



Intravenous Therapy And Medication Administration Curriculum

**For the Colorado Emergency Medical Technician
(formerly EMT-Basic)**



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Colorado Department of Public Health and Environment
Emergency Medical and Trauma Services
HFEMSD-A2
4300 Cherry Creek Drive South
Denver, CO 80246-1530
(303) 692-2980
www.coems.info

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INTRODUCTION

The Colorado Department of Public Health and Environment under the auspices of, 6 CCR 1015-3, Chapter 2 “Rules Defining the Qualifications and Duties of Emergency Medical Services Medical Directors and the Authorized Medical Acts of Emergency Medical Technician” establishes the scope of practice for all levels of EMS providers and is commonly referred to as the “The Practice Rules”. Within the Practice Rules it is stated that a Colorado certified Emergency Medical Technician (EMT formerly EMT-Basic), upon completion of a education program approved by the Colorado Department of Public Health and Environment (CDPHE) Emergency Medical and Trauma Services (EMTS) section and under the authorization (sponsorship) of a Colorado licensed physician may establish a peripheral intravenous line, administer crystalloid fluids, collect venous blood samples, and administer certain medications.

This document contains a description of the minimum curriculum content that a Colorado certified EMT must complete to be eligible for physician sponsorship in the performance of phlebotomy, intravenous therapy, and medication administration.

EMT IV Education Groups, which are recognized by the EMTS section, are obligated to present, at a minimum, the full content of this curriculum.

This curriculum is intended to be descriptive of the content required. Education programs should utilize this material in constructing their courses. Instructor and student supportive materials on the topics contained in this curriculum may be obtained from any source yet must reflect currently accepted standards of medical practice for the skills included.

The contents of this curriculum may be expanded to provide material relevant to other levels of health care providers. Any material added to this curriculum by an EMT IV Education Group does not constitute authorization for performance of skills beyond those defined by the Practice Rules for EMS providers.

This curriculum was developed by the CDPHE EMTS section and the State Emergency Medical and Trauma Services Advisory Council (SEMTAC) to satisfy the requirements for a Department approved education program.

There is no specific state certification for graduates of an EMT IV course. It is the responsibility of the medical director, prior to authorizing (sponsoring) a Colorado EMT to perform these skills, to assure that the sponsored EMT meets the eligibility requirement of successful completion of a state approved education program.

Recommended classroom time to present this content is approximately 21-22 hours. The exact time may vary slightly based on the number and experience level of the class participants.

Clinical experience is required of each student prior to successful course completion. Clinical experience shall consist of no less than 10 successful venipunctures utilizing over-the-needle intravenous catheters or butterfly needles. No less than four (4) of the required 10 successful venipunctures must be performed on real patients in a clinical environment. Clinical sites must have written agreements/contacts with the education program presenting the course.

COURSE SCHEDULE

MODULES (with <i>recommended</i> time breakdown)	RECOMMENDED MODULE TIMES	RECOMMENDED EMT CE HOUR AWARD
1. Course Introduction Didactic 0:30 Lab 0:00	0:30	Preparatory - 0.5 CEU
2. Roles, Responsibilities, Legal Considerations Didactic 1:00 Lab 0:00	1:00	Preparatory - 1.0 CEU
3. Cellular and Vascular Anatomy and Physiology Didactic 1:30 Lab 0:00	1:30	Medical - 0.75 CEU Trauma - 0.75 CEU
4. Shock Principles Didactic 1:30 Lab 0:00	1:30	Trauma - 1.5 CEU
5. Body Substance Isolation Didactic 0:30 Lab 0:00	0:30	Preparatory - 0.5 CEU
6. Venipuncture Site Selection and Preparation Didactic 0:45 Lab 0:45	1:30	Assessment – 1.5 CEU
7. Phlebotomy Equipment Didactic 0:15 Lab 0:30	0:45	Elective - 0.75 CEU
8. Phlebotomy Venipunctures Technique Didactic 0:30 Lab 1:00	1:30	Medical - 1.5 CEU
9. Intravenous Therapy Equipment Didactic 0:15 Lab 0:30	0:45	Elective - 0.75 CEU
10. Intravenous Therapy Venipuncture Technique Didactic 0:30 Lab 1:00	1:30	Medical - 0.75 CEU Trauma - 0.75 CEU
11. Combining Phlebotomy and Intravenous Therapy Technique Didactic 0:15 Lab 0:45	1:00	Medical – 0.5 CEU Trauma - 0.5 CEU
12. Drip Rate Calculation Didactic 0:30 Lab 0:30	1:00	Medical - 1.0 CEU
13. Maintenance of Intravenous Therapy Didactic 0:30 Lab 0:30	1:00	Medical - 1.0 CEU
14. Discontinuation of Intravenous Therapy Didactic 0:30 Lab 0:30	1.00	Medical - 1.0 CEU

Intravenous Therapy,
And Medication Administration
Curriculum

MODULES (with <i>recommended</i> time breakdown)	RECOMMENDED MODULE TIMES	RECOMMENDED EMT CE HOUR AWARD
15. Intravenous Therapy in the Management of Adult Care <div style="text-align: right; margin-right: 50px;"> Didactic 1:30 Lab 0:00 </div>	1:30	Medical - 0.75 CEU Trauma - 0.75 CEU
16. Intravenous Therapy in the Management of Pediatric Care <div style="text-align: right; margin-right: 50px;"> Didactic 1:30 Lab 0:00 </div>	1:30	Pediatrics – 1.5 CEU
17. Documentation <div style="text-align: right; margin-right: 50px;"> Didactic 0:30 Lab 0:00 </div>	0:30	Preparatory - 0.5 CEU
18. Blood Glucose Testing and Administration of Intravenous Dextrose <div style="text-align: right; margin-right: 50px;"> Didactic 0:30 Lab 1:00 </div>	1:30	Assessment - .5 CEU Medical -1.0 CEU
19. Administration of Narcan, intravenous and intranasal <div style="text-align: right; margin-right: 50px;"> Didactic 0:15 Lab 0:15 </div>	0.30	Medical - .5 CEU
20. Administration of Albuterol, nebulized (optional) <div style="text-align: right; margin-right: 50px;"> Didactic 0:30 Lab 0:30 </div>	1.0	Assessment – 0.5 Medical – 0.5 CEU
TOTAL CLASSROOM HOURS	21.5 hours	Preparatory – 2.5 Assessment – 2.5 Pediatrics – 1.5 Medical – 10 Trauma – 4.25 Elective - .75
21. Clinical Experience	Various	
22. Cognitive Testing	Various	
23. Psychomotor Skills Testing	Various	
24. Clinical Requirements	Successful over-the-needle catheter IV starts on no less than ten (10) live subjects: At least four (4) of these ten (10) subjects must be performed on real patients in a clinical setting. The clinical site(s) must have a written contract or agreement for clinical services with the education group.	

MEDICAL ACTS ALLOWED

Before a Colorado certified EMT may perform invasive procedures related to the collection of human blood samples, the initiation of intravenous therapy, or the administration of intravenous, atomized or nebulized medications, the EMT must complete the following requirements in the sequence listed:

1. **EDUCATION**

Successful completion of a course of study approved by the Colorado Department of Public Health and Environment (CDPHE), Emergency Medical and Trauma Services (EMTS) section which contains at a minimum the material included in this curriculum.

2. **AUTHORIZATION**

Formal sponsorship is required for the performance of any or all skills listed within the Practice Rules by a Colorado licensed physician who is registered with EMTS as a recognized EMS Medical Director. This medical sponsorship shall not include basic or advance life support skills not listed in the Practice Rules, unless the sponsoring physician has applied for and received a waiver from the Department.

Skills Permitted

1. Human venipuncture for the following purposes
 - a. Determination of blood glucose measurements
 - b. Collection of a venous blood sample
 - c. Initiation of intravenous therapy to include the following purposes
 - (i) Fluid replacement utilizing sterile-crystalloid solutions
 - (ii) Medication administration route utilizing sterile crystalloid solutions
2. Venous sites permitted shall be limited to the following in both adults and children
 - a. Peripheral veins (excluding external jugular)
 - b. Scalp veins
 - (i) Note: Ages, sites, and time limitations related to venipuncture should be determined by the current Practice Rules and local medical direction (protocols)
3. Measurement of blood glucose levels
4. Administration of intravenous Dextrose
5. Administration of intravenous and intranasal Narcan
6. Administration of nebulized Albuterol

LEARNING OBJECTIVES

1. COURSE INTRODUCTION

Upon completion of Module 1, the EMT should be able to:

Cognitive Objectives

- 1.1. Describe this course's duration, completion requirements, and policies and procedures
- 1.2. Briefly describe the history of IV Therapy
- 1.3. Describe the purpose of this courses as it relates to the EMT

Psychomotor Objectives

None identified

Affective Objectives

- 1.4. Briefly describe personal attitudes regarding the performance of these skills

2. ROLES, RESPONSIBILITIES, AND LEGAL CONSIDERATIONS

Upon completion of Module 2, the EMT should be able to:

Cognitive Objectives

- 2.1. Briefly describe the purpose of the Practice Rules and the regulatory body which establishes those Rules
- 2.2. Summarize the provision in the Practice Rules which authorizes the EMT to establish Intravenous Access
- 2.3. Given a variety of unusual patient scenarios, describe the appropriate action the EMT should take from a legal standpoint and explain the rationale behind those decisions.
- 2.4. Discuss the principles of consent to treatments as they apply to the EMT
- 2.5. Discuss abandonment as it applies to the EMT with additional education above the EMT level
- 2.6. Describe the relationship between the EMT and his/her medical director
- 2.7. Differentiate between protocols and standing orders by definition and field practice
- 2.8. State the local protocol for authorization of the EMT to establish IV Therapy (content to be established by local education programs)

Psychomotor Objectives

None identified

Affective Objectives

- 2.9. Briefly describe the approach to be taken with a patient refusing IV Therapy
- 2.10. Briefly describe considerations when obtaining a blood alcohol sample

3. CELLULAR AND VASCULAR ANATOMY AND PHYSIOLOGY

Upon completion of Module 3, the EMT should be able to:

Cognitive Objectives

- 3.1. Define the following terms
 - 3.1.1. Diffusion
 - 3.1.2. Osmosis
 - 3.1.3. Semi-selective permeable membrane
 - 3.1.4. Osmotic pressure
 - 3.1.5. Oncotic pressure
 - 3.1.6. Tonicity
 - 3.1.7. Hypertonic
 - 3.1.8. Isotonic
 - 3.1.9. Hypotonic
 - 3.1.10. Electrolytes
 - 3.1.11. Intracellular fluid
 - 3.1.12. Extracellular fluid
 - 3.1.13. Interstitial fluid
 - 3.1.14. Intravascular fluid
 - 3.1.15. Crystalloid solution
 - 3.1.16. Colloid solution
- 3.2. Describe the purposes of body water
- 3.3. State the percentage of body weight comprised of water and factors which affect this relationship
- 3.4. Describe the role of electrolytes, osmotic pressure, oncotic pressure, and diffusion in the maintenance of body fluid balance
- 3.5. Identify intravenous therapy solutions as being isotonic, hypertonic, or hypotonic in nature
- 3.6. Explain the effects of infusion of isotonic, hypertonic, and hypotonic IV solutions upon intracellular, intravascular, and interstitial fluids
- 3.7. Describe the role each of the following systems have on body fluid regulation
 - 3.7.1. Cardiovascular system
 - 3.7.2. Renal system
 - 3.7.3. Nervous system
 - 3.7.4. Respiratory system
- 3.8. List the components of blood and their function
- 3.9. Briefly describe the anatomy of the circulatory system
- 3.10. Define and explain the significance of hemoglobin and hematocrit
- 3.11. Briefly describe the blood clotting process
- 3.12. State at least three factors which may alter the body's ability to form clots
- 3.13. List indications for blood transfusion
- 3.14. List three differences between veins and arteries

Psychomotor Objectives

None identified

Affective Objectives

None identified

4. SHOCK PRINCIPLES (review of material on the EMT level)

Upon completion of Module 4, the EMT should be able to:

Cognitive Objectives

- 4.1. Describe the signs and symptoms of internal bleeding
- 4.2. Define shock (hypoperfusion)
- 4.3. Describe the signs and symptoms of shock (hypoperfusion)
- 4.4. Describe briefly the physiology reaction to shock (hypoperfusion) in arteries, capillaries and veins

Psychomotor Objectives

None identified

Affective Objectives

- 4.5 Estimate the volume of simulated blood loss in different setting

5. BODY SUBSTANCE ISOLATION (BSI)

Upon completion of Module 5, the EMT should be able to:

Cognitive Objectives

- 5.1. Discuss the importance of body substance isolation (BSI) based on OSHA standards.
- 5.2. Define pathogens
- 5.3. Define routes of exposure
- 5.4. Describe the steps the EMT should take for personal protection from exposure to pathogens
- 5.5. List the personal protective equipment necessary when initiating venipuncture

Psychomotor Objectives

None identified

Affective Objectives

- 5.6. Explain why the practice of body substance isolation (BSI) is important
- 5.7. Explain the rationale for the EMT serving as an advocate for the use of appropriate protective equipment

6. VENIPUNCTURE SITE SELECTION AND PREPARATION

Upon completion of Module 6, the EMT should be able to:

Cognitive Objectives

- 6.1. Define peripheral IV sites
- 6.2. List three commonly used peripheral IV sites
- 6.3. List advantages and disadvantages to each site listed in 6.2
- 6.4. Explain the complications associated with the use of lower extremity veins for IV initiation of leg veins for IV initiation
- 6.5. List factors which may effect the size and condition of a vein
- 6.6. Describe methods that may be used to distend a vein for identification and venipuncture

- 6.7. Explain why site selection should be based on patient's clinical presentation
- 6.8. Describe the steps in preparing a site for venipuncture
- 6.9. Given the following patient scenarios, describe the site that should be explored first for starting an IV
 - 6.9.1. Cardiac arrest
 - 6.9.2. Major systems trauma
 - 6.9.3. Burns
 - 6.9.4. Pediatric
- 6.10. Explain how a venous constricting band might become a source of contamination
- 6.11. List the steps in venipuncture site preparation
- 6.12. Define the following terms
- 6.13. Septic
- 6.14. Aseptic
- 6.15. Venous constricting band
- 6.16. Anticubital space
- 6.17. Clean
- 6.18. Sterile

Psychomotor Objectives

- 6.19. Demonstrate the techniques of locating a suitable venipuncture site
- 6.20. Demonstrate three techniques to distend a vein for venipuncture
- 6.21. Demonstrate proper aseptic technique in venipuncture site preparation

Affective Objectives

- 6.22. Explain how a non-critical patient situation might alter IV site selection

7. PHLEBOTOMY EQUIPMENT

Upon completion of Module 7, the EMT should be able to:

Cognitive Objectives

- 7.1. List the equipment necessary to perform phlebotomy venipuncture
- 7.2. Identify on a mannequin or live model two commonly used sites to obtain blood samples using phlebotomy venipuncture techniques
- 7.3. List common additives found in the following blood collection tubes, and state their importance
 - 7.3.1. Red top
 - 7.3.2. Blue top
 - 7.3.3. Green top
 - 7.3.4. Yellow top
 - 7.3.5. Lavender top
 - 7.3.6. Marbled top
- 7.4. List common test performed with the following blood collection tubes
 - 7.4.1. Red top
 - 7.4.2. Blue top
 - 7.4.3. Green top
 - 7.4.4. Yellow top
 - 7.4.5. Lavender top
 - 7.4.6. Marbled top

Psychomotor Objectives

- 7.5. Select the equipment necessary to perform phlebotomy venipuncture
- 7.6. Assemble the equipment needed to perform phlebotomy venipuncture

Affective Objectives

None identified

8. PHLEBOTOMY VENIPUNCTURE TECHNIQUE

Upon completion of Module 8, the EMT should be able to:

Cognitive Objectives

- 8.1. Identify at least two sites that are commonly used to perform phlebotomy venipuncture
- 8.2. Explain common questions that should be asked to patients prior to performing phlebotomy venipuncture
 - 8.2.1. Allergies
 - 8.2.2. Phobias
 - 8.2.3. Blood
- 8.3. Needles
- 8.4. Explain how to properly prepare a patient prior to phlebotomy/venipuncture
- 8.5. Explain to the patient the process for performing phlebotomy/venipunctures
- 8.6. Describe the importance of obtaining consent from the patient prior to phlebotomy/venipuncture
- 8.7. Explain proper site preparation prior to phlebotomy/venipuncture
- 8.8. Describe the proper technique for performing phlebotomy/venipuncture
- 8.9. Explain the proper technique for labeling and handling of blood tubes after performing phlebotomy/venipuncture
- 8.10. Explain the correct method for terminating phlebotomy/venipuncture
- 8.11. Explain how to take care of the site after performing phlebotomy/ venipuncture
- 8.12. Define appropriate documentation in regards to phlebotomy/venipuncture

Psychomotor Objectives

- 8.13. Demonstrate the following phlebotomy/venipuncture techniques (human/mannequin)
- 8.14. Patient assessments
- 8.15. Proper preparation
- 8.16. Patient preparation
- 8.17. Equipment assembly
- 8.18. Site selection
- 8.19. BSI precautions
- 8.20. Site preparation
- 8.21. Venipuncture performance
- 8.22. Manipulation of collection tubes
- 8.23. Termination of phlebotomy technique
- 8.24. Site maintenance
- 8.25. Documentation

Affective Objectives

- 8.26. Discuss possible anxieties a patient might have regarding venipuncture and how to allay them

9. INTRAVENOUS THERAPY EQUIPMENT

Upon completion of Module 9, the EMT should be able to

Cognitive Objectives

- 9.1. List the equipment necessary to perform venipuncture technique using an over the needle catheter and a butterfly needles
 - 9.1.1. Fluid
 - 9.1.2. Administration set
 - 9.1.3. Over the needle catheter size
 - 9.1.4. Venous constricting bands
 - 9.1.5. Cleaning solution
 - 9.1.6. Securing device
 - 9.1.7. Tape

Psychomotor Objective

- 9.2. Demonstrate proper assembly of the equipment listed in 9.1

Affective Objectives

- 9.3. None Identified

10. INTRAVENOUS THERAPY VENIPUNCTURE TECHNIQUE

Upon completion of Module 10, the EMT should be able to:

Cognitive Objectives

- 10.1. Describe the proper technique for adult and pediatric intravenous therapy
 - 10.1.1. Patient assessments
 - 10.1.2. Proper authority
 - 10.1.3. Patient preparation
 - 10.1.4. Equipment assembly
 - 10.1.5. Site selection
 - 10.1.6. BSI precautions
 - 10.1.7. Site selection
 - 10.1.8. Venipuncture performance
 - 10.1.9. Site maintenance
 - 10.1.10. Documentation

Psychomotor Objectives

- 10.2. Demonstrate on a mannequin or live model intravenous venipuncture technique for an adult and pediatric patients
 - 10.2.1. Patient assessments
 - 10.2.2. Patient consent
 - 10.2.3. Patient preparation
 - 10.2.4. Equipment assembly
 - 10.2.5. Site selection
 - 10.2.6. BSI precautions
 - 10.2.7. Site selection
 - 10.2.8. Venipuncture performance

- 10.2.9. Site maintenance
- 10.2.10. Documentation

Affective Objectives

None identified

11. METHOD OF COMBINING PHLEBOTOMY AND INTRAVENOUS THERAPY TECHNIQUES

Upon completion of Module 11, the EMT should be able to:

Cognitive Objectives

- 11.1. Describe the reasons for combining blood draws with IV insertion
- 11.2. Describe two types of equipment used to combine phlebotomy and IV insertion:
- 11.3. Syringe
- 11.4. Luer type adapter
- 11.5. List common equipment problems that may be encountered when combining phlebotomy and IV insertion
- 11.6. Connections
- 11.7. Faulty luer type adapters
- 11.8. Operator errors

Psychomotor Objectives

- 11.9. Demonstrate the correct technique for combining phlebotomy and IV insertion technique

Affective Objectives

None Identified

12. DRIP RATE CALCULATION

Upon completion of Module 12, the EMT should be able to:

Cognitive Objectives

- 12.1. Describe how to convert pounds to kilograms using long division Explain how to convert cc/ml to liters, kg to grams, mg to micrograms
- 12.2. Explain how to calculate amount of medication to patient weight in a acute patient environment
- 12.3. Describe how to calculate physician orders to gtts per minute with macro, micro and blood pump administration sets
- 12.4. Describe the conversion process for a known dose of a medication on hand to desired dose

Psychomotor Objectives

- 12.5. Demonstrate how to convert pounds to kilograms using long division and the three AM rule

- 12.6. Demonstrate how to convert cc/ml to liters, kg to grams, mg to micrograms
- 12.7. Calculate amount of medication to patient weight in a acute patient environment
- 12.8. Calculate physician orders to gtt/s per minute with macro, micro and blood pump administration sets
- 12.9. Convert known dose of a medication on hand to desired dose

Affective Objectives

None identified

13. MAINTENANCE OF INTRAVENOUS THERAPY

Upon completion of Module 13, the EMT should be able to:

Cognitive Objectives

- 13.1. Describe the need to obtaining vital signs before and after application of the IV
- 13.2. Name three critical changes that occur from fluid administration and the associated changes in the patients vital signs
- 13.3. Explain how and where to listen to breath sounds
- 13.4. Identify the breath sounds
 - 13.4.1. Rales
 - 13.4.2. Rhchi
 - 13.4.3. Wheezes
 - 13.4.4. Absent breath sounds
- 13.5. List three indication of fluid overload
- 13.6. Describe three ways to confirm the patency of an IV
- 13.7. List three reasons why an IV should be immediately discontinue an IV
- 13.8. Explain how to correct the flow of an IV that has discontinued flowing

Psychomotor Objectives

- 13.9. Demonstrate the ability to obtain vital signs before and after application of the IV
- 13.10. Recognize three critical changes that occur from fluid administration and the associated changes in the patients vital signs
- 13.11. Demonstrate listening to breath sounds

- 13.12. Demonstrate three ways to confirm the patency of an IV
- 13.13. Perform the proper documentation of a IV administration
- 13.14. Demonstrate how to correct the flow of an IV that has discontinued flowing

Affective Objectives

None identified

14. DISCONTINUATION OF INTRAVENOUS THERAPY

Upon completion of Module 14, the EMT should be able to:

Cognitive Objectives

- 14.1. Explain the reasons for contacting on line medical control prior to discontinuing an IV
- 14.2. Explain the importance of describing to the patient the signs and symptoms of infection after an IV has been removed
- 14.3. Describe preparing the proper equipment for discontinuing an IV
- 14.4. Explain how to describe to the patient the procedure for discontinuing and IV

Psychomotor Objectives

- 14.5. Simulate contacting on line medical control prior to removal of an IV
- 14.6. Describe to the patient the signs and symptoms of infection after an IV has been removed
- 14.7. Demonstrate preparing the proper equipment for discontinuing an IV
- 14.8. Describe to the patient the procedure for discontinuing an IV
- 14.9. Prepare the equipment for discontinuation of the IV
- 14.10. Demonstrate removing an IV with aseptic technique

Affective Objectives

None Identified

15. INTRAVENOUS THERAPY IN THE MANAGEMENT OF ADULT CARE

Upon completion of Module 15, the EMT should be able to:

Cognitive Objectives

- 15.1. Given a patient case study or scenario explain the following aspects of patient care in the adult trauma patient, medical patient and patient in cardiac arrest
 - 15.1.1. Indications for IV insertion
 - 15.1.2. Contraindications for IV insertion; both patient condition and scene concerns
 - 15.1.3. List appropriate sites for intravenous therapy for an adult trauma patient
 - 15.1.4. Review differences for site selection and over the needle catheter size based on patient condition
 - 15.1.5. State the recommended/desired flow rate
 - 15.1.6. List acceptable techniques for vein distention
 - 15.1.7. Possible complications associated with IV insertion
 - 15.1.8. Review problem solving techniques for possible IV complications
 - 15.1.9. Review equipment necessary for IV site phlebotomy, as dictated by case study/scenario
 - 15.1.10. Indications of fluid overload as a result of IV therapy
 - 15.1.11. Methods of managing a patient with fluid overload as a result of IV therapy

Psychomotor Objectives

- 15.2. Demonstrate the technique for site selection for venipuncture for an adult patient
- 15.3. Demonstrate the proper aseptic technique for venipuncture
- 15.4. Demonstrate the appropriate IV site phlebotomy techniques
- 15.5. Demonstrate how to appropriately secure an IV
- 15.6. Demonstrate how to regulate volume administration set drip rates

Affective Objectives

- 15.7. Explain how patient condition may alter IV site selection
- 15.8. Explain how patient condition may alter the size and type of IV over the needle catheter and administration set used

16. INTRAVENOUS THERAPY IN THE MANAGEMENT OF PEDIATRIC CARE

Upon completion of Module 16, the EMT should be able to:

Cognitive Objectives

- 16.1. Given a patient case study or scenario explain the following aspects of patient care in the pediatric trauma patient, medical patient and patient in cardiac arrest
 - 16.1.1. Indications for IV insertion
 - 16.1.2. Contraindications for IV insertion; both patient condition and scene concerns
 - 16.1.3. List appropriate sites for intravenous therapy for an pediatric trauma patient
 - 16.1.4. Review differences for site selection and over the needle catheter size based on patient condition
 - 16.1.5. State the recommended/desired flow rate
 - 16.1.6. List acceptable techniques for vein distention in a pediatric trauma patient
 - 16.1.7. Possible complications associated with IV insertion
 - 16.1.8. Review problem solving techniques for possible IV complications
 - 16.1.9. Review equipment necessary for IV site phlebotomy, as dictated by case study/ scenario
 - 16.1.10. Indications of fluid overload as a result of IV therapy
 - 16.1.11. Methods of managing a patient with fluid overload as a result of IV therapy

Psychomotor Objectives

- 16.2. Demonstrate the technique for site selection for venipuncture for a pediatric patient
- 16.3. Demonstrate the proper aseptic technique for venipuncture
- 16.4. Demonstrate appropriate IV site phlebotomy techniques
- 16.5. Demonstrate how to appropriately secure an IV
- 16.6. Demonstrate how to regulate volume administration set drip rates

Affective Objectives

- 16.7. Explain how patient condition may alter IV site selection
- 16.8. Explain how patient condition may alter the size and type of IV over the needle catheter and administration set used

17. DOCUMENTATION

Upon completion of Module 17, the EMT should be able to:

Cognitive Objectives

- 17.1. Discuss the documentation requirements for establishment of an IV
- 17.2. Describe the components of a written report and information that should be included
- 17.3. Identify the various sections of a written report and how it pertains to the EMT
- 17.4. Describe what information is required in each section of the patient care report and how it pertains to the EMT
- 17.5. Define special considerations concerning patient refusals, specifically with IDDM patients

- 17.6. Describe the legal implications associated with the written report
- 17.7. Discuss local considerations

Psychomotor Objectives

- 17.8. Demonstrate different patient care report techniques and formats
- 17.9. Compose an accurate patient care report containing the minimum data set for IV initiation an medication administration

Affective Objectives

- 17.10. Recognize the importance of accurate documentation

18. BLOOD GLUCOSE TESTING AND ADMINISTRATION OF INTRAVENOUS DEXTROSE

Upon completion of Module 18, the EMT should be able to:

Cognitive Objectives

- 18.1. State the indications for blood glucose testing
- 18.2. State appropriate blood glucose levels
- 18.3. Describe the patient presentation requiring the administration of glucose
- 18.4. State the situations in which physician consultation would be indicated for the administration of Dextrose
- 18.5. Identify the following aspects of Dextrose administration in the adult and pediatric patient
 - 18.5.1. Therapeutic effects
 - 18.5.2. Indications
 - 18.5.3. Contraindications
 - 18.5.4. Side effects
 - 18.5.5. Complications with administration
- 18.6. Differentiate between hypoglycemia and hyperglycemia
- 18.7. State the local protocols for the administration of Dextrose
- 18.8. Discuss the importance of drawing a tube of blood just prior to the administration of Dextrose

Psychomotor Objectives

- 18.9. Demonstrate proficiency in performing and interpreting a blood glucose test
- 18.10. Demonstrate the appropriate technique for the administration of Dextrose
- 18.11. Demonstrate the appropriate technique for the administration of oral glucose

Affective Objectives

None Identified

19. ADMINISTRATION OF NARCAN, INTRAVENOUS AND INTRANASAL

Upon completion of Module 19, the EMT should be able to:

Cognitive Objectives

- 19.1. Discuss the general factors that may cause an alteration in a patient's behavior
- 19.2. Describe the patient presentation requiring the administration of Narcan
- 19.3. Discuss the advantages and disadvantages of various routes of Narcan administration (i.e. intravenous, intramuscular, intranasal)
- 19.4. Discuss the importance of patient and provider safety prior to and after administration of Narcan
- 19.5. Identify the following aspects of Narcan administration in the adult and pediatric patient
 - 19.5.1. Therapeutic effects
 - 19.5.2. Indications
 - 19.5.3. Contraindications
 - 19.5.4. Side effects
 - 19.5.5. Complications with administration
- 19.6. State the local protocols for the administration of Narcan.

Psychomotor Objectives

- 19.7. Demonstrate the appropriate technique for the administration of intravenous Narcan
- 19.8. Demonstrate the appropriate technique for the administration of intranasal Narcan

Affective Objectives

None Identified

20. ADMINISTRATION OF ALBUTEROL, NEBULIZED

This module of the "Intravenous Therapy, And Medication Administration Curriculum" may be optional for some students. Students who have successfully completed this material as a portion of their EMT initial curriculum are not required to repeat this information. If however, the student has not covered this information and has not demonstrated both cognitive and psychomotor competency, this information should be covered.

Upon completion of Module 20, the EMT should be able to:

Cognitive Objectives

- 20.1 List various causes of respiratory distress
- 20.2 Describe the signs and symptoms of a patient in respiratory distress
- 20.3 Identify the indications for the administration of nebulized Albuterol
- 20.4 Describe the patient presentation requiring the administration of Albuterol
- 20.5 Identify the following aspects of Albuterol administration in the adult and pediatric patient
 - 20.5.1 Therapeutic effects
 - 20.5.2 Indications
 - 20.5.3 Contraindications
 - 20.5.4 Side effects
 - 20.5.5 Complications with administration
- 20.6 State the local protocols for the administration of Albuterol

Psychomotor Objectives

20.7 Demonstrate the appropriate technique for the administration of nebulized Albuterol

Affective Objectives

20.8 Recognize the importance of patient coaching and calming techniques

Skill Sheet Phlebotomy

Student _____ Evaluator _____

Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Explains procedure to patient	1	
Identifies the need for drawing a blood sample: <ul style="list-style-type: none"> • As part of IV initiation for blood testing (1 point) • Blood glucose determination (1 point) • Legal (Blood alcohol, felony draw, etc. w/o IV) (1 point) 	3	
Checks and prepares equipment	1	
Applies tourniquet	1	
Palpates suitable vein	1	
Cleanses site appropriately	1	
Performs venipuncture: (1 point each) <ul style="list-style-type: none"> • Correct angle/direction • Fills blood tubes as indicated • Gently inverts tubes with additives repeatedly • Removes tourniquet and needle 	4	
Properly dresses puncture site	1	
Manages blood tube properly: <ul style="list-style-type: none"> • Places tubes into small biohazard bag (1 point) • Labels the bag with patient's name (1 point) • Secures bag with patient (1 point) 	3	
Documents the procedure	1	
Disposes of needle in proper container	1	
TOTAL	19	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Failure to identify 2 or more indications
- _____ Failure to identify 2 or more potential complications
- _____ Failure to identify normal parameters
- _____ Failure to dispose of needle in an appropriate container

Skill Sheet Glucometer

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
identifies 4 indications for obtaining a blood glucose level: <ul style="list-style-type: none"> • Altered level of consciousness (1 point) • Suspected diabetic (1 point) • Non-traumatic seizures (1 point) • Unconscious patient of unknown etiology (1 point) 	4	
Identifies the normal parameters for blood glucose (70-120 mg/dl)	1	
Identifies potential complications: <ul style="list-style-type: none"> • Potential exposure to pathogens (1 point) • Arterial Sample (1 point) • Clotted blood sample (1 point) • Glucose machine malfunction (1 point) 	4	
Checks equipment: <ul style="list-style-type: none"> • Glucose machine (1 point) • Test strip (1 point) • Needle or spring-loaded puncture device (1 point) • Alcohol prep(s) (1 point) 	4	
Explains procedure to patient	1	
Turns on power to machine	1	
Preps finger tip with alcohol prep	1	
Lances the prepped site with needle/lancet device, drawing blood	1	
Expresses blood sample and transfer it to test strip	1	
Dresses puncture site	1	
Records reading from monitor and documents is appropriately	1	
Disposes/verbalizes disposal of needle/lancet in appropriate container	1	
TOTAL	22	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Failure to identify 2 or more indications
- _____ Failure to identify 2 or more potential complications
- _____ Failure to identify normal parameters
- _____ Failure to dispose of needle/ lancet in an appropriate container

Skill Sheet Peripheral Intravenous Therapy

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Identifies the need for the IV Identifies the need for blood samples	2	
Explains the procedure(s) to the patient	1	
Checks selected IV fluid for: • Proper fluid (1 point) • Clarity (1 point) • Expiration date (1 point)	3	
Selects appropriate catheter	1	
Selects proper administration set	1	
Connects IV tubing to the IV bag	1	
Prepares administration set (fills drip chamber and flushes tubing)	1	
Cuts or tears tape (at any time before venipuncture)	1	
Applies tourniquet	1	
Palpates suitable vein	1	
Cleanses site appropriately	1	
Performs venipuncture: (1 point each) • Correct angle/direction • Notes or verbalizes flashback • Advances the catheter • Tamponades off vein proximal to the end of the catheter • Removes stylet and properly disposes of needle	6	
Releases tourniquet	1	
Attaches IV and runs for brief period to assure patent line (1 point) Examines site for inflammation and infiltration (1 point)	2	
Secures catheter (tapes securely)	1	
Adjusts flow rate as appropriate	1	
Disposes needle and bio hazards in proper container	1	
Demonstrates correct technique in stopping IV therapy and the removal of IV catheter.	3	
TOTAL	30	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Exceeded the 6 minute time limit in establishing a patent and properly adjust IV
- _____ Contaminates equipment or site without appropriately correcting situation
- _____ Any improper technique resulting in the potential for catheter shear or air embolism
- _____ Failure to successfully establish IV within 3 attempts
- _____ Failure to dispose/verbalize disposal of needle in proper container
- _____ Failure to clean IV site after discontinuation and removal of catheter

Skill Sheet
Peripheral Intravenous Therapy
With Blood Draw

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Identifies the need for the IV Identifies the need for blood samples	2	
Explains the procedure(s) to the patient	1	
Checks selected IV fluid for: <ul style="list-style-type: none"> • Proper fluid (1 point) • Clarity (1 point) • Expiration date (1 point) 	3	
Selects appropriate catheter	1	
Selects proper administration set	1	
Connects IV tubing to the IV bag	1	
Prepares administration set (fills drip chamber and flushes tubing)	1	
Cuts or tears tape (at any time before venipuncture)	1	
Applies tourniquet	1	
Palpates suitable vein	1	
Cleanses site appropriately	1	
Performs venipuncture: (1 point each) <ul style="list-style-type: none"> • Correct angle/direction • Notes or verbalizes flashback • Advances the catheter • Tamponades off vein proximal to the end of the catheter • Removes stylet and properly disposes of needle • Attaches vacutainer barrel to the IV catheter via luer lock adapter • Fills blood tubes as indicated • Gently inverts tubes with additives repeatedly • Properly disposes of needle • Connects IV tubing 	10	
Releases tourniquet	1	
Attaches IV and runs for brief period to assure patent line (1 point) Examines site for inflammation and infiltration (1 point)	2	
Secures catheter (tapes securely)	1	
Adjusts flow rate as appropriate	1	
Disposes needle and bio hazards in proper container	1	
Demonstrates correct technique in stopping IV therapy and the removal of IV catheter.	3	
TOTAL	34	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Exceeded the 6 minute time limit in establishing a patent and properly adjust IV
- _____ Contaminates equipment or site without appropriately correcting situation
- _____ Any improper technique resulting in the potential for catheter shear or air embolism
- _____ Failure to successfully establish IV within 3 attempts
- _____ Failure to dispose/verbalize disposal of needle in proper container
- _____ Failure to clean IV site after discontinuation and removal of catheter

Skill Sheet Intravenous Dextrose Administration

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Completes assessment(s) and determines patient needs medication	1	
Calls medical direction for order or confirms standing order	1	
Lists indications for intravenous Dextrose administration <ul style="list-style-type: none"> • Hypoglycemia (1 point) • Unconscious patient secondary to unknown etiology (1 point) • Non-traumatic seizures (1 point) • Glucometer reading <70 mg/dl (1 point) 	4	
Checks for known allergies, contraindications or incompatibilities: <ul style="list-style-type: none"> • Extravasation and tissue necrosis (1 point) • Requires a pre-administration blood sample to be drawn (1 point) 	2	
Checks medication to determine: <ul style="list-style-type: none"> • Expiration date (1 point) • Concentration (1 point) • Correctness (1 point) • Clarity (1 point) 	4	
Verbalizes the appropriate dosage for the medication	1	
Properly administers medication: <ul style="list-style-type: none"> • Draws up required dosage (1 point) • Instructs patient about the medication effects (1 point) • Administers medication in IV port-slow push (1 point) • Periodically flows IV to ensure patency of line (1 point) • Follows medication with a saline bolus/flush (20cc) (1 point) 	5	
Verbalizes the need for transport	1	
Verbalizes ongoing assessment including observing patient for desired/ adverse side effects	1	
Voices proper documentation of medication administration	1	
TOTAL	22	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Did not complete, or verbalize completion of, patient assessment
- _____ Administered medication without physician order
- _____ Administered, or attempted to administer, a medication to a patient with one or more contraindications for use
- _____ Administers improper medication dosage (wrong drug, incorrect amount, or pushes at in an inappropriate rate)

Skill Sheet Intravenous Narcan Administration

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Completes assessment(s) and determines patient needs medication	1	
Calls medical direction for order or confirms standing order	1	
Lists indications for intravenous Narcan administration <ul style="list-style-type: none"> • Respiratory depression induced by narcotics (1 point) • Altered mental status unknown etiology (1 point) • Non-traumatic seizures unknown etiology (1 point) 	3	
Checks for known allergies, contraindications or incompatibilities: <ul style="list-style-type: none"> • Hypersensitivity (1 point) • Narcotic withdrawal (1 point) 	2	
Checks medication to determine: <ul style="list-style-type: none"> • Expiration date (1 point) • Concentration (1 point) • Correctness (1 point) • Clarity (1 point) 	4	
Verbalizes the appropriate dosage for the medication (adult and pedi)	2	
Verbalizes consideration of restraining patient prior to medication administration	1	
Properly administers medication: <ul style="list-style-type: none"> • Draws up required dosage (1 point) • Instructs patient about the medication effects (1 point) • Administers medication in IV port-slow push (1 point) • Periodically flows IV to ensure patency of line (1 point) • Follows medication with a saline bolus/flush (20cc) (1 point) 	5	
Verbalizes the need for transport	1	
Verbalizes ongoing assessment including observing patient for desired/ adverse side effects	1	
Voices proper documentation of medication administration	1	
TOTAL	23	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Did not complete, or verbalize completion of, patient assessment
- _____ Administered medication without physician order (standing or verbal)
- _____ Administered, or attempted to administer, a medication to a patient with one or more contraindications for use
- _____ Administers improper medication dosage (wrong drug, incorrect amount, or pushes at in an inappropriate rate)

Skill Sheet Intranasal Narcan Administration

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Completes assessment(s) and determines patient needs medication	1	
Calls medical direction for order or confirms standing order	1	
Lists indications for intranasal Narcan administration <ul style="list-style-type: none"> • Respiratory depression induced by narcotics (1 point) • Altered mental status unknown etiology (1 point) • Non-traumatic seizures unknown etiology (1 point) 	3	
Checks for known allergies, contraindications or incompatibilities: <ul style="list-style-type: none"> • Hypersensitivity (1 point) • Narcotic withdrawal (1 point) 	2	
Checks medication to determine: <ul style="list-style-type: none"> • Expiration date (1 point) • Concentration (1 point) • Correctness (1 point) • Clarity (1 point) 	4	
<ul style="list-style-type: none"> • Verbalizes the appropriate dosage for the medication (adult and pedi) 	2	
Verbalizes consideration of restraining patient prior to medication administration	1	
Properly administers medication: <ul style="list-style-type: none"> • Draws up required dosage (1 point) • Instructs patient about the medication effects (1 point) • Expels air from the syringe (1 point) • Assembles mucosal atomization device (MAD) to syringe securely (1 point) • Briskly compress the syringe plunger (1 point) 	5	
Verbalizes the need for transport	1	
Verbalizes ongoing assessment including observing patient for desired/ adverse side effects	1	
Voices proper documentation of medication administration	1	
TOTAL	23	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Did not complete, or verbalize completion of, patient assessment
- _____ Administered medication without physician order (standing or verbal)
- _____ Administered, or attempted to administer, a medication to a patient with one or more contraindications for use
- _____ Administers improper medication dosage (wrong drug, incorrect amount, or pushes at in an inappropriate rate)

Skill Sheet Nebulized Albuterol Administration

Student _____ Evaluator _____
Date _____ Start time _____ End Time _____

	Possible Points	Points Awarded
Takes BSI precautions	1	
Completes assessment(s) and determines patient needs medication	1	
Calls medical direction for order or confirms standing order	1	
Lists indications for nebulized Albuterol administration <ul style="list-style-type: none"> • Bronchospasm due to reversible obstructive airway disease (asthma, bronchitis, acute bronchospasm) (2 points) • Prevention of exercise induced asthma (1 point) 	3	
Checks for known allergies, contraindications or incompatibilities: <ul style="list-style-type: none"> • Hypersensitivity (1 point) • Cardiac dysrhythmias associated with tachycardia (1 point) • Tachycardia caused by digitalis toxicity (1 point) 	3	
Checks medication to determine: <ul style="list-style-type: none"> • Expiration date (1 point) • Concentration (1 point) • Correctness (1 point) • Clarity (1 point) 	4	
Verbalizes the appropriate dosage for the medication	1	
Properly administers medication: <ul style="list-style-type: none"> • Instructs patient about the medication effects (1 point) • Assembles the nebulizer and connects to oxygen (2 points) • Provides appropriate oxygen flow (1 point) • Assists patient with use of the nebulizer (1 point) 	5	
Verbalizes the need for transport	1	
Verbalizes ongoing assessment including observing patient for desired/ adverse side effects	1	
Voices proper documentation of medication administration	1	
TOTAL	22	

Critical Criteria

- _____ Did not take body substance precautions
- _____ Did not complete, or verbalize completion of, patient assessment
- _____ Administered medication without physician order (standing or verbal)
- _____ Administered, or attempted to administer, a medication to a patient with one or more contraindications for use
- _____ Administers improper medication dosage (wrong drug, incorrect amount, or administers incorrectly)