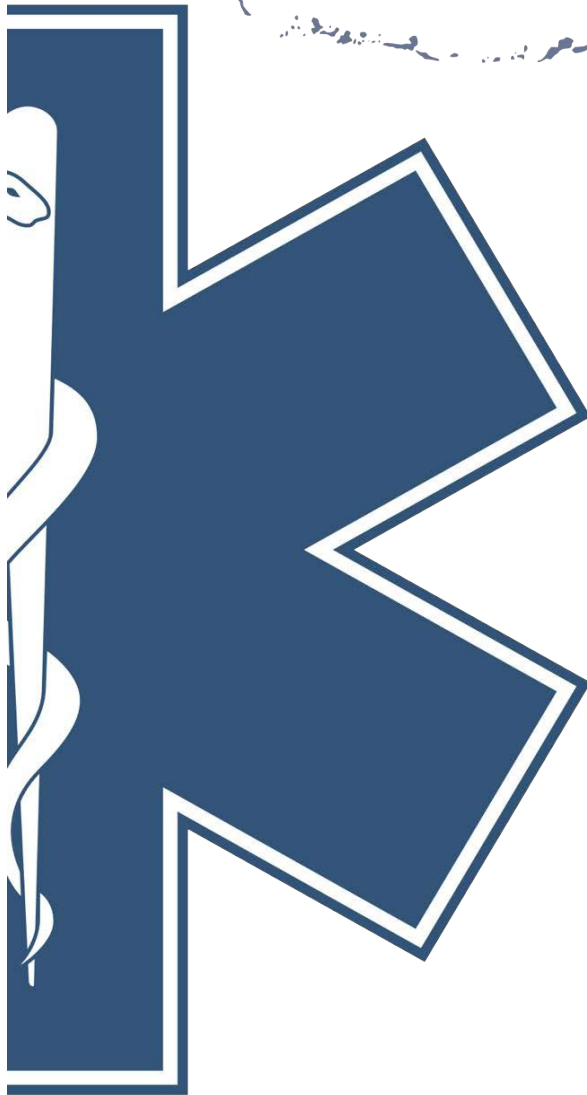
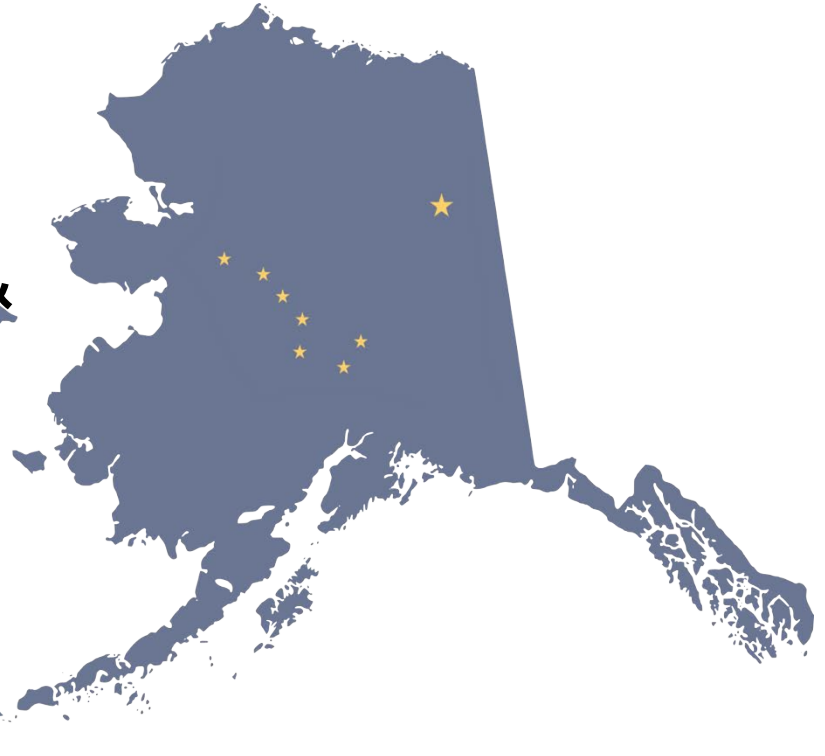


Alaska EMS EMT-3 to AEMT Course Objectives & Lesson Plan



Alaska Council on EMS Committees:
EMS Training Committee and
Implementation Task Force
in cooperation with the
State of Alaska Department of Health and Social
Services
Division of Public Health
Section of Rural and Community Health Systems Office
of Emergency Medical Services.
Box 110616
Juneau, AK 90811-0616
(907-465-3027
<http://www.ems.alaska.gov>
Revised October 2020

State of Alaska
Department of Health & Social Services
Division of Public Health
Office of Emergency Medical Services
2019



STATE OF ALASKA OFFICE OF EMERGENCY MEDICAL SERVICES

TRANSITION FROM EMT-3 TO AK-AEMT COURSE

The purpose of this course is to transition Alaska EMT-3s to the AK-AEMT. This course is for those that have already completed and been certified as EMT-3s. The material is meant to be covered in a time frame that guides the student to become competent with their knowledge and abilities. That means they can remember, understand, apply, analyze, evaluate and create. It is the responsibility of the Course Coordinator and Medical Director to determine competency for each student. Time listed is a recommendation only- (approx. 60 hrs without the ACLS and 12-Lead information).

Table of Contents

Lesson 1: Preparatory EMS Systems	1
Lesson 2: Public Health (Review) (1 hr)	5
Lesson 3: Anatomy & Physiology (8 hrs).....	6
Lesson 4: Pathophysiology (4 hrs)	13
Lesson 5: Principles of Pharmacology (8 hrs)	14
Lesson 6: Pain Management (2 hrs).....	21
Lesson 7: Patient Assessment (<u>Review Only</u>) (2-4 hrs)	24
Lesson 8: Airway Management Overview (2 hrs - Primarily Review)	26
Lesson 9: Respiratory Emergencies (4 hrs including skills).....	32
Lesson 10: Cardiovascular Emergencies (4 hrs including skills).....	34
Lesson 11: Neurology (2 hrs).....	41
Lesson 12: Abdominal And Gastrointestinal Disorders (2 hrs).....	44
Lesson 13: Immunology (Review) (2 hrs)	46
Lesson 14: Infectious Disease (Review) (1 hr)	48
Lesson 15: Endocrine Disorders (Review) (2 hrs).....	50
Lesson 16: Psychiatric (Review) (2 hrs).....	53
Lesson 17: Toxicology (Review) (2 hr).....	57
Lesson 18: Hematology (1 hr).....	61
Lesson 19: Genitourinary/Renal (2hrs)	61
Lesson 20: OB/Gynecology (Review) (1.5 hr)	63
Lesson 21: 12-Lead ECG Course (8 hrs for initial/4 hrs review)	64
Lesson 22: ACLS (12 hrs)	65
Lesson 23: Shock (16 hrs for Shock & Trauma).....	65
Lesson 24: Trauma Review (8-16 hrs depending on group)	71
Lesson 25: Pediatrics (1-2 hrs).....	77
Lesson 26: Geriatrics (1.5 hrs)	80
Lesson 27: Patient with Special Challenges (2 hrs)	85
Lesson 28: Skills Lab/Competencies	86
Example Schedule	88
Example Equipment List- 10 students.....	89

Lesson 1: Preparatory EMS Systems

Objectives

- 1.1 Define the role of the AEMT in Alaska.
- 1.2 Properly complete an EMS patient care report based on a real or simulated patient situation.
- 1.3 Explain the principles of Patient Care Report (PCR) and the importance of PCRs with continuum of care.
- 1.4 Properly complete a Patient Refusal form.
- 1.5 Compare and contrast the roles of an EMT-1, EMT-2, EMT-3, Alaska AEMT, and MICP.
- 1.6 Understand when to use Special Situations/Reports/Incident Reporting.
- 1.7 Describe the relationship between the AEMT, the Physician Medical Director, the receiving facility and other Health Care Professionals.
- 1.8 Explain the principles of communication involved in building Patient rapport.
- 1.9 Review Medical, Legal and Ethical Issues as they pertain to Patient Care.
 - a. Discuss the importance of Do Not Resuscitate (DNR) advance directives and local or state provisions regarding EMS application
 - b. Recall the definition of consent and discuss the methods of obtaining consent
 - c. Differentiate between expressed and implied consent
 - d. Explain the role of consent of minors in providing care
 - e. Discuss the implications for the AEMT in patient refusal of transport
 - f. Discuss the issues of abandonment, negligence, and battery and their implications to the AEMT
 - g. Recall the conditions necessary for the AEMT to have a duty to act
 - h. Explain the importance, necessity and legality of patient confidentiality
 - i. Discuss the considerations of the AEMT in issues of organ retrieval
 - j. Differentiate the actions that an AEMT should take to assist in the preservation of a crime scene
 - k. State the conditions that require an AEMT to notify local law enforcement officials

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

- A. AK-AEMT Roles and Responsibilities (1 hr)
 1. Explain AK-EMT roles and responsibilities within the EMS system
 2. Contrast the roles and responsibilities of ETT, EMT-1, EMT-2, EMT-3, AEMT, AK-AEMT and Paramedic levels in the EMS community
 3. Judge the role that ethics plays in decision making in the out-of-hospital environment
- B. Documentation (2 hrs)
 1. Principles of Medical Document and Report Writing
 - a) List the minimum Data Set
 - 1) Patient Information
 - (a) Chief Complaint
 - (b) Initial assessment
 - (c) Vital Signs
 - (d) Patient Demographics
 - 2) Administrative information

- (a) Time incident reported
 - (b) Time unit notified
 - (c) Time of arrival at patient
 - (d) Time unit left scene
 - (e) Time unit arrival at destination
 - (f) Time of transfer of care
- 2. Prehospital Care Report
- 3. Documentation of Patient Refusal
 - a) Patient Information
 - 1) Chief Complaint
 - 2) Initial assessment
 - 3) Vital Signs
 - 4) Patient Demographics
 - b) Administrative information
 - 1) Time incident reported
 - 2) Time unit notified
 - 3) Time of arrival at patient
 - 4) Time unit left scene
 - 5) Time unit arrival at destination
 - 6) Time of transfer of care
- 4. Special Situations/Reports/Incident Reporting
- C. EMS Communication (Review Only) (1.3 & 1.4 combined- 1 hr)
 - 1. Communicating with other Health Care Professionals
 - 2. Communications with Medical Direction
 - 3. Communications with Receiving Facilities
- D. Therapeutic Communication (Review Only)
 - 1. Principles of Communicating With Patients in a Manner That Achieves a Positive Relationship
- E. Medical Legal (Review) (1-2 hrs)
 - 1. Ethical responsibilities
 - a) Make the physical/emotional needs of the patient a priority
 - b) Practice/maintenance of skills to the point of mastery
 - c) Attend continuing education/refresher programs
 - d) Critically review performances, seeking ways to improve response time, patient outcome, communication
 - e) Honesty in reporting
 - 2. Advance Directives
 - a) Do Not Resuscitate (DNR) orders
 - 1) Patient has the right to refuse resuscitative efforts.
 - 2) In general, requires written order from physician.
 - 3) Review state and local legislation/protocols relative to DNR orders and advance directives.
 - 4) When in doubt or when written orders are not present, the AEMT should begin resuscitation efforts.
 - 3. Consent
 - a) Expressed
 - 1) Patient must be of legal age and able to make a rational decision

- 2) Patient must be informed of the steps of the procedures and all related risks
- 3) Must be obtained from every conscious, mentally competent adult before rendering treatment
- b) Implied
 - 1) Consent assumed from the unconscious patient requiring emergency intervention
 - 2) Based on the assumption that the unconscious patient would consent to life saving interventions
- a) Children and mentally incompetent adults
 - 1) Consent for treatment must be obtained from the parent or legal guardian.
 - 2) Emancipation issues
 - 3) State regulations regarding age of minors
 - 4) When life threatening situations exist and the parent or legal guardian is not available for consent, emergency treatment should be rendered based on implied consent
4. Assault/Battery
 - a) Unlawfully touching a patient without his consent
 - b) Providing emergency care when the patient does not consent to the treatment
5. Refusals
 - a) The patient has the right to refuse treatment
 - b) The patient may withdraw from treatment at any time. Example: an unconscious patient regains consciousness and refuses transport to the hospital
 - c) Refusals must be made by mentally competent adults following the rules of expressed consent
 - d) The patient must be informed of and fully understand all the risks and consequences associated with refusal of treatment/transport, and must sign a "release from liability" form
 - e) When in doubt, err in favor of providing care
 - f) Documentation is a key factor to protect AEMT in refusal
 - 1) Competent adult patients have the right to refuse treatment
 - 2) Before the AEMT leaves the scene, he should:
 - (a) Try again to persuade the patient to go to a hospital.
 - (b) Ensure the patient is able to make a rational, informed decision, e.g., not under the influence of alcohol or other drugs, or illness/injury effects.
 - (c) Inform the patient why he should go and what may happen to him if he does not.
 - (d) Consult medical direction as directed by local protocol.
 - (e) Consider assistance of law enforcement.
 - (f) Document any assessment findings and emergency medical care given, and if the patient still refuses, then have the patient sign a refusal form.
 - (g) The AEMT should never make an independent decision not to transport.
6. Abandonment - termination of care of the patient without assuring the continuation of care at the same level or higher.
7. Negligence - deviation from the accepted standard of care resulting in further injury to the patient. Components:
 - a) Duty to act
 - b) Breach of the duty
 - c) Injury/damages were inflicted

- 1) Physical
- 2) Psychological
- d) The actions of the EMT-Basic caused the injury/damage.
- 8. Duty to Act
 - a) A contractual or legal obligation must exist.
 - 1) Implied
 - (a) Patient calls for an ambulance and the dispatcher confirms that an ambulance will be sent.
 - (b) Treatment is begun on a patient.
 - 2) Formal - ambulance service has a written contract with a municipality. Specific clauses within the contract should indicate when service can be refused to a patient.
 - b) Legal duty to act may not exist. May be moral/ethical considerations.
 - 1) In some states, while off duty, if the AEMT comes upon an accident while driving.
 - 2) When driving the ambulance not in the company's service area and AEMT observes an accident.
 - (a) Moral/ethical duty to act
 - (b) Risk management
 - (c) Documentation
 - 3) Specific state regulations regarding duty to act.
- 9. Confidentiality
 - a) Confidential information
 - 1) Patient history gained through interview
 - 2) Assessment findings
 - 3) Treatment rendered
 - b) Releasing confidential information
 - 1) Requires a written release form signed by the patient. Do not release on request, written or verbal, unless legal guardianship has been established.
 - 2) When a release is not required
 - (a) Other health care providers need to know information to continue care.
 - (b) State law requires reporting incidents such as rape, abuse or gunshot wounds.
 - (c) Third party payment billing forms
 - (d) Legal subpoena
- 10. Special Situations
 - a) Donor/organ harvesting consideration
 - 1) Requires a signed legal permission document
 - (a) Separate donor card
 - (b) Intent to be a donor on the reverse of patient's driver's license
 - 2) A potential organ donor should not be treated differently from any other patient requesting treatment
 - 3) EMT-Basic's role in organ harvesting
 - (a) Identify the patient as a potential donor
 - (b) Establish communication with medical direction
 - (c) Provide care to maintain viable organs
 - b) Medical identification insignia
 - 1) Bracelet, necklace, card

- 2) Indicates a serious medical condition of the patient
 - (a) Allergies
 - (b) Diabetes
 - (c) Epilepsy
 - (d) Others
11. Potential Crime Scene/Evidence Preservation
 - a) Dispatch should notify police personnel
 - b) Responsibility of the EMT-Basic
 - 1) Emergency care of the patient is the EMT-Basic's priority
 - 2) Do not disturb any item at the scene unless emergency care requires it
 - 3) Observe and document anything unusual at the scene
 - 4) If possible, do not cut through holes in clothing from gunshot wounds or stabbings
12. Special Reporting Situations
 - a) Established by state legislation and may vary from state to state
 - b) Commonly required reporting situations
 - 1) Abuse
 - (a) Child
 - (b) Elderly
 - (c) Spouse
 - 2) Crime
 - (a) Wounds obtained by violent crime
 - (b) Sexual assault
 - c) Infectious disease exposure
 - d) Patient restraint laws e.g. forcing someone to be transported against their will
 - e) Mentally incompetent, e.g., intoxication with injuries

Lesson 2: Public Health (Review) (1 hr)

Objectives

- 2.1 Describe the relationship between EMS and public health.
- 2.2 Explain the role of public health systems and their relationship to EMS, disease surveillance, and injury prevention.
- 2.3 Define how public health and EMS interface in the following areas:
 - a. Health Education
 - b. Injury prevention and surveillance
 - c. Disease surveillance
 - d. Vaccinations
 - e. Health screening

Psychomotor Objectives

There are no psychomotor objectives for this section

Lesson Content

- A. Basic Principles of Public Health
 1. Role of Public Health
 - 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
- 2. Public Health Laws Regulations & Guidelines
- 3. EMS Interface with Public Health-
 - a) Reporting Requirements
 - b) Disease Surveillance
 - c) Injury Prevention
 - d) Vaccinations
 - e) Health Screenings
- 4. Role of EMS in Public Health Emergencies
 - a) Epidemic alerts.
 - b) Safe patient transport to isolation facilities

Lesson 3: Anatomy & Physiology (8 hrs)

Objectives

- 3.1 Understand the body's topographic anatomy, including the anatomic position and the planes of the body.
- 3.2 Explain the following directional terms: anterior (ventral), posterior (dorsal), right, left, superior, inferior, proximal, distal, medial, lateral, superficial, and deep.
- 3.3 Describe the prone, supine, Fowler's, Trendelenburg's, and shock positions of the body.
- 3.4 Identify the anatomy and describe the physiology of the respiratory system.
- 3.5 Describe the process of gas exchange in the alveoli.
- 3.6 Discuss the concepts of respiration and ventilation.
- 3.7 Describe chemoreceptors.
- 3.8 Explain the brainstem's role in regulating respiration.
- 3.9 Describe the concept of hypoxic drive.
- 3.10 Explain how the level of carbon dioxide in the blood and the blood's pH relate to ventilation.
- 3.11 Discuss the anatomy and physiology of the circulatory system.
- 3.12 Explain the concept of perfusion, including the components necessary to maintain perfusion. Don't have a definition/section for perfusion in the lesson content
- 3.13 Describe the composition of blood, including the function of plasma.- this is in lesson 2 content
- 3.14 Discuss the concepts of afterload, stroke volume, and cardiac output.
- 3.15 Discuss Starling's law of the heart.
- 3.16 Discuss cell transport mechanisms, including diffusion, osmosis, facilitated diffusion, active transport, endocytosis, and exocytosis.
- 3.17 Explain the concept of fluid balance, as well as the purpose and mechanisms for maintaining homeostasis.
- 3.18 Recall the structural components and physiological functions of the body systems.
- 3.19 Discuss the anatomy and physiology of the nervous system.

- 3.20 Discuss the anatomy and physiology of the integumentary system.
- 3.21 Discuss the anatomy and physiology of the digestive system.
- 3.22 Discuss the anatomy and physiology of the endocrine system.
- 3.23 Discuss the anatomy and physiology of urinary system.
- 3.24 Discuss the anatomy and physiology of genital system.
- 3.25 Describe the life support chain, aerobic and anaerobic metabolism

Psychomotor Objectives:

There are no psychomotor objectives for this section.

Lesson Content

- A. Anatomy & Body Functions Review
 - 1. Anatomical Planes
 - a) Frontal or coronal planes
 - b) Sagittal or lateral plane
 - c) Transverse or axial plane
 - 2. Body 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
 - 3. Respiratory System
 - a) General function of the respiratory system
 - 1) Upper respiratory tract
 - 2) Lower respiratory tract
 - b) Structure and functions of the nasal cavities and pharynx
 - 1) Nasal cavities
 - (a) nose
 - (b) nasal cavities
 - (c) nasal septum
 - (d) nasal mucosa
 - (e) olfactory receptors
 - (f) paranasal sinuses
 - 2) Pharynx

- (a) nasopharynx
- (b) soft palate
- (c) oropharynx
- (d) laryngopharynx
- c) Structure and function of the larynx and the speaking mechanism
 - 1) Voice box/larynx
 - 2) Thyroid cartilage
 - 3) Epiglottis
 - 4) Vocal cords
 - 5) Glottis
- d) Structure and functions of the trachea and bronchial tree
 - 1) Trachea
 - 2) Primary bronchi
 - 3) Bronchial tree
 - 4) Right and left main-stem bronchi
 - 5) Bronchioles
- e) Lungs
 - 1) Location and function
 - 2) Pleura l membranes
 - (a) parietal pleura
 - (b) visceral pleura
 - (c) serous fluid
 - 3) Hilus
- f) Structure and function of the alveoli and pulmonary capillaries
- g) Mechanism of breathing-
 - 1) Mechanical ventilation
 - (a) mechanism of inhalation
 - (b) inspiration
 - (c) phrenic nerve
 - (d) intercostal nerves
 - (e) respiration
 - (f) ventilation/perfusion disturbance
 - (g) diaphragm
 - (h) external intercostal muscles
 - (i) internal intercostal muscles
 - (j) pressures- this is below in (b)
 - 2) Changes in air pressure that occur within the thoracic cavity during ventilation
 - (a) atmospheric
 - (b) intra-pleural
 - (c) intra-pulmonic
 - 3) Role of the visceral and parietal pleura in ventilation
 - 4) Mechanics of exhalation
- h) Explain the diffusion of gases in external and internal respiration
- i) Discuss pulmonary volumes
 - 1) Tidal volume
 - 2) Minute respiratory volume (MRV)
 - 3) Vital capacity

- j) Physiological dead space and lung compliance
 - k) Oxygen and carbon dioxide transport in the blood
 - l) Nervous and chemical mechanisms that regulate ventilation
 - 1) Normal Respiratory Drive
 - (a) chemoreceptors
 - 2) Hypoxic Drive
 - m) Respiration and acid-base balance
 - 1) Respiratory acidosis and alkalosis
 - 2) Metabolic acidosis and alkalosis
4. Circulatory System
- a) Blood
 - 1) Composition and function of blood
 - 2) Composition and function of blood plasma
 - (a) amount
 - (b) color
 - (c) pH
 - (d) viscosity
 - (e) plasma
 - 3) Primary hemopoietic tissue
 - 4) Function of red blood cells
 - 5) Red blood cell production in hypoxic state
 - 6) Red blood cell and hemoglobin destruction
 - 7) ABO group and Rh factor blood types
 - 8) Function of white blood cells (leukocytes) and Platelets
 - b) The Heart
 - 1) Location and features of the heart
 - (a) mediastinum
 - (b) pericardial membranes
 - (c) fibrous pericardium
 - (d) parietal pericardium
 - (e) epicardium
 - (f) myocardium
 - (g) endocardium
 - 2) Chambers of the heart
 - (a) right and left atria
 - (b) right and left ventricles
 - 3) Valves of the heart and their function
 - (a) tricuspid valve
 - (b) pulmonic valve
 - (c) mitral valve
 - (d) aortic valve
 - 4) Cardiac cycle
 - 5) Coronary Arteries
 - 6) Major blood vessels
 - 7) Stroke volume, cardiac output, and Starling's law of the heart
 - (a) Preload
 - (b) Afterload

- 8) Nervous system regulation of the function of the heart
- c) Blood vessels and circulation
 - 1) Structure and function of the blood vessels, arteries, veins and capillaries
 - 2) Arterial and venous anastomosis
 - 3) Structure of capillaries
 - 4) Exchange of gases that occurs at the capillary level
 - 5) Mechanism that regulate blood flow through arteries, capillaries, and veins
 - 6) Pathway and purpose of the pulmonary circulation
 - 7) Pathway of the systemic circulation
 - 8) Pathway and purpose of the hepatic portal circulation
 - 9) Branches of the aorta and their distributions
 - 10) Major systemic arteries and the parts of the body they nourish
 - 11) Major systemic veins and the parts of the body they drain of blood
 - 12) Hemodynamics
 - (a) blood pressure
 - (1) venous return
 - (2) pulse pressure
 - (3) peripheral resistance
 - (b) factors that maintain systemic blood pressure
 - (1) heart rate and force of contraction
 - (2) vessel elasticity (preload)
 - (3) blood viscosity
 - (4) hormones
 - (5) peripheral resistance (afterload)
 - (c) Fluid Balance/ Homeostasis
 - (1) osmosis
 - (2) diffusion
 - (3) facilitated diffusion
 - (4) active transport
 - (5) hydrostatic pressure
 - (6) oncotic pressure
 - 13) Regulation of blood pressure by the heart and kidneys
 - 14) Medulla and autonomic nervous system regulation of the diameter of the blood vessels
 - 15) Coordination of the cardiac, vasomotor, and respiratory centers to control blood flow through the tissues
5. Nervous System
 - a) Structural division
 - 1) Central nervous system (CNS)
 - (a) brain
 - (b) spinal cord
 - 2) Peripheral nervous system (PNS)
 - b) Functional
 - 1) Autonomic
 - (a) sympathetic
 - (b) parasympathetic
 - c) Functions of the nervous system

- 1) Consciousness
 - (a) cerebral hemispheres
 - (b) reticular activating system (center of consciousness)
 - 2) Sensory function
 - 3) Motor function
 - 4) Fight-or-flight response
6. Integumentary (Skin)
- a) Structures
 - 1) Epidermis
 - 2) Dermis
 - 3) Subcutaneous layer
 - b) Functions of the skin
 - 1) Protection
 - 2) Temperature control
7. Digestive System
- a) Anatomy of the Organs of the Abdominopelvic Cavity
 - 1) Stomach
 - 2) Intestines
 - 3) Esophagus
 - 4) Spleen
 - 5) Urinary Bladder
 - 6) Liver
 - 7) Gall Bladder
 - 8) Pancreas
 - 9) Kidney
 - 10) Reproductive Organs
8. Endocrine System
- a) Structures
 - 1) Pancreas
 - 2) Adrenal glands
 - (a) epinephrine
 - (b) norepinephrine
 - b) Function
 - 1) Control of blood glucose level
 - 2) Stimulate sympathetic nervous system
9. Renal System
- a) Structures
 - 1) Kidneys
 - 2) Bladder
 - 3) Urethra
 - b) Function
 - 1) Blood filtration
 - 2) Fluid balance
 - 3) Buffer
10. Reproductive System
- a) Male
 - 1) Structures

- (a) testicles
 - (b) penis
 - 2) Functions
 - (a) Reproduction
 - (b) Urination
 - (c) hormones
 - b) Female
 - 1) Structures
 - (a) ovaries
 - (b) fallopian tubes
 - (c) uterus
 - (d) vagina
 - 2) Functions
 - (a) reproduction
 - (b) hormones
- B. Life Support Chain
- 1. Fundamental Elements
 - a) Oxygenation
 - 1) Alveolar/capillary gas exchange
 - 2) Cell/capillary gas exchange
 - b) Perfusion
 - 1) Oxygen
 - 2) Glucose
 - 3) Removal of carbon dioxide and other waste products
 - c) Cell Environment
 - 1) Aerobic metabolism
 - (a) high ATP (energy) production
 - (b) byproduct of water and carbon dioxide
 - 2) Anaerobic metabolism
 - (a) low ATP (energy) production
 - (b) byproduct of lactic acid
 - d) 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. Age-Related Variations for Peds and Geriatrics
- 1. See Special Patient Populations

Lesson 4: Pathophysiology (4 hrs)

Objectives

- 4.1 Differentiate between the processes of aerobic and anaerobic cellular metabolism, including explanations of amount of ATP required and the removal of by-products.
- 4.2 Explain the disease processes that affect the function of the body, starting at the cellular level.
- 4.3 Define the pathophysiology of shock and the forensic changes at the cellular level.
- 4.4 Describe the concept of systemic vascular resistance and its relationship to blood pressure and pulse pressure.
- 4.5 Define pathophysiology of respiratory emergencies, including the concepts of respiratory compromise.

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

- A. Correlation of Pathophysiology with Disease Process Review
 1. Cells and the multi-cellular organism
 2. Cellular communication
- B. Basic Cellular Review
 1. Major Classes of Cells
 2. Chief Cellular Function
 3. Cellular Components
 - a) Structure
 - b) Function
 4. Alterations in Cells and Tissues
- C. Cellular Injury Review
 1. Hypoxic Injury- Causes
 - a) Decreased oxygenation
 - b) Loss of hemoglobin or hemoglobin function
 - c) Decreased red blood cells
 - d) Respiratory or cardiovascular system disease
- D. Hypoperfusion
 1. Pathogenesis
 - a) Decreased cardiac output
 - b) Compensatory mechanisms
 - 1) Catecholamine release
 - (a) epinephrine
 - (b) norepinephrine
 - (c) increase in systemic vascular resistance
 - (1) increased blood volume
 - (2) vasoconstriction
 - (3) increased stroke volume
 - (4) increased heart rate
 - (5) increased preload
 - c) Oxygen impairment
 - 1) Anaerobic metabolism

- 2) Increased lactate
 - 3) Metabolic acidosis
 - (a) decreased oxygen affinity for hemoglobin
 - (b) decreased ATP
 - (c) changes in cellular electrolytes
 - (d) cellular edema
 - (e) release of lysosomal enzymes
 - 4) Impaired glucose use
1. Types of Shock
 - a) Cardiogenic Shock
 - 1) Defined
 - 2) Pathophysiology
 - 3) Evaluation and treatment
 - b) Obstructive Shock
 - 1) Defined
 - 2) Pathophysiology
 - 3) Evaluation and treatment
 - c) Hypovolemic Shock
 - 1) Defined
 - 2) Pathophysiology
 - 3) Evaluation and treatment
 - d) Distributive Shock:
 - 1) Neurogenic
 - (a) Defined
 - (b) Pathophysiology
 - (c) Evaluation and treatment
 - 2) Anaphylactic
 - (a) Defined
 - (b) Pathophysiology
 - (c) Evaluation and treatment
 - 3) Septic
 - (a) Defined
 - (b) Pathophysiology
 - (c) Evaluation and treatment

Lesson 5: Principles of Pharmacology (8 hrs)

Objectives

- 5.1 List the legislation that pertains to medication administration and management.
- 5.2 Describe the forms that medication may be package in.
- 5.3 Summarize the naming and classification process for medications.
- 5.4 State the 6 “rights” of medication administration:
 - a. Right Patient
 - b. Right Medication
 - c. Right Dose
 - d. Right Route
 - e. Right Time

- f. Right Documentation
- 5.5 Recall the functional use of the metric system as it applies to medication administration.
- 5.6 Describe, compare, and contrast the various drug administration routes and recall the indications for each.
- 5.7 Describe the indications, equipment needed, techniques used, precautions and general principles of administering medications by different routes.
- 5.8 Recall the potential complications that can occur with various routes, and discuss how to prevent and/or treat potential complications that could result from each.
- 5.9 For each of the AEMT medications give the following:
 - a. Generic name
 - b. Trade name
 - c. Classification
 - d. Drug Action
 - e. Indications
 - f. Contraindications
 - g. Side Effects
 - h. Precautions
 - i. How supplied
 - j. Dose: Adult/pediatrics
 - k. Routes of administration
- 5.10 Describe reconstitution (e.g., Glucagon) or admixture (e.g., TXA) of medications for administration.
- 5.11 Describe the role of medical direction in medication administration, and explain the difference between direct orders (online) and standing orders (off-line). not in lesson content
- 5.12 Describe the medication administration considerations that must be applied to special populations, including pediatric, geriatric, and pregnant patients. not in lesson content
- 5.13 Given a patient scenario, state and/ or demonstrate the correct drug, dosage, and administration route(s) for AEMT medications: not in lesson content

Psychomotor Objectives

- 5.14 Demonstrate functional use of the metric system as it applies to medication administration.
- 5.15 Demonstrate understanding of the 6 “rights” of medication administration.
- 5.16 Demonstrate bolus drug dose calculations, including volume to be administered, confirming with a double-check system.
- 5.17 Demonstrate ability to calculate medication drip rates.
- 5.18 Demonstrate withdrawal of medication from an ampule, vial (single dose or multi-dose), and assembly of prefilled syringes.
- 5.19 Demonstrate the preparation and administration of medications given by the following routes:
 - a. Aerosolized/nebulized
 - b. Inhaled
 - c. Intramuscular
 - d. Sublingual
 - e. Oral
 - f. Intravenous/Intraosseous push
 - g. Intravenous/Intraosseous infusion, including the addition of medication and appropriate IV fluid
 - h. Subcutaneous

- 5.20 Demonstrate IV drip calculations, including volume to be administered, confirming with a double-check system.
- 5.21 Demonstrate IV drug administration calculations, including volume to be administered, confirming with a double-check system.
- 5.22 Demonstrate given a patient scenario the correct drug, dosage and administration route(s).

Lesson Content

- A. Medication Safety
 - 1. Roles and responsibilities of the Alaska AEMT
- B. Medication Legislation
 - 1. Pure Food and Drug Act
 - 2. Federal Food, Drug and Cosmetic Act
 - 3. Harrison Narcotic Act
 - 4. Controlled Substances Act
 - 5. Drug Enforcement Agency
 - 6. Development of Pharmaceuticals
 - a) Food and Drug Administration approval process
 - b) Special Considerations
 - 1) Pregnancy
 - 2) Pediatrics
 - 3) Geriatrics
- C. Drug Forms
 - 1. Liquids
 - 2. Solids
 - 3. Gases
- D. Naming
 - 1. Chemical
 - 2. Generic
 - 3. Propriety/Trade
 - 4. Official
 - 5. Authoritative Sources of Drug Information
 - a) United States Pharmacopeia (USP)
 - b) Physician's Desk Reference (PDR)
 - c) Drug Package Inserts
 - d) Drug handbooks
- E. Classifications
 - 1. Body System Affected
 - 2. Class of Agent-
 - 3. Classifications by Body System
 - a) Central nervous system
 - 1) Autonomic pharmacology
 - (a) cholinergic
 - (b) anticholinergic
 - (c) adrenergic
 - (d) antiadrenergic
 - (1) alpha-adrenergic blockers
 - (2) beta-adrenergic blockers

- 2) Analgesics
 - (a) opioid agonists
 - (b) opioid antagonists
 - (c) non-steroidal anti-inflammatory drugs
 - (d) acetaminophen
- 3) Sedative/hypnotic
 - (a) benzodiazepines
 - (b) barbiturates
- 4) Anticonvulsants
- 5) Stimulants
- 6) Antiemetics
 - (a) Cardiovascular drug definitions
 - (1) Anti-dysrhythmic
 - (2) Cardiac glycosides
 - (3) Antihypertensives
 - (4) Antianginal drugs
 - (b) Drugs affecting the blood-
 - (c) Psychiatric medications
 - (d) Respiratory system
 - (1) Mucolytics
 - (2) Cholinergic antagonists
 - (3) Sympathomimetics
 - (4) Xanthine derivatives
 - (5) Antihistamines
- 7) Endocrine system -- drugs affecting the pancreas
 - (a) Insulin preparations
 - (b) Oral hypoglycemic agents
 - (c) Hyperglycemic agents
- 8) Herbal preparations
 - (a) Potential Implications
 - (1) interaction with pharmaceuticals
 - (2) idiosyncratic reactions
 - (3) manufacturing error
 - (4) contamination
 - (5) substitution
 - (b) Adulteration
 - (1) Incorrect preparation
 - (2) Incorrect labeling
- 9) Over the counter medications-
 - (a) Drugs affecting the central nervous system
 - (1) sedatives
 - (2) stimulants
 - (3) hallucinogenic (dextromethorphan)
 - (4) analgesics
 - (b) Drugs affecting the respiratory system
 - (1) asthma treatment products
 - (2) cold and allergy products

- (c) Supplements
 - (1) herbs
 - (2) vitamins
 - (3) minerals
 - (4) other
- F. Storage and Security
 - 1. Factors Affecting Drug Potency
 - a) Temperature
 - b) Light
 - c) Moisture
 - d) Shelf Life
 - 2. Locking and Double Locking of Medications
 - 3. Reporting Responsibilities
- G. Drug Terminology
 - 1. Antagonism
 - 2. Bolus
 - 3. Contraindications
 - 4. Cumulative Action
 - 5. Depressant
 - 6. Habituation
 - 7. Hypersensitivity
 - 8. Idiosyncrasy
 - 9. Indications
 - 10. Potentiation
 - 11. Refractory
 - 12. Side Effects
 - 13. Stimulant
 - 14. Synergism
 - 15. Therapeutic Action
 - 16. Tolerance
 - 17. Untoward Effect
- H. Pharmacological Concepts
 - 1. Pharmacokinetics
 - a) Absorption
 - b) Distribution
 - c) Biotransformation
 - d) Metabolism and Excretion -- organs of elimination
 - 1) kidneys
 - 2) intestine
 - 3) lungs
 - 4) exocrine glands
 - 2. Pharmacodynamics
 - a) Mechanism of action
 - 1) Drug receptor interaction
 - (a) agonists
 - (b) antagonists
 - (c) affinity

- (d) efficacy
 - 2) Drug enzyme interaction
 - b) Medication response relationship
 - 1) Plasma levels
 - 2) Biologic half-life
 - 3) Therapeutic threshold
 - 4) Therapeutic index
 - 5) Lethal Dose (LD) 50
 - 6) Factors altering drug response
 - (a) age
 - (b) sex
 - (c) body mass index
 - (d) pathologic state
 - (e) genetic factors
 - (f) time of administration
 - (g) psychological factors
 - (h) predictable responses
 - (1) tolerance
 - (2) cross tolerance
 - (i) iatrogenic responses
 - (j) drug allergy
 - (k) anaphylactic reaction
 - (l) delayed reaction ("serum sickness")
 - (m) hypersensitivity
 - (n) idiosyncrasy
 - (o) cumulative effect
 - (p) drug dependence
 - (q) drug antagonism
 - (r) summation (addition or additive effect)
 - (s) synergism
 - (t) potentiation
 - (u) interference
 - c) Medication interaction
 - d) Toxicity
- I. Medication Administration- (primarily review)
 - 1. Routes of Administration
 - a) Alimentary Tract
 - 1) Oral
 - 2) Sublingual
 - b) Parenteral
 - 1) Subcutaneous
 - 2) Intramuscular
 - 3) Intravenous
 - 4) Intraosseous
 - 5) inhalation
- J. Administration of Medication to a Patient
 - 1. The "Rights" of Drug Administration

- a) Right Patient
 - b) Right Medication
 - c) Right Dose
 - d) Right Route
 - e) Right Time
 - f) Right Documentation
2. Drug Dose Calculations
 - a) System of weights and measures
 - b) Drug calculations
 - 1) Desired dose
 - 2) Concentration on hand
 - 3) Volume on hand
 - c) Calculate
 - 1) Volume based bolus
 - 2) IV drip rate
 - 3) Medication drip rate
 3. Techniques of Medication Administration (Advantages, Disadvantages, Techniques)
 - a) Peripheral venous cannulation
 - b) Intraosseous
 - c) Intramuscular (manual)
 - d) Subcutaneous (manual)
 - e) Aerosolized
 - f) Nebulized
 - g) Sublingual
 - h) Intranasal
 4. Reassessment
 - a) Data - Indications for medication
 - b) Action - Medication administered
 - c) Response - Effect of medication
 5. Documentation
- K. Drug Profiles
1. Drug cards for these medications may be found in the Instructor Repository
 2. The student will develop a drug profile for the following emergency medications allowed by the Alaska OEMS for administration by the AK-AEMT in Alaska

MEDICATION	RESTRICTIONS
AK- AEMT (Not Part of NAEMT Curriculum)	
Adenosine	
Benzodiazepines	Seizures Only
Ativan (Lorazepam)	
Valium)(Diazepam	
Versed (Midazoam)	
Ketamine	Excited delirium only
Magnesium Sulfate	Asthma, eclampsia, torsades de pointe
NR-AEMT	
Epinephrine 1mg/ml (1:1,000)	
Monitoring other existing medications	Individuals may only monitor medications that they are otherwise authorized to administer

The Following are EMT-2/-3 Meds <i>(Review Only if needed not part of NAEMT curriculum)</i>	
Narcan (EMT-2)	
*TXA (Tranexamic Acid) (EMT-2)	
*Diphenhydramine (EMT-2)	
Glucagon (EMT-2)	
Nitrous Oxide (EMT-2)	
*Ondasetron (Zofran) (EMT-2)	
*Antiarrhythmic (EMT-3)	
Amiodarone	
Lidocaine	
*Atropine (EMT-3)	
*Fentanyl (EMT-3)	
*Morphine Sulfate (EMT-3)	
*Epinephrine 0.1mg/ml(1:10,000) (EMT-3)	

***AK-AEMT Specific Medications**

NOTE: Review AK-AEMT specific medications, but bear in mind they will not be tested in the NR-AEMT exam on these drugs.

3. Each drug profile shall contain the following information:
 - a) Generic name
 - b) Trade name
 - c) Classification
 - d) Drug Action
 - e) Indications
 - f) Contraindications
 - g) Side Effects
 - h) Precautions
 - i) How supplied
 - j) Dose: Adult/pediatrics
 - k) Routes of administration

Lesson 6: Pain Management (2 hrs)

Objective

- 6.1 Conduct pain assessment appropriately by patient's age.
- 6.2 Discuss the symptoms of pain.
- 6.3 Discuss non-pharmacological and pharmacological pain management options.
- 6.4 Determine the differences between acute and chronic pain management.
- 6.5 Discuss the benefits of each medication:
 - a. Morphine
 - b. Fentanyl
- 6.6 Explain the importance of considering:
 - a. Anti-emetics (Ondansetron)
 - b. Narcotic antagonists (Naloxone)
- 6.7 Analyze the value of QA/QI, medical direction involvement, documentation of pain management.
- 6.8 Outline monitoring and documentation techniques during various phases of pain management.

- 6.9 Critique the position paper published by the National Association of EMS Physicians regarding Prehospital Pain Management.

Psychomotor Objectives

- 6.10 Demonstration of non-medication pain management treatment.
6.11 Demonstration of pain medication administration.

Lesson Content

- A. Pain Assessment
- B. Adequate pain control is not routinely provided for a number of reasons
 - 1. Most common—underestimation of patient’s needs
 - 2. EMS personnel may base their judgement on past, similar patients.
 - 3. Relief from Pain is a basic human right
 - 4. Adequate pain relief is known to minimize anxiety and cardiac complications
 - 5. Prehospital protocols should require:
 - a) Assessment of pain severity
 - b) Reassessment of pain level after every intervention
 - c) Document every intervention
- C. Tools for pain assessment
 - 1. Use the same scale to assess and reassess
 - 2. Interpretation of the signal includes the following dimensions:
 - a) Physiologic
 - b) Psychological
 - c) Emotional
 - d) Behavioral
 - 3. Assessment instrument - document
 - a) Presence of pain
 - b) Intensity of pain
 - c) Change in pain severity with time and treatment
 - 4. Types of scales
 - a) Numeric Rating Scale
 - 1) “Rate your pain on a scale of 0-10”
 - 2) Proven more reliable in trauma
 - b) Graphic Scale
 - 1) Commonly used in pediatric patients
- D. Clinical protocols for prehospital pain management
 - 1. Careful use of appropriate wording
 - 2. Distraction away from painful stimuli
 - 3. Parents’ presence typically reduces the level of distress in infants and children
 - 4. Traditional interventions should be provided, for example:
 - a) Immobilization of fractures
 - b) Elevation
 - c) Ice
 - d) Compression
 - e) Padding of spinal immobilization.
- E. Pharmacological interventions for pain management
 - 1. Narcotics

- a) Morphine
 - b) Fentanyl
- 2. Over the Counter Medications
 - a) Ibuprofen
 - b) acetaminophen
- F. Adverse effects and benefits of opioid pain medications
 - 1. Morphine
 - 2. Fentanyl
- G. Complications and management
 - 1. CNS Effects
 - a) Respiratory depression
 - 2. Gastrointestinal Effects
 - a) Nausea and Vomiting
 - 3. Management
 - a) Narcotic antagonists (Naloxone)
 - b) Anti-emetics (Ondansetron)
- H. Monitoring and documentation before and after analgesic administration
 - 1. Documentation of the patient's clinical status before and after analgesic administrations is required
 - 2. Vital Signs
 - a) Level of consciousness
 - b) HR, BP, pulse, pulse oximetry, etc.
 - 1) Baseline
 - 2) Following each intervention
 - 3. Document
 - a) Any significant change in clinical status
 - b) Any corrective action taken
 - 4. Follow all local controlled substances policies for documentation, wastage, storage, etc.
- I. Quality improvement and medical oversight
 - 1. Systems with established QI programs have better compliance to pain management protocols.
 - a) Establish benchmarks
 - b) Tracking plan
 - c) Feedback and discussion with ED staff, medical director, patients
- J. Acute vs chronic pain management
 - 1. Dependence, abuse, and addiction of prescribed medications is well documented.
 - 2. Perform a thorough pain assessment prior to providing treatment
 - 3. Pain management should depend on objective clinical decision making
 - 4. Pain is individualized with each patient.
 - a) When patients report where their level of pain is, it should not be influenced by the provider's bias
- K. Sedation monitoring
 - 1. Reference: ACEP-Out-of-hospital Use of Analgesia and Sedation
 - a) Analgesia
 - 1) Use of NSAIDs and acetaminophen with opioid's
 - 2) Fentanyl as an "ideal narcotic agent"
 - 3) Misplaced fear of clouding ultimate diagnoses when using analgesia

- b) Sedation/Chemical Restraint
 - 1) Midazolam as an “optimal agent of anxiety and agitation”
 - 2) Monitor patient closely when administering benzodiazepines
 - 3) Ketamine use for violent patients
- L. Pediatric pain management
 - 1. Reference: “ACEP-Reducing Pediatric Pain and Anxiety”
 - a) Optimizing the environment
 - 1) Combat anxiety and reduce pain by improving the physical environment
 - 2) Assessing pain
 - (a) Self-reporting pain scale examples:
 - (1) Wong-Baker FACES[®]
 - (2) FACES and FACES revised
 - (3) OUCHER[®]
 - (b) Non-self-reporting pain scale example
 - (1) FLACC Scale- Faces, legs, Activity, Cry, Console
 - (2) Utilizes presenting history and physical exam
 - 2. Non-invasive pain management
 - a) Multidisciplinary/complimentary method
 - b) Distraction
 - 3. Systemic Analgesia and Anxiolysis
 - a) Oral/liquid medications are usually sufficient
 - 1) NSAIDs and some opiate formulations
 - b) Intranasal
 - c) Less intrusive
 - d) Efficient
 - e) Easy and quick
 - f) Effective route for analgesia and anxiolysis
- M. Neo-natal pain management
 - 1. Reference: ACEP-Reducing Pediatric Pain and Anxiety
 - a) Physiologic awareness of medication use in children less than six months (neonates)
 - 1) Most analgesics conjugate in the liver
 - 2) Enzymes for drug metabolism develop for up to six months
 - 3) Higher percentage of water/less fat
 - (a) Water soluble drugs distribute greater volumes in neonates
 - 4) Topical anesthesia
 - (a) Requires appropriate dosing to prevent systemic toxicity
 - (b) No prolonged exposure

Lesson 7: Patient Assessment (Review Only) (2-4 hrs)

Objectives

- 7.1 Recall components of the primary patient assessment for the adult and pediatric patient.
- 7.2 Recall components of the secondary patient assessment for the adult and pediatric patient.

Psychomotor Objectives

- 7.3 Demonstration the ability to perform a primary patient assessment on an adult and pediatric patient.

- 7.4 Demonstrate the ability to perform a secondary patient assessment on an adult and pediatric patient.
- 7.5 Demonstrate the ability to incorporate a proper primary and secondary patient assessment given an adult and pediatric scenario.

Lesson Plan

- A. Primary Patient Assessment Review-familiarize student to NAEMT Patient Assessment
 - 1. Primary Survey/Primary Assessment
 - 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) If yes, assess for adequacy of breathing
 - (b) If no, open airway
 - d) Breathing Status
 - 1) Patient responsive
 - (a) Breathing is adequate (rate and quality)
 - (b) Breathing is too fast (> 24 breaths per minute)
 - (c) Breathing is too slow (<8 breaths per minute)
 - (d) Breathing 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 absent (rate and quality)
 - (a) Normal Rate
 - (b) Fast
 - (c) Slow
 - (d) Irregular rate
 - 2) Assess if major bleeding is present
 - 3) Perfusion status
 - (a) Skin color
 - (b) Skin temperature
 - (c) Skin moisture
 - (d) Capillary refill (as appropriate)
 - f) Identify Life Threats

- g) Assessment of Vital Functions
- 2. Integration of Treatment/Procedures Needed to Preserve Life
- 3. Evaluating Priority of Patient Care and Transport
 - a) Primary Assessment: Stable
 - b) Primary Assessment: Potentially Unstable
 - c) Primary Assessment: Unstable
- B. Secondary Patient Assessment
 - 1. Assessment of Lung Sounds
 - a) Expose the Chest as Appropriate for the Environment
 - b) Auscultation
 - 2. Technique
 - a) Medical versus trauma
 - b) Anterior chest
 - 3. Lung sounds
 - a) Vesicular
 - b) Bronchovesicular
 - c) Bronchial sounds
 - d) Adventitious sounds
 - e) Absence of breath sounds
 - 4. Inspiratory versus expiratory phase
 - 5. Special Considerations for Pediatric and Geriatric Patients
 - a) Normal Vital Signs by Age
 - b) See Special Patient Populations section
- C. Apply the following for the Trauma Assessment
 - 1. Scene Size-up
 - 2. Primary Assessment/Resuscitation
 - 3. History
 - 4. Secondary Assessment
 - 5. Vital Signs
 - 6. Reassessment
- D. Apply the following for the Medical Assessment
 - 1. Scene Size-up
 - 2. Primary Assessment/Resuscitation
 - 3. History
 - 4. Secondary Assessment
 - 5. Vital Signs
 - 6. Reassessment

Lesson 8: Airway Management Overview (2 hrs - Primarily Review)

Objectives

- 8.1 Describe the major structures of the respiratory system.
- 8.2 Discuss the physiology of breathing.
- 8.3 Give the signs of adequate breathing.
- 8.4 Give the signs of inadequate breathing.
- 8.5 Review how to assess for adequate and inadequate respirations, including the use of pulse oximetry and ETCO₂.

- 8.6 Review the importance of giving supplemental oxygen to patients who are hypoxic.
- 8.7 Review the signs associated with adequate and inadequate artificial ventilation.
- 8.8 Review the comparison and of a healthy airway and an injured airway for both the adult and pediatric airway.
- 8.9 Recall the terms and definitions surrounding waveform capnography.
- 8.10 Recall normal and abnormal capnography values.
- 8.11 Identify phases of the capnography waveform.
- 8.12 Discuss the clinical uses of waveform capnography.
- 8.13 List and identify the equipment necessary to successfully apply waveform capnography for both the adult and pediatric patient.
- 8.14 Recall terms and definitions associated with Continuous Positive Airway Pressure (CPAP).
- 8.15 Explain how CPAP assists patients with acute respiratory distress.
- 8.16 Identify the indications and contraindications associated CPAP.
- 8.17 Explain how CPAP can affect blood pressure.
- 8.18 Identify reasons a patient may resist CPAP.
- 8.19 Compare the advantages and disadvantages of CPAP.

Psychomotor Objectives

- 8.20 Demonstrate the ability to manage an airway and breathing per EMT-1 objectives.
- 8.21 Demonstration the ability to incorporate the use of waveform capnography into patient care given both an adult and pediatric scenario.
- 8.22 Demonstrate the insertion of a supraglottic airway.
- 8.23 Demonstration the application of CPAP to a patient.
- 8.24 Demonstrate the ability to incorporate the use of CPAP into patient care given both an adult and pediatric scenario.

Lesson Plan

- A. Anatomy of the Respiratory System
 1. Includes all airway anatomy covered in the Airway Management Section
 2. Additional Respiratory System Anatomy
 3. Chest Cage
 - a) Ribs
 - b) Muscles of respiration
 - 1) Intercostal muscles
 - 2) Diaphragm
 - c) Pleura
 - 1) Parietal pleura
 - 2) Visceral pleura
 4. Phrenic Nerve
 5. Mediastinum
- B. Physiology of Respiration
 1. 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
 - (1) tidal volume
 - (2) minute volume
 - (3) residual volume
 - (4) dead space volume
 - (5) alveolar volume (as it relates to asthma hyperinflation)
 - (b) capacities
 - (1) vital capacity
 - (2) maximum inspiratory force
 - (3) maximum expiratory force
 - (4) significance of pulmonary volumes and capacities
- 2. Gas exchange
- 3. Oxygenation
- 4. Respiration
 - b) External
 - c) Internal
 - d) Cellular
- 5. Lung compliance
- C. Pathophysiology of Respiration
 - 1. Pulmonary Ventilation
 - a) Interruption of nervous control
 - 1) Drugs
 - 2) Trauma
 - 3) Muscular dystrophy
 - b) Structural damage to the thorax
 - c) Bronchoconstriction
 - d) Disruption of airway patency
 - 1) Infection
 - 2) Trauma/burns
 - 3) Foreign body obstruction
 - 4) Allergic reaction
 - 5) Unconsciousness (loss of muscle tone)
 - 2. Oxygenation
 - 3. Respiration
 - a) External
 - 1) Deficiencies due to altitude
 - 2) Deficiencies due to closed environments
 - 3) Deficiencies due to toxic or poisonous environments
 - b) Internal
 - 6) Pathology typically related to changes in alveolar - capillary gas exchange
 - 7) Typical disease processes
 - (a) emphysema
 - (b) pulmonary edema
 - (c) pneumonia
 - (d) environmental/occupational exposure

- (e) drowning
 - c) Cellular
- D. Assessment of Adequate and Inadequate Respirations
- E. Management of Adequate and Inadequate Respirations
 1. Respiratory Compromise
 - a) Assure an adequate airway
 - b) Review supplemental oxygen therapy
 - c) Assisted positive pressure ventilations
 - 1) Purpose/definition
 - 2) Indications
 - 3) Contraindications
 - 4) Complications
 - 5) Procedure
- F. Supplemental Oxygen Therapy
 1. Review of Oxygen Delivery Devices Used by EMTs
 - a) Purpose
 - b) Indications
 - c) Contraindications
 - d) Complications
 - e) Procedures
- G. Age-Related Variation in Pediatric and Geriatric Patients
- H. Comprehensive Ventilation Assessment
 1. Purpose
 2. Procedure
 3. Minute Volume
 4. Alveolar Volume
 5. Evaluating the Effects of Artificial Ventilation
 6. Pulse Oximetry
 - a) Purpose
 - b) Indications
 - c) Contraindications
 - d) Complications
 - e) Procedure
- I. The Management of Inadequate Ventilation
 1. Assure an Adequate Airway
 2. Supplemental Oxygen Therapy
 3. 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-face 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) requires oxygen however, typical adult ventilation consumes 5 liters per minute O₂ versus 15 -25 liters per minute for a bag-valve-mask.
 - (c) typically used on adult patients only
 - (d) requires special unit and additional training for use in pediatric patients
 - (e) the rescuer is unable to easily assess lung compliance.
 - (f) high ventilatory pressures may damage lung tissue.
 - c) Automatic Transport Ventilator/Resuscitator
 - 1) Advantages
 - 2) Disadvantages
 - (a) requires oxygen however, typical adult ventilation consumes 5 liters per minute O₂ versus 15 -25 liters per minute for a bag-valve-mask.
 - (b) may require an external power source
 - (c) must have bag-valve-mask device available
 - (d) may interfere with timing of chest compressions during CPR
 - (e) must monitor to assure full exhalation
 - (f) barotrauma
 - 4. Ventilation of an Apneic Patient
 - b) Purpose
 - c) Indications
 - d) Contraindications
 - e) Procedure
 - 5. Ventilation of the Protected Airway
 - a) Purpose
 - b) Indications
 - c) Contraindications
 - d) Complications
 - e) Procedure
- J. The Differences Between Normal and Positive Pressure Ventilation
1. Air Movement
 - a) Normal ventilation
 - 1) Negative intrathoracic pressure
 - 2) Air is sucked into lungs
 - b) Positive pressure ventilation
 2. Blood Movement
 - a) Normal ventilation
 - 1) Blood return from the body happens naturally
 - 2) Blood is pulled back to the heart during normal breathing
 - b) Positive pressure ventilation
 - 1) Venous return is decreased during lung inflation
 - 2) Amount of blood pumped out of the heart is reduced.
 3. Airway Wall Pressure
 - a) Normal ventilation
 - b) Positive pressure ventilation
 - 1) Walls are pushed out of normal anatomical shape
 - 2) More volume is required to have the same effect as normal breathing
 4. Esophageal Opening Pressure
 - a) Normal ventilation

- b) Positive pressure ventilation
 - 1) Air is pushed into the stomach during ventilation
 - 2) Gastric distention may lead to vomiting
 - 3) Left lung/diaphragmatic displacement by distended stomach
- 5. Over Ventilation (Either by Rate or Volume) Can Be Detrimental to the Patient
 - a) Hypotension
 - b) Gastric distention
 - c) Pulmonary injury/ARDS
 - d) Other unintended consequences
- K. Consider Age-Related Variations in Pediatric and Geriatric Patients
- L. Waveform Capnography – Science (AK-AEMT Curriculum not in NR-AEMT) (GH- 1 hr)
 - 1. Definitions:
 - a) Capnography
 - b) Capnometer
 - c) Capnogram
 - d) End Tidal CO₂ (ETCO₂ OR Pet CO₂)
 - 2. Oxygenations Versus Ventilation
 - 3. Capnography versus Pulse Oximetry
 - 4. Circulation and Metabolism
 - a) PaCO₂ vs. PETCO₂
 - b) V/Q Mismatch
 - 5. Normal Capnography Values
 - a) ETCO₂ 35-45 mm Hg
 - 6. Abnormal Values and Wave Forms
 - a) ETCO₂ less than 35mmHg
 - b) ETCO₂ greater than 45mmHg
 - 7. Capnography Wave Form
 - a) Post inspiration/dead space exhalation
 - b) Define the phases
 - 1) Phase 1-Start of alveolar exhalation
 - 2) Phase 2- Exhalation upstroke where dead space gas mixes with lung gas
 - 3) Phase 3-Continuation of exhalation or plateau
 - 4) Phase 4-End tidal value
 - 1) Inspiration washout
 - 8. Clinical uses of Capnography
 - a) Monitoring Ventilation
 - 1) Hyperventilation
 - 2) Hypoventilation
 - b) Confirming, Maintaining, and Assisting Intubation
 - 1) Continuous wave form capnography versus color metric capnography
 - c) Measuring Cardiac Output During CPR
 - 1) Return of Spontaneous Circulation (ROSC)
 - 2) Loss of Spontaneous Circulation
 - d) End Tidal CO₂ as Predictor of Resuscitation Outcomes
 - e) Monitoring Sedated Patients
 - 1) Sedated, Intubated Patients
 - f) ETCO₂ in Asthma, COPD and CHF

- 1) Changing Asthma Values
- 2) Hypoxic Drive
- 3) CHF: Cardiac Asthma
- g) Ventilation Head Injured Patients
- h) Perfusion Warning Sign
- i) Other Issues
 - 1) DKA
 - 2) Pulmonary Embolus
 - 3) Hyperthermia
 - 4) Trauma
 - 5) Field Disaster Triage
 - 6) Anxiety
 - 7) Anaphylaxis
 - 8) Accurate Respiratory Rate
- 9. Using the equipment
 - a) Tube
 - b) Sidestream
 - c) Zoll
 - d) Physio Control
- M. Continuous Positive Airway Pressure (CPAP) (AK-AEMT Curriculum not in NR-AEMT) (1hr)
 - 1. Define CPAP
 - 2. Explain how CPAP assists patients with acute respiratory distress
 - a) COPD
 - b) CHF
 - c) Asthma
 - 3. Identify the indications for CPAP
 - 4. Explain the contraindications for CPAP
 - 5. Explain how CPAP can affect blood pressure
 - 6. Demonstrate the application of CPAP to a patient
 - 7. Identify reasons a patient may resist CPAP
 - 8. Compare the advantages and disadvantages of CPAP
 - 9. Comprehensive Ventilation Assessment (from the NAEMT Curriculum)

Lesson 9: Respiratory Emergencies (4 hrs including skills)

Objectives

- 9.1 Discuss pathophysiology of Respiratory Emergencies.
- 9.2 Differentiate between respiratory distress and respiratory failure added.
- 9.3 Review when to oxygenate and when to ventilate a patient.
- 9.4 Understand acute upper airway disorders signs and symptoms.
- 9.5 Describe the management of upper and lower airway emergencies.
- 9.6 Describe the difference between obstructive and reactive pulmonary diseases.

Psychomotor Objectives

- 9.7 Demonstrate the process of history taking to obtain more information related to patients chief complaint based on a case scenario.
- 9.8 Demonstration how to assist a patient with the administration of a small volume nebulizer.

Lesson Content

- A. Respiratory Emergencies (1 hr : primarily review)
 - 1. Pathophysiology
 - a) Respiratory Distress vs Respiratory Failure
 - b) Obstructive / Restrictive/ Reactive Lung Diseases
 - 1) Emphysema
 - (a) changes in respiratory tract
 - (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
 - c) Infectious Lung Disease
 - 1) Pneumonia
 - d) Pediatric Respiratory Illnesses
 - 1) RSV
 - 2) Bronchiolitis
 - 3) Croup
 - 2. Impact of Disease on Prehospital Assessment
 - a) Pertinent historical questions
 - b) Pertinent physical findings
 - 1) Breath sounds
 - (a) coarse crackles
 - (b) fine crackles
 - (c) ronchi
 - (d) wheezes
 - (1) diffuse
 - (2) continuous
 - (e) stridor
 - (f) pleural rub
 - 2) Inspiratory vs. Expiratory ratios
 - 3. Findings Associated with Specific Diseases:
 - a) Upper Respiratory Infection
 - b) Epiglottitis
 - c) Croup
 - d) Emphysema
 - e) Chronic Bronchitis
 - f) Asthma

- g) Pneumonia
- 4. Age-Related Considerations:
 - a) Pediatrics
 - 1) Variations in symptomatology
 - 2) Variations in physical presentation
 - (a) Asthma
 - (b) Types of pneumonia
 - b) Geriatrics
 - 1) Variations in symptomatology
 - 2) Variations in physical presentation
- B. Management
 - 1. Oxygenation and Ventilations Requirements
 - 2. Use of Inhaled Beta-Agonists
 - a) MDI
 - b) Nebulizer
 - 3. CPAP
 - 4. Magnesium Sulfate
 - 5. IV Fluid Therapy in Respiratory Illness
 - 6. Age-Related Considerations
 - a) Pediatrics
 - 1) Dosage considerations
 - 2) Fluid considerations
 - b) Geriatrics
 - 1) Drug interaction considerations
 - 2) Fluid considerations
 - 7. Communication and documentation

Lesson 10: Cardiovascular Emergencies (4 hrs including skills)

Note: Minimal review – already included in EMT-3 Curriculum – possibly use quizzes.

Lesson Objectives

- 10.1 Identify major structures of the heart.
- 10.2 Describe the electrical and conductive system of the heart.
- 10.3 Describe the blood circulation via the double pump system.
- 10.4 Recall the signs associated with Return of Spontaneous Circulation (ROSC).
- 10.5 Discuss and understand the following cardiac syndromes and their management:
 - a. Angina Pectoris/Acute Coronary Syndrome
 - b. Acute Myocardial Infarction
 - c. Irregularity of Pulse
 - d. Heart failure
 - e. Cardiogenic shock
- 10.6 Review of atypical presentations of myocardial infarction.
- 10.7 Effectively manage hemodynamic instability in the syndromes listed in 9.13 a.
- 10.8 Investigate possible causes of cardiac arrest.
- 10.9 Make appropriate treatment choices based on the cause of cardiac arrest.
- 10.10 Determine the appropriate destination for your cardiac emergency patient.

- 10.11 Compare the difference between heart failure and cardiogenic shock.
- 10.12 Understand the management of heart failure, cardiogenic shock, and cardiac arrest.
- 10.13 Describe communication strategies for dealing with family and significant others in cardiac arrest situations.
- 10.14 Discuss when termination of resuscitation is an option.

Psychomotor Objectives:

- 10.15 Demonstrate how to assess and provide emergency medical care for a patient with chest pain or discomfort.
- 10.16 Demonstrate the administration of chest pain medications to include aspirin, nitroglycerine, and opioid pain medication.
- 10.17 Demonstrate how to perform maintenance of an AED and manual defibrillator.
- 10.18 Demonstrate how to perform CPR while incorporating the use of a manual defibrillator.

Lesson Content

- A. Location
 - 1. Layers
 - a) Myocardium
 - b) Endocardium
 - c) Pericardium
 - 1) visceral (epicardium)
 - 2) parietal
 - 3) pericardial fluid
 - 2. Chambers
 - a) Atria
 - b) Ventricles
 - 3. Valves
 - a) Atrioventricular (AV) valves
 - 1) tricuspid (right)
 - 2) mitral (left)
 - b) Semi-lunar valves
 - 1) pulmonic (right)
 - 2) aortic (left)
 - 4. Myocardial blood supply
 - a) Arteries
 - b) Veins
 - 5. Electrical and conduction system
 - a) Myocardial muscle cells
 - b) Specialized electrical cells
 - c) Automaticity
 - d) Autonomic Control
 - 1) Sympathetic
 - 2) parasympathetic
- B. Vessels
 - 1. Aorta
 - 2. Arteries
 - 3. Arterioles

4. Capillaries
 5. Venules
 6. Veins
 7. Vena Cava
- C. Blood
1. Red blood cells
 2. White blood cells
 3. Platelets
 4. Plasma
- D. Physiology
1. Cardiac Cycle
 - a) Systole
 - b) Diastole
 2. Pulses
 - a) Peripheral pulses
 - b) Central pulses
 3. Blood Pressure
 - a) Systolic
 - b) Diastolic
 4. Blood Circulation Through a Double Pump
 - a) Respiratory system
 - 1) Deoxygenated blood to lungs
 - 2) Oxygenated blood back to heart
 - b) Body
 5. Cardiac Output
 6. Perfusion
 - a) Function of red blood cells in oxygen delivery
 - b) Factors governing adequate perfusion
 - 1) Rate
 - 2) Pump
 - 3) Volume
 7. Oxygenation of Tissues
 - a) Delivery of oxygenated blood
 - b) Removal of tissue wastes
- E. Angina Pectoris/Acute Coronary Syndrome
1. Epidemiology
 2. Precipitating Causes
 - a) Atherosclerosis
 - b) Vasospastic (Prinzmetal's)
 - c) Medications
 - d) Morbidity/mortality
 - 1) Not a self-limiting disease
 - 2) Chest pain may dissipate, but myocardial ischemia and injury continue
 - 3) A single anginal episode may be a precursor to myocardial infarction
 - 4) May not be cardiac in origin
 - 5) Must be diagnosed by a physician
 - 6) Related terminology

- (a) Defined as a brief discomfort, has predictable characteristics and is relieved promptly - no change in this pattern
 - (b) Stable
 - (1) occurs at a relative fixed frequency
 - (2) usually relieved by rest and/ or medication
 - (c) Unstable
 - (1) occurs without fixed frequency
 - (2) may or may not be relieved by rest and/ or medication
 - (d) Initial - first episode
 - (e) Progressive - accelerating in frequency and duration
 - (f) Pre-infarction angina
 - (1) pain at rest
 - (2) sitting or lying down
- 3. Primary Survey findings
 - a) Airway/ breathing
 - 1) Labored breathing may or may not be present
 - b) Circulation
 - 1) Peripheral pulses
 - (a) quality
 - (b) rhythm
 - 2) Peripheral perfusion
 - (a) changes in skin color
 - (b) changes in skin temperature
 - (c) changes in skin moisture
- 4. History of Present Illness/Sample History
 - 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
- 5. Secondary-Survey Findings
 - a) Airway
 - b) Breathing
 - 1) May or may not be labored
 - 2) Breath sounds
 - 3) May be clear to auscultation
 - 4) 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

6. Management
 - a) Refer to American Heart Association guidelines
 - 1) Scope of Practice includes
 - (a) Oxygen
 - (b) Aspirin
 - (c) Nitroglycerin
 - (d) Morphine/Fentanyl or Nitrous oxide
 - b) Rapid transport
 - 1) Sense of urgency for reperfusion
 - 2) No relief with medications
 - 3) Hypotension/ hypoperfusion with CNS involvement
- F. Acute Myocardial Infarction
 1. Epidemiology
 2. Precipitating Causes (as With Angina)
 - a) Atherosclerosis
 - b) Persistent angina
 - c) Occlusion
 - d) Non-traumatic- Toxin (such as cocaine, amphetamines, and inhalants)
 - e) Trauma
 3. Morbidity/Mortality
 - a) Sudden death
 - b) Extensive myocardial damage
 - c) May result in ventricular fibrillation
 4. Primary Survey Findings
 - a) Airway/breathing
 - b) Circulation
 - 1) Peripheral pulses
 - (a) quality
 - (b) rhythm
 - 2) Peripheral perfusion
 - (a) changes in skin color
 - (b) changes in skin temperature
 - (c) changes in skin moisture
 5. History of the Present Illness/Sample History
 - a) Chief complaint
 - 1) Typical onset of discomfort, usually of long duration, over 30 minutes
 - 2) Typically unrelieved by rest and/ or nitroglycerin preparation
 - 3) Epigastric pain or discomfort
 - 4) Atypical
 - b) Contributing history
 - 1) First time
 - 2) Recurrent
 - 3) Increasing frequency and/ or duration
 - c) Denial
 6. Secondary Survey Findings
 - a) Airway
 - b) Breath sounds

- 1) May be clear to auscultation
- 2) Congestion in bases may be present
- c) Circulation
 - 1) Skin
 - (a) pallor during the episode
 - (b) temperature may vary
 - (c) diaphoresis is usually present
 - 2) Alterations in heart rate and rhythm may occur
 - 3) Peripheral pulses are usually not affected
 - 4) Blood pressure may be elevated or lowered
- 7. Management
 - a) Refer to American Heart Association guidelines
 - 1) Scope of Practice includes
 - (a) Oxygen
 - (b) Aspirin
 - (c) Nitroglycerin
 - (d) Morphine/Fentanyl or Nitrous oxide
- 8. Transport
 - a) Criteria for rapid transport
 - 1) No relief with medications
 - 2) Hypotension/hypoperfusion with CNS involvement
- G. Irregularity of Pulse
 - 1. Epidemiology
 - 2. Precipitating causes
 - 3. Related terminology
 - 4. Morbidity/mortality
 - 5. Management
 - 6. Support and communications strategies
- H. Heart failure
 - 1. Pathophysiology of CHF
 - a) May refer to right or left sided heart failure
 - b) No valves between left atria and lungs
 - 1) may allow fluid backup
 - 2. Precipitating causes
 - a) Increased peripheral vascular resistance (PVR)
 - 1) Chronic hypertension
 - (a) Increased left ventricular workload
 - (b) Hypertrophy/cardiomegaly
 - (c) P mitral (seen with left atrial enlargement)
 - 2) Chronic COPD
 - 3) Pulmonary emboli
 - 4) Non-compliance with medications
 - b) Ventricular failure
 - 1) Myocardial Infarction
 - (a) AMI
 - (b) Previous MI with ventricular involvement
 - (c) Non-compliance with medications

- c) Fluid overload
 - 1) Non-compliance with medications
 - 2) Renal Failure
- 3. Presentation/Signs/Symptoms of CHF
 - a) Distended neck veins
 - b) Peripheral edema
 - 1) Can be pitting (late sign)
 - c) Difficulty breathing
 - 1) Crackles and wheezes in dependent portions of the lungs
- 4. Management
 - a) Continuous Positive Airway Pressure (CPAP)
 - 1) Positive end expiratory pressure
 - 2) Forces alveoli open and helps keep them open
 - (a) Forces fluid out of alveoli
 - (b) Increases oxygenation
 - 3) Contraindications
 - (a) Inability for the patient to maintain their own airway
 - (b) Hypotension (systolic BP of 90mm/Hg or less) may be a contraindication.
Follow local protocol or guidelines
 - (c) Recent esophageal surgery
 - b) Nitroglycerin
 - 1) Peripheral vasodilator
 - 2) Reduces oxygen demand in the heart
 - 3) Dilates coronary arteries
 - 4) Contraindications
 - (a) Hypotension (systolic BP of 90mm/Hg or less)
 - (b) Use of phosphodiesterase inhibitors in the past 24-48 hours (e.g., Cialis[®], Viagra[®])
 - 5) Support and communications strategies
- I. Cardiogenic shock
 - 1. Pathophysiology
 - a) Recognized as low-cardiac-output secondary to:
 - 1) extensive left ventricular infarction
 - 2) development of a mechanical defect
 - (a) ventricular septal defect
 - 3) right ventricular infarction
 - b) Characterized by systemic hypotension leading to end organ hypoperfusion
 - 2. Precipitating causes
 - a) Myocardial infarction
 - b) Systolic dysfunction
 - c) Diastolic dysfunction
 - d) Cardiac arrhythmias
 - e) Age
 - f) Trauma
 - 3. Management
 - a) Treat shock but use fluid sparingly
- J. Cardiac arrest (Review Protocols)

1. Pathophysiology
 2. Precipitating causes
 - a) Trauma
 - b) Medical conditions (for example)
 - 1) End Stage Renal Disease
 - 2) Hyperkalemia with renal disease
 - c) End Stage Renal Disease
 - d) Hyperkalemia with renal disease
 3. Management
 - a) Related terminology
 - b) Indications for WITHHOLDING resuscitation efforts
 - c) Advanced airway management and ventilation
 - d) Circulation
 - e) IV therapy as appropriate
 - f) Refer to ILCOR Consensus for treatment
 - g) Rapid transport
 4. Support and communications strategies
 - a) Explanation for patient, family, significant others
 - b) Communications and transfer of data to the physician
 5. Termination of resuscitation efforts
 - a) Inclusion criteria
 - b) Criteria NOT to be considered as inclusionary or exclusionary
- K. Special Considerations
1. Ventricular Assist Devices

Lesson 11: Neurology (2 hrs)

Lesson Objectives

- 11.1 Identify the options for out-of-hospital stroke assessment tools.
- 11.2 Explain oxygen administration during a stroke emergency.
- 11.3 Discuss the importance of knowing a timeline of stroke events.
- 11.4 Identify patients needing rapid transport to the most appropriate stroke hospital.
- 11.5 Discuss the importance of starting the fibrinolytic check sheet.
- 11.6 Explain signs, symptoms and management of the following neurologic emergencies:
 - a. Seizures
 - b. Headache
 - c. Hypertensive emergencies
 - d. Toxemia of pregnancy
- 11.7 List age-related variation to assessment and management of the following neurologic emergencies:
 - a. Seizures
 - b. Headache
 - c. Hypertensive emergencies
 - d. Toxemia of pregnancy

Psychomotor Objectives:

- 11.8 Demonstrate how to use a stroke assessment tool to test a patient for aphasia, facial weakness and motor weakness.

Lesson Content

- A. Review AEIOUTIPS
- B. Coma of unknown Origin
- C. Stroke/TIA
 - 1. Overview of Stroke
 - 2. Stroke recognition and treatment timeline
 - 3. Causes
 - a) Hemorrhage
 - b) Clot
 - c) Non-thrombotic emboli
 - 4. Review of Anatomy and Function of the Brain and Cerebral Blood Vessels
 - 5. Assessment Findings and Symptoms
 - a) Confused, dizzy, weak
 - b) Decreasing or increasing level of consciousness
 - c) Combative or uncooperative or restless
 - d) Facial drooping, inability to swallow, tongue deviation
 - e) Neglect (hemi-agnosia)
 - f) Double vision or blurred vision
 - g) Difficulty speaking or absence 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
 - 6. Stroke Alert Criteria
 - a) Cincinnati Prehospital Stroke Scale
 - b) Other stroke scales
 - c) Fibrinolytic check sheet
 - d) Local Stroke Alert Criteria
 - 7. Management of Patient With Stroke Assessment Findings or Symptoms
 - 8. Scene Safety and Standard Precautions
 - a) ABCs/position
 - b) Oxygen/suction
 - c) Pulse oximetry
 - d) Emotional support
 - e) Rapid transport
 - 9. Transient Ischemic Attack (TIA)
- D. Seizures
 - 1. Types of Seizures
 - a) Generalized
 - 1) Tonic-clonic
 - 2) Absence
 - b) Partial
 - 1) Simple
 - 2) Complex
 - c) Status epilepticus
 - 1) A continuous seizure lasting more than 30 minutes

- 2) Two or more seizures without regaining consciousness between any of them
 - 3) Prolonged seizures last between 5-30 minutes- should be treated as status epilepticus
 - 4) Complications:
 - (a) Aspiration
 - (b) Bone and spine fractures
 - (c) Brain damage from lack of oxygen and/or depletion of glucose
 - (d) Dehydration
2. Causes
- a) Medication non-compliance
 - b) Rapid increase in body temperature (febrile)
 - c) AEIOU-TIPPSS
 - 1) Alcohol
 - 2) Epilepsy
 - 3) Insulin (diabetic condition)
 - 4) Oxygen (lack of)
 - 5) Uremia (Kidney failure)
 - 6) Trauma
 - 7) Infection
 - 8) Psychiatric
 - 9) Poisoning (including drug overdose)
 - 10) Shock
 - 11) Stroke
3. Incidence
4. Assessment Findings
- a) Spasms, muscle contractions
 - b) Bite tongue, increased secretions
 - c) Sweating
 - d) Cyanosis
 - e) Deviated gaze, facial or limb twitching, blinking, lip smacking
 - f) Abnormal behavior
 - g) Unconscious gradually increasing level of consciousness
 - h) May shaking or tremors and no loss of consciousness
 - i) Incontinent
 - j) Persistent coma
 - k) Altered autonomic function
 - l) confusion
 - m) Amnesia of event
5. Management
- a) Safety of patient/position
 - b) ABCs, consider nasopharyngeal airway
 - c) Oxygen/suction
 - d) Medications:
 - 1) Diazepam
 - 2) Lorazepam
 - 3) Midazolam
 - e) Pulse oximetry

- f) Emotional support
- E. Headache
 - 1. As a Symptom
 - 2. As a Neurological Condition
 - 3. Assessment Findings and Symptoms
 - 4. Management
- F. Hypertensive emergencies
 - 1. Epidemiology
 - 2. Precipitating Causes
 - a) History of hypertension
 - b) Non-compliance with medication or any other treatment
 - 3. Management
- G. Toxemia of pregnancy
 - 1. Epidemiology
 - 2. Morbidity/ mortality
 - a) Hypertensive encephalopathy
 - b) Stroke
 - 3. Management
 - a) Position of comfort
 - b) Airway and ventilation
 - c) Refer to ILCOR Consensus for treatment
 - d) Rapid transport
 - 4. Support and communications strategies
 - a) Explanation for patient, family, significant others
 - b) Communications and transfer of Data
- H. Age Related Variations for Pediatric and Geriatric Assessment and Management
 - 1. Pediatrics
 - a) Epidemiology
 - b) Anatomic and physiologic differences in children
 - c) Pathophysiology
 - d) Causes of altered mental status in children
 - e) Assessment
 - 1) History
 - 2) Physical findings
 - f) Meningitis
 - g) Seizures
 - h) Altered mental status
 - i) Management
 - 2. Geriatrics- Stroke Common in this Age Group
- I. Communication and Documentation
- J. Transport Decisions- Rapid Transport to Appropriate Facility

Lesson 12: Abdominal And Gastrointestinal Disorders (2 hrs)

Lesson Objectives

- 12.1 Explain signs and symptoms of specific acute abdominal conditions.
- 12.2 Discuss general management for patients with an acute abdomen.

12.3 List age-related variation to assessment and management of the acute abdominal conditions.

Psychomotor Objectives

12.4 Demonstrate the assessment of a patient's abdomen.

Lesson Content

- A. Define Acute Abdomen
- B. Assessment and Symptoms
 - 1. Techniques
 - 1) Inspection
 - 2) Palpation
 - 2. Normal Findings- Soft Non-Tender
 - 3. Abnormal Finding
 - a) Nausea/vomiting
 - 1) Excessive
 - 2) Hematemesis
 - b) Change in bowel habits/stool
 - 1) Constipation
 - 2) Diarrhea
 - 3) Dark tarry stool
 - c) Urination
 - 1) Pain
 - 2) Frequency
 - 3) Color
 - 4) Odor
 - d) Vaginal discharge or bleeding
 - e) Dysmenorrhea
 - f) Weight loss
 - g) Belching/flatulence
 - h) Concurrent chest pain
 - i) Pain, tenderness, guarding, distension
 - j) Other
- C. General Management for Patients with an Acute Abdomen
 - 1. Scene Safety and Standard Precautions
 - 2. Airway, Ventilatory and Circulation
 - 3. Position
 - 4. Pain management
 - 5. Emotional Support
- D. Specific Acute Abdominal Conditions- Definition, Causes, Assessment Findings and Symptoms, Complications, and Specific Prehospital Management.
 - 1. Acute and Chronic Gastrointestinal Hemorrhage
 - 2. Peritonitis
 - 3. Ulcerative Diseases
 - 4. Appendicitis
 - 5. GERD
 - 6. Pancreatitis
 - 7. Gall Bladder Disease

8. Diverticulitis
 9. Bowel Obstruction
 10. Ectopic pregnancy
 11. PID
 12. Ovarian cyst
 13. Testicular torsion
 14. Esophageal Spasm/obstruction/rupture
 15. Kidney infection/Stones
- E. Consider Age-Related variation for pediatric and geriatric assessment and management.
1. Pediatrics
 - a) Anatomic and Physiologic Differences in Children
 - b) Pathophysiology
 - c) Assessment
 - 1) History
 - 2) Physical findings
 - (a) Vomiting causes dehydration
 - (b) Appendicitis common in children
 - (c) Abdominal pain from constipation
 - (d) Vomiting
 - (e) GI Bleeding
 - (f) Congenital abnormalities
 - (1) Malrotation and volvulus
 - (2) Intussusception
 - d) Management
 - 1) Scene Safety and Standard Precautions
 - 2) Airway, Ventilatory and Circulation
 - 3) Position of comfort
 - 4) Pain management
 - 5) Emotional Support Position of comfort
 2. Geriatric
 - a) May not exhibit rigidity or guarding
 - b) Abdominal pain related to cardiac conditions
- F. Communication and Documentation for patients with an abdominal or gastrointestinal condition or emergency
- G. Transport Decisions

Lesson 13: Immunology (Review) (2 hrs)

Objectives

- 13.1 Describe the purpose of the immune system.
- 13.2 Understand and define the terms allergic reaction and anaphylaxis.
- 13.3 Explain the difference between a local response and a systemic to allergens.
- 13.4 Recall the signs and symptoms of an allergic reaction with those of anaphylaxis.
- 13.5 Discuss the assessment process for a patient with an allergic reaction.
- 13.6 Review the process for providing emergency medical care to a patient with allergic reaction.

Psychomotor Objectives

- 13.7 Demonstration how to remove a stinger from a bee sting and proper patient management following its removal.
- 13.8 Demonstrate the proper management of a patient experiencing an allergic reaction.
- 13.9 Demonstration how to draw up and administer epinephrine to a patient experiencing anaphylaxis.
- 13.10 Demonstrate the proper management of a patient experiencing anaphylaxis.

Lesson Content

- A. Introduction
 - 1. Definition of Terms
 - a) Allergic reaction
 - b) Anaphylaxis
 - 2. Risk Factors and Common Allergens
- B. Basic Immune System's Response to Allergens
 - 1. The purpose of the response
 - 2. The type of response (local versus systemic)
 - 3. The speed of the response
- C. Pathophysiology
 - 1. Allergic Reaction
 - a) Antigens
 - b) Antibodies
 - c) Mast cells and basophils
 - d) Histamine, leukotrienes, and other mediators
 - e) Local reactions
 - f) Systemic Reactions
- D. Assessment
 - 1. Mild Allergic Reaction
 - a) Cutaneous
 - b) Other
 - 2. Moderate Allergic Reaction
 - a) Upper airway
 - b) Lower airway
 - c) Cardiovascular
 - d) Cutaneous
 - e) Gastrointestinal
 - f) Neurological
 - 3. Severe Allergic Reaction/Anaphylaxis
 - a) Upper airway
 - b) Lower airway
 - c) Cardiovascular
 - d) Cutaneous
 - e) Gastrointestinal
 - f) Neurological
- E. Managing Anaphylaxis
 - 1. Provide treatment specific to assessment findings and severity of reaction
 - 2. Remove allergen if possible

3. Protect the airway
 4. Oxygenate the Patient
 5. Ventilate if needed
 - a) Apneic patient
 - b) Dyspneic patient
 - c) Patient with airway edema
 6. Medication administration
 - a) Epinephrine administration
 - b) Bronchodilation
 - 1) Albuterol
 - 2) Ipratropium
 - c) Diphenhydramine
 7. Fluid administration
- F. Age Related Considerations
1. Pediatric epinephrine dosing
 2. Pediatric albuterol dosing
 3. Use of epinephrine in the geriatric patient

Lesson 14: Infectious Disease (Review) (1 hr)

Objectives

- 14.1 Define infectious diseases.
- 14.2 List common infectious agents and diseases related to them.
- 14.3 Discuss methods of Prevention of infectious diseases.
- 14.4 Discuss specific infectious diseases to include: HIV and AIDS; Hepatitis; and TB.
- 14.5 Explain the legal requirements regarding reporting communicable or infectious diseases.

Psychomotor Objectives

- 14.6 Demonstrate the proper handwashing techniques.
- 14.7 Demonstrate how to properly remove gloves.
- 14.8 Demonstration the necessary steps to take to prevent a potential exposure situation.

Lesson Content

- A. Causes of Infectious Disease
 1. Infectious Agents (give examples)
 - a) Bacteria
 - b) Viruses
 - c) Fungi
 - d) Protozoa
 - e) Prions
 - f) Helminths (worms)
- B. Standard Precautions, Personal Protective Equipment, and Cleaning and Disposing of Equipment and Supplies.
 1. Principles of Standard Precautions
 2. Hand Washing Guidelines
 3. Recommendations for Personal Protective Equipment
 4. Recommendations for Cleaning or Sterilization of Equipment
 5. Recommendations for Disposing of Contaminated Linens and Supplies Including Sharps

6. Recommendations for Decontaminating the Ambulance
- C. Specific Diseases and Conditions
1. HIV and AIDS
 - a) Incidence, morbidity, mortality, risk factors, modes of transmission
 - b) Pathophysiology
 - c) Body systems affected
 - d) Progression of disease including opportunistic infections
 - e) Healthcare worker susceptibility and transmission
 - f) Assessment findings and symptoms
 - 1) Often asymptomatic
 - 2) Non-specific febrile illness
 - 3) Sore throat, fatigue
 - 4) Swollen spleen and lymph glands
 - 5) Weight loss
 - 6) Opportunistic infections
 - g) Management for a patient with HIV or AIDS-related conditions
 - 1) Prehospital care is supportive
 - 2) Manage airway and support ventilation
 - 3) IV if needed
 - 4) Respiratory isolation if coughing
 - h) Immunization and treatment of exposure
 2. Hepatitis
 - a) Introduction--Pathophysiology, incidence, types, causes, risk factors, methods of transmission, complications
 - b) General assessment findings and symptoms
 - 1) Asymptomatic
 - 2) Non-specific febrile illness
 - 3) Light-colored stools
 - 4) Dark urine
 - 5) Fatigue
 - 6) Nausea/vomiting
 - 7) Abdominal pain/tenderness
 - 8) Jaundice
 - 9) Fulminant acute hepatitis
 - c) Treatments for exposure/prevention; immunizations
 - d) Types
 - 1) Hepatitis A
 - 2) Hepatitis B
 - 3) Hepatitis C
 - 4) Hepatitis D
 - 5) Hepatitis E
 - 6) Hepatitis G
 - 7) Other
 - e) Management for a patient with hepatitis
 - 1) Prehospital care is supportive
 - 2) Manage airway and support ventilation
 - 3) IV if needed

3. Tuberculosis (TB)
 - a) Introduction--Pathophysiology, incidence, types, causes, risk factors, methods of transmission, complications
 - b) General assessment findings and symptoms
 - 1) Bad cough that lasts 3 weeks or longer
 - 2) Pain in the chest
 - 3) Coughing up blood or sputum
 - 4) Weakness or fatigue
 - 5) Weight loss
 - 6) No appetite
 - 7) Chills
 - 8) Fever
 - 9) Sweating in night
 - c) Treatments for exposure/prevention; immunizations
 - d) Management for a patient with TB
 - 1) Prehospital care is supportive
 - 2) Manage airway and support ventilation
 - 3) IV if needed
- D. Consider age related variations in pediatric and geriatric patients as they relate to assessment and managements of patients with a gastrointestinal condition or infectious disease
- E. Transport decisions including special infection control procedures
- F. Legal Requirements Regarding Reporting Communicable or Infectious Diseases/Conditions
 1. Exposure of Health Care Providers
 - a) Current recommended treatment modalities and follow up
 - b) Prevention of exposure or immunizations/vaccines
 2. Required Reporting to the Health Department or Other Health Care Agency

Lesson 15: Endocrine Disorders (Review) (2 hrs)

Objectives

- 1.1. Review the anatomy and physiology of the endocrine system and its main function in regulating blood sugar.
- 1.2. Define the term Diabetes Mellitus.
- 1.3. Distinguish between Hypoglycemia and Hyperglycemia.
- 1.4. Discuss complications of Diabetes.
- 1.5. Describe the assessment and management of a patient during hypoglycemic crisis.
- 1.6. Describe the assessment and management of a patient during a hyperglycemic crisis.
- 1.7. Give a brief overview of the pathophysiology and the signs and symptoms of hyperthyroidism and hypothyroidism.
- 1.8. Give a brief overview of the pathophysiology and the signs and symptoms of disorders of the adrenal glands, including Cushing's syndrome and Addison's disease.

Psychomotor Objectives

- 1.9. Demonstrate the assessment and care of a patient with hypoglycemia and a decreased level of consciousness.
- 1.10. Demonstrate the administration of glucose to a patient with an altered mental status.
- 1.11. Demonstrate the administration of dextrose to a patient with hypoglycemia.

1.12. Demonstration the administration of glucagon to a patient with hypoglycemia.

Lesson Content

- 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
 - 1) Type I
 - 2) Type II
 - 3) Gestational
 - 5. Drugs to Manage Diabetes
 - a) Insulins
 - 1) Types
 - 2) Delivery methods
 - b) Oral antihyperglycemics
 - 6. Assessment
 - a) Impact of Disease on Prehospital Assessment
 - b) Alterations of Findings in Long-Term Diabetics
 - c) Hypoglycemia
 - 1) Physical findings
 - 2) Blood sugar level
 - 3) Causes
 - d) Hyperglycemia/DKA
 - 1) Physical findings
 - 2) Blood sugar level
 - 3) Causes
 - e) CPT-1A Arctic Variant
 - 1) Physical findings
 - 2) Blood sugar level
 - 3) Causes
 - f) Treatment
 - 1) Oxygenation and ventilation requirements
 - 2) Blood glucose determination
 - 3) Oral glucose
 - 4) Glucagon administration
 - 5) IV placement and fluid therapy for
 - (a) hyperglycemia
 - (b) hypoglycemia
 - 6) D50/D10 Administration
 - g) Reassessment and Evaluation for other Underlying Acute Illness in the Hyperglycemic Patient
 - 7. Age-Related Considerations
 - a) Pediatric patients
 - 1) Usually type I diabetes

- 2) Late stages of hyperglycemia may have cerebral edema
 - 3) Prone to seizures
 - 4) Prone to dehydration in hyperglycemia
 - 5) Consider congenital hyperplasia
 - 6) Use D10 for these patients
 - b) Geriatric patients
 - 1) Masking of illness through changes in pain perception
 - 2) Prone to dehydration and sepsis
 8. Communication and Documentation
- B. Adrenal Emergencies
1. Hypoadrenalism: Addison's Disease
 - a) Adrenal glands fail to produce adequate amounts of steroid hormones
 - 1) Cortisol
 - 2) Aldosterone
 - b) Pathophysiology
 - 1) When body experiences stress, ie trauma, infection, cardiac ischemia, or a severe illness, adrenal glands may not be able to compensate triggering an exacerbation of Addison's disease
 - c) Signs and symptoms:
 - 1) Chronic fatigue and weakness
 - 2) loss of appetite
 - 3) GI disturbances:
 - (a) abdominal pain
 - (b) nausea
 - (c) vomiting
 - (d) diarrhea.
 - d) Treatment
 - 1) Treat symptoms
 2. Hyper-adrenalism: Cushing's syndrome
 - a) Adrenal glands produce to high amounts of steroid hormones
 - 1) Cortisol
 - b) Pathophysiology
 - 1) Excessive circulating serum levels of glucocorticoids, particularly cortisol.
 - 2) Can be caused by adrenal gland or pituitary tumor or long-term use of corticosteroids
 - 3) Excess cortisol causes characteristic changes in body systems
 - (a) Fatty "buffalo hump" at the back of the neck
 - (b) Central body obesity
 - (c) Full, puffy face (moon face)
 - (d) Increased body and facial hair
 - (e) Thin, fragile skin
 - (f) Hypertension
 - c) Treatment
 - 1) Treat symptoms

Lesson 16: Psychiatric (Review) (2 hrs)

Objectives

- 16.1 Discuss the potential causes of behavioral emergencies, including organic and functional causes.
- 16.2 Describe the assessment process for patients with psychiatric emergencies, including safety guidelines and specific questions to ask.
- 16.3 Discuss risk factors that help indicate whether a patient may become violent.
- 16.4 Discuss general management of a patient with psychiatric emergencies.
- 16.5 Describe situations where restraint may be justified.
- 16.6 Describe methods used to restrain patients including both physical and chemical restraints.
- 16.7 Explain the safe management of a potentially violent patient.

Psychomotor Objectives:

- 16.8 Demonstrate the technique used to mechanically restrain a patient.
- 16.9 Demonstration the administration of Ketamine and benzodiazepines as a chemical restraint.
- 16.10 Demonstration the assessment and care of a patient with agitated delirium.

Lesson Content

- A. Define
 1. Behavior
 2. Psychiatric Disorder
 3. Behavioral Emergency
- B. Epidemiology of Psychiatric Disorders
- C. Assessment
 1. General Appearance
 - a) Dress
 - b) Grooming
 - c) Posture
 - d) Wringing of hands
 - e) Facial grimaces
 - f) Mannerisms
 - g) Actions
 - h) Violence
 2. Speech
 - a) Spontaneous or pressured
 - b) Slow or fast
 - c) Soft or loud
 - d) Understandable or not
 - e) Appropriate or inappropriate
 - 1) Mixed/confused words (word salad)
 - 2) Full words inappropriately used together
 - 3) Delusion
 3. Mood
 - a) Depressed
 - b) Euphoric
 - c) Manic
 - d) Anxious

- e) Angry
- f) Agitated
- g) Fearful
- h) Guilty
- 4. Area of thought
 - a) Racing thoughts
 - b) Hallucinations
 - 1) Auditory
 - 2) Visual
 - 3) Somatic (strange body sensations)
 - c) Obsessive
 - d) Delusions (false beliefs)
 - e) Suicidal
 - f) Unconnected
 - g) Disturbed or distorted
- 5. Posture/Gait
- 6. Mental Status
- D. Behavioral Change
 - 1. Factors that may alter a patients behavior – May include Situational Stresses, Medical Illnesses, Psychiatric Problems, and Alcohol or Drugs
 - 2. Common Causes of Behavioral Alteration
 - a) Low blood sugar
 - b) Lack of oxygen
 - c) Hypoperfusion
 - d) Head trauma
 - e) Mind altering substances
 - f) Psychogenic - resulting in psychotic thinking, depression or panic
 - g) Excessive cold
 - h) Excessive heat
 - i) Meningitis
 - j) Seizure disorders
 - k) Toxic ingestions-overdose
 - l) Withdrawal of drugs or alcohol
- E. Psychiatric Emergencies
 - 1. Acute Psychosis
 - a) Assessment for Suicide Risk
 - 1) Depression
 - 2) Risk Factors/signs or symptoms
 - 3) ideation or defined lethal plan of action which has been verbalized and/or written.
 - 4) alcohol and substance abuse
 - 5) purposelessness
 - 6) anxiety, agitation, unable to sleep or sleeping all the time
 - 7) feeling trapped, no way out v1. hopelessness
 - 8) withdrawal from friends, family and society
 - 9) anger and/or aggressive tendencies
 - 10) recklessness or engaging in risky activities
 - 11) dramatic mood changes

- 12) history of trauma or abuse
 - 13) some major physical illness (cancer, CHF, etc.)
 - 14) previous suicide attempt
 - 15) job or financial loss
 - 16) relational or social loss
 - 17) easy access to lethal means
 - 18) lack of social support and sense of isolation
 - 19) 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?
2. Management of Violent Patients
- a) Scene Safety
 - b) Methods of Restraint
 - 1) Physical
 - (a) Attempt verbal de-escalation prior to physical restraint, if safe
 - (b) Provider safety first
 - (c) Determine the need for pharmacological restraint
 - (d) Restrain only those who can be overpowered with the physical forces available to you
 - (e) Five people should be available to apply full body restraint- one for each limb and one for restraint application
 - (f) Pre-plan each provider's role during restraint-know your communication signals or verbal cues.
 - (g) Swift, coordinated action is most effective
 - (h) Talk to the patient continually
 - (i) Do not remove restraints in the out-of-hospital setting
 - (j) Thoroughly document restraints
 - (k) Legal considerations: in law enforcement custody and age
 - (l) Transportation
 - (1) Ensure continued ability to restrain
 - (2) Ensure adequate personnel and equipment
 - (m) Principles of restraining motion:
 - (1) Understand normal range of motion
 - (2) Restrain range of motion
 - (3) Understand muscle groups
 - (n) Patient Considerations
 - (1) Pregnant
 - (2) Pediatric
 - (3) Geriatric
 - 2) Chemical restraint
 - (a) Indications
 - (b) Patient poses a threat to himself or others

- (c) Patients requiring physical restraining who struggle or fight should immediately be chemical restrained
 - (d) Requires continuous monitoring, assessment, and management
 - (e) Medication types
 - (1) Ketamine
 - (2) Benzodiazepines e.g. midazolam, lorazepam, diazepam
 - (f) Dosage
 - (1) Titrate dosage to level of agitation
 - (2) Combination therapy may be necessary
 - (3) Follow local protocols
 - (g) Medication routes
 - (1) IM
 - (2) IV/IO
 - (3) Nasal
3. Agitated Delirium Syndrome
- a) Characterized by a sudden onset of extreme agitation and extremely irrational or combative behavior
 - 1) Bizarreness, aggressiveness, agitation, ranting, hyperactivity, paranoia, panic
 - 2) Reported to result from substance intoxication, psychiatric illness, alcohol withdrawal, head trauma or a combination of these.
 - 3) Patient may exhibit hypertension, tachycardia, diaphoresis, dilated pupils, tachypnea, abnormal tolerance to pain, hyperthermia, noncompliance, and endless endurance and strength.
 - 4) May lead to respiratory and cardiac arrest-restraints may increase the risk
 - b) Emergency medical care
 - 1) Scene size-up, personal safety
 - 2) Establish rapport
 - (a) utilize therapeutic interviewing techniques
 - (1) engage in active listening
 - (2) supportive and empathetic
 - (3) limit interruptions
 - (4) respect patient's territory, limit physical touch
 - (b) avoid threatening actions, statements and questions
 - (c) approach slowly and purposefully
 - c) Patient assessment
 - 1) intellectual functioning
 - 2) orientation
 - 3) memory
 - 4) concentration
 - 5) judgment
 - (a) thought content
 - (b) disordered thoughts
 - (c) delusions, hallucinations
 - (d) unusual worries, fears
 - 6) language
 - (a) speech pattern and content
 - (b) garbled or unintelligible

- 7) mood
 - (a) anxiety, depression, elation, agitation
 - (b) level of alertness, distractibility
 - (1) appearance, hygiene, dress
 - (2) psychomotor activity
- 8) Pathophysiologic effects of Excited Delirium Syndrome
 - (a) Hypoxia
 - (b) Acidosis
 - (c) electrolyte derangement
 - (d) Rhabdomyolysis
 - (e) hyperthermia
- d) Treatment
 - 1) Calm the patient -do not leave the patient alone, unless unsafe situation; consider need for law enforcement
 - 2) Restrain if necessary
 - 3) Chemical Restraint
 - (a) Benzodiazepines
 - (b) Ketamine
 - 4) Temperature Management
 - 5) Maximize respiratory compensation
 - 6) Search for treatable causes
 - 7) Transport
 - 8) If overdose, bring medications or drugs found to medical facility
- F. Medical-Legal Considerations
 - 1. Types of Restraints
 - 2. Transport Against Patient Will
- G. Consider Age-Related Variations for Pediatric and Geriatric Assessment and Management
 - 1. Pediatric Behavioral Emergencies
 - a) Teenage suicide concerns
 - b) Aggressive behavior may be a symptom of an underlying disorder or disability
 - 2. Geriatrics
 - a) Delirium vs Dementia
 - b) Alzheimers

Lesson 17: Toxicology (Review) (2 hr)

Objectives

- 17.1 Define the terms toxicology, poison and overdose.
- 17.2 Describe the routes by which poisons are absorbed in the body.
- 17.3 Describe the assessment and treatment of a patient with suspected poisoning.
- 17.4 Describe the assessment and treatment of a patient with a possible overdose.
- 17.5 Understand the role of airway management in a patient with poisoning or overdose.
- 17.6 Explain the effects of each of the specific types of poisons:
 - a. Opiates/Narcotics;
 - b. Alcohol
 - c. Stimulants
 - d. Marijuana

- e. Hallucinogens
- f. Sedative-hypnotic drugs
- g. Cardiac medications
- h. Organophosphates
- i. Inhalants

Psychomotor Objectives

- 17.7 Demonstrate steps in the assessment and treatment of the patient with suspected poisoning.
- 17.8 Demonstration the steps in the assessment and treatment of the patient with suspected overdose.
- 17.9 Demonstration the steps required to administer activated charcoal.
- 17.10 Demonstration the steps required to administer opioid antagonists.

Lesson Content

- 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
- F. Drugs of Abuse
 - 1. Opiates/Narcotics
 - a) Common causative agents
 - b) Assessment findings and symptoms
 - 1) Decreased level of consciousness, sedation
 - 2) Hypotension
 - 3) Respiratory depression/ arrest
 - 4) Nausea, Pinpoint pupils
 - 5) Seizures and Coma

- c) Management for a patient using opiates
 - 1) Narcan
 - 2) Ventilatory support
 - 2. Alcohol
 - 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) Incoordination
 - 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
 - 3. Common Causative Agents, Assessment Findings and Symptoms Management
 - a) Cannabis
 - b) Hallucinogens
 - c) Stimulants
 - d) Barbiturates/sedatives/ hypnotics
- G. Poisonings and Exposures
 - 1. Scene Safety Issues
 - 2. Common causative agents, assessment findings and symptoms, management
 - a) Pesticides
 - b) Chemicals
 - c) Household Cleaning poisonings
 - d) Poisonous Plants
- H. Medication Overdose
 - 1. Common Causes of Overdoses (Other than Drugs or Abuse)
 - a) Cardiac medications
 - b) Psychiatric medications
 - c) Non-prescription pain medications including Salicylates and Acetaminophen
 - d) Other
 - 2. Assessment Findings and Symptoms for Patients with Medication Overdose
 - 3. Management for a Patient with Medication Overdose
- I. General Treatment Modalities for Poisonings
 - 1. Scene Safety
 - 2. Standard Precautions and Decontamination
 - 3. Airway Control
 - 4. Ventilation and Oxygenation
 - 5. Circulation
 - 6. Use of Activated Charcoal
 - a) Indications/contraindications/side effects
 - b) Dose
- J. Toxic Syndromes
 - 1. Introduction

- a) Definition of a toxic syndrome (toxidrome)
- b) Incidence of opiate abuse
- 2. Opiate Intoxication/Poisoning
 - a) Common causative agents
 - 1) heroin, morphine, methadone
 - 2) codeine, meperidine, propoxyphene
 - 3) fentanyl, Lortab, oxycontin
 - 4) other
 - b) 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
 - (e) seizures
 - (f) coma
 - 2) Respiratory
 - (a) decreased respiratory rate and effort
 - (b) apnea
 - 3) Gastrointestinal
 - (a) nausea
 - (b) vomiting
 - c) Management specific to opiate intoxication/poisoning
 - 1) Airway/Breathing support
 - (a) oxygenation requirements
 - (b) Ventilatory requirements
 - (1) considerations in use of oral pharyngeal airways
 - (2) bag-valve mask
 - (3) considerations of use of the advanced airway in the opiate overdose patient
 - 2) Circulatory Support
 - (a) causes of hypotension in the opiate overdose
 - (b) IV access
 - 3) Pharmaceutical interventions
 - 4) Other considerations in the care of the opiate overdose
 - (a) underlying chronic illness
 - (1) HIV/AIDS
 - (2) hepatitis
 - (3) malnutrition
 - (4) sepsis
 - (b) family interaction and social issues
 - 5) chronic pain patients
 - (a) drug dependency
 - (b) consequences of narcotic antagonist use in the chronic pain patient
- K. Consider Age-Related Variation for Pediatric and Geriatric Assessment and Management
 - 1. Pediatric
 - a) Toddler-age prone to ingestions of toxic substance

- b) Adolescent prone to experimentation with drugs of abuse
- 2. Geriatric
 - a) Alcoholism
 - b) drug dependency
 - c) consequences of narcotic antagonist use in the chronic pain patient
- L. Documentation and Communication
 - 1. Documentation of the Opiate Overdose Specific Patient
 - 2. Communication
 - a) Hospital personnel
 - b) Family
 - c) Law enforcement personnel
 - 3. Transport Decisions

Lesson 18: Hematology (1 hr)

Objectives

- 18.1 Discuss the composition and functions of blood.
- 18.2 Describe the pathophysiology of sickle cell disease and the four main types of sickle cell crisis.
- 18.3 Describe the assessment and management of a patient with suspected sickle cell disease.

Psychomotor Objectives

- 18.4 Demonstrate the assessment and treatment of a patient with sickle cell crisis.

Lesson Content

- A. Introduction
 - 1. Epidemiology of Blood Disorders
 - 2. Anatomy and Physiology
- B. Sickle Cell Disease
 - 1. Definition, Pathophysiology, Epidemiology, Mortality and Morbidity
- C. Assessment
 - 1. Types of Presentations
 - 2. Specific signs and Symptoms
- D. Management
 - 1. Airway and Oxygenation Requirements
 - 2. IV Access
- E. Age-Related Considerations
 - 1. Types of Crisis Specific to the Pediatric Patient
 - a) Hematologic malignancies
 - 2. Special Considerations in Treatment
- F. Documentation and Communication

Lesson 19: Genitourinary/Renal (2hrs)

Objectives

- 19.1 Review the anatomy and physiology of the renal system.
- 19.2 Explain the purpose or renal dialysis and potential complications.
- 19.3 Discuss the general management of a patient with a urology emergency.

Psychomotor Objectives

19.4 Demonstrate the assessment and care of a patient with a urologic emergency.

Lesson Content

- A. Anatomy and Physiology
 - 1. Urinary System
 - a) Structures
 - b) Function
- B. Pathophysiology
 - 1. Renal Calculi (kidney stones)
 - a) Calculi formation
 - b) Consequences of renal calculi
 - 2. Types of renal failure
 - a) Acute
 - b) Chronic
 - 3. End-stage renal disease
 - a) Definition
 - b) Causes
- C. Dialysis
 - 1. Definition of dialysis
 - 2. Process of dialysis
 - 3. Types of dialysis
 - 4. Complication s/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
- D. Assessment
 - 1. Findings in renal calculi
 - 2. Findings in renal failure
 - a) Acute
 - b) Chronic
 - c) End-stage
- E. Management
 - 1. Renal calculi patient
 - a) Oxygen requirements
 - b) IV access
 - c) Fluid administration considerations

2. Renal failure patients
 - a) Oxygen and ventilation requirements
 - b) IV access
 - 1) hypotensive patient
 - 2) pulmonary edema patient
- F. Documentation
1. Documentation of the renal calculi patient
 2. Documentation of dialysis complication patient

Lesson 20: OB/Gynecology (Review) (1.5 hr)

Objectives

- 20.1 Discuss the pathophysiology of preeclampsia and eclampsia.
- 20.2 Discuss the pathophysiology of gynecologic emergencies including pelvic inflammatory disease, sexually transmitted diseases, ruptured ovarian cyst, ectopic pregnancy, vaginal bleeding, traumatic abdominal pain and sexual assault.
- 20.3 Describe the assessment process for patients with gynecologic emergencies.
- 20.4 Discuss the importance of history taking when assessing a patient with a gynecologic emergency.
- 20.5 Discuss the assessment and management of preeclampsia and eclampsia.
- 20.6 Discuss the assessment and management of specific gynecologic emergencies including pelvic inflammatory disease, ruptured ovarian cyst, ectopic pregnancy, vaginal bleeding.

Psychomotor Objectives

- 20.7 Demonstrate steps in the assessment and treatment of the patient with gynecological emergency.

Lesson Content

- A. Anatomy of the Female Reproductive System
 1. Vulva
 - a) Mons pubis
 - b) Labia majora
 - c) Labia minora
 - d) Clitoris
 - e) Prepuce
 - f) Vestibule
 - g) Urethra opening
 2. Vagina
 - a) Cervix
 - b) Uterus
 3. Fallopian tubes
 4. Ovaries
- B. Pathophysiology
 1. Pelvic Inflammatory Disease (PID)
 2. Sexually Transmitted Diseases
 3. Ruptured Ovarian Cyst
 4. Ectopic Pregnancy
 5. Vaginal Bleeding

- 6. Preeclampsia versus Eclampsia
- C. GYN emergencies
 - 1. Assessment
 - 2. Management
 - 3. Treatment
- D. Preeclampsia
 - 1. Assessment
 - 2. Management
 - 3. Treatment
 - a) Magnesium Sulfate
- E. Eclampsia
 - 1. Assessment
 - 2. Management
 - 3. Treatment
 - a) Magnesium Sulfate

Lesson 21: 12-Lead ECG Course (8 hrs for initial/4 hrs review)

Note: Only if needed for audience.

Objectives

- 21.1 Understand and describe the electrical system of the heart.
- 21.2 Recognize normal and abnormal rhythms.
- 21.3 Describe the meaning of injury patterns on a 12-lead ECG.
- 21.4 List the difference between STEMI and NSTEMI.

Psychomotor Objectives

- 21.5 Demonstrate ECG placement.
- 21.6 Demonstration the proper placement of 12 & 15-lead ECGs.

Lesson Content

- A. Three Lead Review
 - 1. Intrinsic Pacer Sites
 - 2. P Waves
 - 3. PR Interval
 - 4. QRS Complex
 - 5. Q-Waves
 - 6. Normal Ventricular Conduction
 - 7. ST-Segment
 - 8. QT-Segment
 - 9. T Wave
- B. Cardiac Action Potential
- C. 12 Lead Introduction
 - 1. 4-lead vs 12-lead
 - 2. When to use a 12-lead
 - 3. 12-lead Placement
 - 4. 15-lead Placement

5. ECG Accuracy
6. Reading a 12-Lead
 - a) What is the 12-lead looking at
 - b) Interpretation Steps
- D. AHA ACS Classification
 1. STEMI
 2. UA/NSTEMI
 3. Low Risk UA
- E. Identifying STEMI
 1. Inferior Wall
 2. Septal
 3. Lateral
 4. Anterior
 5. Posterior
- F. Differentiate STEMI from STEMI imposters
 1. Common STEMI imposters
 - a) Left ventricular hypertrophy
 - b) Bundle branch blocks
 - c) Implanted pacemakers
 - d) Pericarditis

Lesson 22: ACLS (12 hrs)

Note: ACLS or verification that advanced cardiac life support information has been taught is required for AK-AEMT certification – this information is not usually included in NR-AEMT course.

Lesson 23: Shock (16 hrs for Shock & Trauma)

Objectives

- 23.1 Describe the physiology of perfusion, including the role of the autonomic nervous system in controlling blood pressure.
- 23.2 Discuss cardiac output, heart rate stroke volume and systemic vascular resistance.
- 23.3 Describe how the body compensates for decreased perfusion.
 - a. Baroreceptors
- 23.4 Recognize the causes of shock.
- 23.5 Describe the three states of shock.
- 23.6 Describe the various types of shock including:
 - b. Cardiogenic shock
 - c. Obstructive shock
 - d. Distributive shock
 - e. Hypovolemic Shock
- 23.7 Describe the signs and symptoms of shock.
- 23.8 Discuss the role of fluid administration in treating a patient in potential shock.

Psychomotor Objectives

- 23.9 Demonstrate how to treat a patient in potential shock.

23.10 Demonstrate how to complete an EMS patient care report for a patient with bleeding and/or shock.

Lesson Content

A. Shock-Review (1hr)

1. Definition

- 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

2. Anatomy and Physiology Review

- a) Heart/blood vessels
- b) Physiology of respiration
 - 1) Gas exchange
 - (a) alveolar level
 - (b) tissue level
 - 2) Circulation
 - (a) pulmonary
 - (b) systemic
- c) Essential components for normal perfusion
 - 1) Functioning pump/heart
 - (a) stroke volume
 - (b) cardiac output
 - (c) blood pressure
 - (d) mean arterial pressure
 - (e) pulse pressure
 - 2) baroreceptors
 - 3) nervous control of heart
 - (a) sympathetic nervous system
 - (b) parasympathetic nervous system
 - 4) Adequate volume
 - (a) formed elements
 - (b) plasma
 - 5) Intact container/vessels
 - (a) arteries
 - (b) arterioles
 - (c) capillary beds
 - (d) sphincters
 - (e) venules
 - (f) veins
 - (g) capacity of each vessel
 - (h) sympathetic nervous system control of each vessel
 - (i) blood flow control led by cellular tissue demands
 - (j) sphincter control

3. Tissue Hypoperfusion
 - a) Inadequate fluid volume
 - b) Inadequate pump
 - c) Inadequate container size
4. Physiologic Response to Shock
 - a) Cellular
 - 1) Fick principle
 - 2) Waste removal
 - 3) Aerobic metabolism/glycolysis
 - 4) Anaerobic metabolism
 - b) Sympathetic nervous system and endocrine implications
5. Categories of Shock
 - a) Compensated
 - b) Uncompensated
 - c) Irreversible shock
6. Specific Types of Shock
 - 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 II I
 - (d) Class IV
 - b) Distributive
 - 1) Neurogenic
 - 2) Anaphylactic
 - 3) Septic
 - 4) Psychogenic (vasovagal)
 - c) Cardiogenic
 - 1) Intrinsic causes-heart muscle damage
 - (a) physiology
 - (b) signs/symptoms
 - (c) assessment
 - (d) management
 - 2) Extrinsic causes (Obstructive)
 - (a) cardiac tamponade
 - (b) tension pneumothorax
7. Complications of Shock
 - a) Multiple Organ Dysfunction Syndrome (MODS)
 - 1) Sepsis
 - 2) Death of organs

- 3) Death of organism
- b) Acute Respiratory Distress Syndrome (ARDS)
- 8. Advanced Management
 - 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 positioning
 - 3) Keep patient warm - attempt to maintain normal body temperature.
 - g) Fluid resuscitation
 - 1) Controllable external hemorrhage
 - 2) Uncontrollable external hemorrhage
 - 3) Internal hemorrhage
 - h) Medication
 - 1) TXA
 - i) Begin transport at the earliest possible moment
 - j) Treat any additional injuries that might be present
- 9. Age-Related Variations
 - a) Pediatrics
 - 1) Common causes of shock
 - (a) Trauma
 - (b) Fluid loss
 - (c) Neurological injury
 - (d) Anaphylaxis
 - (e) Heart disease
 - (f) Infection
 - 2) Presentation
 - (a) Cardiovascular
 - (b) Skin signs
 - (c) Mental status
 - (d) Decreased fluid output
 - (e) Vital signs
 - 3) Anatomic and physiologic implications
 - (a) Unreliable indicators
 - (b) Indicators of shock
 - (1) tachycardia for age
 - (2) weak distal pulses
 - (3) delayed capillary refill time
 - (4) cool mottled extremities
 - (5) altered mental status
 - 4) Management
 - (a) Inline spinal stabilization

- (b) Suction, as needed
- (c) High-concentration oxygen
- (d) Control bleeding
- (e) Positioning
- (f) Maintain body temperature
- (g) Fluid replacement
- (h) Consider TXA
- (i) Transport

10. Geriatrics

a) Assessment

- 1) Body system changes affecting presentation of shock
 - (a) nervous system
 - (b) cardiovascular
 - (1) difficulty tolerating hypotension from hemorrhage
 - (2) beta-blocker and calcium channel blockers can alter physiologic response to hemorrhage
 - (c) respiratory
 - (d) integumentary
 - (e) renal
 - (f) gastrointestinal
- 2) Vital sign variations
 - (a) altered mental status
 - (1) sudden onset
 - (2) 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 hot

b) Management

- 1) In-line spinal stabilization
- 2) Suction, as needed
- 3) High-flow oxygen
- 4) Control bleeding
- 5) Positioning
- 6) Maintain body temperature

- c) Transport
- B. Resuscitation (1 hr review)
 - 1. Ethical Issues in Resuscitation
 - a) Withholding Resuscitation Attempts
 - 1) Irreversible death
 - 2) Do Not Resuscitate (DNR) orders
 - b) Provide Emotional Support for Family
 - c) Organ and Tissue Donation
 - 2. 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
 - (1) begins 4-6 minutes after the patient suffers cardiac arrest.
 - (2) becomes irreversible in 8-10 minutes.
 - (c) Cardio-pulmonary resuscitation (CPR)
 - (1) Artificial ventilation
 - (2) External chest compressions
 - (3) 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
 - 3. Resuscitation
 - a) System Components to Maximize Survival
 - 1) Early access
 - (a) Public education and awareness
 - (1) rapid recognition of a cardiac emergency
 - (2) rapid notification before CPR starts - "phone first"
 - (b) 911-pre-arrival instructions and dispatcher directed CPR
 - 2) Early CPR
 - (a) Lay public
 - (1) family
 - (2) bystanders
 - (b) Emergency Medical Responders
 - 3) Early Defibrillation
 - 4) Early Advanced Care
 - b) Basic Cardiac Life Support (Refer to Current American Heart Association Guidelines)
 - 1) Adult CPR and foreign body airway obstruction
 - 2) Child CPR and foreign body airway obstruction
 - 3) Infant CPR and foreign body airway obstruction
 - 4) Neonatal sequence
 - 5) Alternative CPR techniques-Interposed abdominal compression
 - c) Airway Control and Ventilation
 - 1) Airway adjuncts

- 2) Basic adjuncts
 - 3) Advanced adjuncts (as defined by Scope of Practice)
 - d) 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
 - e) Chest Compressions
 - 1) Factors which decrease effectiveness
 - (a) Compression that are too shallow
 - (b) Slow compression rate
 - (c) Sub-maximum recoil
 - (d) Frequent interruptions
 - 2) Devices to assist circulation
 - (a) Active compression-decompression CPR
 - (b) Impedance threshold device
 - (c) Mechanical piston device
 - (d) Load-distributing band or vest CPR
4. Automated External Defibrillation (AED) (Refer To Current American Heart Association Guidelines)
 - a) Adult Sequence
 - b) Child Sequence
 - c) Infant Sequence
 - d) Special Situations
 - 1) Pacemaker/implanted cardioverter/defibrillator
 - 2) Wet patients
 - 3) Transdermal medication patches
 5. Advanced Life Support-Refer to the Current American Heart Association Guidelines
 6. Post-Resuscitation Support-Refer to the Current American Heart Association Guidelines
 - a) Return of Spontaneous Circulation (ROSC)
 - 1) Temperature regulation
 - (a) Induced hypothermia
 - 2) Glucose control
 - 3) Organ specific support
 - (a) Respiratory system
 - (1) ventilation rates
 - (b) Cardiovascular system
 - (1) monitor
 - (2) leave AED pads in place
 - (c) Central nervous system

Lesson 24: Trauma Review (8-16 hrs depending on group)

Note: This whole section could be covered by an ITLS or PHTLS Course- this would update and refresh Trauma Care knowledge. Could instead spend a day doing Trauma scenarios, incorporating review of pathophysiology of injuries.

Objectives

- 24.1 Identify the triage criteria in the CDC's Field Triage Decision Scheme.
- 24.2 State the four steps of the CDC's Field Triage Decision Scheme Examine Field Triage local protocols.
- 24.3 Identify the signs and symptoms of a patient with a traumatic brain injury (TBI).
- 24.4 Differentiate between the various levels of a TBI.
- 24.5 Discuss the current research and practices for the use of selective spinal immobilization.
- 24.6 Identify and treat severe hemorrhage.
- 24.7 Differentiate among indications, effects, and contraindications for the use of:
 - a. Tourniquets
 - b. Junctional Tourniquets
 - c. Hemostatic agents
- 24.8 (Use the Objectives from the EMT-1 Course)

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

- A. Trauma Overview
 1. Identification and Categorization of Trauma Patients
 - a) National Trauma Triage Protocol
 - 1) Centers for Disease Control and Prevention. Guidelines for Field Triage of Injured Patients: Recommendations of the National Expert Panel on Field Triage. MMW R 2008:58 RR- I : 1-35.
 - 2) [http://cdc.gov/field triage](http://cdc.gov/field%20triage) contains the National Trauma Triage Protocols and additional instructional materials.
- B. Bleeding
 1. Fluid Resuscitation in Bleeding and Shock
 - a) Pathophysiology of Shock
 - b) Blood volume and Shock Stages
 - c) Management of Bleeding and Shock using Fluid Resuscitation
 2. Special Considerations in Fluid Resuscitation
 - a) Permissive Hypotension
 - b) Reperfusion Injury
 - c) Pediatrics
 - d) Geriatrics
 - e) Obstetrical Patients
- C. Chest Trauma
 1. Traumatic Aortic Disruption
 - a) Pathophysiology
 - b) Assessment
 - c) Management
 2. Pulmonary Contusion
 - a) Pathophysiology
 - b) Assessment
 - c) Management
 3. Hemothorax

- a) Pathophysiology
- b) Assessment
- c) Management
- 4. Pneumothorax
 - a) Open
 - b) Simple
 - c) Tension
- 5. Cardiac Tamponade
 - a) Pathophysiology
 - b) Assessment
 - c) Management
- 6. Rib Fractures
 - a) Pathophysiology
 - b) Assessment
 - c) Management
- 7. Flail Chest
 - a) Pathophysiology
 - b) Assessment
 - c) Management
- 8. Commotio Cordis
 - a) Pathophysiology
 - b) Assessment
 - c) Management
- D. Abdominal and Genitourinary Trauma
 - 1. Incidence
 - a) Morbidity/Mortality
 - 2. Anatomy
 - a) Quadrant and Boundaries of the Abdomen
 - b) Surface Anatomy of the Abdomen
 - c) Intraperitoneal Structures
 - d) Retroperitoneal Structures
 - e) Reproductive Organs
 - 3. Physiology
 - a) Solid Organs
 - b) Hollow Organs
 - c) Vascular Structures
 - 4. Specific Injuries
 - a) Closed Abdominal Trauma
 - b) Penetrating/Open Abdominal Trauma
 - c) Considerations in Abdominal Trauma
 - 5. General Assessment
 - 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
- h) Associated Trauma
- i) Recognition and Prevention of Shock
- j) PASG for Pelvic Fracture Stabilization
- k) Transportation Decisions to Appropriate Facility
- 6. General Management
 - a) Scene Safety/Standard Precautions
 - b) Airway Management
 - c) Oxygenation and Ventilation
 - d) Spinal Immobilization Considerations
 - 1) Current research and practices for the use of selective spinal immobilization
 - 2) Define SMR
 - 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
 - j) Communication and Documentation
- 7. Age-Related Variations for Pediatric and Geriatric Assessment and Management
 - a) Pediatric
 - 1) Pediatric blood volume
 - 2) Compensatory system process
 - b) Geriatric
- 8. Special Considerations of Abdominal Trauma
 - a) Sexual Assault
 - b) Vaginal Bleeding due to Trauma
- E. Orthopedic Trauma
 - 1. Amputations
 - a) Pathophysiology
 - b) Special Assessment Finding
 - c) Special Management Considerations
 - 2. Pelvic Fractures
 - a) Anatomy of the Pelvic Girdle
 - b) Pathophysiology
 - c) Special Assessment Findings
 - d) Management Considerations
 - 3. Compartment Syndrome
 - a) Pathophysiology
 - b) Special Assessment Findings
 - c) Special Management Considerations
- F. Soft Tissue Trauma
 - 1. Incidence of Soft Tissue Injury
 - a) Mortality/Morbidity
 - 2. Anatomy and Physiology of Soft Tissue Injury
 - a) Layers of the Skin
 - b) Function of the Skin
 - 3. Closed Soft Tissue Injury

- a) Type of Injuries
 - b) Signs and Symptoms
 - c) Assessment
 - d) Management
4. Open Soft Tissue Injury
 - a) Types of Injuries
 - b) Signs and Symptoms
 - c) Assessment
 - d) Management
5. General Assessment
 - a) Safety of Environment/Standard Precautions
 - b) Airway Patency
 - c) Respiratory Distress
 - d) Concepts of Open Wound Dressings/Bandaging
 - e) Hemorrhage Control
 - f) Associated Injuries
6. Management
 - a) Airway Management
 - b) Control Hemorrhage
 - c) Prevention of Shock
 - d) Prevent Infection
 - e) Transportation to the Appropriate Facility
 - f) Communication and Documentation
 - g) Bites
 - h) Avulsions
7. Incidence of Burn Injury
 - a) Morbidity/Mortality
 - b) Risk Factors
8. Anatomy and Physiology of Burns
 - a) Types of Burns
 - b) Complications of Burns
 - c) Depth Classification of Burns
 - d) Body Surface Area of Burns
 - e) Severity of Burns
9. Complications of Burn Injuries
 - b) Infection
 - c) Vasoconstriction
 - d) Hypoxia
 - e) Hypothermia
 - f) Hypovolemia
 - g) Complications with Circumferential Burns
 - 1) Pediatric/Geriatric Abuse
10. General Assessment of Burn Injuries
 - a) Safety/Standard precautions
 - b) Airway Patency
 - c) Respiratory Distress
 - d) Hemorrhage Control

- e) Classification of Burn Depth
- f) Percentage of Body Surface Area Affected
- g) Severity
- 11. General Management
 - a) Stop the Burning
 - b) Airway Management
 - c) Respiratory Distress
 - d) Circulatory
 - 1) Parkland Formula
 - e) Dry, Sterile, Non-Adherent Dressing
 - f) Remove Jewelry and Clothing
 - g) Prevent Shock
 - h) Prevent Hypothermia
 - i) Transportation to Appropriate Facility
 - j) Pediatric Considerations
 - k) Geriatric Considerations
- 12. Specific Burn Injury Management Considerations
 - a) Thermal
 - b) Inhalation
 - c) Chemical
 - d) Electrical
- 13. Age-Related Variations
 - a) Pediatric
 - b) Geriatrics
- G. Head, Facial, Neck, and Spine Trauma
 - 1. Facial Fractures
 - a) Types
 - b) Unstable Facial Fractures
 - c) Signs and Symptoms
 - d) Assessment Considerations in facial and Eye Injuries
 - e) Management Considerations in Facial and Eye Injuries
 - 2. Laryngo-tracheal Injuries
 - a) Pathophysiology
 - b) Specific Assessment Considerations
 - c) Specific Management Considerations
- H. Nervous System Trauma
 - 1. Incidence of Traumatic Brain Injury
 - 2. Morbidity/Mortality
 - 3. Prevention Strategies
 - a) Traumatic Brain Injury
 - 1) Anatomy
 - 2) Physiology
 - 3) Pathophysiology
 - 4) Specific Assessment Considerations
 - 5) Special Management Considerations
- I. Special Considerations in Trauma
 - 1. Trauma in Pregnancy

- a) Incidence
 - b) Anatomy
 - c) Physiology
 - d) Pathophysiology
 - e) Special Considerations in Assessment
 - f) Special Considerations in Management
2. Pediatric Trauma
 - a) Incidence
 - b) Anatomy
 - c) Physiology
 - d) Pathophysiology
 - e) Special Considerations in Assessment
 - f) Special Considerations in Management
 3. Geriatric Trauma
 - a) Incidence
 - b) Review of Anatomical Changes of Aging
 - c) Review of Physiological Changes of Aging Affecting Trauma
 - d) Special Considerations in Assessment
 - e) Special Considerations in Management
 4. Cognitively Impaired Patient Trauma
 - a) Incidence
 - b) Types of Cognitive Impairment
 - c) Challenges with Cognitive Impaired Patients
 - d) Special Considerations in Assessment
- J. Multiple System Trauma
1. Kinematics of Trauma
 - a) Definition
 2. Multi-system Trauma
 - a) Definition
 - b) The Golden Principles of Out-of-Hospital Trauma Care
 - c) Critical Thinking in Multi-System Trauma Care
 3. Specific Injuries Related to Multi System Trauma
 - a) Blast Injuries

Lesson 25: Pediatrics (1-2 hrs)

Objectives

- 25.1 State the leading causes of death of the pediatrics population.
- 25.2 Describe the physiologic differences of pediatric patients versus adults.
- 25.3 List the pediatric dosages of the following medications:
 - a. Pain management medications: opioid analgesics
 - b. Anaphylaxis medications: epinephrine and diphenhydramine
 - c. Cardiac arrest medications: epinephrine
 - d. Seizure medications: benzodiazepines
- 25.4 Apply ALS management skills during a pediatric cardiac arrest.
 - a. Airway management
 - b. Vascular access

- c. Pharmacology
- 25.5 Discuss assessment and management differences in a pediatric trauma patient.
- 25.6 Investigate unique causes of pediatric cardiac arrest.
- 25.7 Demonstrate the current techniques of one and two-rescuer CPR.
- 25.8 Demonstrate the current techniques of pediatric cardiac arrest management.
- 25.9 Define child abuse and discuss its causes.

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

Note: Review the section on EMT-1 Pediatric Emergencies with an emphasis on the following:

- A. Leading cause of death in Alaska for pediatrics
 - 1. Unintentional injury (trauma)
- B. Age-related assessment findings and age-related treatment modifications for pediatric specific major diseases and/or Emergencies:
 - 1. Upper airway obstruction
 - a) Anatomy differences
 - b) Pathophysiology
 - c) Management
 - 2. Lower airway reactive disease
 - a) Pathophysiology
 - b) Presentation
 - c) Management
 - 3. Respiratory distress/failure/arrest
 - a) Distress vs failure
 - b) Limited compensatory reserve
 - 4. Shock
 - a) Common causes of shock
 - 1) Trauma
 - 2) Fluid loss
 - (a) Diarrhea
 - (b) Vomiting
 - (c) Fever
 - 3) Neurological injury
 - 4) Anaphylaxis
 - 5) Infection
 - 6) Heart disease
 - b) Presentation
 - 1) Cardiovascular
 - 2) Skin signs
 - 3) Mental status
 - 4) Decreased fluid output
 - 5) Vital Signs
 - c) Anatomic and physiologic implications
 - 1) Unreliable indicators
 - 2) Indicators of shock for Pediatrics

- (a) Tachycardia for age
 - (b) Weak distal pulses
 - (c) Delayed capillary refill time
 - (d) Cool mottled extremities
 - (e) Altered mental status
 - d) Management
 - 1) Approach to patient
 - (a) Toe to head assessment
 - (b) Get at the child's level
 - 2) Inline spinal stabilization
 - 3) Suction, as needed
 - 4) High-concentration oxygen
 - 5) Control bleeding
 - 6) Positioning
 - 7) Maintain body temperature
 - 8) Fluid replacement
 - 9) Transport
 - e) Special considerations in Fluid Resuscitation
 - 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 immediate need of fluid
 - (a) Keep normal vital signs by age on hand
 - (b) Infuse up to 20cc/kg of warmed isotonic solution
 - (c) Consider a second infusion of 20cc/kg if there is no response to 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 20cc/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
5. Seizures
- a) Causes
 - 1) Febrile
 - 2) Decreased oxygenation
 - 3) Idiopathic
 - b) Treatment
6. Sudden infant death syndrome
7. Gastrointestinal disease
- a) Anatomic and Physiologic Differences in Children
 - b) Pathophysiology
 - c) Assessment
 - 1) History
 - 2) Physical findings
 - (a) Vomiting causes dehydration
 - (b) Appendicitis common in children

- (c) Abdominal pain from constipation
- (d) Vomiting
- (e) GI Bleeding
- (f) Congenital abnormalities
 - (1) Malrotation and volvulus
- (g) Intussusception
- d) Management
 - 1) Airway, Ventilatory and Circulation
 - 2) Position of Comfort
 - 3) Fluid resuscitation
 - 4) Pain management
 - 5) Emotional Support
- C. Trauma- Review EMT 1 and discuss ALS additions for treatment
 - 1. Fluid Resuscitation
 - 2. Pain Management
 - 3. Shock considerations

Lesson 26: Geriatrics (1.5 hrs)

Objectives

- 26.1 Define the term “geriatric”.
- 26.2 State the leading causes of death of the geriatric population.
- 26.3 Describe the physiologic changes of aging.
- 26.4 Describe appropriate ways to communicate with geriatric patients.
- 26.5 Define the problem known as polypharmacy.
- 26.6 Define elder abuse and discuss its causes.
- 26.7 Explain why the special needs of older people and the changes that the aging process brings about in physical structure, body composition, and organ function should be considered in the patient assessment process.

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

- A. Geriatrics: The Challenges
 - 4. Increasing population
 - 5. Major users of health care at all levels
 - 6. Twice as likely to die from traumatic injury than 20-24 year olds
 - 7. Effective treatment requires an understanding of changes due to age
 - 8. Elder Abuse
- B. Who are the “elderly”
 - 1. Depends on the Perspective:
 - a) Federal government places it at 65
 - b) 12 year old thinks anyone over 30
 - c) Geriatrician considers anyone that suffers from 1 or more chronic disease as elderly
 - d) Trauma surgeons believe anyone in their 4th decade.
 - 2. For EMS, anyone over the age of 65.

- C. Common Stereotypes
 1. Perception that most elderly have dementia, chronic illness and are sedentary
 2. Truth is:
 - a) Elderly stay fit
 - b) Most elderly lead very active lives
 - c) Activity improves quality of life
- D. Common Societal Issues
 1. Elderly persons living alone represent one of the most impoverished and vulnerable parts of society
 2. Factors include
 - a) Living environments
 - b) Poverty
 - c) Loneliness
 - d) Lack of social support
 3. Many fear the loss of independents or consider the illnesses as “normal” for their age
- E. Leading causes of Death
 1. According to CDC National Vital Static Report-2019:
 - a) Heart disease
 - b) Cancer
 - c) COPD and other respiratory illnesses
 - d) Stroke
 - e) Alzheimer’s Disease
 - f) Diabetes
 - g) Trauma- top three causes:
 - 1) MVCs
 - 2) Firearms (typically suicides)
 - 3) Poisonings
- F. System Pathophysiology in the Elderly
 1. Skin
 - a) Susceptible to injury
 - b) Perspires less
 - c) Thinner skin leads to tearing easily
 - 1) Difficult to bandage
 - 2) Can cause extensive bruising
 - d) Heals slowly
 - e) Loss of subcutaneous tissue leads to:
 - 1) Loss of support structures
 - 2) Loss of lubrication
 - 3) Wrinkles
 - 4) Loss of heat conservation
 - 5) Pressure sores
 - f) Effects on EMS assessment and treatment
 - 1) Handle gently
 - 2) IVs more difficult- Veins roll and skin slides
 - 3) Protect patients from temperature changes
 - 4) Protect from pressure sores- Use padding
 2. Respiratory System

- a) Smooth muscle that lines the airway weakens with age
 - 1) Decreased airway clearance
 - 2) Decreased cough & laryngeal reflexes
 - 3) Decline in mucus clearance
 - 4) Higher risk of pneumonia
 - b) Decrease ciliary action which can contribute to higher risk of aspiration
 - c) Loss of elastic recoil in lungs
 - d) Prone to undiagnosed pulmonary embolism secondary to prevalence of chronic disease
 - e) Effects on EMS assessment and treatment
 - 1) Often difficult to determine cause of respiratory problems due to chronic illnesses
 - 2) Less capacity to tolerate injuries/illness
 - 3) Must determine what "normal" baseline is for patient (89% PaO₂ may be patient's norm)
3. Cardiovascular System
- a) Heart muscle changes (fibrous tissue buildup) due to age
 - 1) Left Ventricular hypertrophy
 - 2) Atrial Stiffening
 - 3) Increased left atrial size
 - 4) Decreased endothelial-mediated vasodilation
 - b) Sinus node changes result in decreased maximum heart rate and variability
 - c) AV node may have increased conduction time
 - d) Conduction system changes
 - 1) Inability to maintain compensatory heart rates
 - 2) Inability to maintain cardiac output
 - e) Loss of valve integrity of veins
 - 1) Varicose veins
 - 2) Orthostatic hypotension
 - f) Vascular Changes can lead to :
 - 1) Inefficient compensation
 - 2) Rigid arteries/arteriosclerosis (hypotension may occur at higher systolic pressures)
 - g) Effects on EMS assessment and treatment
 - 1) Changes in the left ventricle may cause problems if fluid resuscitation is required. Large volumes of fluid may easily overwhelm the heart causing CHF
 - 2) Normal compensatory mechanisms become inefficient
4. Nervous System
- a) Brain shrinkage
 - 1) Brain can shrink as much as 80% by age 80
 - 2) Pulls against arachnoid layer which results in capillaries easier to leak or tear with traumatic injury
 - 3) Creates more space
 - (a) Greater amount of bleeding before signs and symptoms occur
 - b) Slowing of peripheral nerves
 - 1) Neurons decrease in the brain producing less transfer of information
 - 2) Slowing of reflexes
 - (a) Reaction time slows down
 - (b) More susceptible to MVAs and serious burns
 - (c) Balance is less precise-prone to falls

- 3) Decreased Pain sensation
 - c) Memory impairment
 - d) Altered Mental Status
 - 1) Delirium
 - (a) Recent rapid onset, course may fluctuate
 - (b) Usually associated with underlying cause
 - (c) More indicative of a serious medical problem than fever, tachycardia or pain
 - (d) Most common cause is drug toxicity, systemic disease or metabolic changes
 - 2) Dementia
 - (a) Develops slowly over a period of years
 - (b) Course is progressive
 - e) Effects on EMS assessment and treatment
 - 1) History more difficult to obtain
 - 2) Pain level may not match the actual illness or injury
 - 3) Serious head trauma may not show usual signs and symptoms, maintain a high level of suspicion
 - 4) Look at all possible causes of altered mental status besides dementia
 - (a) Decreased blood sugar
 - (b) Hypothermia or hyperthermia
 - (c) Hypoxia
 - (d) Hypoperfusion
 - (e) Poor Medication Compliance
 - (f) Infection
 - (g) Heart Rhythm disturbances
 - (h) Trauma
5. Senses
- a) Eye movement and pupillary reaction slow with age
 - b) Vision distorts secondary to lens thickening and
 - c) Hearing loss is 4 times more common than loss of vision
 - d) Taste sensation decreases making food bland and unappetizing
 - e) Effects on EMS assessment and treatment
 - 1) Get down on the patients level to talk
 - 2) Don't shout until you have determined that normal speech is not effective
 - 3) Slow down and give the patient an opportunity to absorb your questions and answer
6. Renal, Hepatic and GI Systems
- a) Kidneys become smaller (as much as 20%)
 - 1) Many drugs are eliminated through the urine
 - 2) UTIs common and can be fatal
 - b) Hepatic blood flow decreases
 - 1) Diminishes ability to produce and use metabolic enzymes
 - 2) Medication level are harder to regulate
 - c) GI systems
 - 1) Salivation decreases
 - 2) Gastric motility slows- constipation common
 - 3) Blood flow through the mesentery arteries can drop as much as 50%
 - 4) All of the above can reduce ability to extract nutrition from GI system
 - d) Effects on EMS assessment and treatment

- 1) Maintain high level of suspicion for effects of multiple medications (Polypharmacy)
 - 2) UTIs can cause altered mental status
7. Musculoskeletal System
- a) Decreased muscle mass
 - b) Changes in Posture
 - 1) Kyphosis-
 - (a) Spinal disorder
 - (b) Excessive outward curve of the spine
 - (c) Results in abnormal rounding of upper back (hump)
 - 2) Ankylosing Spondylitis
 - (a) Form of inflammatory arthritis effecting the spine primarily
 - (b) As inflammation persists new bone is formed
 - (c) Results in stiff inflexible spine
 - (d) Fused spine can be fragile
 - c) Arthritic changes
 - 1) Bones tend to compact against one another
 - 2) Spinal vertebrae common fracture site
 - d) Decrease in bone mass
 - 1) Osteoporosis
 - 2) Bones fragile and prone to fracture
 - 3) Fractures more difficult to discern
 - e) Effects on EMS assessment and treatment
 - 1) May have to modify airway management techniques to accommodate changes in spine configuration
 - 2) Splinting and spinal restriction may also have to be modified
 - 3) Pay special attention to position of comfort for the patient (pillows under knees/ padding for head).
8. Geriatrics and Trauma
- a) Contributing factors:
 - 1) Osteoporosis
 - 2) Reduced cardiac reserve
 - 3) Decreased respiratory function
 - 4) Impaired renal function
 - 5) Decreased elasticity in the peripheral blood vessels
 - b) Elderly patients have increased risk of shock due to contributing factors
 - c) Elderly patients may have decreased ability to localize even simple injuries
 - d) Assessment must include all past medical conditions
9. Polypharmacy
- a) Patients taking 5 or more medications
 - b) Effects of Polypharmacy
 - 1) Antihypertensive (Alpha and Beta Blockers)
 - 2) Antiplatelet Medications
 - 3) Vasodilators
 - 4) Digitalis
 - c) Effects on EMS assessment and treatment
 - 1) Antihypertensives can interfere with the patients response to hypotension and interfere with maintaining perfusion

- 2) Antiplatelet Meds interfere with clotting and make bleeding control difficult
 - 3) Vasodilators interfere with efficient vasoconstriction
 - 4) Digitalis interferes with reflex tachycardia
10. Summary
- a) Organ systems decline in the aging process
 - b) Aging body has
 - 1) Decrease in muscle and bone
 - 2) Changes in body structure
 - 3) Less ability to compensate for stress
 - c) Incorporate knowledge and understanding of these changes into your assessment
 - d) Don't allow stereotypes to influence your assessment

Lesson 27: Patient with Special Challenges (2 hrs)

Objectives

- 27.1 Identify common special needs patients seen in EMS.
- 27.2 Understand the need for empathy and respect when caring for patients with special challenges.
- 27.3 Explain the role the caregiver of the special needs patient plays in regards to patient care and its importance in patient assessment.
- 27.4 Define special considerations and questions when assessing a special needs patient. List common home medical equipment EMS providers may encounter.
- 27.5 Describe common maintenance issues and of home medical equipment and how to troubleshoot them.
- 27.6 Discuss the concept of hospice care.
- 27.7 Explain the special physiologic, medical, and psychosocial concerns and accommodations and modifications to patient assessment and management that are required when caring for patients with special challenges and needs.
- 27.8 Recognize circumstances, signs and/ or symptoms that may indicate abuse.
- 27.9 State appropriate actions of EMS professionals in the presence of abuse.

Psychomotor Objectives

There are no psychomotor objectives for this section.

Lesson Content

- A. Abuse and Neglect
 1. Child Abuse
 2. Elder Abuse
- B. Homelessness/Poverty
 1. Advocate for Patient Rights and Appropriate Care
 2. Identify Facilities that will treat Regardless of Payment
 3. Prevention Strategies will likely be absent, increasing the probability of Disease
 4. Familiarity with Assistance Resources offered in Community
- C. Bariatric Patients
 1. Increase Risk
 2. Patient Handling Issues
- D. Technology Assisted/Dependent
 1. Devices

- a) Ventilation Devices
 - b) Apnea Monitoring/Pulse Oximetry
 - c) Long Term Vascular Access Devices
 - d) Dialysis Shunts
 - e) Nutritional Support
 - f) Elimination Diversion
 - g) Insulin Pumps
 - h) Ventricular Assist Devices (LVAD)
 - i) Automatic Implantable Cardioverter Defib (AICD)/Pacemaker
 - j) Remote Cardiac Monitoring
2. Common failures of Devices
- E. Hospice Care and Terminally Ill
1. What is Hospice?
 2. EMS Intervention
 - a) MOLST/POLST
 - b) DNR Orders
- F. Tracheostomy Care
1. Tracheostomy: Surgical Opening from the Anterior Neck into the Trachea
 2. Consist of
 3. Routine Care
 4. Acute Care
 5. Troubleshooting issues with Tracheostomy
- G. Sensory Deficits
1. Sight
 2. Hearing Impaired
 3. Paralysis
- H. Homecare
1. Common for Patients over age 65
 2. Various Reasons for Calls
- I. Patient with Developmental Disability
1. Treat like any other Patient
 2. Family or Friends may supply Additional Information
 3. Take Special Care to Provide Explanations

Lesson 28: Skills Lab/Competencies

Note: Time frame may vary due to class size and the students need for adequate practice to ensure each student has mastered each skill.

Skills Lab/Competencies

- A. Use universal precautions and body substance isolation procedures during medication administration.
 1. Demonstrate intraosseous needle placement and infusion for Adults.
 2. Demonstrate clean technique during medication administration.
 3. Demonstrate administration of medications by the inhalation route.
 4. Demonstrate preparation and techniques for obtaining a blood sample.
 5. Perfect disposal of contaminated items and sharps.

6. Demonstrate placement of 12 & 15-leads
 7. Demonstrate withdrawal of medication from an ampule, vial (single dose or multi-dose), and assembly of prefilled syringes.
- B. Demonstrate the preparation and administration of medications given by the following routes:
1. Oral
 2. Sublingual
 3. Aerosolized/nebulized
 4. Inhaled
 5. Intramuscular
 6. Subcutaneous
 7. Intravenous/Intraosseous push
 8. Intravenous/Intraosseous infusion, including the addition of medication and appropriate IV fluid
- C. Demonstrate IV drip calculations, including volume to be administered, confirming with a double-check system
- D. Demonstrate the insertion of a supraglottic airway
- E. Pediatric Skills:
1. Demonstrate intraosseous needle placement and infusion.
 2. Recognize pediatric respiratory compromise - recognizing and differentiating respiratory distress vs respiratory failure
- F. Demonstrate the application of CPAP to a patient
- G. Demonstration how to perform CPR while incorporating the use of a manual defibrillator
- H. Trauma Assessment
- I. Medical Assessment
- J. Review of the following skills:
1. Long bone immobilization
 2. Joint immobilization
 3. Bleeding and Shock management

Example Schedule

Time/hrs	Description
0.5	Welcome, Intro to Class, Review of Objectives
1	Preparatory EMS Systems
1	Public Health Review
8	Anatomy & Physiology of Body Systems
4	Pathophysiology
4	Principles of Pharmacology
4-8	Skills: Med Administration, including IV, IO, SQ, IM
2	Pain Management
2	Patient Assessment
2	Airway Management Review
2	Respiratory Emergencies
2	Skills: CPAP, Nebulizer, Admin of Epi & Mag Sulphate
2	Cardiovascular Emergencies
2	Skills: CPR Review; Code Station Review; 12 Lead setup Review
2	Neurology
2	Abdominal and Gastrointestinal Disorders
2	Immunologic Disorders
1	Infectious Diseases
2	Endocrine Disorders
2	Mental Illness and Behavioral Disorders
2	Toxicological Emergencies
1	Hematologic Disorders
2	Genitourinary and Gynecologic Disorders
4	Medical Patient Assessment Scenarios
12	ACLS
8-16	Trauma Review: <i>may consider doing an Blended ITLS or PHTLS course here or do overview of All Trauma Systems which would only entail 8 hours of class time (see outline)</i>
2	Pediatric Patient
4	Pediatric Medical, Trauma and Cardiac Arrest Assessment Scenarios
1.5	Geriatrics Patient
2	Patient with Special Challenges
8	Skills Review- NREMT testing station review
94-106	Total estimated hours for the course, depending on the level of training of the EMT 3. If the EMT 3 has some 670 expanded scope training, this may take less time.
Optional:	As needed – depending on the EMT 3
8	12- Lead course
12	PALs Course

Example Equipment List- 10 students

Qty	Description
2	Nasal Airway Kits
2	Oral Airway Kits
2	Adult BVM
2	Child/invant BVM
2	Suction Units
2	O2 cannisters with regulators
2	Adult Airway Management Manikins
2	Pedi Airway Management Manikins (ALS Baby Manikin w IO preferred)
2	CPAP Masks
2	I-Gel or other Supraglottic Airway sets (King LT or Combitube Trainers)
2	Monitor/Defibrillator with Electrodes / Cables
2	Arrhythmia Generators, could be part of an ALS Simulation Manikin
2	ALS Manikins
1	ALS Junior Manikins
1	ALS Baby Manikin
2	IO Systems (ie EZ IO)
2	Blankets
2	Blood pressure cuffs
2	Splint Kit (misc long bone splints)
2	Bandaging Kit (misc gauge, dressings & tape)
	Disposable Supplies
	Gloves
	Alcohol Prep Pads
	Tape and/or Tegederm
	2x2s
	Chux Sheets
	IV Cateters
	Normal Saline
	IV Tubing Sets
	10 cc Preload w NS Syringes
	Blunt Cannula Tips
	Saline Locks/ Ext Sets
	Band aids
	Tourniquets
	3-way stop cocks
	IO needles
	ECG Electrodes
	Face Shields
	Disposable Stethoscopes
	Sharps Container
	Biohazard bags/disposal container
	Med Box with following Medications:
	AEMT Medications
	Adenosine
	Benzodiazepines
	Ativan (Lorazepam)

	Valium)(Diazepam
	Versed (Midazoam)
	Ketamine
	Magnesium Sulfate
	Epinephrine 1mg/ml (1:1,000)
	The Following are EMT-2/-3 Meds <i>(Review Only if needed not part of NAEMT curriculum)</i>
	Narcan (EMT-2)
	*TXA (Tranexamic Acid) (EMT-2)
	*Diphenhydramine (EMT-2)
	Glucagon (EMT-2)
	Nitrous Oxide (EMT-2)
	*Ondasetron (Zofran) (EMT-2)
	*Antiarrhythmic (EMT-3)
	Amiodarone
	Lidocaine
	*Atropine (EMT-3)
	*Fentanyl (EMT-3)
	*Morphine Sulfate (EMT-3)
	*Epinephrine 0.1mg/ml(1:10,000) (EMT-3)
	Med Administrations supplies:
	Various sizes syringes and needles
	ampules
	Preloaded syringes
	Mucosal Atomization Device (MAD)
	Nebulizer
	Filtered needles
	AEMT Testing Equipment list may be found at the NREMT website (nremt.org)