

Module 6:
Medical/Behavioral

OBJECTIVES

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

COGNITIVE OBJECTIVE

- 6-1 State which medications the EMT-Basic may assist the patient with administering.
- 6-2 Discuss the forms in which the medications may be found.
- 6-3 List the signs and symptoms of difficulty breathing
- 6-4 Describe the emergency medical care of the patient with breathing difficulty.
- 6-5 Recognize the need for medical direction to assist in the emergency medical care of the patient with breathing difficulty.
- 6-6 State the generic name, medication forms, dose, administration, action, indications and contraindications for the prescribed inhaler.
- 6-7 Describe the emergency medical care of the patient experiencing chest pain/discomfort.
- 6-8 Discuss the position of comfort for patients with various cardiac emergencies.
- 6-9 Recognize the need for medical direction of protocols to assist in the emergency medical care of the patient with chest pain.
- 6-10 List the indications for the use of nitroglycerin.
- 6-11 Describe the structure and function of the cardiovascular system.
- 6-12 State the contraindications and side effects for the use of nitroglycerin.
- 6-13 Discuss the circumstances which may result in inappropriate shocks.
- 6-14 Explain the considerations for interruption of CPR, when using the automated external defibrillator.
- 6-15 List the steps in the operation of the automated external defibrillator.
- 6-16 Discuss the need to complete the Automated Defibrillator: Operator's Shift Checklist.
- 6-17 Explain the role medical direction plays in the use of automated external defibrillation.
- 6-18 Define a Cerebrovascular Accident (CVA)
- 6-19 List the signs and symptoms of a CVA
- 6-20 Describe the emergency care of a person experiencing a CVA
- 6-21 List causes of Altered Mental Status
- 6-22 Describe the general steps for emergency care of a patient with altered mental status.
- 6-23 State the steps in the emergency medical care of the patient taking diabetic medicine with an altered mental status and a history of diabetes.
- 6-24 Evaluate the need for medical direction in the emergency medical care of the diabetic patient.
- 6-25 Define seizures.
- 6-26 Identify possible causes of a seizure.
- 6-27 State the emergency care of a seizure.
- 6-28 Recognize the patient experiencing an allergic reaction.
- 6-29 Describe the emergency medical care of the patient with an allergic reaction.
- 6-30 State the generic and trade names, medication forms, dose, administration, action, and contraindications for the epinephrine auto-injector.

- 6-31 Evaluate the need for medical direction in the emergency medical care of the patient with an allergic reaction.
- 6-32 Differentiate between the general category of those patients having an allergic reaction and those patients having an allergic reaction and requiring immediate medical care, including immediate use of epinephrine auto-injector.
- 6-33 List various ways that poisons enter the body.
- 6-34 List signs/symptoms associated with poisoning.
- 6-35 Describe the steps in the emergency medical care for the patient with suspected poisoning.
- 6-36 Discuss the emergency medical care for the patient with possible overdose.
- 6-37 State the generic and trade names, indications, contraindications, medication form, dose, administration, actions, side effects and reassessment strategies for activated charcoal.
- 6-38 Describe the various ways that the body loses heat
- 6-39 List the signs and symptoms of exposure to cold.
- 6-40 Explain the steps in providing emergency medical care to a patient exposed to cold.
- 6-41 List the signs and symptoms of exposure to heat
- 6-42 Explain the steps in providing emergency care to a patient exposed to heat.
- 6-43 Discuss the characteristics of an individual's behavior which suggests that the patient is at risk for suicide.
- 6-44 Discuss the special considerations for assessing a patient with behavioral problems.
- 6-45 Discuss the general principles of an individual's behavior which suggests that he is at risk for violence.
- 6-46 Discuss methods to calm behavioral emergency patients.

AFFECTIVE OBJECTIVES

- 6-47 Defend the rationale for the EMT-Basic to carry and assist with medications.
- 6-48 Explain the rationale for administering nitroglycerin to a patient with chest pain or discomfort.
- 6-49 Explain the rationale for administering activated charcoal.
- 6-50 Recognize and respond to the feelings of the patient who may require interventions to be performed.

PSYCHOMOTOR OBJECTIVES

- 6-51 Given medical scenarios, demonstrate the ability to properly assess the patient and demonstrate the ability to properly utilize the intervention to include inhaler, nitroglycerin, oral glucose and activated charcoal.
- 6-52 Demonstrate the use of an epinephrine auto-injector.
- 6-53 Given a cardiac arrest scenario, demonstrate the use of the AED.
- 6-54 Perform the necessary steps required to provide a patient with activated charcoal.
- 6-55 Demonstrate proper disposal of the equipment used for the administration of activated charcoal.

PREPARATION

Motivation: Many of the emergencies that an EMT-Basic responds to will be of a medical nature. The ability to recognize a medical emergency through proper assessment and questioning techniques and then providing the appropriate intervention is critical to the well-being of the patient.

MATERIALS

AV Equipment: Utilize various audio-visual materials relating to general pharmacology medical emergencies. The continuous design and development of new audio-visual materials relating to EMS requires careful review to determine which best meets the needs of the program. Materials should be edited to assure meeting the objectives of the curriculum.

EMS Equipment: Exam gloves, stethoscope, blood pressure cuff, penlight, suction equipment, tube of oral glucose, epinephrine auto-injector trainer, hand held inhaler suitable for training purposes, defibrillator manikins, automated external defibrillator, nitroglycerin training bottle, activated charcoal.

PERSONNEL

Primary Instructor: An EMT-Basic instructor who is knowledgeable in the assessment and intervention of common medical conditions.

Assistant Instructor: The instructor to student ratio should be adequate to allow for supervision of psychomotor skill practice. Individuals used as assistant instructors should be knowledgeable in general pharmacology as well as assessment and management of the medical patient.

PRESENTATION

Declarative (What)

1. General Pharmacology
 1. Overview - the importance of medications and the dangers associated with their administration
 2. Medications (carried on the EMS unit)
 1. Activated Charcoal
 2. Oral Glucose
 3. Oxygen
 3. Medications (prescribed by a physician and the patient has them in his possession; they are not carried on the EMS unit). May assist patients in taking, with approval by medical direction).
 1. Prescribed Inhaler
 2. Nitroglycerin
 3. Epinephrine auto-injector
 4. Medication names
 1. Generic
 1. The name listed in the U.S. Pharmacopeia, a governmental publication listing all drugs in the U.S.
 2. Name assigned to drug before it becomes officially listed. Usually a simple form of the chemical name
 3. Give examples
 2. Trade
 1. Brand name is the name a manufacturer uses in marketing the drug
 2. Give examples
 5. Indications - the indication for a drug's use includes the most common uses of the drug in treating a specific illness
 6. Contraindications - situations in which a drug should not be used because it may cause harm to the patient or offer no effect in improving the patient's condition or illness
 7. Medication Form
 1. Medications the EMT-Basic carries or helps administer
 1. Compressed powders or tablets - nitroglycerin
 2. Liquids for injection - epinephrine
 3. Gels - glucose
 4. Suspensions - activated charcoal
 5. Fine powder for inhalation - prescribed inhaler
 6. Gasses - oxygen

7. Sublingual spray - nitroglycerin
8. Liquid/vaporized fixed dose nebulizers
2. Each drug is in a specific medication form to allow properly controlled concentrations of the drug to enter into the blood stream where it has an effect on the target body system.
8. Dose - state how much of the medication should be given
9. Administration - state route by which the medication is administered such as oral, sublingual (below the tongue), injectable, or intramuscular
10. Actions - state desired effects of a medication
11. Side Effects - state any actions of a medication other than those desired. Some side effects may be predictable
12. Re-assessment strategies
 1. Repeat vital signs
 2. Must be done as part of the on-going patient assessment
 3. Documentation of response to intervention
2. Breathing Difficulty
 1. Signs and symptoms
 1. Shortness of breath
 2. Restlessness
 3. Increased pulse rate
 4. Increased breathing rate
 5. Decreased breathing rate
 6. Skin color changes
 1. Cyanotic (blue-gray)
 2. Pale
 3. Flushed (red)
 7. Noisy breathing
 1. Crowing
 2. Audible wheezing
 3. Gurgling
 4. Snoring
 5. Stridor
 - (1) A harsh sound heard during breathing
 - (2) Upper airway obstruction
 8. Silent Chest - may be found in Asthma in children & adults
 9. Inability to speak due to breathing efforts.
 10. Retractions (the visible sinking-in of the soft tissues of the chest between the ribs and above and below the sternum)
 11. Shallow or slow breathing may lead to altered mental status (with fatigue or obstruction).
 12. Abdominal breathing (diaphragm only)
 13. Coughing

14. Irregular breathing rhythm
 15. Patient position
 1. Tripod position
 2. Sitting with feet dangling, leaning forward
 16. Unusual anatomy (barrel chest)
2. Emergency Medical Care - Focused History and Physical Exam
1. Important questions to ask
 1. **O**nset
 2. **P**rovocation
 3. **Q**uality
 4. **R**adiation
 5. **S**everity
 6. **T**ime
 7. **I**nterventions
 2. Breathing
 1. Complains of trouble breathing.
 - (1) Apply oxygen if not already done.
 - (2) Assess baseline vital signs.
 2. Has a prescribed inhaler available.
 - (1) Consult medical direction.
 - (2) Facilitate administration of inhaler
 - (3) Repeat as indicated.
 - (4) Continue focused assessment.
 3. Does not have prescribed inhaler - continue with focused assessment.
 4. Should be prepared to intervene with appropriate oxygen administration and artificial ventilation support.
3. Medications
1. Prescribed inhaler

NOTE: Only Bronchodilators listed below and authorized by the REMAC may be administered. DO NOT ADMINISTER A STEROID BASED INHALER.

 1. Medication name
 - (1) Generic - albuterol, isoetharine, metaproterenol, etc.
 - (2) Trade - Proventil®, Ventolin®, Bronkosol® , Bronkometer®, Alupent®, Metaprel®, etc.
 2. Indications - meets all of the following criteria:
 - (1) Exhibits signs and symptoms of respiratory emergency,
 - (2) Has physician prescribed hand held inhaler, and
 - (3) Specific authorization by medical advisory committee.
 3. Contraindications
 - (1) Inability of patient to use device.
 - (2) Inhaler is not prescribed for the patient.
 - (3) No permission from medical direction.

- (4) Patient has already met maximum prescribed dose prior to EMT-Basic arrival.
4. Medication form - hand held metered dose inhaler
5. Dosage - number of inhalations based upon medical direction's order or physician's order based upon consultation with the patient.
6. Administration
 - (1) Obtain order from medical direction either on-line or off-line.
 - (2) Assure right medication, right patient, right route, patient alert enough to use inhaler.
 - (3) Check the expiration date of the inhaler.
 - (4) Check to see if the patient has already taken any doses.
 - (5) Shake the inhaler vigorously several times.
 - (6) Remove oxygen adjunct from patient.
 - (7) Have the patient exhale deeply.
 - (8) Have the patient put his lips around the opening of the inhaler.
 - (9) Have the patient depress the hand held inhaler as he begins to inhale deeply.
 - (10) Instruct the patient to hold his breath for as long as he comfortably can (so medication can be absorbed).
 - (11) Replace oxygen on patient.
 - (12) Allow patient to breath a few times and repeat second dose per medical direction.
 - (13) If patient has a spacer device for use with his inhaler, it should be used. A spacer device is an attachment between inhaler and patient that allows for more effective use of medication.
7. Actions - Beta agonist bronchodilators
 - (1) dilates bronchioles reducing airway resistance.
8. Side effects
 - (1) Increased pulse rate
 - (2) Tremors
 - (3) Nervousness
 - (4) Nausea
9. Re-assessment strategies
 - (1) Gather baseline vital signs and focused reassessment.
 - (2) Patient may deteriorate and need positive pressure artificial ventilation.
10. Infant and child considerations
 - (1) Use of hand held inhalers is very common in children.
 - (2) Retractions are more commonly seen in children than adults.
 - (3) Cyanosis (blue-gray) is a late finding in children.
 - (4) Very frequent coughing may be present rather than

wheezing in some children.

- (5) Emergency care with usage of hand held inhalers is the same if the indications for usage of inhalers is met by the ill child.

3. Review of Circulatory System Anatomy and Physiology

1. Circulatory (Cardiovascular)

1. Heart

1. Structure/function

(1) Atrium

(1) Right - receives blood from the veins of the body and the heart and pumps oxygen-poor blood to the right ventricle.

(2) Left - receives blood from the pulmonary veins (lungs) and pumps oxygen-rich blood to left ventricle.

(2) Ventricle

(1) Right - pumps oxygen-poor blood to the lungs.

(2) Left - pumps oxygen-rich blood to the body.

(3) Valves prevent backflow of blood.

(4) Septum - divides the heart into right and left halves.

2. Cardiac conductive system

(1) Heart is more than a muscle.

(2) Specialized contractile and conductive tissue in the heart

(3) Electrical impulses

2. Arteries

1. Function - carry blood away from the heart to the rest of the body.

2. Major Arteries

(1) Coronary arteries - vessels that supply the heart muscle with oxygenated blood.

(2) Aorta

(1) Major artery originating from the heart and lying in front of the spine in the thoracic and abdominal cavities.

(2) Divides at the level of the navel into the iliac arteries.

(3) Pulmonary

(1) Artery originating at the right ventricle.

(2) Carries oxygen-poor blood to the lungs.

(4) Carotid

(1) Major artery of the neck

(2) Supplies the head with blood.

(3) Pulsations can be palpated on either side of the neck.

(5) Femoral

(1) The major artery of the thigh

- (2) Supplies the groin and the lower extremities with blood.
 - (3) Pulsations can be palpated in the groin area.
 - (6) Radial
 - (1) Major artery of the wrist
 - (2) Pulsations can be palpated at the wrist thumb side.
 - (7) Brachial
 - (1) An major artery of the upper arm
 - (2) Pulsations can be palpated on the inside of the arm between the elbow and the shoulder.
 - (3) Used when determining a blood pressure (BP) using a BP cuff (sphygmomanometer) and a stethoscope.
 - (8) Posterior tibial - pulsations can be palpated on the posterior surface of the medial malleolus.
 - (9) Dorsalis pedis
 - (1) An artery in the foot
 - (2) Pulsations can be palpated on the anterior surface of the foot.
3. Arterioles - the smallest branches of an artery leading to the capillaries.
 4. Capillaries
 1. Tiny blood vessels that connect arterioles to venules.
 2. Found in all parts of the body
 3. Allow for the exchange of nutrients and waste at the cellular level.
 5. Venules - the smallest branches of the veins leading from the capillaries.
 6. Veins
 1. Function - vessels that carry blood back to the heart.
 2. Major veins
 - (1) Pulmonary vein - carries oxygen-rich blood from the lungs to the left atrium.
 - (2) Venae Cavae
 - (1) Superior
 - (2) Inferior
 - (3) Carries oxygen-poor blood back to the right atrium.
 7. Blood
 1. Function
 - (1) Transports oxygen and nutrients to the tissues and transports waste products for elimination.
 - (2) Bleeding control
 - (3) Protection from foreign bodies
 2. Composition
 - (1) Red Blood cells - contain hemoglobin which enables the cells to transport oxygen and carbon dioxide

- (2) White blood cells - fight infection
 - (3) Platelets - contain Fibrin, a protein which is responsible for clotting.
 - (4) Plasma - the fluid component which carries the cells and nutrients to all tissues of the body.
3. Volume
- (1) Depends on a persons size
 - (2) Average volumes by age group
 - (1) adult - 6 liters
 - (2) teen - 4.5 -5.5 liters
 - (3) child - 1.5 -200 liters
 - (4) infant - 300 ml
8. Physiology
1. Cardiac cycle
- (1) Electrical impulse - spreads through the heart muscle causing it to contract.
 - (2) Myocardial contraction - forces blood from the ventricles to:
 - (1) the lungs - from the right ventricle
 - (2) the body - from the left ventricle
2. Pulse
- (1) Left ventricle contracts sending a wave of blood through the arteries.
 - (2) Can be palpated anywhere an artery simultaneously passes near the skin surface and over a bone.
 - (3) Peripheral
 - (1) Radial
 - (2) Brachial
 - (3) Posterior tibial
 - (4) Dorsalis pedis
 - (4) Central
 - (1) Carotid
 - (2) Femoral
3. Blood Pressure
- (1) Systolic - the pressure exerted against the walls of the artery when the left ventricle contracts.
 - (2) Diastolic - the pressure exerted against the walls of the artery when the left ventricle is at rest.
2. Inadequate circulation - Shock (hypoperfusion): A state of profound depression of the vital processes of the body. Characterized by signs and symptoms such as: pale, cyanotic, cool, clammy skin, rapid but weak pulse, rapid and shallow breathing, restlessness, anxiety or mental dullness, nausea and vomiting, reduction in total blood volume, low or decreasing blood pressure and subnormal body temperature.

4. Cardiovascular Emergencies

1. Background

1. Causes

1. Disease - Coronary Artery Disease - a disease process affecting the coronary vessels.
 - (1) Controllable risk factors include: smoking, diet, obesity, sedentary lifestyle, stress, diabetes, hypertension.
 - (1) Uncontrollable risk factors include: age, race, gender, heredity, type "A" personality.
2. Structural defects
3. Harmful substances - poisons, drugs

2. Assessment

1. History of present illness
2. Patient medical history
3. Family history
4. Physical assessment

2. Disorders Affecting the heart

1. Angina Pectoris - Temporary lack of oxygen to the heart muscle

1. Caused by a partial blockage of a coronary vessel which leads to ischemia of the heart muscle.
2. Signs and symptoms may include:
 - (1) Chest pain
 - (2) Difficulty breathing
 - (3) Diaphoresis
 - (4) Nausea

2. Myocardial Infarction - Lack of oxygen to heart muscle leading to tissue death.

1. Caused by a complete blockage of a coronary artery which leads to tissue death.
2. Signs and symptoms may include:
 - (1) Chest pain
 - (2) Epigastric pain
 - (3) Difficulty breathing
 - (4) Diaphoresis
 - (5) Nausea, vomiting
 - (6) Feeling of impending doom
 - (7) Anxiety
 - (8) Abnormal pulse rate / rhythm
 - (9) Abnormal blood pressure

3. Cardiogenic Shock - a type of shock that is the result of a massive myocardial infarction. The heart becomes so badly damaged that it is unable to pump effectively. As a result, blood begins to back up in the system.

1. Signs and symptoms - may include
 - (1) Chest pain (may or may not be present)
 - (1) pressure, squeezing, etc.

- (2) may radiate down the arms or into the jaw or neck
- (2) Epigastric pain
- (3) Dyspnea
- (4) Pulmonary Edema
 - (1) pink, frothy sputum
- (5) Diaphoresis
- (6) Pallor and cyanosis
- (7) Cool skin
- (8) Nausea, vomiting
- (9) Anxiety
- (10) Feeling of impending doom
- (11) Irregular pulse rate / rhythm
- (12) Hypotension
- (13) Cardiac Arrest

5. Cardiac Emergencies

1. Emergency Medical Care - Initial Patient Assessment Review

- 1. Circulation - pulse absent
 - 1. Medical patient > or = 9 years old - CPR with AED
 - 2. Medical patient < 9 years old or < 90 lbs. - CPR
- 2. Responsive patient with a known history - cardiac
 - 1. Perform initial assessment
 - 2. Perform focused history and physical exam
 - 3. Place patient in the position of comfort

2. Cardiac

- 1. Complains of chest pain/discomfort
 - 1. Apply oxygen if not already done
 - 2. Assess baseline vital signs
 - 3. Important questions to ask
 - (1) **O**nset
 - (2) **P**rovocation
 - (3) **Q**uality
 - (4) **R**adiation
 - (5) **S**everity
 - (6) **T**ime
- 4. Patient has been prescribed nitroglycerin (NTG) and nitro is with the patient
 - (1) Blood pressure greater than 120 systolic
 - (1) One dose, repeat in 3-5 minutes if no relief and authorized by medical direction up to a maximum of three doses
 - (2) Reassess vital signs and chest pain after each dose
 - (2) Blood pressure less than 120 systolic - continue with focused assessment

5. Does not have prescribed nitroglycerin (NTG) - continue with focused assessment
3. Relationship to Basic Life Support
 1. Not all chest pain patients become cardiac arrest patients
 2. One Rescuer CPR - rarely done by EMT-Basics while on duty, may be done while partner is preparing equipment, or en route to facility
 3. Two Rescuer CPR - learning outcomes of a Professional Rescuer CPR Course must be enhanced during an EMT-Basic course
6. Automated External Defibrillation
 1. Review requirements for authorization to use an AED
 1. Successful completion of this training course does not authorize an individual to operate an AED.
 2. An operator of an AED must (800.15):
 1. be acting as certified first responder, emergency medical technician or advanced emergency medical technician;
 2. be under medical control
 3. be authorized by, and serving with, an agency providing emergency medical services which has been approved by the regional emergency medical advisory committee (REMAC) to provide AED level care within the EMS system and
 4. complete AED training that meets or exceeds the state minimum AED curriculum.
 2. Cardiology for the Automated External Defibrillation Operator
 1. "Chain of Survival"
 1. Components of the chain
 - (1) Early Access
 - (2) Early CPR
 - (3) Early Defibrillation
 - (4) Early Advanced Life Support care
 2. Importance of early defibrillation
 2. Electrophysiology
 1. Normal electrical rhythm that is converted into mechanical work and produces a pulse that can be felt.
 3. Sudden cardiac death
 1. If the normal rhythm is disturbed, useful work may stop and cardiac arrest results.
 4. What is fibrillation?
 1. Fibrillation
 - (1) A very fast regular rhythm that is referred to as ventricular tachycardia
 - (2) A very fast irregular rhythm. This is referred to as ventricular fibrillation.
 - (3) a and b are shockable by the AED and may be converted to a useful rhythm.

- (4) Other rhythms are non-shockable by the AED.
- 5. What is a Defibrillator?
 - 1. What is an AED?
 - 2. Fully automated
 - 3. Semi-automated - shock advisory
- 6. Treatment of sudden death: back to the basics plus defibrillation
 - (1) Scene control
 - (2) Careful assessment
 - (3) Good CPR
 - (4) Rapid defibrillation
 - (5) Early ACLS
 - (6) Limitations of CPR in the out-of-hospital setting
 - (7) The Dying Heart

Note to Instructors: The protocols to be used by the students are distributed and reviewed. The protocol for the treatment of shockable and non shockable rhythms is to be reviewed. For the treatment protocol. See appendix

- 3. Treatment Protocols -
 - 1. Patient Indications for use
 - 1. Unresponsive
 - 2. Pulseless
 - 3. Apneic
 - 2. Patient Contraindications
 - 1. Pediatric patient

Notes to Instructors: A chalkboard or an erasable white board will be useful. This brief lecture will be followed immediately by several scenarios that present the protocol contingencies that may be encountered in the clinical setting.

- 4. Medical Control; Quality Assurance/Quality Improvement; Out-of-Hospital Do Not Resuscitate (DNR) Orders.
 - 1. Define:
 - 1. "Patient Care Protocols"
 - 2. "Medical Control".
 - 2. Documentation and recordkeeping
 - 1. Voice narration
 - 2. Patient Care Report (PCR)
 - 3. Paper ECG strip if the AED provides one
 - 3. Quality Assurance / Quality Improvement
 - 1. EMS agency quality assurance/ quality improvement case reviews
 - 2. REMAC quality assurance/ quality improvement
 - 4. Contacting the medical director regarding a specific patient.
 - 5. Do Not Resuscitate (DNR) Orders
 - 1. Some patients may have an "out-of-hospital" Do Not Resuscitate (DNR) order. DNR orders, only on a New York State Department of Health prescribed form (DOH-3474), should be honored.

2. Living Wills and Health Care Proxies are not applicable for out-of-hospital emergencies.

Note to Instructors: Distribute the Department of Health Memorandum on DNR Law Changes (series 92-32, date 11/2/92).

5. Orientation to the Automated External Defibrillator, Safety Issues and Demonstration
 1. Instructor displays an AED and describes its parts and support equipment.
Controls should be described in the sequence in which they are used.
 1. Describe the function of all controls on the AED, including event documentation devices
 - (1) On/Off switch location and use.
 - (2) Screen (if unit has one)
 - (3) Battery and battery access
 - (4) Patient cables and electrodes
 - (5) Control Module (if unit has one) - Documentation device or tape recorder
 - (6) Battery charger
 2. Demonstrate proper maintenance of the battery and AED components
 - (1) Battery charger and battery support system components
 - (2) Battery charging requirements
 - (3) Battery capacity and number of shocks that can be delivered
 3. Demonstrate all messages the AED conveys to the operator
 - (1) Analyzing
 - (2) Charging
 - (3) Joule selection
 - (4) Improper lead attachment
 - (5) Other messages
 4. Demonstrate preparation of the AED for use, its after-use care, and daily equipment inspections
 - (1) Preparation before a call
 - (1) Proper storage
 - (2) Battery charging
 - (3) Electrodes and pad availability
 - (4) Control module or documentation device
 - (5) Other Disposable supplies and materials
 - 1) Scissors
 - 2) Razors
 - 3) Disposable gloves
 - 4) Towels (for drying the chest)
 - (2) Patient preparation and use
 - (1) Place electrodes

- (2) Turn unit on
 - (3) Activate documentation device
 - (4) Analyze rhythm
 - (5) Deliver shocks
 - (3) After Use
 - (1) Check equipment condition
 - (2) Replace/recharge battery
 - (3) Replace disposable supplies and materials
 - (4) Complete documentation and recordkeeping
 - (5) Replace cassette tape or event documentation module
 - 5. AED Maintenance
 - (1) Use of the AED operators shift checklist (see appendix)
 - (2) Agency maintenance requirements
 - (3) Authorized factory service maintenance
 - (4) Documentation components
 - (1) Cassette tapes
 - (2) ECG paper (if applicable)
 - (3) Digital or solid-state memory components
 - 6. Demonstrate proper safety techniques
 - (1) Clearing the patient
 - (2) Clearing the stretcher
 - (3) "Dumping" a charge
 - (4) Problems with defibrillation while moving
 - (5) Rain and wet conditions and locations
 - (6) Patient on metal floor or decking
 - (7) Use in explosive atmosphere
6. Demonstration of Automated Defibrillation Protocol
1. Present a demonstration of actual defibrillations that follow the approved protocols.
 2. Scenarios should include:
 1. The rhythm is shockable; the patient receives one shock and regains a pulse.
 2. The rhythm is shockable; the patient receives two shocks and does not regain a pulse.
 3. The patient receives two shocks and the rhythm becomes non-shockable.
 4. The rhythm is shockable; the patient receives three shocks and regains a pulse.
 5. The rhythm is shockable; the patient receives three shocks and does not regain a pulse.
 6. The rhythm is a non-shockable rhythm; the patient receives no shocks.
 7. The patient is conscious then arrests during transport to the hospital.
 8. ALS intercept arrives on the scene after the first shock.

9. Patient who regains a pulse but does not resume respirations
3. Demonstrate the use of an AED - Simulate the arrival of a two person response team.
 1. When demonstrating this procedure, the manikin is on the floor.
 2. On arrival at the scene:
 - (1) One rescuer assumes responsibility for the patient and operates the AED.
 - (2) The other rescuer begins BLS (CPR).
 - (3) Stress the importance of deciding these roles before arrival at the scene.
 3. CPR
 - (1) Establish unresponsiveness; request ALS intercept.
 - (2) Position the victim; open the airway.
 - (3) Establish breathlessness.
 - (4) Give two full ventilations with bag-valve mask or pocket mask.

Note to Instructors: If a foreign body airway obstruction is identified, the airway must be cleared before proceeding any further.

- (5) Establish pulselessness.
- (6) Announce "cardiac arrest-start defibrillation protocol," and begin CPR.
4. Ventilations must be performed with ongoing CPR chest compressions.
5. Stress that the AED is only put on an unresponsive, breathless and pulseless patient.
6. Use a simulator to produce an appropriate rhythm.
7. Place AED near the left side of the patient's head.
 - (1) Better access to the AED controls and placement of the defibrillation pads on the chest are achieved with the AED and the AED operator positioned at the patient's left side.
 - (2) However, this may not be possible in all clinical situations. Discuss alternatives.
8. Attach patient cables to the AED.
9. Open defibrillation adhesive pads.
10. Attach patient cables to defibrillation pads (for simulations, the patient cables may need to be attached to the connections of a simulator.)
11. Attach defibrillation pads to the proper locations on the patient (manikin).
 - (1) White, or sternum, pads are attached to the right border of the sternum with the top edge just touching the bottom of the clavicle,
 - (2) Red, or apex, pads are attached to the left lower ribs at the anterior axillary line.

Note to Instructors: Demonstrate how the person performing CPR must briefly move his or her hands to achieve proper pad placement.

12. Turn on "power."
 - (1) Make certain that the tape recorder is running (if applicable).
 - (2) Demonstrate the "no contact" signal from improper placement of the pads.

Note to Instructors: The AED operator is responsible for directing the medical treatment of the patient. The AED operator is also responsible to ensure that adequate CPR is performed.

13. Begin verbal report. The rescuer should:
 - (1) Identify herself or himself and the responding emergency unit.
 - (2) Briefly describe the clinical situation.
 - (3) Report each step while proceeding through the protocol.
 - (4) State whether shocks are delivered.
 - (5) Continue to provide explanatory comments on actions, decisions to transport, and problems encountered.
 - (6) Emphasize the importance of accurate and adequate verbal and written documentation.

Note to Instructors: Be prepared to provide several examples of verbal reports. Verbal reports can be too short, resulting in insufficient information being provided, or too long, resulting in distraction from the performance of the defibrillation protocols. Be aware that everything said in the vicinity of the AED will also be recorded.

14. If in a moving ambulance, tell driver to stop the vehicle in a safe location.

Note to Instructors: AED assessment should not take place in a moving ambulance. Movement of the patient during this time can interfere with rhythm analysis.

15. Tell CPR technician to stop CPR and for everyone to "clear" the patient.
16. Analyze the patient's rhythm.
 - (1) State loudly, "Everybody clear the patient!"
 - (2) Verify that everyone is clear of the patient. Everyone must remain clear of the patient while assessment is in progress.
 - (3) Press the "analyze" control of the AED.
 - (4) Takes 10 to 20 seconds depending on the manufacturer.
 - (5) Operator counts to 20 out loud slowly, during the assessment period.

- (6) If by the count of 20 the device has not indicated that a shock is advised, resume CPR.

Note to Instructors: The AED indicates that charging is under way with a tone, voice-synthesized message, or light indicators.

17. If a "shock indicated" message is presented, repeat the "clear the patient" command
 - (1) Once charging begins, the operator can assume that a shockable rhythm is present and that the device will indicate the need to deliver a shock.
 - (2) Visually check to make certain that everyone (including yourself) is clear from every part of the patient.
 - (3) In particular, check the person who was performing chest compressions and ventilation.
 - (4) Clear the stretcher
18. Press the "shock" control.
 - (1) Fully automated AEDs deliver shocks without additional actions from the operator.
 - (2) For shock-advisory devices, a message such as "shock advised," "shock now," or "shock indicated" will be presented to the operator from either a liquid crystal display or a voice synthesizer.
 - (3) Defibrillation should not be performed in a moving ambulance.
 - (4) Three (3) consecutive shocks will be delivered without interruption if the rhythm continues to be shockable.
19. The first defibrillation should be performed within 90 seconds of the AED reaching the patient.
20. Repeat analyze (step #16) and shock (step #17) to a maximum of three (3) shocks. Increase the energy level to 360 J for the third shock if not done automatically by the AED.
21. If "no shock indicated" message is received or three (3) shocks have been delivered, check the pulse.
22. If there is no pulse present, resume CPR for one (1) minute
23. Reanalyze
24. Repeat three (3) shocks if indicated.
25. If "no shock indicated" message is received or three (3) shocks have been delivered, check the pulse.
26. Reanalyze.
27. A maximum of six (6) shocks or three (3) "No Shock Indicated" are permitted at this time.
28. Support the patient with oxygen, if available.
29. Transport.

7. Additional Notes on AED usage:
 1. The high priority of defibrillation.
 1. No other therapeutic intervention should take precedence over, or be routinely performed, before defibrillation. These include:
 - (1) Setting up oxygen delivery systems
 - (2) Suction equipment
 - (3) Advanced airway procedures
 - (4) Intravenous lines
 - (5) Mechanical CPR devices
 2. The above listed interventions should proceed simultaneously whenever possible. This means that the AED operator concentrates on operation of the AED while the CPR provider attends to the airway and chest compressions. Additional providers may initiate the interventions described above.
 3. Emphasize that defibrillation can not proceed in the presence of an obstructed airway. If necessary, foreign-body obstructed airway management must be performed, and an open airway established before attaching the AED to the patient.
 4. Emphasize that three consecutive shocks will be delivered without interruption if the rhythm continues to be shockable. If a “no shock” message is received or three shocks have been delivered, the pulse is checked. In the absence of a pulse CPR is performed for one minute. This is followed by analysis. Pulse checks are not performed after shocks 1, 2, 4, and 5, unless “no shock indicated” message is received. This is considered an acceptable exception to the ACLS recommendations for ventricular fibrillation. A pulse check is not considered necessary at these times because the patient has already been confirmed to be in cardiac arrest and a palpable pulse almost never returns immediately after the initial shocks.
 5. Protocols may vary if ventricular fibrillation persists after the first six shocks. The AHA Task Force on Defibrillation recommends that, in general, protocols should direct the AED operator to continue delivering sets of three stacked shocks separated by 1 minute of CPR until shocks are no longer indicated. If transport times to ALS are short (<10 minutes), then it is reasonable to stop defibrillation after a specified number of shocks, for example, six shocks, and transport the patient as rapidly as possible.
 6. After three (3) “no shock indicated” messages are given, repeat analysis every 1 to 2 minutes and if a shockable rhythm recurs after transiently converting, restart the treatment algorithm from the beginning.
 1. Note that some AEDs may be programmed to deliver all shocks after the first one or two at 360 J rather than restart at 200 J, this is acceptable.
 7. Review post-shock care of the cardiac arrest patient who regains spontaneous circulation.

8. When to interrupt or stop CPR:
 9. Airway maintenance adjuncts and when to use each one in the protocol
 10. Preparation of the patient for transport.
 11. Rhythm analysis and defibrillation should not be done in a moving vehicle.
 12. Discuss the proper response and procedures for an unsuccessful resuscitation.
 13. Defibrillator maintenance checklist for AEDs.
 1. Provide and review AED maintenance checklist.
 14. Requirements for skills maintenance.
 1. Agency Medical Director requirements
 2. REMAC requirements
 3. Agency training records
8. Troubleshooting, Safety and Special Situations
1. Discuss appropriate responses to the following possibilities:
 1. Patient has electrode contact problems.
 - (1) Diaphoretic patients must be dried with the gauze pads carried in the AED pack or with a suitable wipe.
 - (2) Excess hair on the chest under the pads must be removed prior to defibrillation.
 - (3) Automated external defibrillation operators must have extra adhesive pads.
 2. Nitroglycerin patches or paste on the chest. Place the defibrillation pads away from these patches and remove any paste with gauze pad or similar wipe.
 3. A pacemaker or automatic defibrillator/cardioverter implanted in the patient's skin. Place the defibrillator pad approximately 5 inches from this site.
 4. Uncontrolled scene.
 5. Hazards such as water, swimming pools, bathtubs, or the patient being on a metal surface.
 6. "Disarming" / "Dumping" the defibrillator charge.
 - (1) Different AEDs do this in different ways.
 - (2) Explain the various methods.
 - (3) Caution students not to turn the device off if possible, as this action may interfere with proper documentation of the call.
 7. Overzealous bystanders.
 - (1) Be especially careful with bystanders who have been helping with CPR. They may not be familiar with defibrillation procedures. Be sure that those in contact with the stretcher know when you are using the AED.
9. Medications
1. Nitroglycerin

1. Medication name
 - (1) Generic - nitroglycerin
 - (2) Trade - Nitro-bid, Nitro-stat
2. Indications - must have all of the following criteria
 - (1) Exhibits signs and symptoms of chest pain
 - (2) Has physician prescribed sublingual tablets
 - (3) Has specific authorization by medical direction
3. Contraindications
 - (1) Clinical indicators or Hypotension or blood pressure below 120 mmHg systolic
 - (2) Head injury
 - (3) Infants and children
 - (4) Patient has already met his/her maximum prescribed dose prior to EMT-Basic arrival
4. Medication form - tablet, sublingual spray
5. Dosage - one dose, repeat in 3-5 minutes if no relief, BP > 120, and authorized by medical direction up to a maximum of three doses.
6. Administration
 - (1) Obtain order from medical direction either on-line or off-line
 - (2) Perform focused assessment for cardiac patient
 - (3) Take blood pressure - proceed if above 120 mmHg systolic, see item #10 if <120 mmHg systolic.
 - (4) Contact medical control if no standing orders
 - (5) Assure right medication, right patient, right route, patient alert.
 - (6) Check expiration date of nitroglycerin
 - (7) Question patient on last dose administration, effects, and assures understanding of route of administration
 - (8) Ask patient to lift tongue and place tablet or spray dose under tongue (while wearing gloves) or have patient place tablet or spray under tongue
 - (9) Have patient keep mouth closed with tablet under tongue (without swallowing) until dissolved and absorbed.
 - (10) Recheck blood pressure within 2 minutes
 - (11) Record activity and time
 - (12) Perform reassessment
7. Actions
 - (1) Relaxes blood vessels
 - (2) Decreases workload of heart
8. Side effects
 - (1) Hypotension
 - (2) Headache
 - (3) Pulse rate changes
9. Reassessment strategies
 - (1) Monitor blood pressure

- (2) Ask patient about effect on pain relief
 - (3) Seek medical direction before re-administering
 - (4) Record reassessments
7. Disorders affecting the brain
1. Cerebrovascular Accident (Stroke)
 1. A sudden interruption of blood flow to a portion of the brain that results in tissue death.
 2. Signs and symptoms may include:
 1. Severe headache
 2. Lack of speech
 3. Difficulty swallowing
 4. Facial droop
 5. Unequal pupil size
 6. Paralysis / tingling Sensation
 7. Incontinence
 8. Bounding pulse
 9. Hypertension
 10. Altered mental status / coma
 3. Emergency medical care
 1. Perform initial assessment
 2. Perform focused history and physical exam
 3. Place patient in position of comfort or coma position
 4. Apply oxygen (high concentration)
 5. Assist ventilations as necessary
 6. Suction the airway as necessary
 7. Assess vital signs
 8. Monitor neurologic status frequently
8. Emergency Medical Care of a patient with an Altered Mental Status
1. Caused by a variety of conditions
 1. Hypoglycemia
 2. Hyperglycemia
 3. Poisoning
 4. Post seizure
 5. Infection
 6. Head trauma
 7. Decreased oxygen levels
 2. Emergency medical care
 1. Assure patency of airway.
 2. Be prepared to artificially ventilate/suction.
 3. Transport.
 4. Consider trauma, trauma can cause altered mental status
9. Emergency medical care of altered mental status with a history of diabetes
1. Perform initial assessment
 2. Perform history and physical exam

1. Facts surrounding the episode
 2. Onset
 3. Duration
 4. Associated symptoms
 5. Evidence of trauma
 6. Interventions
 7. Seizures
 8. Fever
3. Performs baseline vital signs and SAMPLE history
 4. Assure known history of diabetes (medical identification tags), etc.
 5. Determine last meal, last medication dose, any related illness
 6. Determine if patient can swallow
 7. Administer oral glucose in accordance with local medical direction or protocol
 8. Medication
 1. Oral Glucose
 1. Medication Name
 - (1) Generic - Glucose, Oral
 - (2) Trade - Glucose®, Insta-glucose®
 2. Indications - patients with altered mental status with a known history of diabetes controlled by medication
 3. Contraindications
 - (1) Unresponsive
 - (2) Unable to swallow
 4. Medication form - Gel, in toothpaste type tubes
 5. Dosage - one tube
 6. Administration
 - (1) Obtain order from medical direction either on-line or off-line
 - (2) Assure signs and symptoms of altered mental status with a known history of diabetes
 - (3) Assure patient is conscious and can swallow and protect their airway
 - (4) Administer glucose
 - (1) Between cheek and gum
 - (2) Place on tongue depressor between cheek and gum
 - (5) Perform ongoing assessment
 7. Actions - increases blood sugar
 8. Side effects - none when given properly. May be aspirated by the patient without a gag reflex
 9. Administer oxygen

10. Re-assessment strategies - if patient loses consciousness or seizes, remove tongue depressor from mouth

10. Seizures-

Seizures are a sudden change in sensation, behavior or movement, usually related to brain malfunction that can be the result of disease infection or injury to brain tissue. The more severe form of seizures are characterized by violent muscle contractions called convulsions. Epilepsy is a medical disorder characterized by episodic or sudden onset attacks of unconsciousness, with or without convulsions. Status epilepticus occurs when the patient has two or more convulsive seizures without regaining full consciousness.

1. Chronic Seizures Disorders in children are rarely life-threatening. Seizures of unknown origin, however, including febrile, should be considered life-threatening by the EMT.
2. May be brief or prolonged.
3. Caused by fever, infection, poisoning, hypoglycemia, trauma, decreased levels of oxygen or could be idiopathic in children.
4. Emergency medical care
 1. Assure patency of airway
 2. Position patient on side if no possibility of cervical spine trauma.
 3. Protect patient from injury.
 4. If cyanotic, assure airway and artificially ventilate.
 5. Transport.
 1. Although brief seizures are not harmful, there may be a more dangerous underlying condition.
 2. Rule out trauma, head injury can cause seizures.

11. Allergic reactions (Anaphylactic)

1. Patient has come in contact with substance that caused past allergic reaction and complains of respiratory distress or exhibits signs and symptoms of shock/hypoperfusion (anaphylactic shock)
2. Assessment findings may include:
 1. Skin
 1. Patient may state he has a warm tingling feeling in the face, mouth, chest, feet and hands.
 2. Itching
 3. Hives
 4. Flushed skin
 5. Swelling to face, neck, hands, feet and/or tongue
 2. Respiratory system
 1. Patient may state he feels a tightness in his throat/chest.
 2. Cough
 3. Rapid breathing
 4. Labored breathing

5. Noisy breathing
 - (1) Stridor
 - (2) Wheezing
 6. Hoarseness
 3. Cardiac
 1. Increased heart rate
 2. Decreased blood pressure
 4. Generalized findings
 1. Itchy, watery eyes
 2. Headache
 3. Sense of impending doom
 4. Runny nose
 5. Decreasing mental status
 6. Assessment findings that reveal shock/hypoperfusion (anaphylactic shock) or respiratory distress indicate the presence of a severe allergic reaction.
3. Emergency medical care of allergic reactions
 1. Perform initial assessment
 2. Perform a focused history and physical exam
 1. History of allergies
 2. What was the patient exposed to
 3. How were they exposed
 4. What effects
 5. Time of onset
 6. Progression
 7. Interventions
 3. Assess baseline vital signs and **SAMPLE** history
 4. Administer oxygen if not already done in the initial assessment
 5. Contact medical direction
 6. Determine if patient has prescribed preloaded epinephrine available. Facilitate administration of preloaded epinephrine
 7. Record and reassess in two minutes
 8. Record reassessment findings
 9. If patient does not have epinephrine auto-injector available - transport immediately
 4. Patient has contact with substance that causes allergic reaction without signs of respiratory distress or shock/hypoperfusion (anaphylactic shock)
 1. Continue with focused assessment
 2. Patient not wheezing or without signs of respiratory distress or hypotension should not receive epinephrine
 5. Relationship to Airway Management
 1. These patients may initially present with airway/respiratory distress, or may develop as the allergic reaction progresses.
 2. The airway should be managed according to the principles identified in the airway management lesson presented earlier.

6. Medications

1. Epinephrine auto-injector

1. Medication name

(1) Generic - Epinephrine

(2) Trade - Adrenalin

2. Indications - must meet all of the following three criteria

(1) Emergency medical care for the treatment of the patient exhibiting the assessment findings of an allergic reaction *IE. Respiratory distress and/or wheezing*

(2) Medication is prescribed for this patient by a physician

(3) Medical direction authorizes use for this patient

3. Contraindications - no contraindications when used in a life-threatening situation

4. Medication form - liquid administered via an automatically injectable needle and syringe system

5. Dosage

(1) Adult - one adult auto-injector (0.3 mg)

(2) Infant and child - one infant/child auto-injector (0.15 mg)

6. Administration

(1) Obtain order from medical direction either on-line or off-line

(2) Obtain patient's prescribed auto injector. Ensure:

(1) Prescription is written for the patient experiencing allergic reactions

(2) Medication is not discolored

(3) Remove safety cap from the auto-injector

(4) Place tip of auto-injector against the patient's thigh

(1) Lateral portion of the thigh

(2) Midway between the waist and the knee

(5) Push the injector firmly against the thigh to activate the injector

(6) Hold the injector in place until the medication is injected

(7) Record activity and time

(8) Dispose of injector in biohazard container

7. Actions

(1) Dilates the bronchiole

(2) Constricts blood vessels

8. Side effects

(1) Increases heart rate

(2) Pallor

(3) Dizziness

(4) Chest pain

(5) Headache

- (6) Nausea
 - (7) Vomiting
 - (8) Excitability, anxiousness
 - 9. Transport
 - 10. Re-assessment strategies
 - (1) Continue focused assessment of airway, breathing and circulatory status
 - (1) Decreasing mental status
 - (2) Increasing breathing difficulty
 - (3) Decreasing blood pressure
 - (4) Obtain medical direction
 - 1) Additional dose of epinephrine
 - 2) Treat for shock/hypoperfusion (anaphylactic shock)
 - (5) Prepare to initiate Basic Cardiac Life Support measures:
 - 1) CPR
 - 2) AED
 - 3) ACLS intercept
 - (2) Provide supportive care.
 - (1) Oxygen
 - (2) Treat for shock/hypoperfusion (anaphylactic shock)
 - 1) Decreasing mental status
 - 2. Document all responses to medications
12. Emergency Medical Care of Poisoning/Overdose
 - 1. Important questions to consider asking patient
 - 1. What substance?
 - 2. When did you ingest/become exposed?
 - 3. If an ingestion, how much did you ingest?
 - 4. Over what time period?
 - 5. Patient interventions?
 - 6. How much do you weigh?
 - 2. Ingested
 - 1. Signs and symptoms
 - 1. History of ingestion
 - 2. Nausea
 - 3. Vomiting
 - 4. Diarrhea
 - 5. Altered mental status
 - 6. Abdominal pain
 - 7. Chemical burns around the mouth
 - 8. Different breath odors
 - 2. Emergency medical care
 - 1. Remove pills, tablets or fragments with gloves from patient's mouth, as needed, without injuring oneself.

2. Consult medical direction for administration of activated charcoal
 3. Bring all containers, bottles, labels, etc. of poison agents to receiving facility.
3. Inhaled
1. Signs and symptoms
 1. History of inhalation of toxic substance
 2. Difficulty breathing
 3. Chest pain
 4. Cough
 5. Hoarseness
 6. Dizziness
 7. Headache
 8. Confusion
 9. Seizures
 10. Altered mental status
 2. Emergency medical care
 1. Have trained rescuers remove patient from poisonous environment.
 2. Give oxygen, if not already done in the initial assessment.
 3. Bring all containers, bottles, labels, etc. of poison agents to receiving facility.
4. Toxic injection
1. Signs and symptoms
 1. Weakness
 2. Dizziness
 3. Chills
 4. Fever
 5. Nausea
 6. Vomiting
 2. Emergency medical care
 1. Airway and oxygen.
 2. Be alert for vomiting.
 3. Bring all containers, bottles, labels, etc. of toxic agents to receiving facility.
5. Absorbed
1. Signs and symptoms
 1. History of exposure
 2. Liquid or powder on patient's skin
 3. Burns
 4. Itching
 5. Irritation
 6. Redness
 2. Emergency medical care
 1. Skin - remove contaminated clothing while protecting

oneself from contamination.

2. Powder - brush powder off patient, then continue as for other absorbed poisons.
3. Liquid - irrigate with clean water for at least 20 minutes (and continue en route to facility if possible).
4. Eye - irrigate with clean water away from affected eye for at least 20 minutes and continue en route to facility if possible.

NOTE: Be alert for contact lenses

6. Relationship to Airway Management

1. These patients may initially present with airway/respiratory compromise or airway/respiratory compromise may develop as the allergic reaction progresses.
2. The airway should be managed according to the principles identified in the airway management lesson presented earlier.

13. Environmental Emergencies

1. Important Questions to Ask Patients Exposed to the Environment

1. Source
2. Environment
3. Loss of consciousness
4. Effects
 1. General
 2. Local

2. Exposure to Cold

1. Generalized cold emergency - generalized hypothermia
 1. Predisposing factors
 - (1) Cold environment
 - (1) Immersion
 - (2) Non-immersion
 - (2) Age
 - (1) Very old
 - (2) Very young
 - 1) Infants and young children are small with large surface area.
 - 2) Small muscle mass, so shivering is poor in children and not at all in infants.
 - 3) Less body fat
 - 4) Younger children need help to protect self. Cannot put on or take off clothes.
 - (3) Medical conditions
 - (1) Shock (hypoperfusion)
 - (2) Head injury
 - (3) Burns
 - (4) Generalized infection
 - (5) Injuries to the spinal cord
 - (6) Diabetes and hypoglycemia

- (4) Drugs/poisons
2. Signs and symptoms of generalized hypothermia
 - (1) Environmental conditions of cold exposure
 - (1) Obvious exposure
 - (2) Subtle exposure
 - 1) Ethanol ingestion
 - 2) Underlying illness
 - 3) Overdose/poisoning
 - 4) Major trauma
 - 5) Outdoor resuscitation
 - 6) Ambient temperature decreased (e.g. home of elderly patient)
 - (2) Cool/cold skin temperature - the EMT-Basic should place the back of his hand between the clothing and the patient's abdomen to assess the general temperature of the patient. The patient experiencing a generalized cold emergency will present with cool abdominal skin temperature.
 - (3) Decreasing mental status or motor function - correlates with the degree of hypothermia.
 - (1) Poor coordination
 - (2) Memory disturbances
 - (3) Reduced or loss of sensation - to touch
 - (4) Mood changes
 - (5) Less communicative
 - (6) Dizziness
 - (7) Speech difficulty
 - (4) Stiff or rigid posture
 - (5) Muscular rigidity
 - (6) Shivering may be present or absent.
 - (7) Breathing variations
 - (1) Early - rapid breathing
 - (2) Late - shallow, slow or even absent breathing
 - (8) Slowly responding pupils
 - (9) Pulse
 - (1) Early - rapid
 - (2) Late - slow and barely palpable and/or irregular, or completely absent
 - (10) Low to absent blood pressure
 - (11) Poor judgement - patient may actually remove clothing.
 - (12) Complaints of joint/muscle stiffness.
 - (13) Skin
 - (1) Red - early
 - (2) Pale
 - (3) Cyanotic
 - (4) Stiff/hard
3. Emergency medical care for generalized hypothermia

- (1) Remove the patient from the environment - protect the patient from further heat loss.
 - (2) Remove wet clothing and cover with blanket.
 - (3) Handle the patient extremely gently. Avoid rough handling.
 - (4) Do not allow the patient to walk or exert himself.
 - (5) Administer oxygen if not already done as part of the initial assessment - oxygen administered should be warmed and humidified, if possible.
 - (6) Assess pulses for 30-45 seconds before starting CPR.
 - (7) If the patient is alert and responding appropriately, actively rewarm.
 - (1) Warm blankets
 - (2) Heat packs or hot water bottles to the groin, axillary and cervical regions.
 - (3) Turn the heat up high in the patient compartment of the ambulance.
 - (8) If the patient is unresponsive or not responding appropriately, rewarm passively:
 - (1) Warm blankets
 - (2) Turn the heat up high in the patient compartment of the ambulance.
 - (9) Do not allow the patient to eat or drink stimulants.
 - (10) Do not massage extremities.
 - (11) Be prepared for cardiac arrest, have the defibrillator nearby
2. Local cold injuries - localized to specific area of body
1. Predisposing factors
 2. Tend to occur on the extremities and exposed ears, nose, and face.
 3. Signs and symptoms of local cold injuries
 - (1) Local injury with clear demarcation.
 - (2) Early or superficial injury
 - (1) Blanching of the skin - palpation of the skin in which normal color does not return.
 - (2) Loss of feeling and sensation in the injured area.
 - (3) Skin remains soft.
 - (4) If rewarmed, tingling sensation
 - (3) Late or deep injury
 - (1) White, waxy skin
 - (2) Firm to frozen feeling upon palpation
 - (3) Swelling may be present.
 - (4) Blisters may be present.
 - (5) If thawed or partially thawed, the skin may appear flushed with areas of purple and blanching or mottled and cyanotic.

4. Emergency medical care for local cold injuries
 - (1) Remove the patient from the environment.
 - (2) Protect the cold injured extremity from further injury.
 - (3) Administer oxygen if not already done as part of the initial assessment.
 - (4) Remove wet or restrictive clothing.
 - (5) If early or superficial injury
 - (1) Splint extremity.
 - (2) Cover the extremity.
 - (3) Do not rub or massage.
 - (4) Do not re-expose to the cold.
 - (6) If late or deep cold injury
 - (1) Remove jewelry.
 - (2) Cover with dry clothing or dressings.
 - (3) Do not:
 - 1) Break blisters
 - 2) Rub or massage area
 - 3) Apply heat
 - 4) Rewarm
 - 5) Allow the patient to walk on the affected extremity
 - (7) When an extremely long or delayed transport is inevitable, then active rapid rewarming should be done.
 - (1) Immerse the affected part in warm water bath.
 - (2) Ensure the water does not cool from the affected part.
 - (3) Continuously stir water.
 - (4) Continue until the part is soft and color and sensation return.
 - (5) Dress the area with dry sterile dressings. If hand or foot, place dry sterile dressings between fingers or toes.
 - (6) Protect against refreezing the warmed part.
 - (7) Expect the patient to complain of severe pain.

3. Exposure to Heat
 1. Predisposing factors
 1. Climate
 - (1) High ambient temperature reduces the body's ability to lose heat by radiation.
 - (2) High relative humidity reduces the body's ability to lose heat through evaporation.
 2. Exercise and activity
 - (1) Can lose more than 1 liter of sweat per hour.
 - (2) Loss of electrolytes (sodium, chloride and fluid through sweat).
 3. Age

- (1) Elderly
 - (1) Poor thermoregulation
 - (2) Medications
 - (3) Lack mobility - can not escape hot environment.
 - (2) Newborn/infants
 - (1) Poor thermoregulation
 - (2) Cannot remove own clothing
 - 4. Pre-existing illness and/or conditions
 - (1) Heart disease
 - (2) Dehydration
 - (3) Obesity
 - (4) Fever
 - (5) Fatigue
 - (6) Diabetes
 - 5. Drugs/medications
- 2. Signs and symptoms
 - 1. Muscular cramps
 - 2. Weakness or exhaustion
 - 3. Dizziness or faintness
 - 4. Skin
 - (1) Moist, pale, normal to cool temperature
 - (2) Hot, dry or moist - dire emergency
 - 5. Rapid heart rate
 - 6. Altered mental status to unresponsive
- 3. Emergency medical care of heat emergencies - patient with moist, pale, normal to cool temperature skin.
 - 1. Remove the patient from the hot environment and place in a cool environment (back of air conditioned ambulance).
 - 2. Administer oxygen if not already done during the initial assessment.
 - 3. Loosen or remove clothing.
 - 4. Cool patient by fanning.
 - 5. Put in supine position with legs elevated.
 - 6. If patient is responsive and is not nauseated, have the patient drink water.
 - 7. If the patient is unresponsive or is vomiting, transport to the hospital with patient on his left side.
- 4. Emergency medical care of heat emergencies - patient with hot, dry or moist skin.
 - 1. Remove the patient from the hot environment and place in a cool environment (back of air conditioned ambulance with air conditioner running on high).
 - 2. Remove clothing.
 - 3. Administer oxygen if not already done during the initial assessment.
 - 4. Apply cool packs to neck, groin and armpits.
 - 5. Keep the skin wet by applying water by sponge or wet

- towels.
 - 6. Fan aggressively.
 - 7. Transport immediately.
- 14. Water-Related Emergencies
 - 1. Near drowning/drowning
 - 1. Ensure the safety of the rescue personnel.
 - 2. Suspect possible spine injury if diving accident is involved or unknown.
 - 3. Consider length of time in cold water drowning. Any Pulse less, non-breathing patient who has been submerged in cold water should be resuscitated.
 - 4. Complications of near drowning can include:
 - 1. Airway obstruction
 - 2. Hypothermia
 - 3. Cardiac Arrest
 - 5. Emergency medical care:
 - 1. In-line immobilization and removal from water with backboard if spine injury is suspected and patient is responsive.
 - 2. If there is no suspected spine injury, place patient on left side to allow water, vomitus and secretions to drain from upper airway.
 - 3. Suction as needed.
 - 4. Administer oxygen if not already done during the initial assessment.
 - 5. If gastric distention interferes with artificial ventilation, the patient should be placed on his left side. With suction immediately available, the EMT-Basic should place his hand over the epigastric area of the abdomen and apply firm pressure to relieve the distention. This procedure should only be done if the gastric distention interferes with the ability of the EMT-Basic to artificially ventilate the patient effectively.
 - 6. For warm water drowning requiring resuscitation - see cardiac module.
- 15. Behavioral Emergencies
 - 1. Psychologic Crises
 - 1. Panic
 - 2. Agitation
 - 3. Bizarre thinking and behavior
 - 4. Danger to self - self destructive behavior, suicide
 - 5. Danger to others - threatening behavior, violence
 - 2. Assessment for Suicide Risk
 - 1. Depression
 - 1. Sad, tearful
 - 2. Thoughts of death or taking one's life

2. Suicidal gestures - the EMT-Basic must recognize and intervene in self-destructive behavior before the patient commits the act of suicide. Risk factors may include:
 1. Individuals, over 40, single, widowed or divorced, alcoholic, depressed.
 2. A defined lethal plan of action which has been verbalized.
 3. Unusual gathering of articles which can cause death such as purchase of a gun, large volumes of pills, etc.
 4. Previous history of self-destructive behavior.
 5. Recent diagnosis of serious illness.
 6. Recent loss of significant loved one.
 7. Arrest, imprisonment, loss of job
3. Assessment findings
 1. Patient in an unsafe environment or with unsafe objects in hands.
 2. Displaying of self-destructive behavior during initial assessment or prior to emergency response.
4. Emergency medical care
 1. Scene size-up, personal safety
 2. Patient assessment
 3. Calm the patient - do not leave patient alone
 4. Restrain if necessary
 5. Transport
 6. If overdose, bring medications or drugs found to medical facility.
3. Medical/Legal Considerations - Emotionally disturbed patient who consents to care - legal problems greatly reduced.
 1. How to handle the patient who resists treatment
 1. Emotionally disturbed patient will often resist treatment.
 2. May threaten EMT-Basics and others
 3. To provide care against patient's will, you must show a reasonable belief the patient would harm himself or others.
 4. If a threat to self or others, patient may be transported without consent.
 5. Usually law enforcement is required.
4. Avoiding unreasonable force
 1. Reasonable force depends on what force was necessary to keep patient from injuring himself or others.
 2. Reasonableness is determined by looking at all circumstances involved.
 1. Patients size and strength
 2. Type of abnormal behavior
 3. Sex of patient
 4. Mental state of patient
 5. Method of restraint

3. Be aware after a period of combativeness and aggression some calm patients may cause unexpected and sudden injury to self and others.
 4. Avoid acts or physical force that may cause injury to the patient.
 5. EMS personnel may use reasonable force to defend against an attack by emotionally disturbed patients.
5. Police and medical direction involvement
 1. Seek medical direction when considering restraining a patient.
 2. Ask for police assistance if during scene size-up the patient appears or acts aggressive or combative.
6. Restraining Patients - restraint should be avoided unless patient is a danger to self or others. When using restraints have police present, if possible, and get approval from medical direction. If restraints must be used, do the following:
 1. Be sure to have adequate help.
 2. Plan your activities.
 3. Use only the force necessary for restraint.
 4. Estimate range of motion of patients arms and legs and stay beyond range until ready.
 5. Once decision has been made - act quickly.
 6. Have one EMT-Basic talk to patient throughout restraining.
 7. Approach with four persons, one assigned to each limb all at the same time.
 8. Secure limbs together with equipment approved by medical direction.
 9. Position patient appropriately.
 10. Secure to stretcher with multiple straps.
 11. Cover face with surgical mask if spitting on EMT-Basics.
 12. Reassess circulation frequently.
 13. Document indication for restraining patients and technique of restraint.
 14. Avoid unnecessary force.
7. Protection against false accusations
 1. Documentation of abnormal behavior exhibited by the patient is very important.
 2. Have witnesses in attendance especially during transport, if possible.
 3. Accusing EMT-Basics of sexual misconduct is common by emotionally disturbed patients - have help, same sex attendants, and third party witnesses.
8. Principles for Assessing Behavioral Emergency Patients
 1. Identify yourself and let the person know you are there to help.
 2. Inform him of what you are doing.
 3. Ask questions in a calm, reassuring voice.

4. Allow the patient to tell what happened.
5. Show you are listening by rephrasing or repeating part of what is said.
6. Acknowledge the patient's feelings.
7. Assess the patient's mental status.
 1. Appearance
 2. Activity
 3. Speech
 4. Orientation for time, person, and place

9. Assessment of Potential Violence
 1. Scene size-up
 2. History - the EMT-Basic should check with family and bystanders to determine if the patient has a known history of aggression or combativeness.
 3. Posture - stands or sits in a position which threatens self or others. May have fists clinched or lethal objects in hands.
 4. Vocal activity - is yelling or verbally threatens harm to self or others.
 5. Physical activity - moves toward care giver, carries heavy or threatening objects, has quick irregular movements, muscles tense.

10. Methods to Calm Behavioral Emergency Patients
 1. Acknowledge that the person seems upset and restate that you are there to help.
 2. Inform him of what you are doing.
 3. Ask questions in a calm, reassuring voice.
 4. Maintain a comfortable distance.
 5. Encourage the patient to state what is troubling him.
 6. Do not make quick moves.
 7. Respond honestly to patient's questions.
 8. Do not threaten, challenge or argue with disturbed patients.
 9. Tell the truth, do not lie to the patient.
 10. Do not "play along" with visual or auditory disturbances of the patient.
 11. Involve trusted family members or friends.
 12. Be prepared to stay at scene for a long time. Always remain with the patient.
 13. Avoid unnecessary physical contact.
 14. Use good eye contact.

SUGGESTED APPLICATION

Procedural (How)

1. Demonstrate reading labels and inspecting each medication that will be carried on the unit or will be assisting the patient in self administering.
2. Perform the steps in facilitating the use of nitroglycerin for chest pain using a substitute candy tablet and breath spray.

3. Demonstrate application and operation of the automated external defibrillator including completion of the daily checklist
4. Demonstrate the steps in the administration of oral glucose.
5. Demonstrate the steps in the administration activated charcoal.
6. Demonstrate the steps in the use of the epi-autoinjector.
7. Demonstrate the steps in the use of a handheld inhaler.
8. Demonstrate the steps in caring for a behavioral emergency.

Contextual (When, Where, Why)

For years, the primary care provide by the EMT-Basic to the patient experiencing a medical emergency was administration of oxygen and rapid transportation to a treatment facility. While these interventions continue to be critical to patient outcome, the EMT now has other specific interventions that will assist in stabilizing the patient prior to the patients arrival in the emergency department. The EMT-Basic may now have activated charcoal, oral glucose, epinephrine, handheld inhalers, nitroglycerin and automated defibrillators on the unit to administer with medical direction approval.

STUDENT ACTIVITIES

Auditory (Hear)

1. Students should hear information on medications they will use on the EMS unit.
2. Students should hear computer voice simulations made by automated external defibrillators giving instructions on protocols or shocks.
3. Students should hear of actual cases where cardiac arrest resuscitation efforts were successful and unsuccessful and the reasons for the outcomes.
4. Students should hear the steps required to appropriately administer epinephrine auto-injector, activated charcoal, oral glucose, handheld inhaler and nitroglycerin.
5. Students should hear the various methods used to calm the behavioral emergency patient.

Visual (See)

1. Students should see a demonstration of the proper steps in assisting in the usage of handheld inhalers.
2. Students should see an instructor team appropriately resuscitate a simulated cardiac arrest patient using an automated external defibrillator.
3. Students should see re-enactments of cardiac arrest resuscitation efforts by EMT-Basics using automated external defibrillators.
4. Students should see an instructor team appropriately administer a small candy or breath spray sublingually to a simulated patient presenting with chest pain.
5. Students should see various methods to calm the behavioral emergency patient.
6. Students should see the administration of oral glucose (as a simulated paste) to a simulated patient.
7. Students should see the instructor demonstrate the appropriate steps in using an auto-injector.
8. Students should see a demonstration of how to administer activated charcoal.

Kinesthetic (Do)

Instructor Note regarding AED Student Practice:

Time should be reserved for the students to practice. The instructors should give two-person provider teams several scenarios during which they perform a simulated response. The clinical situations, rhythms, and patient response should be varied. During this session, the instructors should assess which students are proficient with the skills and which students will need more practice before final evaluation.

In addition to the scenarios described previously, the following scenarios should also be considered:

Shockable rhythm that remains shockable after six shocks

Shockable rhythm that converts to a non-shockable rhythm after a shock

Artifact troubleshooting

Refrillation after a perfusing rhythm

Patients who have to be moved from one location to another

Cardiac arrest in various locations, (i.e., a physician's office, in a pool water or other hazards are present)

Cardiac arrest with various complications, (i.e, an electrode is displaced, nitroglycerin paste is on the patient's chest, the patient has an implantable pacemaker, patient has an implantable defibrillator/cardioverter).

1. The student will practice inspecting and reading the labels of each type of medication they will use on the EMS unit.
2. The student should practice assessment and management of adult, child and infant patients having a respiratory illness who have been prescribed a handheld inhaler by his physician.
3. The student should practice the steps in facilitating the use of a handheld inhaler.
4. The student should practice role play situations where use of handheld inhalers is appropriate and inappropriate.
5. The student should practice the application and operation of the automated external defibrillator.
6. The student should practice maintenance checks of the automated external defibrillator.
7. The student should practice the assessment and documentation of patient response to the automated external defibrillator
8. The student should practice performing the steps in facilitating the use of nitroglycerin for chest pain using a suitable candy tablet and breath spray.
9. The student should practice assessment, defibrillation, airway management, lifting and moving a patient, and transportation out of the training laboratory of a manikin in a simulated cardiac arrest situation in which a patient does not respond to defibrillation.
10. The student should practice the assessment and documentation of patient response to nitroglycerin.
11. The student will practice the steps in the administration of oral glucose.
12. The student should practice the correct way to use an epinephrine auto-injector.

Instructor Activities

Supervise student practice.

Reinforce student progress in cognitive, affective, and psychomotor domains.

Redirect students having difficulty in content.

EVALUATION

Written: Develop evaluation instruments, e.g., quizzes, verbal reviews, and handouts, to determine if the students have met the cognitive and affective objectives of this lesson.

Practical: Evaluate the actions of the EMT-Basic students during role play, practice or other skill stations to determine their compliance with the cognitive and affective objectives and their mastery of the psychomotor objectives of this lesson.

REMEDIATION

Identify students or groups of students who are having difficulty with this subject content.

SUGGESTED ENRICHMENT

What is unique in the local area concerning this topic?