow and barely palpable and/or irregular, or completely absent

f. Blood pressure – lowered to absent
g. Cool abdominal skin below clothing
h. Delayed pupil response
i. Complaints of joint/muscle stiffness
j. Skin
k. With extreme hypothermia:
i. Cardiac insufficiency
ii. May have no palpable pulse
iii. Cardiac arrest

4. Management
a. Remove patient from the environment (protect from further heat loss)
b. Remove wet clothing; cover with blanket
c. Gentle handling (to decrease risk of ventricular fibrillation)
d. Do not allow the patient to walk
e. Administer oxygen
f. If the patient is alert and responding appropriately, actively rewarm
i. Use warmed blankets
ii. Apply heat packs
iii. Turn heat up in patient compartment of ambulance
iv. Provide warm clear liquids if conscious and not vomiting

g. If the patient is unresponsive or not responding appropriately, rewarm passively
i. Use warmed blankets
ii. Turn heat up in the patient compartment of ambulance

h. Do not allow the patient to eat or drink stimulants
i. Do not massage extremities
j. Assess pulses for 30-45 seconds before

	starting CPR k. Rapid transport
10.10.4 – Heat Exposure	
C 10.10.4.1 – Discuss the predisposing factors of heat exposure.	A. Environmental 1. High ambient temperature reduces the body's ability to lose heat by radiation 2. High relative humidity reduces the body's ability to lose heat through evaporation B. Exercise/activity 1. Can lose more than 1 liter of sweat per hour 2. Loss of electrolytes (sodium, chloride and fluid through sweat) C. Age 1. Pediatrics a. Poor thermoregulation b. Cannot remove own clothing 2. Geriatrics a. Poor thermoregulations b. Medications c. Lack mobility – cannot escape hot environment D. Pre-Existing Illness or conditions 1. Heart disease 2. Dehydration 3. Obesity 4. Fever 5. Fatigue 6. Diabetes 7. Alcohol Use
C 10.10.4.2 - Discuss the signs and symptoms and management of various heat illnesses.	A. Heat Cramps – painful muscle spasms brought on by vigorous exercise in a hot environment; due to changes in body's electrolytes; dehydration and excessive sweating affect normal muscle function 1. Signs and Symptoms a. Severe muscle spasms b. Usually affect leg or abdominal muscles 2. Management a. Remove patient from hot environment b. Rest muscles c. Administer oxygen d. Replace fluids by mouth e. Cool patient with water spray or mist B. Heat Exhaustion – caused by hypovolemia that results from dehydration (loss of fluids and electrolytes) from heavy sweating; most common, serious heat-related illness 1. Signs and Symptoms a. Muscle cramps b. Weakness or exhaustion c. Nausea and vomiting d. Dry tongue and thirst e. Change in level of consciousness – dizziness or faintness f. Cool, clammy, ashen skin

g. Weak, rapid pulse
h. Blood pressure – may see low diastolic pressure
i. Normal or slightly elevated blood pressure

2. Management
a. Remove patient from hot environment
b. Turn AC on in back of ambulance
c. Administer oxygen
d. Loosen or remove clothing
e. Cool patient with water spray or mist
f. Place in supine position, legs elevated
g. Suction as needed
h. If patient is responsive and is not nauseated, have the patient drink water
i. Transport patient on side if unresponsive

C. Heatstroke – results from exposure to excessive high temperatures, beyond the body's ability to regulate; tissue damage occurs; most serious heat-related injury; untreatable heatstroke results in death.

1. Signs and Symptoms
a. Hot, dry flushed skin (due to extreme dehydration and malfunction of sweating mechanism)
b. Behavioral changes
c. Loss of consciousness
d. Rapid respirations
e. Pulse – rapid and strong initially, then weakens quickly
f. Blood pressure – falling
g. seizures

2. Management
a. Remove patient from hot environment
b. Turn AC on in back of ambulance
c. Remove clothing
d. Administer oxygen
e. Apply cool packs to neck, groin and armpits
f. Keep skin wet by applying water by sponge or wet towel
g. Fan aggressively
h. Transport immediately

10.10.5 – Submersion Incidents

C 10.10.5.1 – Discuss signs and symptoms and management of different submersion incidents including drowning and diving emergencies.

A. Drowning

1. Ensure the safety of the rescue personnel
2. Suspect possible spine injury if diving accident is involved or unknown
3. Suspect possible hypothermic conditions if immersion in cold water or an open body of water
4. Consider length of time in cold water drowning. Any pulseless, non-breathing

patient who has been submerged in cold water should be resuscitated. Check pulses for a full 60 seconds.

5. Types of drowning
   a. Fresh water
   b. Salt water
6. Pathophysiology
   a. Little difference in patient lungs regardless of type of water submersion
   b. Submersion in cold water results in better survival than warm water
   c. Age is a factor due to cardiovascular health
   d. Duration under water effects outcome
   e. Submersion in very cold water can produce cardiac disturbances
   f. Hypoxia from submersion is major factor in death
   g. Diving in shallow water can cause spinal trauma
   h. Prolonged hypoxia causes death of brain tissue
7. Signs and Symptoms
   a. Airway – obstructed with water immediately after rescue
   b. Breathing
      i. Coughing
      ii. Agonal breaths if prolonged submersion
      iii. Respiratory arrest
   c. Circulation
      i. Cardiac arrest possible
      ii. Cyanosis
      iii. Skin cold to touch
8. Assessment, specific to drowning
   a. Oxygen saturation may be difficult to obtain if patient is cold
   b. Use spinal precautions when opening airway to assess if risk of spinal trauma is possible
   c. Auscultate breath sounds
9. Management
   a. Airway, ventilation and oxygenation
      i. Suction and maintain open airway
      ii. Ventilate if impaired ventilation or respiratory arrest
      iii. Administer oxygen by non-re-breather mask if breathing is adequate
   b. Circulation
      i. If cardiac arrest is present, refer to current AHA guidelines
      ii. Defibrillate with AED if indicated (refer to current AHA guidelines)
   c. In-line immobilization and removal

from water with backboard if spine injury is suspected and patient is responsive
   d. If there is not suspected spinal injury, place patient on left side to allow water, vomitus and secretions to drain from upper airway
   e. Manage gastric distension
   f. Rapid transport – all patients who had submersion injury with any report of signs and symptoms during or after submersion need transport to appropriate facility

B. Diving Emergencies
   1. Mechanism of Injury
      a. SCUBA diving at greater depths for long periods of time
      b. Repeated dives at depth on the same day
   2. Pathophysiology
      a. Diver remains at depth too long
      b. Compressed air in blood expands upon ascent, turning into bubbles, which obstruct blood flow
      c. Dysbarism – signs and symptoms related to change in barometric pressure (caused by diving and high-altitude climbing)
   3. Signs and Symptoms
      a. Occur after patient rises to the surface too fast
      b. Cyanosis
      c. Cough
      d. Respiratory distress
      e. Pain in joints
   4. The Diver Alert Network (DAN) – resource management for diving accident patients
   5. Decompression Sickness
      a. Caused by ascending too quickly or flying within 12 hours of diving
      b. Most often occurs within 3 hours of incident but may occur up to 48 hours after
      c. Signs and symptoms
         i. Personality changes
         ii. Fatigue
         iii. Muscle and joint pain ("bends")
         iv. Skin blotching, mottling or rash
         v. Numbness and paralysis
         vi. Choking
         vii. Labored breathing
         viii. Intoxicated appearance (e.g. staggering gait)
         ix. Chest pain
         x. Collapse and unconsciousness

6. Air embolism
   a. Caused by diver holding their breath due to inexperience, equipment failure, underwater emergencies, or to conserve air
   b. Gases leave a damaged lung and enter the bloodstream
   c. Signs and symptoms
      i. Blurred vision
      ii. Chest pains
      iii. Numbness and tingling
      iv. Weakness/paralysis
      v. Frothy blood at mouth and nose
      vi. Convulsions
      vii. Unconsciousness occurs rapidly
      viii. Respiratory or cardiac arrest
7. Management Considerations
   a. Airway patency
   b. Consider spinal immobilization
   c. Oxygen administration, high flow
   d. Rapid transport to specialized facility (hyperbaric chamber for recompression therapy) may be needed
   e. Maintain normal blood pressure
   f. Position patient supine or on side
   g. Transport dive gear with the patient

10.10.6 – Bites, Stings and envenomation

C 10.10.6.1 – Discuss the pathophysiology, assessment considerations, and management of injuries caused by bites and stings.

A. Injuries of concern
   1. Spider bites
   2. Snake bites
   3. Hymenoptera (bees, wasps, ants, yellow jackets)

B. Pathophysiology
   1. Spider bites (black widow) - inject neurotoxins
   2. Snake bites – rattlesnake
      a. Toxins affect blood and nervous system; localized systemically
      b. Patient age and weight cause different effects
      c. Amount of toxin injected is related to toxicity
      d. Initial 6-8 hours of care is essential
   3. Hymenoptera
      a. Cause allergic reactions in sensitized (allergic) people
      b. May lead to an anaphylactic response

C. Signs and symptoms
   1. Spider bite (black widow)
      a. Localized swelling initially
      b. Chest or abdominal pain may occur depending on bite site
      c. Serious in children, may be fatal
   2. Rattlesnake bite

a. Time of bite to provision of care is important
b. Pain at site
c. Progressive weakness
d. Nausea and vomiting
e. Seizures
f. Vision disturbances
g. Altered levels of consciousness

3. Bee, wasp, and other stings
a. Pain at site
b. Swelling
c. Signs of allergic reaction
d. Signs of anaphlyaxis

D. General Management
1. Wash area gently
2. Remove jewelry from injured area before swelling begins, if possible
3. Place injection site slightly below the level of the patient's heart
4. Observe for development of signs and symptoms of an allergic reaction

E. Bite/Sting specific management
1. Spider bite (black widow)
a. Clean wound with soap and water
b. Apply ice pack to area of bite
c. Transport immediately with supportive care

2. Rattlesnake Bite
a. Note time of bite
b. Slow venous return
c. Keep patient calm
d. Immobilize extremity
e. Position extremity
f. Clean bite site with soap and water
g. Identify snake if possible
h. Do not apply cold
i. Consult medical direction regarding use of constricting band

3. Bees, wasps, and other stings
a. Remove stinger or venom sac
i. Scrape stinger out; e.g. with edge of card
ii. Avoid using tweezers or forceps as these can squeeze the venom from the venom sac into the wound
b. If anaphylaxis develops, follow protocol

10.11 – Multi-System Trauma

Objective	Educational Standard
10.11.1 – Kinematics of Trauma	
C 10.11.1.1 – Discuss the kinematics of trauma.	A. Looking at trauma scene and attempting to determine what injuries might have resulted B. Kinetic energy (function of weight of an item and its speed) C. Blunt trauma 1. Objects collide during crashes a. Car with object b. Victim with part of car c. Organs collide inside body 2. Unbelted drivers and front seat passengers suffer multi-system trauma due to multiple collisions of the body and organs 3. Direction of the force has impact on type of injury a. Frontal impacts b. Rear impacts c. Side impacts d. Rotational impacts e. Roll-overs D. Deceleration injuries E. Penetrating traumas 1. Types of bullets have effect a. Distance from shooter b. Size of bullet c. Fragmentation d. Cavitation 2. Energy levels have effect a. Low energy (stabbings) b. Medium energy (handguns and some rifles) c. High energy (military weapons) 3. Organs struck have effect a. Head b. Chest c. Abdomen d. Extremities
10.11.2 – Multi-System Trauma	
C 10.11.2.1 – Define multi-system trauma.	A. Almost all trauma affects more than one system B. Typically a patient considered to have "multi-trauma" has more than one major system or organ involved (examples): 1. Head and spinal trauma 2. Chest and abdominal trauma 3. Chest and multiple extremity trauma C. Multi-trauma treatment will involve a team of physicians to treat the patient, such as neurosurgeons, thoracic surgeons, and orthopedic surgeons D. Multi-trauma has a high level of morbidity and mortality

C 10.11.2.2 – Discuss the golden principles of out-of-hospital trauma care.	A. Safety of patient and rescue personnel B. Determination of additional resources C. Kinematics 1. Mechanism of injury 2. High index of suspicion D. Identify and manage life threats E. Airway management while maintaining cervical spinal immobilization F. Support ventilation and oxygenation G. Control external hemorrhage H. Basic shock therapy 1. Maintain normal body temperature 2. Splint musculoskeletal injuries I. Maintain spinal immobilization on long board 1. Standing patients 2. Sitting patients 3. Rapid transport considerations 4. Prone patients 5. Supine patients J. Transportation considerations 1. Golden period 2. Closest appropriate facility 3. "Platinum 10 minutes" K. Obtain medical history L. Secondary survey after maintenance of life threats M. "Do no further harm"
C 10.11.2.3 – Discuss critical thinking in multi-system trauma care.	A. Airway, ventilation, and oxygenation are key elements to success 1. Airways must be opened and clear throughout care 2. Adequate ventilation must occur 3. Oxygenation in multi-system trauma is high concentrations of oxygen B. Oxygenation cannot occur when patients are bleeding profusely 1. Stop arterial bleeding rapidly 2. Consider use of tourniquets in emergent, hostile, or multiple patient situations where bleeding is considerable C. Sequence of treating patients 1. Not all treatments are linear 2. At times care must be adjusted, depending on the needs of the patient (example): a. Control arterial bleeding in an awake patient first b. Much care can be done en route D. Rapid transport is essential 1. The definitive care for multi-system trauma is surgery, which cannot be done in the field 2. On-scene time is critical and should not be delayed 3. Rapid extraction is an important consideration 4. Use of ALS intercept and air medical

	resources in a multi-trauma patient should be highly considered 5. Early notification of hospital resources is essential once rapidly leaving the scene 6. Transport to the appropriate facility is critical E. Backboards F. Documentation and reporting 1. EMTs are the eyes and ears of the physicians 2. EMTs need to re-create the scene 3. Important kinematics and mechanisms of injury are important to trauma teams 4. Changes in vital signs or assessment findings while en-route are critical to report and document G. Personal safety 1. Most important when arriving on scene, and throughout care; an injured EMT cannot provide care 2. Be sure to assess your environment a. Passing automobiles b. Hazardous situation c. Hostile environments d. Unsecured crime scenes e. Suicide patients who may become homicidal H. Experience 1. Newly licensed Advanced EMT s who have not seen many multi-system trauma patients need to stick with the basics of life-saving techniques 2. Do not develop "tunnel" vision by focusing on patients who complain of lots of pain and are screaming for your help while other patients who may be hypoxic or bleeding internally cannot call out for help because of decreases in level of consciousness 3. Be suspicious at trauma scenes, sometimes and obvious injury is not the critical cause of the potential for harm 4. Trauma care is a leading cause of death in young people (it is essential to keep important care principles in mind when providing care)
10.11.3 – Specific Injuries Related to Multi-System Trauma	
C 10.11.3.1 – Discuss the pathophysiology, signs/symptoms, and management of multi-system trauma blast injuries.	A. Types of blast injuries (explosions) 1. Blast waves 2. Blast winds 3. Ground shock 4. Heat B. Pathophysiology 1. Blast waves when the victim is close to the blast cause, disruption of major blood

vessels, rupture of major organs, and lethal cardiac disturbances
2. Blast winds and ground shock can collapse buildings, causing trauma

C. Signs/symptoms
1. Hollow organs are injured first
2. Multi-system injury sign and symptom patterns
   a. Lungs
   b. Heart
   c. Major blood vessels

D. Management considerations in blast injuries
1. Multi-system trauma care
2. Immediate transport to appropriate facility
3. Multi-casualty care

11.0 – Special Patient Populations

Integrates assessment findings with principles of pathophysiology and knowledge of psychosocial needs to formulate a field impression and implement a comprehensive treatment/disposition plan for patients with special needs.

11.1 – Neonatal Care

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
11.1.1 – Introduction to the care of the neonate.	
C 11.1.1.1 – Define newborn and neonate.	A. Newborn (a recently born infant; usually considered the first few hours of life) B. Neonate (considered the first 28 days of life)
C 11.1.1.2 - Identify routine care of the neonate.	E. Physiologic response to birth 1. Respiratory adaptations 2. Cardiovascular adaptations 3. Temperature regulation F. Routine Care 1. Support 2. Dry 3. Warm 4. Position 5. Airway 6. Stimulation G. Assessment

11.2 Pediatrics

Instructor Note: This is a review of the EMT Curriculum

Objective	Educational Standard
11.2.1 – Pediatric Anatomical Variations and Assessment	
C 11.2.1.1 – Differentiate the anatomical differences between the pediatric and adult head.	A. Compared to the body, the head is proportionally larger in size B. The head contributes a larger portion of the body's surface area than in adults C. Implications for the health care provider 1. Higher proportion of blunt trauma involves the head 2. Cover an infant's head to prevent excessive heat loss 3. Properly placing an infant in "sniffing position" to open the airway may require a towel or roll under the shoulders 4. Examine fontanelle in infants a. Bulging fontanelle in an ill-appearing non-crying infant suggests increased intracranial pressure b. Sunken fontanelle in an ill-appearing infant suggests dehydration
C 11.2.1.2 – Differentiate the anatomical differences between the pediatric and adult airway.	A. Much smaller in diameter and shorter in length B. Infant's tongues take up more room in the oropharynx C. The jaw is proportionally smaller D. Infants are nasal breathers E. Tracheal cartilage is softer and more collapsible F. The epiglottis in infants and toddlers is long, floppy, narrow, and extends at a 45° angle into the airway G. Implications for the health care provider 1. Suctioning to clear the nares of infants in respiratory distress cannot be overemphasized 2. Smaller airways are more easily obstructed by: a. Flexion or hyperextension b. Particulate matter c. Soft tissue swelling (injury, inflammation) 3. Posterior displacement of the tongue may cause airway obstruction
C 11.2.1.3 – Differentiate the anatomical differences between the pediatric and adult chest and lungs.	A. Ribs are more cartilaginous and pliable B. Less overlying muscle and fat to protect ribs and vital organs C. Young children breathe primarily with their diaphragms; their chest muscles are immature and fatigue easily D. Thin chest wall allows for easily transmitted breath sounds E. Implications for the health care provider 1. Infants and children are dependent on effective diaphragmatic excursion for adequate ventilation; a distended abdomen may not allow for this 2. Rib fractures are less common; but when present represent a significant force generally accompanied by multi-system injury 3. Lungs are more prone to pneumothorax from

	excessive pressures while bag-mask ventilating
C 11.2.1.4 – Differentiate the anatomical differences between the pediatric and adult abdomen.	A. Less developed abdominal muscles offer less protection B. Abdominal organs are situated more anteriorly and are less protected by ribs C. Liver and spleen are proportionally larger D. Implications for the health care provider 1. Seemingly insignificant forces can cause serious internal injury; therefore, abdominal pain after trauma should be taken seriously 2. Liver, spleen, and kidneys are more frequently injured 3. Multiple organs injured more commonly
C 11.2.1.5 – Differentiate the anatomical differences between the pediatric and adult extremities.	A. Bones are softer B. Injuries to the growth plates of long bones may result in poor bone growth C. Open growth plates are weaker than ligaments and tendons D. Implications for the health care provider 1. Immobilize any "sprain" or "strain" as it is more likely a fracture 2. Angle slightly away from the growth plate when inserting an intraosseous needle
C 11.2.1.6 – Differentiate the anatomical differences between the pediatric and adult skin and body surface area.	A. Larger surface area to body mass B. Implications for the health care provider 1. Skin is more easily, quickly, and deeply burned 2. Larger surface area means larger losses of fluid and heat 3. Be diligent about preventing core hypothermia (even in a burn patient) 4. Hypothermia can limit resuscitative efforts and interfere with the body's ability to clot properly
C 11.2.1.7 – Differentiate the anatomical differences between the pediatric and adult respiratory system.	A. Higher oxygen demand per kilogram of body weight (two times that of an adult) B. Smaller lung oxygen reserves C. Implications for the health care provider 1. Higher oxygen demand with less reserves means that hypoxia develops rapidly with apnea or ineffective bagging 2. Err on using a larger bag for ventilating the pediatric patient; regardless of the size of the bag used for ventilation, one should only use enough force to make the chest rise slightly to limit pneumothorax
C 11.2.1.8 – Differentiate the anatomical differences between the pediatric and adult nervous system and spinal column.	A. Continually evolves throughout childhood allowing them to develop new abilities B. Brain tissue is more fragile and prone to bleeding from injury C. The subarachnoid space is relatively smaller offering less cushioning to the brain D. The brain requires nearly twice the cerebral blood flow as does an adult's E. Brain and spinal cord are less well-protected by a thinner skull and spinal column F. Implications for the health care provider 1. The large cerebral blood flow requirement makes

	children with head injuries extremely susceptible to hypoxia; hypoxia and hypotension in a child with a head injury can cause ongoing damage as bad as the initial injury itself 2. Less cushioning by the subarachnoid space means that head momentum is more likely to result in bruising and damage to the brain 3. Through spinal cord injuries are less common in pediatrics, they more frequently occur with normal appearing x-rays; this phenomenon is referred to as SCIWORA (spinal cord injury without radiographic abnormalities) 4. Cervical spine injuries, when present, are more commonly ligamentous injuries rather than secondary to broken vertebrae 5. Since the weaker neck supports a relatively heavier head and, therefore, flexes more easily with trauma, cervical spine injuries sustained are usually higher (C1 to C3) 6. When in doubt about the presence of a cervical spine injury, assume the worst and maintain immobilization of the child's head and neck
C 11.2.1.9 – Differentiate the metabolic differences between a pediatric and adult patient.	A. Infants and children have limited glucose stores B. Infants and children are prone to hypothermia due to increased body surface area C. Implications for the health care provider 1. Keep the infant or child warm during treatment and transport 2. Make sure to cover the head (not the face, though) to minimize heat loss 3. Have a very low threshold for checking blood glucose levels, especially in children who are having a seizure or are lethargic on your exam 4. Newborns particularly need to be kept warm; hypothermia is a "killer" and can predispose them to spontaneous head bleeds
11.2.2 – Growth and Development	
C 11.2.2.1 – Discuss the physical, and cognitive development of infants.	A. Birth to two months 1. Physical development a. Begin to better control gazing at faces, turning their heads, and sucking b. Sleep accounts for up to 16 hours a day; only half of that is at night c. Infants have a relatively large surface area, which predisposes them to hypothermia 2. Cognitive development a. Crying is the only way infants communicate b. Crying peaks at six weeks to three hours a day; by three months it drops to one hour c. Infants cry for obvious reasons, such as hunger and needing to be changed d. When obvious reasons for crying have been addressed, persistent crying can be a sign of significant illness

3. Implications for the healthcare provider
    a. Persistent crying or irritability in a birth to two month old can be a symptom of serious bacterial infections such has meningitis, supraventricular tachycardia (SVT), physical abuse, intussusception, cardiac problems, corneal abrasions, or electrolyte disturbances
    b. Though infants sleep a lot, they should be arousable; inability to arouse an infant should be considered an emergency
    c. Be diligent about keeping infants warm and dry to limit hypothermia
    d. Infants do not develop head control until closer to six months, so when handling an infant, make sure to support head and neck well
    e. This is a particularly stressful time for parents adjusting to the eating, sleeping, and crying cycle; sometimes this is complicated by post-partum depression too, which can be a risk factor for abuse

B. Two to six months
    1. Physical development
        a. Begin voluntarily smiling and increasing eye contact
        b. Both hands begin to be used to examine objects
        c. 70% of babies sleep through the night by six months
        d. Intentional rolling over begins
        e. Begin to hold their heads up
    2. Cognitive development
        a. Increased awareness of what is going on around them
        b. Begin to explore their own bodies
    3. Implications for the health care provider
        a. Persistent crying or irritability can be a symptom of serious bacterial infections such as meningitis, SVT, physical abuse, intussusception, cardiac problems, corneal abrasions, or electrolyte disturbances
        b. Infants do not typically roll until around three to four months; a history of an infant less than that rolling himself/herself off of a bed or table and sustaining major injuries may indicate abuse
        c. Infants of this age begin to identify and respond to facial expressions; approach them with a smile or funny face and a happy, soft spoken voice
        d. By six months, infants should make eye contact; no eye contact in a sick infant could be a sign of significant illness or depressed mental state

C. Six to 12 months
    1. Physical development
        a. Begin to sit without support
        b. Develop a pincer grasp; everything goes to the mouth
        c. Begin to crawl

	d. Begin developing teeth and eating soft foods 2. Cognitive development a. Begin babbling and, by 12 months, learn their first word b. Develop "object consistency;" they do not forget that something exists just because you take it away c. Interested in what objects do and what objects fit where 3. Implications for the health care provider a. Persistent crying or irritability can be a symptom of serious bacterial infections such as meningitis, SVT, physical abuse, intussusception, cardiac problems, corneal abrasions, or electrolyte disturbances b. Infants explore objects with their mouths, which greatly increases the risk of foreign body aspiration; do not give infants exam gloves to play with c. Separation anxiety is best dealt with by keeping the infant and parent together as much as possible during evaluation and involving the parent in the treatment if appropriate; if possible, interact first with the parent to build trust with infant d. With the increased mobility of crawling and walking comes exposure to physical dangers
C 11.2.2.2 – Discuss the physical, cognitive, and emotional development of toddlers.	A. 12 to 18 months a. Physical development b. Cognitive development i. Imitation of older children and parents ii. Make-believe play iii. Understand more than what they can express iv. Know major body parts v. Know four to six words c. Implications for the health care provider i. Persistent crying or irritability can be a symptom of serious bacterial infections such as meningitis, SVT, physical abuse, intussusception, cardiac problems, corneal abrasions, or electrolyte disturbances ii. The front teeth come in before the molars, which means that toddlers may bit off large pieces of food and then not be able to grind them up before swallowing, increasing the risk of food aspiration; do not give toddlers exam gloves to play with iii. Separation anxiety is best dealt with by keeping the toddler and parent together as much as possible during evaluation and involving the parent in the treatment if appropriate; if possible, interact first with the parent to build trust with the toddler iv. With increased mobility comes exposure to

physical dangers and injury
v. Talk to the toddler during the assessment even if the conversation is one-sided
vi. Distracting a toddler with a flashlight or toy may increase one's chances of obtaining a good physical examination

B. 18 to 24 months
a. Physical development
i. Improved gait and balance
ii. Begin to run and climb
iii. Head begins to grow more slowly than the body
b. Cognitive development
i. Begin to understand cause and effect
ii. Start to use "tools"
iii. Play with dolls
iv. Begin to label objects
v. 10 to 15 words becomes 100 by 24 months
c. Emotional development
i. Increasing clinginess with parents
ii. Attachment to a special object, like a blanket
d. Implications for the health care provider
i. Persistent crying or irritability can be a symptom of serious bacterial infections such as meningitis, SVT, physical abuse, intussusception, cardiac problems, corneal abrasions, or electrolyte disturbances
ii. The front teeth come in before the molars, which means that children may bite off large pieces of food and then not be able to grind them up before swallowing, increasing the risk of food aspiration; do not give children exam gloves to play with
iii. Separation anxiety is best dealt with by keeping the child and parent together as much as possible during evaluation and involving the parent in the treatment if appropriate; if possible, interact first with the parent to build trust with the child
iv. With increase mobility comes exposure to physical dangers and injury
v. Talk to the child during the assessment even if the conversation is one-way
vi. Distracting a child with a flashlight or toy may increase one's chances of obtaining a good physical examination
vii. Allow a child to hold objects of importance to them, like a blanket, stuffed animal, or doll
viii. With the head beginning to grow at a slower rate than the body, children begin to no longer require shoulder rolls limiting flexion of the neck when bag-valve-mask ventilating or intubating
ix. As children begin to relate cause and effect,

	painful procedures make lasting impressions; be considerate by limiting painful procedures and adequately treating pain
C 11.2.2.3 – Discuss the physical, cognitive, and emotional development of preschoolers.	A. Two to five years B. Physical development 1. Bodies become leaner 2. Develop 20/20 vision by age four 3. Have all their teeth by three 4. They perfect normal walking and running 5. Begin throwing, catching, and kicking 6. Generally establish left or right handedness 7. Toilet training C. Cognitive development 1. Most rapid increase in language 2. Magical thinking 3. Rules tend to be absolute 4. Irrational fears D. Emotional development 1. Learn what are acceptable behaviors 2. Have tantrums around control issues 3. Modesty develops E. Implications for the health care provider 1. Airway, respiration and ventilatory procedures on the dominant hand or arm 2. The rapid increase in language means they will understand much of what you say if simple terms are used 3. Respect the patient's modesty and cover them up after the physical examination 4. Foreign body airway obstruction risk continues to be high 5. Offer choices to the patient if appropriate (i.e., listen to the front first or the back?) 6. Do not waste time trying to use logic to convince preschoolers; they are concrete thinkers; Airway, respiration and ventilatory frightening or misleading comments 7. Appealing to their magical thinking may allow you to do more (e.g., this magic smoke will help you breath better [nebulizer]) 8. Preschoolers tend to hold rules true for all situations; if they have been told that no one should look at their privates, they will not understand why it is okay all of a sudden for the health care worker to do that
C 11.2.2.4 – Discuss the physical, cognitive, and emotional development during middle childhood.	A. Six to 12 years B. Physical development C. Cognitive development 1. Begin to think logically 2. Life centers around school D. Emotional development 1. Popularity and peer pressure become very important 2. Children with chronic illness or disabilities begin to be very self-conscious

	3. Children begin to understand that death is final E. Implications for the health care provider 1. With patients loosing baby teeth and developing adult teeth, one must be particularly careful when intubating 2. School-aged children understand simple explanations for illness and treatments 3. Be honest about procedures that will cause them discomfort 4. Give children some sense of control by giving choices if possible 5. Reassure children that everything is going to be all right, if appropriate, and that they are not going to die 6. Respect the child's modesty and cover them up after the physical examination 7. Asking about school will often allow children to warm up to you faster
C 11.2.2.5 – Discuss the physical, cognitive, and emotional development of adolescents.	A. 12 to 20 years B. Physical development (puberty begins) 1. Girls first develop breasts around eight to 13 years; menstruation starts between nine and 16 2. Boys first develop increase in testicle size, which typically starts around ten C. Cognitive development 1. Acquire the ability to reason 2. Do not see possibilities as real things that could happen to them 3. Develop morals D. Emotional development 1. Self-conscious about body image 2. Begin to understand who they are and begin to be comfortable with that 3. Relationships generally transition from mostly same sex ones to those with the opposite sex E. Implications for the healthcare provider 1. Explain things clearly and honestly as you would to an adult 2. Give the adolescent choices when appropriate 3. Respect the adolescent's modesty and cover them up after the physical examination 4. Be honest about procedures that will cause them discomfort 5. Address adolescents' concerns and fears about the lasting effects of their injuries (especially cosmetic) and, if appropriate, reassure them that everything is going to be all right 6. Adolescence is a the tumultuous effect of hormonal surges, emotions, and peer pressure; these place children at risk for substance abuse, self-endangerment, pregnancy, and dangerous sexual practices
11.2.3 – Pediatrics: Specific Pathophysiology, Assessment, and Management	

C 11.2.3.1 – Discuss the pathophysiology, assessment, and management of specific pediatric medical conditions or emergencies.

A. Respiratory compromise
   1. Introduction
      a. Epidemiology
      b. Anatomic and physiologic differences in children
   2. Pathophysiology
      a. Respiratory distress
      b. Respiratory failure
      c. Respiratory arrest
   3. Assessment
      a. History (age, preceding symptoms, choking episode, underlying disease, sick contacts, prematurity)
      b. Physical findings (mental status, respiratory rate, pulse oximetry, capnometry, work of breathing, color, heart rate, degree of aeration, presence of stridor or wheeze)
   4. Upper airway obstruction
      a. Croup
      b. Foreign body aspiration
      c. Bacterial tracheitis
      d. Epiglottis
      e. Tracheostomy dysfunction
   5. Lower airway disease
      a. Asthma
      b. Bronchiolitis (respiratory syncytial virus ["RSV"] is common cause)
         i. Highly contagious
         ii. Most common in infants under one year
         iii. Infections usually occur epidemically in the winter
      c. Pneumonia
      d. Foreign body lower airway obstruction
      e. Pertussis

B. Non cardiogenic shock
   1. Introduction
      a. Epidemiology
      b. Anatomic and physiologic differences in children
   2. Pathophysiology (compensated versus decompensated)
      a. Hypovolemic
      b. Distributive (septic, neurogenic, anaphylactic)
   3. Assessment
      a. History (fever, vomiting, diarrhea, urine output, fluid intake, blood loss, allergic symptoms, burns, accidental ingestion)
      b. Physical findings (heart rate, blood pressure, capillary refill, color, petechiae, mental status, mucous membranes, skin turgor, face/lip/tongue swelling)
   4. Management

C. Neurologic
   1. Introduction
      a. Epidemiology
      b. Anatomic and physiologic differences in children
   2. Pathophysiology

a. Causes of altered mental status in children (trauma, toxins, infection, electrolyte or glycemic imbalance, intussusception, seizure, uremia, intracranial bleed, intracranial mass)
b. Pathophysiology of seizures

3. Assessment
a. History (age, fever, vomiting, photophobia, headache, prior seizures, extremity shaking, staring episodes, trauma, ataxia, ingestions, oral intake, bloody stool, urine output, baseline developmental level)
b. Physical findings (vital signs, photophobia, nuchal rigidity, GCS, palpation of ventricular shunt, full neurologic examination)

4. Meningitis
5. Seizures
a. Afebrile
b. Febrile
c. Status epilepticus

6. Management
a. Seizures
i. Oxygen for prevention of brain hypoxia
b. Altered mental status
i. Assess for need to protect airway

D. Gastrointestinal
1. Introduction
a. Epidemiology
b. Anatomic and physiologic differences in children

2. Pathophysiology
a. Diarrhea
b. Vomiting mechanism

3. Assessment
a. History (blood or bile in emesis, diarrhea, age, gender, constipation, fever, medications, tolerance of gastrostomy tube feeds, prematurity, blood type incompatibility, epistaxis, liver disease)
b. Physical findings (heart rate, blood pressure, mucous membranes, icterus, capillary refill, blood in nares, abdominal distention or mass, hepatomegaly, pallor, anal fissure)
c. Inspection of gastrostomy tube

4. Vomiting

E. Toxicologic
1. Introduction
a. Epidemiology
b. Nontoxic exposures
c. Role of the Poison Control Center

2. Assessment
a. History (time of ingestion/exposure, amount ingested, abnormal symptoms, bottles/containers available)
b. Physical findings (all vitals, airway/breathing/circulation)

3. Ingestion

4. Inhalation

F. Sudden Infant Death Syndrome (SIDS)
   1. Introduction
      a. Definition of SIDS
         Risk factors
   2. Assessment
      b. Cardiopulmonary status
      c. Clinical signs of death
      d. Evaluation for signs of abuse
   3. Management
      a. Local EMS criteria for death in the field
      b. Notification of appropriate authorities
      c. Caregiver support

11.3 – Geriatrics

Objective	Educational Standard
11.3.1 – Normal and Abnormal Changes Associated with Aging	
C 11.3.1.1 – Discuss normal and abnormal changes associated with aging.	A. Normal changes associated with aging primarily occur due to deterioration of organ system B. Pathological changes in the elderly are sometimes difficult to discern from normal aging changes C. Cardiovascular a. Inability to tolerate cardiovascular dysfunction of any kind b. Inability to increase rate and cardiac output c. Degeneration of valves d. Degeneration of conduction system e. More likely to have dysrhythmias f. Stroke volume decreases g. Vessel walls lose elasticity and are less flexible D. Respiratory a. Loss of elastic recoil in the chest wall b. Diminished respiratory muscle strength and endurance c. Loss of alveoli d. Reduction in oxygen and carbon dioxide exchange e. Inability to increase rate of respiratory effort f. Decreased cough reflex g. Decreased ability of cilia to move mucus upward E. Neurovascular a. Atrophy of the brain tissue i. Cognitive and short-term memory effects ii. Delayed verbal response b. Deterioration of the nervous system function in controlling: i. Rate and depth of breathing ii. Heart rate iii. Blood pressure iv. Hunger and thirst v. Temperature vi. Sensory perception (including audio, visual, olfactory, touch, and pain) c. Delayed reflexes and response times d. Impaired balance F. Gastrointestinal a. Dental problems b. Decrease in saliva c. Poor sphincter muscle tone d. Heartburn and acid reflux e. Decrease in hydrochloric acid in the stomach f. Alterations in absorption of nutrients g. Slowing peristalsis causing constipation h. Rectal sphincter weakens with increased incidence of fecal incontinence i. Liver function decreases with increased potential for drug toxicity

	G. Genitourinary a. Reduction in renal function due to decreased blood flow and tubule degeneration b. Decreased bladder capacity c. Decline in sphincter muscle control causing incontinence d. Decline in voiding senses and nighttime voiding e. In males, benign prostatic hypertrophy H. Endocrine a. Increase in incidence of diabetes b. Increase in secretion of antidiuretic hormone causing fluid imbalance c. Decreased production of estrogen causing osteoporosis I. Musculoskeletal a. Atrophy of muscles b. Degenerative changes and loss of bone c. Loss of strength d. Degenerative changes in joints e. Loss of elasticity in ligaments and tendons f. Thinning of cartilage and thickening of synovial fluid J. Integumentary a. Atrophy of the epidermis, hair follicles, and sweat glands b. Lessened skin turgor c. Tenting present even when patient is hydrated d. Nails become thin and brittle e. Increased healing time f. Pigment changes g. Decreased elasticity h. Hair loss i. Reduction of subcutaneous tissue j. Skin easily torn
11.3.2 – Sensory Changes	
C 11.3.2.1 – Discuss sensory changes in vision, hearing, and pain perception related to aging.	A. Vision 1. Decreased visual acuity (inability to accommodate) 2. Inability to differentiate colors 3. Decreased night vision 4. Decreased tear production 5. Development of cataracts 6. Disease processes a. Glaucoma b. Macular degeneration c. Retinal detachment B. Hearing 1. Presbycusis 2. Inability to hear high frequency sounds 3. Use of hearing aids C. Pain perception (inability to differentiate hot from cold)
11.3.3 – Pharmacokinetic Change	
C 11.3.3.1 – Discuss physiological	A. Physiological changes that impact pharmacokinetics

changes of aging that impact pharmokinetics.	1. Decrease in amount of body water 2. Decrease in muscle mass 3. Increase in body fat 4. Renal function deterioration 5. Liver function deterioration 6. Altered distribution of drugs B. Implications of altered pharmacokinetics 1. Increased drug sensitivity 2. Increased adverse drug reactions 3. Increased drug toxicity 4. Dosages should possibly be decreased C. Difficulty in compliance of drug therapy 1. Lack of money to purchase 2. Complicated drug regime 3. Forgetfulness ("did I take it or not") 4. Difficulty opening containers 5. Directions for use not understood 6. Other
11.3.4 – Polypharmacy	
C 11.3.4.1 – Discuss polypharmacy as related to aging.	A. Multiple chronic diseases means multiple medications B. Drug dosages may not have been adjusted for multiple meds C. Drug interactions may cause problems D. Consider polypharmacy as a reason for problems
11.3.5 – Psychosocial and Economic Aspects	
C 11.3.5.1 – Discuss the psychosocial and economic aspects of aging in the United States.	1. Demographics and "graying of America" 2. Psychosocial issues a. Living environments b. Financial issues c. Social services
11.3.6 – Specific Conditions that Occur More Frequently in the Elderly	
C 11.3.6.1 – Discuss the pathophysiology and management of specific medical conditions or emergencies that occur more frequently in the elderly.	1. Myocardial infarction a. Patient will usually have atypical chest pain or no pain b. May present with only dyspnea, acute confusion (delirium), syncope, weakness, or nausea and vomiting 2. Congestive heart failure a. A frequent condition of the elderly b. May present with dyspnea, orthopnea, or mental status alteration c. Peripheral edema is frequently present in elderly patients with or without failure and may signify a variety of conditions d. Fluid balances are sometimes difficult to achieve 3. Aortic dissection 4. Syncope a. May have a variety of causes, usually cardiac or neurological b. Causes to consider: i. Vasopressor use

ii. Orthostatic hypotension
iii. Transient reduction in blood flow to the brain due to cardiac output drop for any reason
iv. TIA
v. Vasovagal syncope

5. Hypertension
6. Pneumonia
   a. Presentation can include dyspnea, congestion, altered mental status, or abdominal pain
   b. Fever may be absent
7. Pulmonary embolism
   a. Should be considered in any elderly patient with acute dyspnea
   b. Common after hip fracture
8. Asthma
9. Emphysema and chronic bronchitis
10. Stroke
11. Transient ischemic attacks ("TIA")
12. Alzheimer's disease
    a. Definition
       i. Stages
       ii. Diagnosis
       iii. Prognosis
    b. Epidemiology
       i. Population
       ii. Early onset
    c. Pathophysiology
       i. Plaques
       ii. Tangles
    d. Signs and symptoms
       i. Memory
       ii. Learning
       iii. Judgment
       iv. Language
       v. Tasks
    e. Personality changes
       i. Apathy
       ii. Irritability
       iii. Depression
       iv. Agitation
       v. Psychosis
    f. Normal day-to-day living
       i. Problems associated with management
       ii. Patient violence
       iii. Patient verbal abuse
       iv. Fearful patient
    g. Management
       i. Communication
       ii. Slow clear instructions
       iii. Distraction from agitation
       iv. Other
       v. Treat symptomatically
       vi. Consider co-illnesses
       vii. Consider medication reactions
    h. Alzheimer's treatment

i. Cholinesterase inhibitors
ii. Antipsychotics
iii. Antidepressants

13. Dementia
    a. Definition
    b. Causes of dementia
        i. Alzheimer's disease (most common form of dementia)
            1. Pathophysiology
            2. Stages
            3. Assessment and interactions
        ii. Multi-infarct dementia
        iii. Drug toxicity
        iv. Emotional disorders
        v. Metabolic and endocrine disorders
        vi. Brain tumor
        vii. Brain trauma
        viii. Infections
        ix. Major depression
        x. Parkinson's disease
        xi. Huntington's chorea
    c. Associated signs and symptoms
        i. Progressive loss of cognitive function; short and long-term memory problems
        ii. Loss of attention span
        iii. Loss of communication skills
        iv. Inability to perform daily routines
        v. Easily lost
        vi. Angers easily
    d. Problems associated with management of patient with dementia
        i. Poor historian; impaired judgment
        ii. Inability to vocalize areas of pain and current symptoms
        iii. Unable to follow commands
        iv. Anxiety over movement out of home or current establishment
        v. Anxiety and fear of treatment of current medical problems
14. Delirium (a sudden change in behavior, consciousness, or cognitive processes generally due to a reversible physical ailment)
    a. Mortality rates
    b. Evaluation of pathophysiology through history, possible risk factors, and current medications
        i. Intoxication or withdrawal from alcohol
        ii. Withdrawal from sedatives
        iii. Vitamin deficiencies
        iv. Urinary tract infections/bowel obstructions
        v. Cardiovascular disease
        vi. Hyper/hypoglycemia
        vii. Psychiatric disorders
        viii. Malnutrition
        ix. Dehydration
        x. Environmental emergencies

xi. Depression
xii. Fever
xiii. Current medications (anticholinergic medications)

c. Associated signs and symptoms
i. Onset of minutes, hours, days
ii. Disorganized thoughts (inattention, memory loss, disorientation)
iii. Hallucinations
iv. Delusions
v. Reduced level of consciousness

d. Possible changes in physical assessment
i. Changes in peripheral, core, and neurovascular perfusion
ii. Changes in response to pupils
iii. Changes in response to motor tests
iv. Dysrhythmias
v. Adventitious breath sounds

e. Assessment tools
i. Neurological examination of cranial nerves, motor and sensory function
ii. Blood pressures
iii. Evaluation of limb lead ECG
iv. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
v. Auscultation of heart to detect irregular, muffled, or extra heart tones
vi. Auscultation of breath sounds to detect adventitious noises
vii. Capnography
viii. Evaluation of glucose

f. Treatment
i. Airway, ventilatory, and circulatory support
ii. Oxygen with adjuncts appropriate to patient condition
iii. Venous access
iv. ECG monitoring
v. Treatment to correct reversible causes
1. Correct hypoglycemia with D50 IV or glucagon
2. Correct possible drug overdose (consider Narcan)
vi. Evaluation of patient treatment through reassessment

15. GI gastrointestinal bleeding (caused by disease processes, inflammation, infection, and obstruction of the upper and lower gastrointestinal tract)

a. Evaluation of pathophysiology through history, possible risk factors, and current medications
i. Peptic ulcer disease
ii. Esophageal varices
iii. Stomach cancer
iv. Esophageal cancer
v. Diverticulitis
vi. Bowel obstruction

vii. Smoking
viii. Alcohol/cirrhosis of the liver
ix. Medications in use (nonsteroidal anti-inflammatory drugs, warfarin)

b. Associated signs and symptoms
i. Hematemesis
ii. Bilious vomitus
iii. Melena
iv. Dyspepsia
v. Hepatomegaly
vi. Jaundice
vii. Constipation, diarrhea
viii. Agitation, inability to find a comfortable position
ix. Dizziness

c. Possible changes in physical assessment
i. Changes in peripheral, core, and neurovascular perfusion
ii. Pale or yellow, thin skin, frail musculoskeletal system
iii. Peripheral, sacral, and periorbital edema
iv. Hypertension
v. Fever
vi. Tachycardia
vii. Dyspnea

d. Assessment tools
i. Evaluation of limb lead ECG
ii. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
iii. Blood pressures (lying, sitting, and standing, noting any change of 10 mm/Hg or more lower as the patient moves to an upright position)
iv. Pulses, lying sitting, and standing, noting any change of 10 beats per minute more higher as the patient moves to an upright position
v. Auscultation of heart to detect irregular, muffled, or extra tones
vi. Auscultation of breath sounds to detect adventitious noises or foreign bodies
vii. Auscultation of bowel sounds; palpation of abdomen

e. Treatment
i. Management of upper GI bleeds is not dependent upon the identifying the underlying cause; however, assessment and history are the key to successful treatment of this emergency life threatening illness
ii. Airway, ventilatory, and circulatory support
iii. Oxygen with adjuncts appropriate to patient condition
iv. Venous access (Care should be taken to Airway, respiration and ventilation use of indwelling fistulas or shunt unless necessary in cardiac events; depending on patient

presentation, it may be necessary to place two large bore IVs)
v. Dysrhythmia management according to current ACLS standards or local protocol.
vi. Evaluation of patient treatment through reassessment
vii. Definitive care of renal patients in dialysis
viii. Fever
ix. Tachycardia
x. Tachypnea
xi. Diffuse tenderness on palpation of abdomen, with distention, guarding, or masses; upon auscultation high pitched noises
xii. Hypovolemia

16. Biliary disease (disorders of the liver and gallbladder)
    a. Evaluation of pathophysiology through history, possible risk factors, and current medications
        i. Liver disease
        ii. Congestive heart failure
        iii. Gallstones
        iv. Cholecystitis
        v. Medications that cause adverse effects on the liver
    b. Associated signs and symptoms
        i. Jaundice
        ii. Fever
        iii. Right upper quadrant pain, radiating to upper back and shoulder
        iv. Vomiting
    c. Possible changes in physical assessment
        i. Changes in peripheral, core, and neurovascular perfusion
        ii. Pale or yellow, warm skin
        iii. Fever
        iv. Tachycardia
        v. Tachypnea due to pain in the abdomen
        vi. Diffuse tenderness in right upper quadrant on palpation of abdomen, guarding
    d. Assessment tools
        i. Evaluation of limb lead ECG
        ii. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
        iii. Blood pressures
        iv. Auscultation of heart to detect irregular, muffled, or extra tones
        v. Auscultation of breath sounds to detect adventitious noises
        vi. Auscultation of bowel sounds; palpation of abdomen
    e. Treatment
        i. Airway, ventilatory, and circulatory support
        ii. Oxygen with adjuncts appropriate to patient condition
        iii. Venous access
        iv. Dysrhythmia management according to

current ACLS standards or area protocol
v. Evaluation of patient treatment through reassessment

17. Chronic renal failure (the inability of the kidneys to excrete waste, concentrate urine, or control electrolyte balance in the body)
    a. Evaluation of pathophysiology through history, possible risk factors, and current medications
        i. Diabetes
        ii. Congenital disorders
        iii. Pyelonephritis
        iv. Hypertension
        v. Autoimmune disorders
        vi. Glomerulonephritis
        vii. Medications that damage the kidneys (antibiotics, nonsteroidal anti-inflammatory drugs, anticancer drugs)
    b. Associated signs and symptoms
        i. Hypertension
        ii. Headache
        iii. Anxiety
        iv. Fatigue
        v. Anorexia
        vi. Vomiting
        vii. Increased voiding of brown colored urine
        viii. Confusion
        ix. Seizures
        x. Musculoskeletal pain
    c. Possible changes in physical assessment
        i. Changes in peripheral, core, and neurovascular perfusion
        ii. Pale or yellow, thin skin; frail musculoskeletal system
        iii. Peripheral, sacra, and periorbital edema
        iv. Hypertension
        v. Fever
        vi. Tachycardia
        vii. Dyspnea
    d. Assessment tools
        i. Evaluation of limb lead ECG
        ii. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
        iii. Blood pressures
        iv. Auscultation of heart to detect irregular, muffled, or extra tones
        v. Auscultation of breath sounds to detect adventitious noises
        vi. Auscultation of bowel sounds; palpation of abdomen
    e. Treatment
        i. Airway, ventilatory, and circulatory support
        ii. Oxygen with adjuncts appropriate to patient condition
        iii. Venous access (care should be taken to Airway, respiration and ventilation use of

indwelling fistulas or shunt unless necessary in cardiac events)
iv. Dysrhythmia management according to current ACLS standards or area protocol
v. Evaluation of patient treatment through reassessment
vi. Definitive care of renal patients is dialysis

18. Urinary tract infection
    a. Evaluation of pathophysiology through history, possible risk factors, and current medications
        i. Diabetes
        ii. Prostatitis
        iii. Cystocele
        iv. Ureterocele
        v. Kidney obstruction
        vi. Indwelling foley catheters
        vii. Medications used (immunosuppressive and chemotherapy)
    b. Associated signs and symptoms
        i. Urinary frequency and urgency
        ii. Dysuria
        iii. Hematuria
        iv. Nausea, vomiting, and diarrhea
        v. Anorexia
        vi. Shortness of breath
        vii. Fever
        viii. Hypothermia
    c. Possible changes in physical assessment
        i. Changes in peripheral, core, and neurovascular perfusion
        ii. Diaphoresis, pale, cool skin
        iii. Hypotension
        iv. Fever
        v. Tachycardia
    d. Assessment tools
        i. Evaluation of limb lead ECG
        ii. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
        iii. Blood pressures
        iv. Auscultation of heart to detect irregular, muffled, or extra tones
        v. Auscultation of breath sounds to detect adventitious noises
        vi. Auscultation of bowel sounds; palpation of abdomen
    e. Treatment
        i. Airway, ventilatory, and circulatory support
        ii. Oxygen with adjuncts appropriate to patient condition
        iii. Venous access
        iv. Supportive care
        v. Evaluation of patient treatment through reassessment of disease
19. Endocrine
    a. Diabetes mellitus (an inability of the pancreas to

produce a sufficient amount of insulin, causing hyperglycemia)

i. Classification
   1. Type I diabetes is insulin dependent ("IDDM")
   2. Type II diabetes is on-insulin dependent ("NIDDM")

ii. Evaluation of pathophysiology through history, possible risk factors, and current medications
   1. Insulin deficiency
   2. Hyperglycemia (plasma levels greater than 200 mg/dl, fasting levels of greater than 126 mg/dl)
   3. Ketoacidosis
   4. Medications used (short-acting and long-acting insulin)

iii. Associated signs and symptoms
   1. Polyuria
   2. Polydipsia
   3. Polyphagia
   4. Anorexia
   5. Nausea, vomiting
   6. Neuropathy and paresthesia

iv. Possible changes in physical assessment
   1. Changes in peripheral core, and neurovascular perfusion
   2. Diaphoresis, pale skin, poor skin turgor; pale, dry, oral mucosa, furrowed tongue
   3. Hypotension
   4. Hypoglycemia/hyperglycemia
   5. Tachycardia
   6. Fever

v. Assessment tools
   1. Evaluation of limb lead ECG
   2. Interpretation of 12 lead ECG for signs of ischemia, injury or anomalies
   3. Blood pressures
   4. Blood glucose levels
   5. Distal pulses
   6. Auscultation of heart to detect irregular, muffled, or extra tones
   7. Auscultation of breath sounds to detect adventitious noises
   8. Temperature
   9. Capnography

vi. Treatment
   1. Airway, ventilatory, and circulatory support
   2. Oxygen with adjuncts appropriate to patient condition
   3. Venous access
   4. Correction of hypoglycemia with D50 IV
   5. Treatment of hyperglycemia with fluids
   6. Evaluation of patient treatment through

reassessment

b. Diabetic ketoacidosis (diabetic complication of IDDM that occurs when the patient becomes hyperglycemic; this causes the cells to burn fat, which causes the body to create ketones and ketoacids)
   i. Evaluation of pathophysiology through history, possible risk factors, and current medications
      1. Non-compliance in medication use
      2. Recent myocardial infarction, stroke, infection, or anorexia
      3. Insulin pump use
      4. Medications used (short-acting insulin, long-acting insulin, metformin)
   ii. Associated signs and symptoms
      1. Altered level of consciousness
      2. Visual disturbances
      3. Fruity or foul odor to breath (acetone halitosis)
      4. Weight loss
      5. Polyuria
      6. Polydipsia
      7. Polyphagia
      8. Abdominal pain
      9. Nausea and vomiting
   iii. Possible changes in physical assessment
      1. Changes in peripheral, core, and neurovascular perfusion
      2. Warm, flushed skin (even though the patient can be hypothermic), poor skin turgor; pale, dry, oral mucosa, furrowed tongue
      3. Kussmaul respirations
      4. Hyperglycemia
      5. Tachycardia
   iv. Assessment tools
      1. Evaluation of limb lead ECG
      2. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
      3. Blood pressures
      4. Blood glucose levels
      5. Distal pulses
      6. Auscultation of heart to detect irregular, muffled, or extra tones
      7. Auscultation of breath sounds to detect adventitious noises
      8. Temperature
      9. Capnography
   v. Treatment
      1. Airway, ventilatory, and circulatory support
      2. Oxygen with adjuncts appropriate to patient condition
      3. Venous access

4. Treatment of hyperglycemia with fluids
5. Evaluation of patient treatment through reassessment

c. Nonketotic hyperglycemic-hyperosmolar coma (diabetic complication of NIDDM in the elderly; unlike DKA, the resulting high blood glucose levels do not cause ketosis, but rather lead to osmotic diuresis and a shift of fluid to the intravascular space, resulting in dehydration)
   i. Evaluation of pathophysiology through history, possible risk factors, and current medications
      1. Type II diabetes (NIDDM)
      2. Non-compliance of medications
      3. Hypothermia
      4. Heat stroke
      5. Infections
      6. Cardiac disease
      7. Pancreatitis
      8. Stroke
      9. Medications
   ii. Associated signs and symptoms
      1. Hyperglycemia
      2. Polydipsia
      3. Dizziness
      4. Confusion
      5. Altered mental status
      6. Seizures
   iii. Possible changes in physical assessment
      1. Changes in peripheral, core, and neurovascular perfusion
      2. Warm, flushed skin, poor skin turgor; pale, dry, oral mucosa, furrowed tongue
      3. Hypotension and shock
      4. Tachycardia
      5. Blood glucose levels greater than 500 mg/dl
   iv. Assessment tools
      1. Evaluation of limb lead ECG
      2. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
      3. Blood pressures
      4. Blood glucose levels
      5. Distal pulses
      6. Auscultation of heart to detect irregular, muffled, or extra tones
      7. Auscultation of breath sounds to detect adventitious noises
      8. Temperature
      9. Capnography
   v. Treatment
      1. Airway, ventilatory, and circulatory support
      2. Oxygen with adjuncts appropriate to patient condition

3. Venous access may necessitate two large bore IVs
4. Treatment of hyperglycemia with judicious use of fluid boluses
5. Evaluation of patient treatment through reassessment

d. Hypothyroidism (destruction of the thyroid tissue over time that causes an insufficient amount of thyroid hormone in the blood; myxedema coma is a premorbid consequence of hypothyroidism in the elderly caused by a recent history of surgery, hypothermia, infection, hypoglycemia, and sedative use)
   i. Evaluation of pathophysiology through history, possible risk factors, and current medications
      1. Anemia
      2. Congestive heart failure
      3. Hyponatremia
      4. Medications used (levothyroxines)
   ii. Associated signs and symptoms
      1. Cold intolerance
      2. Fatigue
      3. Weight gain
      4. Poor cognitive function
      5. Scaly dry skin and hair loss
      6. Peripheral and facial edema
      7. Altered mentation
      8. Depression, paranoia
   iii. Possible changes in physical assessment
      1. Changes in peripheral, core, and neurovascular perfusion
      2. Bradycardia
      3. Respiratory failure or arrest
      4. Hypercarbia
      5. Changes in blood glucose levels
      6. Non-pitting or pitting edema
   iv. Assessment tools
      1. Evaluation of limb lead ECG
      2. Interpretation of 12 lead ECG for signs of ischemia, injury, or anomalies
      3. Blood pressures
      4. Blood glucose levels
      5. Auscultation of heart to detect irregular, muffled, or extra tones
      6. Capnography and pulse oximetry
   v. Treatment
      1. Airway, ventilatory, and circulatory support
      2. Oxygen with adjuncts appropriate to patient condition; may necessitate aggressive management
      3. Venous access
      4. Correction of hypoglycemic levels with D50

5. Dysrhythmia management according to current ACLS standards or area protocol
6. Evaluation of patient treatment through reassessment

20. Inflammatory arthritis
21. Osteo
    a. Osteoporosis (bone disease that decreases bone density)
        i. Type I osteoporosis is seen in post-menopausal women due to the decline in estrogen and most commonly causes radial and hip fractures
        ii. Type II occurs in both men and women over fifth and causes hip and vertebral fractures that can eventually result in dorsal kyphosis
        iii. Evaluation of pathophysiology through history, possible risk factors, and current medications
            1. Genetics
            2. Smoking
            3. Exercise habits
            4. Diets poor in calcium and vitamin D
            5. Gastrointestinal disorders
            6. Hormones
            7. Body type and weight
            8. Steroids
            9. Anticonvulsants
            10. Alcohol
    b. Osteoarthritis (progressive disease from repetitive trauma to the joints causing destruction of the cartilage; commonly strikes the hands, knees, hips, and spine)
    c. Rheumatoid arthritis (autoimmune disorder that affects the joints of the body; causes inflammation of the joints, resulting in pain and instability of the joints)
22. Immunological system anatomical and physiological changes, plus pathophysiology
    a. Immunological changes in the elderly
        i. Aging of the thymus and reduction of T-cells
        ii. Reduced leukocyte activity
        iii. Increased production of autoantibodies
    b. The changes in the immunological system of the elderly make them more prone to infections and exacerbations of chronic processes; these infections, compounded by an inability due to aging of the hypothalamus, may not produce a fever in the face of an immunological insult such as a viral, bacterial, or occult infection
23. Pressure ulcers (the decay of body tissue due to pressure on a site; this results in a lack of blood supply and oxygen to the tissues)
    a. Evaluation of pathophysiology through history and possible risk factors
        i. Brain or spinal cord injury

ii. Neuromuscular disorders
iii. Acute illness that results in loss of mobility
iv. Nutritional problems
v. Fecal or urinary incontinence

b. Areas of concern
i. Lower legs
ii. Sacrum
iii. Greater trochanter
iv. Buttocks

c. Stages of ulcer
i. Nonblanching erythema
ii. Blisters
iii. Ulcer exposing fat and fascia
iv. Ulcer exposing muscle or bone

d. Management at the BLS level

24. Herpes zoster (highly contagious virus that is manifested by a painful rash that affects the ganglion of a nerve and appears along the affected nerve pathway)

11.4 – Patients with Special Challenges

Objective	Educational Standard
11.4.1 – Abuse and Neglect	
C 11.4.1.1 – Discuss the epidemiology, history, assessment considerations, management, legal aspects, risk profiles, and documentation requirements applicable to abuse and neglect patients.	E. Child Abuse 1. Types of Abuse 2. Epidemiology 3. Assessment a. History or scene findings b. Caregivers' behavior c. Physical findings 4. Management a. Reporting b. Safely transporting c. Role of child/adult protective services 5. Legal Aspects 6. Documentation F. Elder Abuse 1. Types of Abuse 2. Epidemiology 3. Assessment 4. Management 5. Legal Aspects 6. Documentation
11.4.2 – Homelessness/Poverty	
C 11.4.2.1 – Describe the challenges associated with, resources available for, and special considerations in the treatment of homeless or poverty-stricken patients.	A. Justify for patient rights and appropriate care B. Identify facilities that will treat regardless of payment C. Prevention strategies will likely be absent, increasing the probability of disease D. Familiarity with assistance resources offered in community
11.4.3 – Bariatric Patients	
C 11.4.3.1 – Discuss the risk factors, special considerations, and patient-handling issues associated with bariatric patients.	A. Definition B. Risk factors 1. Caloric intake that exceeds calories burned 2. Low basal metabolic rate 3. Genetic predisposition for obesity C. Associated with an increased risk for the following: 1. Hypertension 2. Stroke 3. Heart disease 4. Diabetes 5. Some cancers 6. Injury D. Long-term health effects E. Special considerations F. Patient-handling issues 1. To prevent back injuries 2. To position the patient to breathe
11.4.4 – Technology Assisted/Dependent	
C 11.4.4.1 – Describe care considerations for the technology assisted/dependent	A. Ventilation devices B. Apnea monitoring/pulse oximetry

patient.	C. Long-term vascular access devices D. Dialysis shunts E. Nutritional support (i.e., gastric tubes) F. Elimination diversion
11.4.5 – Hospice Care and Terminally Ill	
C 11.4.5.1 – Describe hospice care and terminally ill care considerations.	A. What is hospice? 1. Comfort care versus curative care 2. Terminally ill as verified by physician 3. Typically cancer, heart failure, Alzheimer's disease, AIDS B. EMS intervention C. DNR (do not resuscitate) orders
11.4.6 – Tracheostomy Care/Dysfunction	
C 11.4.6.1 – Describe the care considerations for a patient with a tracheostomy.	A. Tracheostomy (surgical opening from the anterior neck into the trachea) B. Consists of: 1. Stoma 2. Outer cannula 3. Inner cannula C. Routine care 1. Keep stoma clean and dry 2. Change outer cannula as needed 3. Suction as needed D. Acute care
11.4.7 – Physical Needs/Challenges	
C 11.4.7.1 – Discuss special considerations in managing patients with specific physical needs or challenges (hearing, visual, speech, or paraplegia/quadriplegia).	A. Visual impairments 1. Service dogs 2. Allow patient to take your arm B. Hearing impairments 1. Hearing aid issues 2. Communication a. Face the patient (to lip read) b. Lighted area c. Communicate by writing d. Obtain sign language interpreter C. Paralysis a. Hemiplegia b. Palsy c. Paraplegia d. quadriplegia
C 11.4.7.2 - Discuss issues regarding homecare	A. Common for patients over 65 B. Various reasons for calls
C 11.4.7.3 - Identify considerations for caring for patients with developmental disability	A. Treat like any other patient B. Family or friends may supply additional information C. Take special care to provide explanations

12.0 – EMS Operations

Knowledge of operational roles and responsibilities to ensure safe patient, public, and personnel safety.

12.1 – Principles of Safely Operating a Ground Ambulance

The intent of this section is to give an overview of emergency response to ensure EMS personnel, patient, and other's safety during EMS operations. This does not prepare the entry-level student to be an experienced and competent driver.

Information related to the clinical management of the patient during emergency response id found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

See EMR and EMT levels.

12.2 – Incident Management

Information related to the clinical management of the patient within components of the Incident Management System (IMS) is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

Objective	Educational Standard
12.2.1 – National Incident Management System ("NIMS")	
C 12.2.1.1 – Complete FEMA IS-700 and IS-100 training.	Online IS-100: http://emilms.fema.gov/IS100b/index.htm IS-700: http://emilms.fema.gov/IS700aNEW/index.htm
C 12.2.1.2 – Apply National Incident Management System ("NIMS") standards.	N/A

AFFECTIVE OBJECTIVES: None identified for this unit.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

12.3 – Multiple Casualty Incidents

The intent of this section is to give an overview during a multiple casualty incident when a multiple casualty incident plan is activated.

Information related to the clinical management of the patients during a multiple casualty incident is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

See EMR and EMT levels.

Objective	Educational Standard
12.3.1 – Triage Systems	
C 12.3.1.1 – Utilize a triage system for mitigating multiple casualty incidents.	1. SALT 2. JUMP Start 3. Others

AFFECTIVE OBJECTIVES:
Value the importance of triaging patients during a multiple casualty incident.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

12.4 – Air Medical

The intent of this section is to give an overview of operating safety in and around a landing zone during air medical operations and transport.

Information related to the clinical management of the patients during air medical operations is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

Objective	Educational Standard
12.4.1 – Medical Risks/Needs/Advantages	
C 12.4.1.1 – Describe safe air medical operations including advantages, disadvantages and patient transfer considerations.	G. Types 1. Rotorcraft 2. Fixed Wing H. Advantages 1. Specialized Care – skills, supplies, equipment 2. Rapid Transport 3. Access to Remote Areas 4. Helicopter Hospital Helipads I. Disadvantages 1. Weather/Environmental 2. Altitude limitations 3. Airspeed limitations 4. Aircraft cabin size 5. Terrain 6. Cost J. Patient Transfer 1. Interacting with flight personnel 2. Patient preparation 3. Scene safety a. Securing loose objects b. Approaching the aircraft c. Landing zone K. Landing Zone Selection and Preparation L. Approaching the Aircraft M. Communication Issues
C 12.4.1.2 - Discuss criteria for utilizing Air Medical Response	C. Indications for Patient Transport 1. Medical 2. Trauma 3. Search and Rescue D. Activation – local and State guidelines 1. State Statutes 2. Administrative Rules 3. City/County/District ordinance standards

AFFECTIVE OBJECTIVES:
Value the inclusion of aeromedical transport in the delivery of patient care.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

12.5 – Vehicle Extrication

The intent of this section is to give an overview of vehicle extrication to ensure EMS personnel and patient safety during extrication operations. This does not prepare the entry-level student to become a vehicle extrication expert or technician.

Information related to the clinical management of the patient being cared for during vehicle extrication is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

Objective	Educational Standard
12.5.1 – Safe Vehicle Extrication	
C 14.5.1.1 – Discuss safety considerations integral to vehicle extrication operations.	A. Role of EMS in vehicle extrication 1. Provide patient care 2. Perform simple extrication B. Personal safety 1. First priority for all EMS personnel 2. Appropriate personal protective equipment for conditions 3. Scene size-up C. Patient safety 1. Keep them informed of your actions 2. Protect from further harm D. Situational safety 1. Control traffic flow a. Proper positioning of emergency vehicles i. Upwind/uphill ii. Protect scene b. Use of lights and other warning devices c. Setting up protective barrier d. Designate a traffic control person 2. 360° assessment a. Downed electrical lines b. Leaking fuels or fluids c. Smoke or fire d. Broken glass e. Trapped or ejected patients f. Mechanism of injury 3. Vehicle stabilization a. Place vehicle in “park” or in gear b. Set parking brake c. Turn off vehicle ignition d. Cribbing/chocking e. Move seats back and roll down windows f. Disconnect battery or power source g. Identify and Airway, respiration and ventilation hazardous vehicle safety components 4. Unique hazards a. Alternative-fuel vehicles

	b. Undeployed vehicle safety devices c. Hazardous materials 5. Evaluate the need for additional resources a. Extrication equipment b. Fire suppression c. Law enforcement d. Hazardous materials e. Utility companies f. Air medical g. Others 6. Extrication considerations a. Disentanglement of vehicle from patient b. Multi-step process c. Rescuer-intensive d. Equipment-intensive e. Time-intensive f. Access to patient i. Simple a) Try to open doors b) Ask patient to unlock doors c) Ask patient to lower windows ii. Complex iii. Tools a) Hand b) Pneumatic c) Hydraulic d) Other E. Determine number of patients (implement local multiple casualty incident protocols if necessary)
12.5.2 – Use of Simple Hand Tools	
C 14.5.2.1 – Identify simple hand tools that can be used for vehicle extrication.	A. Hammer B. Center punch C. Pry bar D. Hack saw E. Come-along
12.5.3 – Special Considerations for Patient Care	
C 12.5.3.1 – Discuss special considerations for care of a patient requiring extrication from a vehicle.	A. Removing patient 1. Maintain manual cervical spine stabilization 2. Complete primary assessment 3. Provide critical interventions B. Assist with rapid extrication C. Move patient, not device D. Use sufficient personnel E. Use path of least resistance

AFFECTIVE OBJECTIVES:
Value the integration of resources utilized in patient care during extrication operations.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

12.6 – Hazardous Materials Awareness

Information related to the clinical management of the patient exposed to hazardous materials is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

Objective	Educational Standard
12.6.1 – Hazardous Materials Awareness	
C 12.6.1.1 – Complete hazardous materials awareness/cold zone operations (HAZWOPER) training.	OSHA 29 CFR 1910.120 requirements
C 12.6.1.3 – Prepare for the treatment of patients exposed to hazardous materials.	N/A

AFFECTIVE OBJECTIVES:
Recognize safety for personnel, patients and the public during hazardous materials incidents.

PSYCHOMOTOR OBJECTIVES: None identified for this unit.

12.7 – Mass Casualty Incidents Due to Terrorism and Disaster

The intent of this section is to give an overview of operating during a terrorist event or during a natural or manmade disaster.

Information related to the clinical management of patients exposed to a terrorist event is found in the clinical sections of the National EMS Education Standards and Instructional Guidelines for each personnel level.

Objective	Educational Standard
12.7.1 – Risks and Responsibilities of Operating on the Scene of a Natural or Man-Made Disaster	
C 12.7.1.1 – Discuss the role of EMS and safety considerations while operating on the scene of a natural or man-made disaster.	A. Role of EMS 1. Personal safety 2. Provide patient care 3. Initiate/operate in an incident command system ("ICS") 4. Assist with operations B. Safety 1. Personal a. First priority for all EMS personnel b. Appropriate personnel protective equipment for conditions c. Scene size-up d. Time, distance, and shielding for self-protection e. Emergency responders are targets f. Dangers of the secondary attack 2. Patient a. Keep them informed of your actions b. Protect from further harm c. Signs and symptoms of biological, nuclear, incendiary, chemical, and explosive ("B-NICE") substances d. Concept of "greater good" as it relates to any delay e. Treating terrorists/criminals 3. 360° assessment and scene size-up a. Outward signs and characteristics of terrorist incidents b. Outward signs of a weapons of mass destruction ("WMD") incident c. Outward signs and protective actions of biological, nuclear, incendiary, chemical, and explosive ("B-NICE") weapons 4. Determine number of patients (implement local multiple-casualty incident ["MCI"] protocols as necessary) 5. Evaluate need for additional resources

	6. EMS operations during terrorist, weapons of mass destruction, disaster events: a. All hazards safety approach b. Initially distance from scene and approach when safe c. Ongoing scene assessment for potential secondary events d. Communicate with law enforcement at the scene of an armed attack e. Initiate or expand incident command system as needed f. Perimeter use to protect rescuers and public from injury g. Escape plan and a mobilization point at a terrorist incident 7. Care of emergency responders on scene a. Safe use of an auto-injector for self and peers b. Safe disposal of auto-injector devices after activation
C 12.7.1.2 – Comply with Wisconsin weapons of mass destruction ("WMD") training requirements.	N/A

AFFECTIVE OBJECTIVES:
Value the role of EMS during a terrorism response.

PSYCHOMOTOR OBJECTIVES:
None