

State of Wisconsin - Bureau of Communicable Diseases and Emergency Response EMT-Intermediate Technician - Curriculum Overview

Scope of Practice

The EMT Intermediate Technician will provide the similar level of intervention as the previous EMT-Intermediate (I-85) level. A prerequisite to this level includes current licensure as an EMT-Basic in Wisconsin and having completed the three new modules and medications (ASA, Albuterol, and Glucagon).

In addition to all approved medication administration at the EMT-Basic level, the EMT-Intermediate Technician will administer 50% dextrose, narcan, atrovent, and nitroglycerine. The additional skill is initiation of an intravenous line and solution.

Additional patient assessment knowledge and skills have been integrated throughout the curriculum and a critical decision making module has also been added.

In addition a pediatric component has been added.

The administrative rule for the EMT-Intermediate Technician level is HFS 110.

Course Specifics

Curriculum Modules: The curriculum has been divided into four modules.

Module 1

Introduction

Clinical Decision-Making. This content has been added to enhance the critical thinking of the EMS Provider at this level.

Module 2

Emergency Pharmacology.

IV Access and Medication Administration

The skill of drawing blood specimens has been made an optional skill. Content has been included in the curriculum, but it will be a medical director/training center issue as to whether it will be taught.

Module 3

Cardiovascular Emergencies

Diabetic Emergencies

Poisoning/Overdose

These modules integrate problem specific assessment and history taking with the appropriate interventions that the EMT IV Technician is being prepared to provide.

Module 4 (OPTIONAL)

Endotracheal Intubation

This module is an optional module that may be taught with the approval and involvement of the medical director. It has been taken directly from the Wisconsin Paramedic Curriculum and contains detailed assessment and pathophysiology for the respiratory system. Because endotracheal intubation is a critical skill, which can do significant harm if the provider is not competent, all EMS levels undertaking this skill will have the same curriculum.

Skill Competencies

An extensive set of skill competencies has been developed for this level provider. All competencies must be achieved for this provider to be licensed.

Clinical and Field Experience

All students will be required to participate in a clinical experience. Certain of the competencies have been required to be completed in the clinical setting. Field experience will be optional but recommended. It will be up to the medical director and the training center to evaluate field experience potential and include it in the training if feasible.

Hour Requirement

DHS 110 establishes the minimum hour requirement for this curriculum as 60 hours. Adding the optional intubation module will increase that number of hours appropriately.

Licensure Testing

The tentative plan for licensure is as follows. The Training Center will be responsible for certifying the skill competency of this level provider using minimum standards as approved by the Bureau. Since this is an examination for licensure as a provider in Wisconsin, a written examination will be administered by the State.

Curriculum Rollout

The curriculum will be presented to Training Centers at the annual Wisconsin Technical College System state called Instructor Coordinator Conference the end of February. Following the roll out, Training Centers will be able to enhance the curriculum and begin instruction.

Introduction

UNIT TERMINAL OBJECTIVE

1-1 At the completion of this unit, the EMT Basic IV Technician student will: understand his or her roles and responsibilities within an EMS system, and how these roles and responsibilities differ from other levels of providers; understand the role of medical direction in the out-of-hospital environment for this level; understand the legal issues that impact decisions made in the out-of-hospital environment; and be able to effectively document the essential elements of patient assessment, care and transport using the ambulance run report and the WEMSIS system.

OBJECTIVES LEGEND

C = Cognitive; A = Affective; P = Psychomotor

1 = Knowledge Level

2 = Application Level

3 = Problem Solving Level

COGNITIVE OBJECTIVE

- 1-1.1 Describe an overview of EMT Basic IV Technician initial and continuing education. (C-1)
- 1-1.2 Discuss the development of the EMT Basic IV Technician level of care. (C-1)
- 1-1.3 Describe the roles and responsibilities of the EMT Basic IV Technician. (C-1)
- 1-1.4 Describe the components of continuous quality improvement for the EMT Basic IV Technician. (C-1)
- 1-1.5 Discuss the authority of HFS 110 over the EMT Basic IV Technician. (C-1)
- 1-1.6 Describe the role of the medical director in the EMS system. (C-1)
- 1-1.7 Discuss the part that protocols play in patient care for the EMT Basic IV Technician. (C-1)
- 1-1.8 Describe the patient care documentation using the State Run Report. (C-1)
- 1-1.9 Discuss the importance of data collection by the EMT Basic IV Technician. (C-1)

AFFECTIVE OBJECTIVES

None identified for this unit.

PSYCHOMOTOR OBJECTIVES

None identified for this unit.

Introduction

DECLARATIVE

- I. Course Overview
 - A. Course description
 - B. Course materials & resources
 - C. Student & instructor expectations
 - D. Criteria for successful completion
 - E. Cooperating facilities

- II. History of development of the Basic IV TECHNICIAN course
 - A. US DOT NSC of 1994
 - B. The "Advanced Basic"
 - C. Enhanced Intermediate and the new Intermediate
 - D. EPAC Recommendations
 - E. Inclusion of critical thinking

- III. Roles & Responsibilities
 - A. Ethics
 - B. Professionalism
 - C. Communications
 - D. Safety
 1. Personal
 2. Crew
 3. Patient
 4. Others
 - E. Patient Care
 - F. Maintaining competence
 1. Clinical reviews
 2. Regular training and retraining
 3. Ongoing continuing education
 - G. Records & reports
 - H. Quality Assurance & Continuous Quality Improvement
 - I. Systems integration & maintenance

- IV. Legal Issues
 - A. HFS 110
 - B. Criminal background checks
 - C. Licensing requirements
 - D. Medical control & direction
 - E. Protocols
 1. Local
 2. State
 - F. Patient care considerations
 1. Transport Considerations
 2. Treat and release
 3. Refusal of care

- V. Documentation
 - A. Communications
 - B. Ambulance Run Reports
 - C. WEMSIS

Critical Decision Making

UNIT TERMINAL OBJECTIVE

1-2 At the completion of this unit, the EMT student will be able to apply a process of decision making to use the assessment findings to help form a field impression.

OBJECTIVES LEGEND

C = Cognitive; A = Affective; P = Psychomotor

1 = Knowledge Level

2 = Application Level

3 = Problem Solving Level

COGNITIVE OBJECTIVES

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

- 1-2.1 Compare the factors influencing medical care in the out-of-hospital environment to other medical settings. (C-2)
- 1-2.2 Differentiate between critical life-threatening, potentially life-threatening, and non life-threatening patient presentations. (C-3)
- 1-2.3 Evaluate the benefits and shortfalls of protocols, standing orders, and patient care algorithms. (C-3)
- 1-2.4 Define the components, stages, and sequences of the critical thinking process for EMTs. (C-1)
- 1-2.5 Discuss the fundamental elements of critical thinking for EMTs. (C-2)
- 1-2.6 Describe the effects of the "fight or flight" response and the positive and negative effects on an EMT's decision making. (C-1)
- 1-2.7 Summarize the "six Rs" of putting it all together: Read the patient, Read the scene, React, Reevaluate, Revise the management plan, Review performance. (C-1)

AFFECTIVE OBJECTIVES

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

- 1-2.8 Defend the position that clinical decision making is the cornerstone of effective EMT practice. (A-3)
- 1-2.9 Practice facilitating behaviors when thinking under pressure. (A-1)

PSYCHOMOTOR OBJECTIVES

None identified for this unit.

Critical Decision Making

DECLARATIVE

- I. Introduction and key concepts
 - A. The cornerstones of effective EMT practice
 1. Gathering, evaluating, and synthesizing information
 2. Developing and implementing appropriate patient management plans
 3. Applying judgment and exercising independent decision making
 4. Thinking and working effectively under pressure
 - B. The out-of-hospital environment
 1. Unlike other environments where medical care is traditionally rendered
 2. Unique, heavily influenced by factors that do not exist in other medical settings
 - C. The spectrum of patient care in the out-of-hospital setting
 1. Obvious, critical life-threats
 - a. Major, multi-system trauma
 - b. Devastating single system trauma
 - c. End-stage disease presentations
 - d. Acute presentations of chronic conditions
 2. Potential life-threats
 - a. Serious, multi-system trauma
 - b. Multiple disease etiologies
 3. Non life-threatening presentations
 - D. Providing guidance and authority for EMT action and treatments
 1. Protocols, standing orders, and patient care algorithms
 - a. Can clearly define and outline performance parameters
 - b. Promote a standardized approach
 2. Limitations of protocols, standing orders, and patient care algorithms
 - a. Only address "classic" patient presentations
 - (1) Non-specific patient complaints do not follow model
 - (2) Limited clarity of presenting patient problems
 - b. Do not address multiple disease etiologies
 - c. Do not address multiple treatment modalities
 - d. Promote linear thinking, "cookbook medicine"
- II. Components, stages, and sequence of critical thinking process for EMTs
 - A. Concept formation
 1. MOI/ scene assessment
 2. Initial assessment and physical examination
 3. Chief complaint
 4. Patient history
 5. Patient affect
 6. Technical tools
 - a. Pulse oximetry
 - b. Glucose monitoring
 - c. Et cetera
 - B. Data interpretation
 1. Data gathered
 2. EMT knowledge of anatomy and physiology and pathophysiology
 3. EMT attitude
 4. Previous experience base of the EMT
 - C. Application of principle
 1. Field impression/ working diagnosis
 2. Protocols/ standing orders
 3. Treatment/ intervention

Critical Decision Making

- D. Evaluation
 - 1. Reassessment of patient
 - 2. Reflection in action
 - 3. Revision of impression
 - 4. Protocol/ standing orders
 - 5. Revision of treatment/ intervention
 - E. Reflection on action
 - 1. Run critique
 - 2. Addition to/ modification of experience base of the EMT
- III. Fundamental elements of critical thinking for EMTs
- A. Adequate fund of knowledge
 - B. Ability to focus on specific and multiple elements of data
 - C. Ability to gather and organize data and form concepts
 - D. Ability to identify and deal with medical ambiguity
 - E. Ability to differentiate between relevant and irrelevant data
 - F. Ability to analyze and compare similar situations
 - G. Ability to recall contrary situations
 - H. Ability to articulate assessment based decisions and construct arguments
- IV. Considerations with field application of assessment-based patient management
- A. The patient acuity spectrum
 - 1. EMS is activated for countless reasons
 - 2. Few out-of-hospital calls constitute true life-threatening emergencies
 - a. Minor medical and traumatic events require little critical thinking and are relatively easy decisions
 - b. Patients with obvious life-threats pose limited critical thinking challenges
 - c. Patients who fall on the acuity spectrum between minor and life-threatening pose the greatest critical thinking challenge
 - B. Thinking under pressure
 - 1. Hormonal influence, i.e., “fight or flight” response impacts the EMT’s decision making both positively and negatively
 - a. Enhanced visual and auditory acuity
 - b. Improved reflexes and muscle strength
 - c. Impaired critical thinking skills
 - d. Diminished concentration and assessment ability
 - 2. Mental conditioning is the key to effective performance under pressure
 - a. Skills learned at a pseudo-instinctive performance level
 - b. Automatic response for technical treatment requirements
 - C. Mental checklist for thinking under pressure
 - 1. Stop and think
 - 2. Scan the situation
 - 3. Decide and act
 - 4. Maintain clear, concise control
 - 5. Regularly and continually reevaluate the patient
 - D. Facilitating behaviors
 - 1. Stay calm, don’t panic
 - 2. Assume and plan for the worst; err on the side of the patient
 - 3. Maintain a systematic assessment pattern
 - 4. Balance analysis, data processing, and decision making styles
 - a. Situation analysis style - reflective versus impulsive
 - b. Data processing style - divergent versus convergent
 - c. Decision making style - anticipatory versus reactive

Critical Decision Making

- E. Situation awareness
 - 1. Reading the scene
 - 2. Reading the patient
- F. Putting it all together - "the six Rs"
 - 1. Read the scene
 - a. Safety Issues and Hazards
 - b. General environmental conditions
 - c. Evaluate immediate surroundings
 - d. Mechanism of injury/illness
 - 2. Read the patient
 - a. Observe the patient
 - (1) Level of responsiveness/ consciousness/distress
 - (2) Skin color
 - (3) Position and location of patient - obvious deformity or asymmetry
 - b. Talk to the patient
 - (1) Determine the chief complaint
 - (2) New problem or worsening of preexisting condition
 - c. Touch the patient
 - (1) Skin temperature and moisture
 - (2) Pulse rate, strength, and regularity
 - d. Auscultate the patient
 - (1) Identify problems with the lower airway
 - (2) Identify problems with the upper airway
 - e. Status of ABC's - identifying life-threats
 - f. Complete and accurate set of vital signs
 - (1) Use as triage tool to estimate severity
 - (2) Can assist in identifying the majority of life-threatening conditions
 - (3) Influenced by patient age, underlying physical and medical conditions, and current medications
 - 3. React
 - a. Address life-threats in the order they are found
 - b. Determine the most common and statistically probable cause that fits the patient's initial presentation
 - c. Consider the most serious condition that fits the patient's initial presentation
 - d. If a clear medical problem is elusive, treat based on presenting signs and symptoms
 - 4. Reevaluate
 - a. Focused and detailed assessment
 - b. Response to initial management/ interventions
 - c. Discovery of less obvious problems
 - 5. Revise management plan
 - 6. Review performance at run critique

Emergency Pharmacology

UNIT TERMINAL OBJECTIVE

2-1 At the completion of this unit, the EMT student will be able to understand the basic principles of pharmacology and be able to develop a drug profile for common emergency medications.

OBJECTIVES LEGEND

C = Cognitive; A = Affective; P = Psychomotor

1 = Knowledge Level

2 = Application Level

3 = Problem Solving Level

COGNITIVE OBJECTIVES

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

- 2-1.1 Differentiate between the generic and names of a drug. (C-3)
- 2-1.2 Discuss special consideration in drug treatment with regard to pregnant, pediatric and geriatric patients. (C-1)
- 2-1.3 Discuss the EMT's responsibilities and scope of management pertinent to the administration of medications. (C-1)
- 2-1.4 List and differentiate routes of drug administration. (C-3)
- 2-1.5 Differentiate between enteral and parenteral routes of drug administration. (C-3)
- 2-1.6 Describe various drug interactions. (C-3)
- 2-1.7 Discuss considerations for storing drugs. (C-1)
- 2-1.8 List the components of a drug profile. (C-1)
- 2-1.9 List and describe drugs which the EMT may administer in a pharmacological management plan according to local protocol. (C-1)
- 2-1.10 Integrate pathophysiological principles of pharmacology with patient assessment. (C-3)
- 2-1.11 Synthesize patient history information and assessment findings to form a field impression. (C-3)
- 2-1.12 Synthesize a field impression to implement a pharmacologic management plan. (C-3)

AFFECTIVE OBJECTIVES

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

- 2-1.13 Defend medication administration by an EMT to affect positive therapeutic affect. (A-3)

PSYCHOMOTOR OBJECTIVES

None identified for this unit.

Emergency Pharmacology

DECLARATIVE

- I. Names of drugs
 - A. Drugs - chemical agents used in the diagnosis, treatment, or prevention of disease
 - B. Pharmacology - the study of drugs and their actions on the body
 - C. Generic name
 1. Official name approved by the FDA
 - D. Trade or proprietary name - the brand name registered to a specific manufacturer or owner
 - E. Official name - the name assigned by USP

- II. Sources of drug information
 - A. Physician's Desk Reference (PDR)
 - B. Hospital Formulary (HF)
 - C. Drug inserts

- III. Special considerations in drug therapy
 - A. Pregnant patients
 1. Before using any drug during pregnancy, the expected benefits should be considered-against the possible risks to the fetus
 2. Pregnancy causes a number of anatomical and physiological changes
 3. Drugs may cross the placenta or through lactation
 - B. Pediatric patients
 1. Based on the child's weight or body surface area
 2. Special concerns for neonates
 3. Length-based resuscitation tape
 - C. Geriatric patients
 1. The physiological effects of aging can lead to altered pharmacodynamics and pharmacokinetics

- IV. The scope of management
 - A. EMTs are held responsible for safe and therapeutically effective drug administration
 - B. EMTs are personally responsible - legally, morally, and ethically - for each drug they administer
 - C. EMTs
 1. Use correct precautions and techniques
 2. Observe and document the effects of drugs
 3. Keep their knowledge base current to changes and trends in pharmacology
 4. Establish and maintain professional relationships
 5. Understand pharmacology
 6. Perform evaluation to identify drug indications and contraindications
 7. Seek drug reference literature
 8. Take a drug history from their patients including
 - a. Prescribed medications
 - (1) Name
 - (2) Strength
 - (3) Daily dosage
 - b. Over-the-counter medications
 - c. Vitamins
 - d. Drug reactions/allergies
 9. Consult with medical direction

Emergency Pharmacology

- V. Overview of the routes of drug administration
 - A. The routes of drug administration are categorized as
 - 1. Drugs administered by the inhalation route
 - a. Nebulized medications
 - 2. Enteral (drugs administered along any portion of the gastrointestinal tract)
 - a. Sublingual
 - b. Oral
 - 3. Parenteral (any medication route other than the alimentary canal)
 - a. Subcutaneous
 - b. Intramuscular
 - c. Intravenous
 - d. Pulmonary
 - e. Transdermal
 - 4. Endotracheal
- VI. Unpredictable adverse responses
 - 1. Drug allergy (medications frequently implicated in allergic reactions)
 - 2. Anaphylactic reaction
- VII. Drug storage
 - A. Certain precepts should guide the manner in which drugs are secured, stored, distributed, and accounted for
 - B. Refer to local protocol
 - C. Drug potency can be affected by
 - 1. Temperature
 - 2. Light
 - 3. Moisture
 - 4. Shelf life
 - D. Applies also to diluents
- VIII. Components of a drug profile
 - A. Drug names
 - B. Classification
 - C. Mechanisms of action
 - D. Indications
 - E. Side/ adverse effects
 - F. Routes of administration
 - G. How supplied
 - H. Dosages
 - I. Contraindications
 - J. Considerations for pediatric patients, geriatric patients, pregnant patients, and other special patient groups
 - K. Other profile components

Emergency Pharmacology

IX. Drugs used in pharmacological management plans (drugs appear in generic name)

- A. Acetylsalicylic acid (ASA)
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages
- B. Bronchodilators
 - 1. Suggested commonly administered medications
 - a. Albuterol
 - b. Ipratropium
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages
- C. 50% dextrose
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages
- D. Epinephrine (1:1000)
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages
- E. Glucagon
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages

Emergency Pharmacology

- F. Naloxone
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages
- G. Nitroglycerin
 - 1. Drug names
 - 2. Classification
 - 3. Mechanism of actions
 - 4. Indications
 - 5. Contraindications
 - 6. Side/ adverse effects
 - 7. Routes of administration
 - 8. How supplied
 - 9. Dosages

IV Access and Medication Administration

UNIT TERMINAL OBJECTIVE

2-2 At the completion of this unit, the EMT Intermediate Technician Student will be able to safely and precisely access the venous circulation and administer medications.

OBJECTIVES LEGEND

C = Cognitive; A = Affective; P = Psychomotor

1 = Knowledge Level

2 = Application Level

3 = Problem Solving Level

COGNITIVE OBJECTIVES

At the completion of this unit, the EMT Intermediate Technician Student will be able to:

- 2-2.1 Review the specific anatomy and physiology pertinent to medication administration. (C-1)
- 2-2.2 Discuss legal aspects affecting medication administration. (C-1)
- 2-2.3 Discuss the "six rights" of drug administration and correlate these with the principles of medication administration. (C-1)
- 2-2.4 Discuss medical asepsis and the differences between clean and sterile techniques. (C-1)
- 2-2.5 Describe the use of universal precautions and body substance isolation (BSI) procedures when administering a medication. (C-1)
- 2-2.6 Define a significant exposure and describe the reporting requirements. (C-1)
- 2-2.7 Describe the indications, equipment needed, techniques utilized, precautions, and general principles of peripheral venous cannulation. (C-1)
- 2-2.8 Describe the indications, equipment needed, techniques utilized, precautions, and general principles of administering medications by the inhalation route. (C-3)
- 2-2.9 Differentiate among the different parenteral routes of medication administration. (C-3)
- 2-2.10 Describe the equipment needed, techniques utilized, complications, and general principles for the preparation and administration of parenteral medications. (C-1)
- 2-2.11 Differentiate among the different percutaneous routes of medication administration. (C-3) (OPTIONAL)
- 2-2.12 Describe the purpose, equipment needed, techniques utilized, complications, and general principles for obtaining a blood sample. (C-1)
- 2-2.13 Describe disposal of contaminated items and sharps. (C-1)
- 2-2.14 Synthesize a pharmacologic management plan including medication administration. (C-3)
- 2-2.15 Integrate pathophysiological principles of medication administration with patient management. (C-3)

AFFECTIVE OBJECTIVES

At the completion of this unit, the EMT Intermediate Technician Student will be able to:

- 2-2.16 Comply with EMT standards of medication administration. (A-1)
- 2-2.17 Comply with universal precautions and body substance isolation (BSI). (A-1)
- 2-2.18 Defend a pharmacologic management plan for medication administration. (A-3)
- 2-2.19 Serve as a model for medical asepsis. (A-3)
- 2-2.20 Serve as a model for disposing of contaminated items and sharps. (A-3)

IV Access and Medication Administration

PSYCHOMOTOR OBJECTIVES

At the completion of this unit, the EMT Intermediate Technician Student will be able to:

- 2-2.21 Use universal precautions and body substance isolation (BSI) procedures during medication administration. (P-2)
- 2-2.22 Demonstrate cannulation of peripheral veins. (P-2)
- 2-2.23 Demonstrate clean technique during medication administration. (P-3)
- 2-2.24 Demonstrate administration of medications by the inhalation route. (P-2)
- 2-2.25 Demonstrate administration of oral medications. (P-2)
- 2-2.26 Demonstrate preparation and administration of parenteral medications. (P-2)
- 2-2.27 Demonstrate preparation and techniques for obtaining a blood sample. (P-2) (OPTIONAL)
- 2-2.28 Perfect disposal of contaminated items and sharps. (P-3)

DECLARATIVE

- I. Metric system components used in pharmacology
 - A. Weight (Grams)
 - B. Volume (Liters)
- II. Medical Direction
 - A. Medication administration is bound by the EMT's on-line or off-line medical direction
 - B. Role of the medical director
 - C. Patient management protocols
 - 1. Written standing orders
 - D. Legal considerations - policies and procedures which specify regulations of medication administration
 - E. Consent
- III. Principles of medication administration
 - A. Local drug distribution system - policies which establish stocking and supply of drugs
 - B. EMT's responsibility associated with the drug order
 - 1. Verification of the drug order
 - 2. Resolution of conflict between medical control and EMT
 - C. The "six rights" of medication administration
 - 1. "Right" patient
 - 2. "Right" drug
 - 3. "Right" dose
 - 4. "Right" route
 - 5. "Right" time
 - 6. "Right" documentation
- IV. Medical asepsis
 - A. Clean technique versus aseptic technique
 - B. Sterilization
 - C. Antiseptics
 - D. Disinfectants
- V. Universal precautions and body substance isolation (BSI) in medication administration
 - A. Techniques to avoid contact with blood and body fluids
 - B. Appropriate handling and disposal of needles and syringes
 - C. Define significant exposure and identify reporting requirements

IV Access and Medication Administration

- VI. Venous access
 - A. General principles
 - 1. Types of IV access
 - a. Peripheral
 - b. Central
 - 2. Sterile technique
 - 3. Indications
 - 4. Precautions
 - a. Potential exposure hazards
 - 5. Flow Rates
 - a. Types of Tubing
 - (1) Macrodrip
 - (2) Microdrip
 - (3) Trauma
 - (4) Blood
 - b. Flow rate guidelines
 - (1) To Keep Open (TKO)
 - (2) Wide open
 - (3) Set rates/calculation
 - c. Flow rates for infants and children
 - d. Other factors influencing flow rates
 - B. IV Setup
 - 1. Tubing
 - a. Macrodrip
 - b. Microdrip
 - c. Trauma
 - d. Blood
 - 2. Intravenous solutions
 - a. Types of containers
 - b. Sizes of containers
 - c. Fluids
 - (1) Isotonic
 - (2) Hypotonic
 - (3) Hypertonic
 - (4) Warmed
 - 3. Needles/Catheters
 - a. Design
 - b. Use
 - 4. Sites
 - a. Hand
 - b. Arm
 - c. Other
 - 5. Procedure
 - 6. Trouble shooting
 - a. Slow flow
 - b. No flow
 - c. No vein visible
 - 7. Complications
 - a. Fluid overload
 - b. Infiltration
 - c. Infection/phlebitis
 - d. Air in line
 - 8. Documentation
 - 9. Steps in changing to the next container of IV solution
 - 10. Discontinuing an intravenous line

IV Access and Medication Administration

VII. Medications administered by the inhalation route

- A. Bronchodilator medications
- B. Equipment
 - 1. Oxygen or compressed air source
 - 2. Small volume nebulizer (SVN)
 - a. Other inhaler equipment
 - b. Other adapter equipment
 - c. Modified inhaler equipment
- C. Administering medications by the inhalation route
 - 1. Indications
 - 2. Techniques
 - 3. Precautions
 - 4. General principles for administering medications by the inhalation route
 - 5. Administration documentation

VIII. Parenteral administration of medications

- A. Parenteral routes
 - 1. Subcutaneous
 - 2. Intramuscular
 - 3. Intravenous
- B. Reasons for parenteral administration of medications
- C. Equipment used in parenteral administration of medications
 - 1. Syringes
 - a. Calibration of the syringe
 - b. Prefilled syringes
 - 2. Needles
 - a. Parts of the needle
 - b. Sizes of needles
 - 3. Selection of the syringe and needle
 - 4. Packaging of syringes and needles
 - 5. Packaging of parenteral medications
 - a. Ampules
 - b. Vials
 - c. Prefilled syringes
 - d. Other
- D. Preparation of parenteral medication
 - 1. Equipment needed for preparing a parenteral medication
 - 2. Standard procedures for preparing all parenteral medications
 - 3. Guidelines for preparing medications
 - a. To prepare a medication from an ampule
 - b. Reconstitution of a sterile powder
 - c. Removal of a volume of liquid from a vial
 - d. Preparing a drug from a mix-o-vial
- E. Administration of medication by the subcutaneous route
 - 1. Subcutaneous route - injections are made into the loose connective tissue between the dermis and muscle layer
 - 2. Equipment needed for administration of a medication by the subcutaneous route
 - 3. Locate anatomical sites
 - a. Upper arms
 - b. Anterior thighs
 - c. Abdomen
 - 4. Technique for administration of medication by the subcutaneous route
 - 5. Precautions
 - 6. Administration documentation

IV Access and Medication Administration

- F. Administration of medication by the intramuscular route
 - 1. Intramuscular route - injections are made by penetrating a needle through the dermis and subcutaneous tissue into the muscle layer
 - 2. Equipment needed for administration of a medication by the intramuscular route
 - 3. Locate anatomical sites for adults and children
 - a. Vastus lateralis muscle
 - b. Gluteal area
 - c. Deltoid muscle
 - 4. Technique for administration of medication by the intramuscular route
 - 5. Precautions
 - 6. Administration documentation
- G. Administration of medication by the intravenous route
 - 1. Intravenous route
 - a. Places the drug directly into the bloodstream
 - b. Bypasses all barriers to drug absorption
 - 2. Drugs may be administered by direct injection with a needle and syringe, but more commonly drugs are given intermittently or by continuous infusion through an established peripheral or central line
 - 3. Purpose for a peripheral IV site
 - 4. Dosage forms for IV administration
 - 5. Equipment needed for administration of a medication by the peripheral route
 - 6. General principles of IV medication administration
 - 7. Steps in performing administration of medications into an established IV line
 - 8. Precautions
 - 9. Administration documentation
- H. Administration of percutaneous medications
 - 1. Percutaneous route - application of a medication for absorption through the mucous membranes or skin
 - 2. Factors which influence the amount of medication absorbed through the skin or mucous membranes
 - 3. Methods of percutaneous administration of medications
 - 4. Steps in preparing percutaneous medications
 - 5. Topical medications - applied directly to the area of skin requiring treatment
 - a. Common forms of topical medications
 - b. Steps in administering topical medications
 - 6. Administering medications to mucous membranes
 - a. Places where medications are commonly applied
 - (1) Under the tongue (sublingual)
 - (2) Against the cheek (buccal)
 - (3) In the eye
 - (4) In the nose
 - (5) In the ear
 - (6) Inhaled into the lungs
 - b. Dosage forms
 - (1) Tablets
 - (2) Drops
 - (3) Ointments
 - (4) Creams
 - (5) Suppositories
 - (6) Metered-dose inhalers
 - c. Equipment needed for administration of each type of medication
 - d. Steps for the administration of the dosage form of medication to the place it is commonly applied
 - e. Administration documentation

IV Access and Medication Administration

- IX. Obtaining a blood sample (OPTIONAL)
 - A. Purposes for obtaining a blood sample
 - B. Equipment needed for obtaining a blood sample
 - C. Locations from which to obtain a blood sample
 - 1. Anatomical sites
 - 2. From the established intravenous catheter
 - 3. Other locations
 - D. Steps to preparing equipment for obtaining a blood sample
 - E. Techniques for obtaining a blood sample
 - F. Complications
 - G. Blood sampling documentation

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

Cardiovascular Emergencies

UNIT TERMINAL OBJECTIVE

- 3-1 At the completion of this unit, the EMT student will be able to utilize the assessment findings to formulate a field impression, implement and evaluate the management plan for the patient experiencing a cardiac emergency.

COGNITIVE OBJECTIVES

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

- 3-1.1 Describe the incidence, morbidity, and mortality of cardiovascular disease. (C-1)
- 3-1.2 Identify the risk factors most predisposing to coronary artery disease. (C-1)
- 3-1.3 Identify and describe the components of the focused history as it relates to the patient with cardiovascular compromise. (C-1)
- 3-1.4 Define angina pectoris and myocardial infarction (MI). (C-1)
- 3-1.5 List other clinical conditions that may mimic signs and symptoms of angina pectoris and myocardial infarction. (C-1)
- 3-1.6 List and describe the assessment parameters to be evaluated in a patient with chest pain. (C-1)
- 3-1.7 Identify what is meant by the OPQRST of chest pain assessment. (C-1)
- 3-1.8 List and describe the initial assessment parameters to be evaluated in a patient with chest pain that may be myocardial in origin. (C-1)
- 3-1.9 Identify the anticipated clinical presentation of a patient with chest pain that may be angina pectoris or myocardial infarction. (C-3)
- 3-1.10 Based on the pathophysiology and clinical evaluation of the patient with chest pain, list the anticipated clinical problems according to their life-threatening potential. (C-3)
- 3-1.11 Describe the pharmacological agents available to the EMT for use in the management of arrhythmias and cardiovascular emergencies. (C-2)
- 3-1.12 Describe the "window of opportunity" as it pertains to reperfusion of myocardial injury or infarction. (C-2)
- 3-1.13 Develop, execute, and evaluate a treatment plan based on the field impression for the patient with chest pain that may be indicative of angina or myocardial infarction. (C-3)
- 3-1.14 Define the terms "congestive heart failure" and "pulmonary edema." (C-1)
- 3-1.15 Describe the early and late signs and symptoms of congestive heart failure. (C-1)
- 3-1.16 Synthesize patient history, assessment findings to form a field impression for the patient with chest pain and cardiac arrhythmias that may be indicative of a cardiac emergency. (C-3)

AFFECTIVE OBJECTIVES

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

- 3-1.17 Value the sense of urgency for initial assessment and intervention as it contributes to the treatment plan for the patient experiencing a cardiac emergency. (A-3)
- 3-1.18 Value and defend the sense of urgency necessary to protect the window of opportunity for reperfusion in the patient with chest pain and arrhythmias that may be indicative of angina or myocardial infarction. (A-3)

PSYCHOMOTOR OBJECTIVES

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

- 3-1.19 Perform, document and communicate a cardiovascular assessment. (P-1)

Cardiovascular Emergencies

DECLARATIVE

- I. Introduction
 - A. Epidemiology
 1. Incidence
 - a. Prevalence of cardiac death outside of a hospital
 - (1) Supportive statistics
 - b. Prevalence of warning signs and symptoms for cardiac emergencies
 - (1) Supportive statistics
 - c. Increased recognition of need for early reperfusion
 2. Morbidity/ mortality
 - a. Reduced with early recognition
 - b. Reduced with early access to EMS system
 3. Risk factors
 - a. Age
 - b. Family history
 - c. Hypertension
 - d. Lipids
 - e. Male sex
 - f. Smoking
 - g. Carbohydrate intolerance
 4. Possible contributing risks
 - a. Diet
 - b. Female sex
 - c. Obesity
 - d. Oral contraceptives
 - e. Sedentary living
 - f. Personality type
 - g. Psychosocial tensions
 5. Prevention strategies
 - a. Early recognition
 - b. Education
 - c. Alteration of life style
 - B. Review cardiovascular anatomy and physiology
 1. Anatomy of the heart
 2. Location
 - a. Layers
 - (1) Myocardium
 - (2) Endocardium
 - (3) Pericardium
 - b. Chambers
 - (1) Atria
 - (2) Ventricles
 - c. Valves
 - (1) Atrioventricular (AV) valves
 - (a) Tricuspid (right)
 - (b) Mitral (left)
 - (2) Semilunar valves
 - (a) Pulmonary (right)
 - (b) Aortic (left)
 - d. Papillary muscles
 - e. Chordae tendineae

Cardiovascular Emergencies

3. Cardiac cycle
 - a. Phases
 - (1) Systole
 - (a) Atrial
 - (b) Ventricular
 - (2) Diastole
 - (a) Atrial
 - (b) Ventricular
 - b. Cardiac output
 - (1) Stroke volume
 - (a) Heart rate
 - (b) Contractility
 - (c) Starling's law
4. Vascular system
 - a. Aorta
 - (1) Ascending
 - (2) Thoracic
 - (3) Abdominal
 - b. Arteries
 - c. Capillaries
 - d. Veins
 - e. Vena cava
 - (1) Superior
 - (2) Inferior
 - f. Venous return (preload)
 - (1) Skeletal muscle pump
 - (2) Thoracoabdominal pump
 - (3) Respiratory cycle
 - (4) Gravity
 - g. Resistance (afterload) and capacitance (preload)
 - h. Pulmonary veins
 - i. Collateral Circulation
5. Coronary circulation
 - a. Arteries
 - (1) Left coronary artery
 - (a) Anterior descending branch (LAD)
 - (i) Distribution to the conduction system
 - (b) Circumflex
 - (i) Distribution to the conduction system
 - (2) Right coronary artery
 - (a) Distribution to the conduction system
 - b. Veins
 - (1) Coronary sinus
 - (2) Great cardiac vein

Cardiovascular Emergencies

6. Electrophysiology
 - a. Conduction system overview
 - (1) Sinoatrial node or sinus node (SA node)
 - (2) Atrioventricular (AV) junction
 - (a) AV node
 - (b) Bundle of His
 - (3) His-Purkinje System
 - (a) Bundle branches
 - (i) Right
 - (ii) Left anterior fascicle
 - (iii) Left posterior fascicle
 - (4) Characteristics of myocardial cells
 - (a) Automaticity
 - (b) Excitability
 - (c) Conductivity
 - (d) Contractility
 - b. Electrical potential
 - (1) Action potential
 - (a) Depolarization
 - (b) Repolarization
 - (c) Important electrolytes
 - (i) Sodium
 - (ii) Potassium
 - (iii) Calcium
 - (iv) Chloride
 - (2) Excitability
 - (a) Thresholds
 - (b) Depolarization
 - (c) Repolarization
 - (i) Relative refractory period
 - (ii) Absolute refractory period
 - c. Autonomic nervous system relationship to cardiovascular system
 - (1) Medulla
 - (2) Carotid sinus and baroreceptor
 - (a) Location
 - (b) Significance
 - (3) Parasympathetic system
 - (4) Sympathetic
 - (a) Alpha - vasoconstrictive effect on systemic blood vessels
 - (b) Beta
 - (i) Inotropic
 - (ii) Dromotropic
 - (iii) Chronotropic
 - (5) Systemic circulation

Cardiovascular Emergencies

- II. Initial cardiovascular assessment
 - A. Level of consciousness
 - 1. Alert and responsive
 - 2. Dizziness
 - 3. Unresponsive
 - B. Airway
 - 1. Patent
 - 2. Debris, blood
 - 3. Frothy sputum
 - C. Breathing
 - 1. Absent
 - 2. Present
 - a. Rate and depth
 - (1) Effort
 - (2) Breath sounds
 - (3) Characteristics
 - (4) Significance
 - D. Circulation
 - 1. Pulse
 - a. Absent
 - b. Present
 - (1) Rate and quality
 - (2) Pulse deficit
 - (3) Apical
 - (4) Peripheral
 - 2. Skin
 - a. Color
 - b. Temperature
 - c. Moisture
 - d. Turgor
 - e. Mobility
 - f. Edema
 - 3. Blood pressure
- III. Focused history
 - A. SAMPLE format
 - B. Chief complaint
 - 1. Pain
 - a. OPQRST
 - (1) Onset/ origin
 - (a) Pertinent past history
 - (b) Time of onset
 - (2) Provocation
 - (a) Exertional
 - (b) Non-exertional
 - (3) Quality
 - (a) Patient's narrative description
 - (i) For example - sharp, tearing, pressure, heaviness
 - (4) Region/ radiation
 - (a) For example - arms, neck, back
 - (5) Severity
 - (a) "1-10" scale
 - (6) Timing
 - (a) Duration
 - (b) Worsening or improving

- (c) Continuous or intermittent
- (d) At rest or with activity

Cardiovascular Emergencies

- 2. Dyspnea
 - a. Continuous or intermittent
 - b. Exertional
 - c. Non-exertional
 - d. Orthopneic
 - e. Paroxysmal Nocturnal Dyspnea (PND)
 - f. Cough
 - (1) Dry
 - (2) Productive
 - (3) Frothy
 - (4) Bloody
- 3. Related signs and symptoms
 - a. Restlessness, anxiety
 - b. Diaphoresis
 - c. Level of consciousness (LOC)
 - d. Feeling of impending doom
 - e. Nausea/ vomiting
 - f. Fatigue
 - g. Palpitations
 - h. Edema
 - (1) Extremities
 - (2) Sacral
 - i. Headache
 - j. Syncope
 - k. Behavioral change
 - l. Anguished facial expression
 - m. Activity limitations
 - n. Trauma
- C. Past medical history
 - 1. Coronary artery disease (CAD)
 - 2. Atherosclerotic heart disease
 - a. Angina
 - b. Previous MI
 - c. Hypertension
 - d. Congestive heart failure (CHF)
 - 3. Valvular disease
 - 4. Aneurysm
 - 5. Pulmonary disease
 - 6. Diabetes
 - 7. Renal disease
 - 8. Vascular disease
 - 9. Inflammatory cardiac disease
 - 10. Previous cardiac surgery
 - 11. Congenital anomalies
 - 12. Current/ past medications
 - a. Prescribed
 - (1) Compliance
 - (2) Non-compliance
 - b. Borrowed
 - c. Over-the-counter
 - d. Recreational
 - (1) Cocaine
 - (2) Meth-Amphetamines

Cardiovascular Emergencies

13. Allergies
 14. Family history
 - a. Stroke, heart disease, diabetes, hypertension
 - b. Age at death
 15. Known cholesterol levels
- IV. Detailed physical examination
- A. Inspection
 1. Tracheal position
 - a. Neck veins
 - (1) Appearance
 - (2) Clinical significance
 - b. Thorax
 - (1) Configuration
 - (a) A-P diameter
 - (b) Movement with respirations
 - (2) Clinical significance
 - c. Epigastrium
 - (1) Pulsation
 - (2) Distention
 - (3) Clinical significance
 - B. Auscultation
 1. Breath sounds
 - a. Depth
 - b. Equality
 - c. Abnormal sounds
 - (1) Crackles
 - (2) Wheezes
 - C. Palpation
 1. Areas of crepitus or tenderness
 2. Thorax
 3. Epigastrium
 - a. Pulsation
 - b. Distention

V. Chest pain that may be myocardial in origin

 - A. Define angina pectoris and myocardial infarction
 1. Epidemiology
 2. Precipitating causes
 - B. Morbidity/ mortality
 1. Not a self-limiting disease
 2. Chest pain may dissipate, but myocardial ischemia and injury can 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

Cardiovascular Emergencies

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. Preinfarction angina
 - (1) Pain at rest
 - (2) Sitting or lying down
7. Other possible causes of chest pain
 - a. Cholecystitis
 - b. Aneurysm
 - c. Hiatal hernia
 - d. Pleurisy
 - e. Esophageal and gastrointestinal diseases
 - f. Pulmonary embolism
 - g. Pancreatitis
 - h. Respiratory infections
 - i. Aortic dissection
 - j. Pneumothorax
 - k. Herpes zoster (shingles)
 - l. Chest wall tumors
 - m. Blunt trauma
- C. Initial assessment findings
 1. Level of consciousness
 - a. Anxiety and restlessness
 - b. Near syncopal episodes
 - c. Fatigue
 - d. Vertigo
 2. Airway/ breathing
 - a. Labored breathing may or may not be present
 3. Circulation
 - a. Peripheral pulses
 - (1) Quality
 - (2) Rhythm
 - b. Changes in skin
 - (1) Color
 - (2) Temperature
 - (3) Moisture
- D. Focused history
 1. Chief complaint
 - a. Angina - typically sudden onset of discomfort, usually of brief duration, lasting three to five minutes, maybe five to 15 minutes; usually relieved by rest and/ or medication
 - b. Myocardial infarction - may be sudden onset, lasting more than five minutes, unrelieved by rest and/ or medications
 - c. May be referred to as chest pressure
 - d. Nausea and vomiting
 - e. Epigastric pain or discomfort
 - f. Atypical
 2. Denial

Cardiovascular Emergencies

3. Contributing history
 - a. Onset
 - (1) Exertional
 - (2) Non-exertional
 - b. Initial recognized event
 - c. Recurrent event
 - d. Increasing frequency and/ or duration of event
 - e. Prior use of nitroglycerin
 - f. Prior use of aspirin
 - g. Other medications
 - (1) Prescribed
 - (2) Borrowed
 - (3) Over-the-counter
 - h. Allergy to medications
 - E. Detailed physical exam
 1. Airway
 2. Breathing
 - a. May or may not be labored
 - (1) Sounds
 - (a) May be clear to auscultation
 - (b) May be congested in the bases
 3. Circulation
 - a. Alterations in heart rate and rhythm may occur
 - b. Peripheral pulses are usually not affected
 - c. Blood pressure may be elevated during the episode and normalize afterwards
 - d. ECG Devices
 - (1) Monitor
 - (2) Transmission
 - (3) Documentation
 - F. Management
 1. Position of comfort
 2. Pharmacological interventions
 - a. Oxygen
 - b. Aspirin
 - c. Nitroglycerin
 3. ECG
 - G. Transport considerations
 1. Sense of urgency for reperfusion
 - a. No relief with medications
 - b. Hypotension/ hypoperfusion
 - H. Psychological support/ communications strategies
 1. Explanation for patient, family, significant others
 2. Communication and transfer of data to the physician
- VI. Complications of cardiovascular compromise
- A. Define pulmonary edema
 - B. Epidemiology
 1. Precipitating causes
 - a. Left-sided failure
 - b. Right-sided failure
 - c. Myocardial infarction
 - d. Pulmonary embolism
 - e. Hypertension
 - f. Cardiomegaly

Cardiovascular Emergencies

2. Related terminology
 - a. Preload
 - b. Afterload
 - c. Congestive heart failure
 - (1) Loss of contractile ability which results in fluid overload
 - d. Chronic versus acute
 - (1) First time event
 - (2) Multiple events
- C. Morbidity/ mortality
 1. Pulmonary edema
 2. Respiratory failure
 3. Death
- D. Initial assessment
 1. Airway/ breathing
 - a. Labored breathing may or may not be present
 2. Circulation
 - a. Peripheral pulses
 - (1) Quality
 - (2) Rhythm
 - b. Changes in skin
 - (1) Color
 - (2) Temperature
 - (3) Moisture
- E. Focused history
 1. Chief complaint
 - a. Progressive or acute SOB
 - b. Progressive accumulation of edema
 - c. Weight gain over short period of time
 - d. Episodes of paroxysmal nocturnal dyspnea
 - e. Medication history
 - (1) Prescribed
 - (a) Compliance
 - (b) Non-compliance
 - (2) Borrowed
 - (3) Over-the-counter
 - f. Home oxygen use
- F. Detailed physical exam
 1. Level of consciousness
 - a. Unconscious
 - b. Altered level of consciousness
 2. Airway/ breathing
 - a. Dyspnea
 - b. Productive cough
 - c. Labored breathing
 - (1) Most common, often with activity
 - (2) Paroxysmal nocturnal dyspnea (PND)
 - (3) Tripod position
 - (4) Adventitious sounds
 - (5) Wheezes
 - (6) Crackles
 - (7) Frothy sputum
 - (8) Retraction
 - (9) Cyanosis in advanced stages

Cardiovascular Emergencies

3. Circulation
 - a. Heart rate/ rhythm
 - (1) Rapid, "thready" pulse
 - (2) Any tachycardia with ectopy
 - (3) Any bradycardia with ectopy
 - (4) Atrial arrhythmias
 - b. Changes in skin
 - (1) Color
 - (2) Temperature
 - (3) Moisture
 - c. Peripheral pulses
 - (1) Quality
 - (2) Rhythm
 - d. Edema
 - (1) Pitting versus non-pitting
 - (2) Extremities
 - (a) Localized in ankles
 - (b) To the midcalf
 - (c) To the knees
 - (d) Obliteration of pulses
 - (3) Ascites
 - (4) Sacral
 - G. Management
 1. Position of comfort
 2. Pharmacological interventions
 - a. Oxygen
 - b. Nitroglycerin
 - c. Lasix
 - d. Morphine
 - H. Transport considerations
 - I. Psychological support/ communications strategies
 1. Explanation for patient, family, significant others
 2. Communication and transfer of data to the physician
- VII. Integration
- A. Apply pathophysiological principles to the assessment of a patient with cardiovascular disease
 - B. Formulation of field impression; decisions based on
 1. Initial assessment
 2. Focused history
 3. Detailed physical examination

Cardiovascular Emergencies

- C. Develop and execute a patient management plan based on field impression
 - 1. Initial management
 - a. Airway support
 - b. Ventilation support
 - c. Circulation support
 - d. Non-pharmacologic
 - e. Pharmacologic
 - f. Electrical
 - 2. On-going assessment
 - 3. Transport Decisions
 - a. Appropriate mode
 - b. Appropriate facility
 - 4. Non-transport criteria
 - 5. Advocacy
 - 6. Communications
 - 7. Prevention
 - 8. Documentation
 - 9. Quality assurance

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Diabetic Emergencies

UNIT TERMINAL OBJECTIVE

3-2 At the completion of this unit, the EMT-Intermediate Technician student will be able to utilize the assessment findings to formulate a field impression and implement a treatment plan for the patient with a diabetic emergency.

OBJECTIVES LEGEND

C = Cognitive; A = Affective; P = Psychomotor

1 = Knowledge Level

2 = Application Level

3 = Problem Solving Level

COGNITIVE OBJECTIVE

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

- 3-2.1 Describe the pathophysiology of diabetes mellitus. (C-1)
- 3-2.2 Describe the effects of decreased levels of insulin on the body. (C-1)
- 3-2.3 Correlate abnormal findings in assessment with clinical significance in the patient with a diabetic emergency. (C-3)
- 3-2.4 Discuss the management of diabetic emergencies. (C-1)
- 3-2.5 Describe the mechanism of ketone body formation and its relationship to ketoacidosis. (C-1)
- 3-2.6 Describe the effects of decreased levels of insulin on the body. (C-1)
- 3-2.7 Discuss the pathophysiology of hypoglycemia. (C-1)
- 3-2.8 Recognize the signs and symptoms of the patient with hypoglycemia. (C-1)
- 3-2.9 Describe the management of a hypoglycemic patient. (C-1)
- 3-2.10 Integrate the pathophysiological principles and the assessment findings to formulate a field impression and implement a treatment plan for the patient with hypoglycemia. (C-3)
- 3-2.11 Demonstrate the management of the patient with hypoglycemia utilizing the critical thinking skills. (C-3)
- 3-2.12 Discuss the pathophysiology of hyperglycemia. (C-1)
- 3-2.10 Recognize the signs and symptoms of the patient with hyperglycemia. (C-1)
- 3-2.11 Describe the management of hyperglycemia. (C-1)
- 3-2.12 Differentiate between diabetic emergencies based on assessment and history. (C-3)
- 3-2.13 Develop a patient management plan based on field impression in the patient with a diabetic emergency. (C-3)

AFFECTIVE OBJECTIVES

3-2.14 Appreciate the psychological needs of the patient and family members as the result of a diabetic emergency. (A-2).

PSYCHOMOTOR OBJECTIVES

- 3-2.15 Assess a blood glucose level using a glucose measuring device. (P- 2)
- 3-2.16 Demonstrate venous access. (P- 2)
- 3-2.17 Demonstrate the administration of D50. (P- 2)
- 3-2.18 Demonstrate the administration of glucagon intramuscularly. (P- 2)
- 3-2.19 Demonstrate the management of the patient with hypoglycemia utilizing the critical thinking skills. (P-3)

Diabetic Emergencies

DECLARATIVE

- I. Introduction
 - A. Define
 1. Diabetes mellitus
 2. Hypoglycemia
 3. Hyperglycemia
 4. Diabetic ketoacidosis
- II. Specific illnesses
 - A. Diabetes mellitus
 1. Epidemiology
 - a. Incidence
 - b. Long term complications
 2. Pathophysiology
 - a. Types
 - (1) Type I-insulin dependent
 - (2) Type II-non insulin dependent
 - b. A chronic system syndrome characterized by hyperglycemia caused by a decrease in the secretion or activity of insulin
 - c. Normal insulin metabolism
 - d. Abnormal metabolism/ ketone formation
 - (1) When insulin supply is insufficient, glucose cannot be used for cellular energy
 - (2) Response to cellular starvation
 - (3) Body releases and breaks down stored fats and protein to provide energy
 - (4) Fatty acids produce ketones
 - (5) Excess ketones upset pH balance and acidosis develops (DKA)
 - B. Hypoglycemia
 1. Pathophysiology
 - a. Blood glucose levels fall below that required for normal body functioning
 - b. Cellular/ organ death can occur
 2. Assessment
 - a. History
 - (1) General health
 - (2) Medical history
 - (3) Medications/ alcohol /drug usage
 - (4) Last food intake/ prolonged fasting
 - (5) Insulin usage
 - (a) amount
 - (b) type
 - (c) time taken
 - (6) Previous experience with the complaint
 - (7) Time of onset
 - (8) Treatment by patient and /or family

Diabetic Emergencies

- b. Signs and symptoms
 - (1) Weakness
 - (2) Irritability
 - (3) Combativeness
 - (4) Hunger
 - (5) Confusion
 - (6) Anxiety
 - (7) Bizarre behavior
 - (8) Tachycardia
 - (9) Normal respiratory pattern
 - (10) Cool, pale skin
 - (11) Diaphoresis
- c. Blood glucose analysis
- 3. Management
 - a. Airway and ventilation
 - (1) Oxygen
 - (2) Positioning
 - (3) Suction
 - (4) Assisted ventilation
 - (5) Advanced airway devices
 - b. Circulation
 - (1) Venous Access
 - c. Pharmacological interventions
 - (1) Oral glucose
 - (2) D50
 - (3) Glucagon
 - d. Non-pharmacological interventions
 - e. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility
 - (3) Non transport issues
 - f. Psychological support/ communication strategies
- C. Hyperglycemia
 - 1. Pathophysiology
 - a. Occurs in patients with diabetes when they are not able to produce enough insulin for adequate glucose metabolism and blood glucose levels rise.
 - b. Can progress to abnormal glucose metabolism with the production of metabolic acids (DKA).
 - 2. Assessment
 - a. History
 - (1) General health
 - (2) Medical history
 - (3) Medications/ alcohol /drug usage
 - (4) Last food intake/ prolonged fasting
 - (5) Insulin usage
 - (a) amount
 - (b) type
 - (c) time taken
 - (6) Previous experience with the complaint
 - (7) Time of onset
 - (8) Treatment by patient and /or family

Diabetic Emergencies

- b. Signs and symptoms
 - (1) Neurologic abnormalities
 - (a) Altered level of consciousness
 - (b) Coma
 - (c) Increasing mental depression
 - (2) Hyperventilation
 - (3) Abnormal breathing patterns (Kussmaul respiration)
 - (4) May have fruity odor on breath
 - (5) Dehydration
 - (6) Nausea and vomiting
 - (7) Abnormal increase in urination
 - (8) Abdominal pain
 - c. Blood Glucose Measurement
3. Management
- a. Airway and ventilation
 - (1) Oxygen
 - (2) Positioning
 - (3) Suction
 - (4) Assisted ventilation
 - (5) Advanced airway devices
 - b. Circulation
 - c. Pharmacological interventions
 - (1) Rehydration
 - d. Non-pharmacological interventions
 - e. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility
 - f. Psychological support/ communication strategies
- D. Diabetic ketoacidosis
- 1. Pathophysiology
 - a. a. Hyperglycemia
 - b. b. Ketonemia
 - c. c. Relative insulin insufficiency
 - 2. Assessment findings
 - a. a. History
 - (1) (1) General health
 - (2) (2) Previous medical conditions
 - (3) (3) Medications
 - (4) (4) Previous experience with complaint
 - (5) (5) Time of onset
 - b. b. Physical
 - (1) (1) Dehydration
 - (2) (2) Hypotension
 - (3) (3) Reflex tachycardia
 - (4) (4) Acetone (fruity) odor on breath
 - (5) (5) Nausea
 - (6) (6) Vomiting
 - (7) (7) Abdominal pain
 - (8) (8) Hyperventilation
 - (9) (9) Kussmaul's respiration

Diabetic Emergencies

3. Management
 - a. Airway and ventilation
 - (1) Oxygen
 - (2) Positioning
 - (3) Suction
 - (4) Assisted ventilation
 - (5) Advanced airway devices
 - b. Circulatory support
 - (1) Venous access
 - (2) Blood analysis
 - c. Pharmacological interventions
 - (1) Rehydration
 - d. Non-pharmacological interventions
 - (1) General comfort measures
 - e. Transport considerations
 - (1) Appropriate mode
 - (2) Appropriate facility
 - f. Psychological support/ communications strategies

Poisoning / Overdose

UNIT TERMINAL OBJECTIVE

- 3-3 At the completion of this unit, the EMT Intermediate Technician student will be able to utilize assessment findings to formulate a field impression and implement a treatment plan for the patient with a narcotic overdose.

OBJECTIVES LEGEND

- C = Cognitive; A = Affective; P = Psychomotor
1 = Knowledge Level
2 = Application Level
3 = Problem Solving Level

COGNITIVE OBJECTIVES

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

- 3-3.1 Integrate pathophysiological principles and the assessment findings to formulate a field impression and implement a treatment plan for patients with a narcotic overdose. (C-3)

AFFECTIVE OBJECTIVES

- 3-3.2 Appreciate the psychological needs of victims of narcotic overdose. (A-2)

PSYCHOMOTOR OBJECTIVES

- 3-3.3 Demonstrate the administration of Naloxone to the patient with potential narcotic overdose. (P-2)

Poisoning / Overdose

DECLARATIVE

- I. Narcotics/ opiates
 - A. Common causative agents - heroin, morphine, codeine, meperidine, propoxyphene, fentanyl
 - B. Assessment findings
 1. Euphoria
 2. Hypotension
 3. Respiratory depression/ arrest
 4. Nausea
 5. Pinpoint pupils
 6. Seizures
 7. Coma
 - C. Management
 1. Airway and ventilation
 2. Circulation
 3. Pharmacological
 - a. Naloxone- opiate specific antidotal therapy
 4. Non-pharmacological
 5. Transport considerations
 - a. Appropriate mode
 - b. Appropriate facility
 6. Psychological support/ communication strategies