



Pediatric Education Guidelines for Paramedics

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**PEDIATRIC EDUCATION GUIDELINES
FOR PARAMEDICS**

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EMERGENCY MEDICAL SERVICES FOR CHILDREN

California EMS Authority

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Introduction

Personnel education has long been recognized as a key component of EMS systems. Yet ongoing attention to current, appropriate scope of knowledge, teaching methodologies and psychomotor skills acquisition for prehospital providers has lagged. In 1990, the United States Department of Transportation (DOT) targeted prehospital education of basic life support (BLS) Emergency Medical Technicians (EMTs) as a national priority. Accordingly, a national task force has been underway to revise and update a curriculum for prehospital BLS providers. A similar national consensus process for analysis, and modification of the DOT's EMT-paramedic (EMT-P) curriculum may follow. However, recent serious documented problems in prehospital pediatric education for *paramedics* have raised the issue of paramedic preparedness and education for childhood emergencies to an immediate level of urgency for leaders in EMS and emergency medicine.

In 1990, the California Pediatric Emergency and Critical Care Coalition established the Paramedic Pediatric Education Subcommittee (Subcommittee), to evaluate the problems of existing paramedic pediatric education and to recommend goals and revised guidelines for paramedic education. Ronald A. Dieckmann, MD, Director of Pediatric Emergency Medicine, San Francisco General Hospital and Associate Clinical Professor of Pediatrics and Medicine at the University of California, San Francisco, was appointed chairman of the multidisciplinary, statewide Subcommittee of experts in paramedic education and pediatric emergency medicine (see attached committee membership). The California EMS Authority (Authority) has recognized the growing need for better paramedic curriculum development in pediatrics. In 1991, the Authority awarded the San Francisco EMS Agency and Ronald A. Dieckmann a DHHS Block Grant for EMS to support the work of the original Subcommittee. In 1992, the Authority brought the Subcommittee into the California EMSC Project, so that the paramedic pediatric education guidelines could be appropriately evaluated and modified by the stringent review process set out by the EMSC Project, then implemented statewide as formal recommendations for California paramedic education. The Authority recognizes that the current recommendations represent an optimal educational model, which requires skills that are currently part of the optional paramedic scope of practice and therefore not required under Title 22 regulations.

The Subcommittee's present recommendations reflect the collaborative efforts of the California EMSC Project, several other state EMSC Projects, the ACEP Committee on Pediatric Emergency Medicine,



as well as numerous local and state task forces aimed at improving paramedic pediatric education. The Prehospital Pediatric Equipment Guidelines (Appendix D) were developed by the Prehospital Subcommittee of the California EMSC Project. The purpose of the following recommendations is to strengthen the *didactic*, *psychomotor*, and *attitudinal* education of paramedics for pediatric care and to provide to paramedic training programs and to local EMS leadership concrete strategies for immediate implementation of the guidelines.

I. EDUCATION GOALS

The following goals are the foundation for the education guidelines:

A. Product characteristics

1. Educational content should emphasize the epidemiology of *prehospital* emergencies, not Emergency Department or hospital-based emergencies.
2. The curriculum should be *assessment-based*, not diagnosis-based.
3. The curriculum should include *both psychomotor and didactic components*, with special emphasis on psychomotor on "hands-on" skills development. Psychomotor skills should be acquired through and appropriate combination of supervised clinical settings with acute childhood injury and illness (e.g., the ED, physicians' offices or clinics, the OR), and classroom or laboratory practice (e.g., mannequins, animal labs).
4. In addition to skills development, the curriculum is also intended to improve personnel *attitudes* about education and preparation for pediatric emergencies and to effect enhanced paramedic confidence and self esteem in management of children.
5. Planning and implementation for the education module in paramedic training institutes and local EMS systems should ideally be directed or at least reviewed by a *physician certified in Emergency Medicine with pediatric interest and experience, or certified in Pediatric Emergency Medicine*.



6. Pediatric education should concurrently address local issues of *medical direction* and appropriate education of personnel providing medical direction, including both on-line (direct) and off-line (indirect) elements.
7. *Field treatment protocols specific for children* should be used in every EMS system as performance standards, and as learning adjuncts to the didactic and psychomotor components of the paramedic pediatric curriculum.
8. The curriculum should be *modular in nature*, and adaptable for initial education or continuing medical education.
9. A well designed *curriculum evaluation methodology* should accompany the curriculum.
10. Along with local education of paramedics, some data collection system should be established to evaluate the effectiveness of prehospital pediatric education on field paramedic performance and field treatment, ideally vis-a-vis patient outcome.

B. Process characteristics

1. Education guidelines and revisions should emanate from a multidisciplinary committee, appointed by the Authority, in order to assure an ongoing exchange of information from local and regional EMS agencies and paramedic educational institutes utilizing the recommended curriculum. This will allow for appropriate curriculum *modification, and continuous quality improvement*.
2. Education guidelines, as much as possible, should be accomplished *collaboratively*, involving other local, state, and national organizations committed to improvements in pediatric prehospital care.
3. An appropriate interval for re-education should be established, so that initial education is tied in with *ongoing skills maintenance*, ideally to include periodic clinical rotations through pediatric hospital care settings (e.g., ED, ICU, neonatal ICU).
4. Education recommendations are targeted in this proposal for the paramedic level providers, but should be extended later to other prehospital providers (e.g., EMT-1's).



5. Instructor manuals, with lesson plans, and a well designed assessment-based references for paramedic teaching will standardize and facilitate curriculum teaching and curriculum evaluation.

II. LEARNING OBJECTIVES

The learning objectives outlined in Appendix A represent the actual blueprint for the paramedic pediatric curriculum. These learning objectives were formulated by the Subcommittee, from multiple other existing paramedic education curricula, after two years of deliberations. The curriculum is divided into 11 sections, indicating natural divisions in the organization of didactic education. Basic references are provided for each of the sections.

III. PSYCHOMOTOR SKILLS

Paramedics exposure to pediatric patients in the field is limited. First of all, pediatric calls represent only 10 to 15 percent of all prehospital encounters by the average paramedic. In addition, many of these calls necessitate only BLS interventions, therefore making the frequency of advanced life support (ALS) interventions even more uncommon. In addition to problems of inadequate practical exposure to pediatric care, the paramedic also faces highly emotional circumstances with acutely ill or injured children, which produce high levels of anxiety among all field providers. Indeed, prehospital personnel report encounters with pediatric patients are the most stressful of all encounters in the field.

The following specific psychomotor skills should be combined with the didactic curriculum to provide comprehensive pediatric education for both initial skills acquisition and for skills retention. The Description of Psychomotor Skills and Recommendations for Skills Acquisition (Part B) elaborates on the outline in Part A, and provides examples of supervised clinical settings where paramedics can obtain "hands-on" experience with children, or types of classroom or laboratory practice with mannequins or animals.

A. Specific Psychomotor Skills

Appendix B lists the specific psychomotor skills necessary for optimal paramedic field performance in emergency pediatrics.



B. Description of Psychomotor Skills and Recommendations for Skills Acquisition

1. The primary survey remains the cornerstone of prehospital assessment. Infants and toddlers present different anatomy, physiology and psychosocial considerations for the provider. Direct visualization of both well and ill children, in supervised teaching environments, will provide the most concrete and retainable education for paramedics. Examples of specific, real life clinical scenarios especially important to the paramedic trainee include:
 - a. The infant or toddler with respiratory distress, stridor, or wheezing.
 - b. The multiple-traumatized child.
 - c. The child victim of closed head trauma.
 - d. The dehydrated infant or toddler, with diminished perfusion.
 - e. The toddler with active seizures.
 - f. The febrile or "toxic" infant.
 - g. The suspected victim of child abuse.
 - h. The normal newborn.
 - i. Child apneic and pulseless on rescuer arrival.
2. While maneuvers to clear, open and maintain the airway are well described by traditional Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS), and Advanced Pediatric Life Support (APLS) manuals, actual demonstration of maneuvers for relieving airway obstruction and opening and maintaining the child's and infant's airway can be reinforced by use of mannequins, combined with specific case scenarios, eg., croup, respiratory distress, altered level of consciousness, foreign body aspiration. In addition, pediatric intensivists, anesthesiologists, nurse anesthetists and respiratory therapists can offer clinical instruction on hospitalized patients in monitored care environments.
3. Application of oxygen to different age groups is a fundamental skill for field practice. Review of appropriate equipment and strategies for maintaining oxygen delivery during transport can be demonstrated on mannequins, live models, and through case scenarios. Integration of parental help in oxygen administration to the infant and toddler should be emphasized.



4. Proficiency in mouth-to-mask and in bag-valve-mask ventilation are basic maneuvers for the infant or child in respiratory failure, who either does not require intubation or cannot be intubated in the field. These basic airway/breathing interventions assume special importance for the multiple-traumatized child, with a potential cervical spine injury. Review of techniques of positioning, use of proper fitting masks, and two-rescuer mask ventilation techniques can be emphasized on the mannequin model, and with live human models.
5. Techniques for endotracheal intubation, use of Magill Forceps, and post-intubation management should be demonstrated on mannequin models, and possibly, on small animal models. Supervised operating room experience on children is an ideal educational setting. Didactic education is inadequate for acquisition of these skills. Common complications of management during the post-intubation transport should also be discussed, using case scenarios and mannequins.
6. Instruction in techniques for positioning, stimulation, suctioning and infant warming for infants and toddlers is quite different than in older children or adults. Didactic background for these skills is inadequate. Case scenarios and direct skills practiced on mannequins, using case scenarios, is optimal.
7. Demonstration of CPR proficiency should be performed, under direct observation by qualified instructors, on mannequin models.
8. Electrical treatment of pathologic cardiac rhythms is a basic skill for paramedics, although almost always applied in the adult environment. Recognition of tachy-dysrhythmias and ventricular fibrillation in children is often delayed, because paramedics are not anticipating these presentations in children. Appreciation of these rhythms in the distressed pediatric patient, is best addressed through case scenarios. Review of techniques for application of paddles to the chest wall in children can be done using mannequin models or live subjects with non-charged paddles.
9. After didactic introduction to fluid and drug administration techniques (to outline the basic anatomy involved), specific instruction can be provided by mannequin or by supervised clinical instruction.



10. Modification of adult spinal immobilization maneuvers for the pediatric patient is best demonstrated through case presentations with mannequins, or by direct observation and application on ED patients or human models.
11. Resuscitation of the normal newborn, and the newborn with poor perfusion and/or respiratory insufficiency should be reviewed using infant mannequins and equipment for newborn resuscitation.

IV. PEDIATRIC FIELD TREATMENT PROTOCOLS

Appendix C provides a sample list of assessment-based Pediatric ALS Treatment Protocols. Such protocols should ideally be part of all prehospital systems, either as separate protocols, or as components of generic protocols for adults and children. Local pediatric curricula should reflect local treatment protocols. Treatment protocols set an agreed-upon standard of care, against which to measure performance, and also provide an important teaching adjunct for the paramedic pediatric curriculum.

V. PEDIATRIC PREHOSPITAL EQUIPMENT

Appendix D presents the California EMSC Project recommendations on minimum pediatric *prehospital* equipment guidelines. Availability of properly - sized and maintained equipment for pediatric education and for ambulance utilization is imperative for proper care delivery.

VI. EVALUATION, QUALITY IMPROVEMENT, AND QUALITY MANAGEMENT

Continuous Quality Improvement (CQI), or Total Quality Management (TQM) are important new methodologies for evaluation of EMS systems and components of EMS systems. CQI and TQM are, therefore, concepts that are inextricably connected to paramedic education and curriculum development. Paramedic pediatric education relies on system and provider CQI and TQM, in that problems and needs of the pediatric emergency care component of EMS are identified through appropriate reviews, so that modifications or enhancements in education are timely and relevant. Hence, paramedic education is an important methodology to carry out performance enhancements, system improvement and prospective TQM. CQI and TQM



provide the linkage between overall system performance, as an aggregate of individual personnel performances, and system design. Specific evaluation of the proposed education curriculum for paramedics involves both:

- A. Immediate pre and post-course evaluation of paramedic didactic knowledge, psychomotor skills, and attitudes toward field pediatric care;
- B. Long term analysis of effects of enhanced education on ultimate field performance, (e.g., success rates of intubation, vascular access or appropriate oxygen administration), as measured by CQI and TQM techniques.

VII. CALIFORNIA SUDDEN INFANT DEATH SYNDROME (SIDS) TRAINING CURRICULUM FOR PARAMEDICS

This curriculum should also include appropriate paramedic education in the signs, symptoms and field management of probable Sudden Infant Death Syndrome (SIDS) in children, as well as importance of personnel critical incident stress debriefing for SIDS cases. This curriculum component is already mandated by California statute, and is included as Appendix E.



Appendix A

Learning Objectives, Paramedic Pediatric Education Curriculum

I. BASIC ASSESSMENT

- A. Identify growth and developmental milestones for infants, toddlers, school-age children, and adolescents.
- B. Discuss age-appropriate methods of approach, observation and communication with patients of different developmental stages.
- C. Know how to assess vital signs in evaluation of pediatric patients, and know their limitations.
- D. List objective measures of cardiopulmonary function.
- E. Describe differences in anatomy and physiology of the pediatric and adult cardiopulmonary systems that affect clinical assessment.
- F. Explain an objective, age-appropriate method of assessing neurologic status in children.
- G. Describe methods for estimation of weight, based on age or length, to use for selection of medications and equipment.
- H. Differentiate response to acute illness and injury in children vs. adults.
- I. Identify unique aspects of scene evaluation important to evaluation of acute pediatric injury and illness.
- J. Discuss possible paramedic roles in childhood injury and illness prevention.
- K. Understand need for immunizations, and know possible community resources.

References

1. Barkin RM: Pediatric Emergency Medicine: Concepts and Clinical Practice. Mosby, 1992: 3-10.
2. Grimes J, Burns E: Health Assessment in Nursing Practice. Jones and Bartlett, 3rd Edition, 1992.
3. Simon JE, Goldberg AT: Prehospital Pediatric Life Support. Mosby, 1989:1-14.



4. Dieckmann RA: Pediatric Emergency Care Systems: Planning and Management. Williams and Wilkins, 1992: 80-100.

II. RESPIRATORY EMERGENCIES

- A. Identify causes of respiratory emergencies.
- B. Distinguish between respiratory distress, respiratory failure, and respiratory arrest.
- C. List signs and symptoms of respiratory distress and respiratory failure.
- D. Describe non-pulmonary causes of tachypnea.
- E. Outline management priorities for respiratory distress and respiratory failure.
- F. List signs and symptoms and specific management priorities for upper airway obstruction.
- G. List signs and symptoms and specific management priorities for lower airway obstruction.
- H. Identify indications for endotracheal intubation.
- I. Discuss complications of intubation and post-intubation management.
- J. Understand strategies for prevention of choking and drowning.

References

1. American Heart Association, American Academy of Pediatrics: Textbook of Pediatric Advanced Life Support, 1988.
2. Grossman M, Dieckmann RA: Pediatric Emergency Medicine: A Clinician's Reference. Lippincott, 1991: 78-88.
3. Simon JE, Goldberg AT: Prehospital Pediatric Life Support. Mosby, 1989:20-33.

III. CARDIOVASCULAR EMERGENCIES

- A. Discuss the differences in the etiology of shock in children and adults.
- B. Identify the signs and symptoms of early and late hypovolemia (i.e., compensated and uncompensated shock) and outline appropriate management.



- C. List the causes, signs and symptoms of distributive shock, and outline appropriate management.
- D. Describe the signs and symptoms of cardiogenic shock in different aged children, and outline appropriate management.
- E. Discuss the management of bradycardia.
- F. Distinguish among the different causes of tachycardia and outline appropriate management.
- G. Explain the differences of etiology of cardiac arrest in children and adults.
- H. Outline age-appropriate management of cardiac arrest, including neonatal.
- I. Assess and manage rhythm disturbances.

References

- 1. American Heart Association, American Academy of Pediatrics: Textbook of Pediatric Advanced Life Support, 1988.
- 2. Grossman M, Dieckmann RA: Pediatric Emergency Medicine: A Clinician's Reference. Lippincott, 1991: 30-52.

IV. ALTERED LEVEL OF CONSCIOUSNESS

- A. Discuss age-related differences in etiology of altered level of consciousness.
- B. List management priorities in patients with altered level of consciousness.
- C. Distinguish between focal and generalized seizures in children.
- D. Identify common causes of pediatric seizures.
- E. Describe management of seizures.
- F. List signs and symptoms of hypoglycemia, and outline management.
- G. Recognize major behavioral emergencies and outline management.

References

- 1. Callahan ML: Current Practice of Emergency Medicine, BC Decker, 2nd Edition, 1991:1250-1255.



2. Dieckmann RA: Pediatric Emergency Care Systems: Planning and Management. Williams and Wilkins, 1992: 178-202.

V. TOXICOLOGICAL EMERGENCIES

- A. List common poisons and toxic exposures in children, and describe simple prevention strategies.
- B. Recognize signs and symptoms of poisoning and toxic exposures, including illicit substances.
- C. List indications and contraindications for gastric emptying, bowel decontamination, and toxin elimination.
- D. List management priorities for poisoning and toxic exposures.

References

1. Barkin RM: Pediatric Emergency Medicine: Concepts and Clinical Practice. Mosby, 1992: 463-470.
2. Grossman M, Dieckmann RA: Pediatric Emergency Medicine: A Clinician's Reference. Lippincott, 1991: 332-341.

VI. OTHER EMERGENCIES

- A. Discuss principles of communicating with a distressed family of a critical ill or injured child.
- B. Discuss the importance of temperature control.
- C. Describe the field approach to pain management.

References

1. Barkin RM: Pediatric Emergency Medicine: Concepts and Clinical Practice. Mosby, 1992: 1024-1026.



2. Fleisher G, Ludwig S: Pediatric Emergency Medicine, 2nd Edition. Williams and Wilkins, 1993: 1165-1176.

VII. NEWBORN EMERGENCIES

- A. Outline management priorities for newborn care.
- B. Identify signs of neonatal distress and cardiopulmonary depression and know management priorities.
- C. List pertinent features of maternal history important to assessing probability of neonatal depression.

References

1. American Heart Association, American Academy of Pediatrics: Textbook of Pediatric Advanced Life Support, 1988.
2. American Heart Association: Textbook of Neonatal Resuscitation, 1990.

VIII. TRAUMA

- A. List the common environmental hazards and age-related causes of common intentional and unintentional injuries.
- B. Know simple prevention strategies.
- C. Describe the anatomic features of children that predispose to certain injury patterns.
- D. Differentiate between the pediatric and the adult patient in response to acute blood loss.
- E. Discuss field management of a pediatric trauma, including fluid administration.
- F. Recognize the signs and symptoms of head and neck injury and outline field management.
- G. Differentiate between the pediatric and the adult patient in burn management.
- H. Discuss the unique management issues for children and families during mass casualty events and disasters.



References

1. American Academy of Pediatrics, American College of Emergency Physicians: Textbook of Advanced Pediatric Life Support, 1991.
2. Campbell JE: BTLs: Basic Prehospital Trauma Care. Prentice Hall, 1988: 161-172.
3. Dieckmann RA: Pediatric Emergency Care Systems: Planning and Management. Williams and Wilkins, 1992: 203-211.

IX. CHILD ABUSE AND NEGLECT

- A. Describe indicators of suspected child abuse and neglect.
- B. Identify the medical legal responsibilities of the paramedic in management of suspected child abuse and neglect.
- C. Know how to manage child abuse and neglect, including emotional support of the child.

References

1. Fleisher G, Ludwig S: Pediatric Emergency Medicine, 2nd Edition. Williams and Wilkins, 1993: 1127-1163.
2. Simon JE, Goldberg AT: Prehospital Pediatric Life Support. Mosby, 1989: 87-90.

X. THE PEDIATRIC PATIENT IN EMS SYSTEMS

- A. Describe how etiologic, physiologic and anatomic criteria are commonly used for pediatric medical and trauma triage and transport.
- B. Understand transport and triage, including special pediatric services and personnel offered by emergency departments qualified for pediatrics, pediatric critical care centers and pediatric trauma centers.
- C. Describe the importance of on-line (direct) and off-line (indirect) medical direction in pediatric prehospital care.
- D. Identify circumstances in pediatric prehospital care in which critical incident stress debriefing will be especially helpful, and know community resources.



References

1. Dieckmann RA: Pediatric Emergency Care Systems: Planning and Management. Williams and Wilkins, 1992.

XI MEDICAL LEGAL/ETHICS

- A. Explain the legal basis for paramedic-initiated treatment and transport of a child below the age of consent.
- B. Discuss paramedic responsibilities when a pediatric patient or guardian refuses transport or care in the field.
- C. Discuss unique aspects of DO NOT RESUSCITATE (DNR) orders and advanced directives for pediatric patients.

References

1. Selbst S: Medical legal issues in prehospital pediatric emergency care. *Pediat Emerg Care* 1988; 4:276-278.
2. Shanaberger CJ: Children's rights and EMS. *JEMS* 1987; 12(2): 60-61.



Appendix B Psychomotor Skills

1. Perform a live primary and secondary assessment of the infant and child.
2. Demonstrate basic maneuvers for relieving airway obstruction and the techniques for opening and maintaining the infant and child's airway.
3. Demonstrate methods of oxygen delivery to patients of different age groups.
4. Demonstrate mouth-to-mask and bag-valve-mask ventilation techniques in the neonate, infant and child.
5. Demonstrate the techniques for endotracheal intubation, use of Magill Forceps for foreign body removal, and post-intubation management in infants and children.
6. Demonstrate the techniques of positioning, stimulation, suctioning of the airway, and warming of the newborn.
7. Demonstrate the techniques for infant and child CPR.
8. Demonstrate the techniques for synchronized cardioversion and defibrillation in infants and children.
9. Demonstrate the techniques for catheter placement and fluid and drug administration by the IV, IM, SC, ET, IO, inhaled and rectal routes.
10. Demonstrate the techniques for extrication, spinal immobilization, and extremity splinting in infants and children.



Appendix C
Field Treatment Protocols for Pediatrics

1. Cardiac Arrest
2. Neonatal Resuscitation
3. Respiratory Distress
4. Bradycardia
5. Tachycardia
6. Shock
7. Allergic Reactions/Anaphylaxis
8. Seizures
9. Altered Level of Consciousness
10. Toxic Exposures
11. Burns
12. Trauma



Appendix D
Prehospital Pediatric Equipment For
Basic Life Support Units

1. Oropharyngeal airways-infant, child
2. Bag valve resuscitator, child reservoir¹
3. Clear masks for resuscitator-infant, child, adult
4. Nasal cannulae, child and adult sizes
5. Oxygen masks-child, adult
6. Blood pressure cuffs-infant, child, adult
7. Backboard
8. Cervical immobilization device²
9. Extremity splints
10. Burn dressings³
11. Sterile scissors or equivalent umbilical cord cutting device⁴
12. Thermal blanket
13. Portable suction unit⁵

¹Ventilation bags used for resuscitation should be self refilling without a pop-off valve. The child and adult bags are suitable for supporting adequate tidal volumes for the entire pediatric age range. A child bag is defined as one that has at least a 450 ml reservoir. An adult bag has at least a 1,000 ml reservoir.

²A cervical immobilization device should be a soft device that can immobilize the neck of an infant, child or adult. It may be towel rolls, or a commercially available specific neck cradling device. Cervical immobilization of a small infant can be achieved by use of towel rolls and tape rather than a cervical collar or sandbags. (Infants may need support under shoulders to relieve neutral spine position).

³Burn dressings may include commercially available packs and/or clean sheets and dressings.

⁴Sterile scissors or equivalent devices are for cutting the umbilical cord during childbirth and may be stocked separate from the obstetrical pack carried by the EMS provider, or carrier to assure sterility.

⁵This may include motorized suction device or hand-driven device.



14. Suction catheters, infant, child, adult
15. Tonsil suction tip
16. Bulb syringe
17. Obstetric pack

Prehospital Pediatric Equipment For Advanced Life Support Units

ALS units should have all the equipment listed on the BLS list plus the following additional items.

1. Monitor defibrillator¹
- * 2. Laryngoscope with straight blades 0-4 and curved blades 2,3,4
- * 3. Pediatric and adult size stylets for endotracheal tubes
- * 4. A pediatric Magill forcep
- * 5. Endotracheal tubes uncuffed sizes 2.5-6.0 and cuffed 6.0-8.0
6. Arm boards infant, child
7. Intravenous catheters 14-24 gauge
8. Microdrip and macrodrip I.V. devices²
- * 9. Intraosseous needles

¹All defibrillator should be able to deliver 5 to 400 Joules. The addition of pediatric paddles may give the responding unit enhanced capabilities, but may not be essential for units that rarely use this equipment. The defibrillator may be equipped with only adult paddles/pads or, pediatric paddles and adult paddles/pads. Units carrying only adult paddles/pads should insure that providers are trained in the proper use of adult paddles in infants and children. When defibrillator cannot deliver lower joules, shock at lowest possible energy level.

²These may include burrettes, microdrip tubing, or in-line volume controllers.



10. Drug dose chart or tape³

* These items are required only if the skill is part of the local scope of practice of the EMS providers.

³This may include charts giving the drug doses in mls or mgs/kg, precalculated doses based on weight, or a tape which generates the drug dose based on the length of the patient.

