

**Guidelines for Emergency Departments  
Appropriate for Pediatrics (EDAP)**

**Developed by  
Maria Fareri Children's Hospital  
Section of Pediatric Emergency Medicine**

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## INTRODUCTION

The Maria Fareri Children's Hospital Pediatric Emergency Medicine Section in cooperation with the New York Medical College School of Public Health is conducting a project intended to improve the emergency care received by infants and children in the Hudson Valley Region. This project will focus on instituting a model of Emergency Departments Appropriate for Pediatrics (EDAP) in the hospital emergency departments within this region. The model focuses not only on the emergency department itself but on the community partners that contribute care in the emergency department.

Emergency departments (ED) serve as a crucial point in the care of ill and injured children, where decisions about their care and disposition to appropriate units, home and other facilities are made. EDs should therefore be very well prepared to recognize and care for all types of pediatric illness and injury. While some common childhood illnesses and injuries can be successfully managed in community hospital emergency departments and/or in-patient pediatric units, certain conditions and patients require specific care not offered at a community hospital<sup>1</sup>.

The importance of these community emergency departments in a comprehensive Emergency Medical Services for Children (EMS-C) program is widely recognized. However, critically ill or injured children and/or children at risk for serious or life-threatening sequelae often require a higher level of care or specialized services not available in community hospitals<sup>2</sup>.

Emergency department personnel must be prepared to identify children who need care beyond the capabilities of their institutions<sup>3</sup>.

- Prompt identification and treatment of serious illness and injury in children is critical to achieving good outcomes. Health care providers who lack appropriate training, experience or expertise may find it difficult to recognize children who are critically ill or injured and require urgent and advanced care beyond the capabilities of their hospital or medical center.
- Traditional community emergency departments do not have ready access to in-house pediatric specialists to provide direct assessment and intervention when confronted with a critically ill or injured infant or child.
- Few hospitals have clearly defined mechanisms (e.g. pediatric interfacility transfer agreements) that facilitate the transfer of pediatric patients, when indicated, to centers with specialized pediatric critical care and trauma services.
- EMS and hospital systems must include guidelines to assist physicians and hospitals in identifying the types of pediatric illnesses and injuries that might require specialized consultation (with critical care or trauma specialists) or transfer to appropriate specialized pediatric centers.

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<sup>1</sup> Athey J, Dean JM, Ball J, et al. Ability of hospitals to care for pediatric emergency patients. *Pediatric Emergency Care*. 2001.

<sup>2</sup> Committee on Pediatric Emergency Medicine. Access to Optimal Emergency Care for Children. *Pediatrics*, 119(1): 161 – 164, January 2007.

<sup>3</sup> Moody-Williams JD, Krug S, O'Connor R, Shook JE, Athey JL, Holleran RS. Practice guidelines and performance measures in emergency medical services for children. *Annals of Emergency Medicine* 39 :404 –412, 2002.

Despite this need, the 2006 Institute of Medicine Report entitled the Future of Emergency Care stated<sup>4</sup>:

**“EMS and EDs are not well equipped to handle pediatric care.**

- Most children receive emergency care in general (not children’s) hospitals, which are less likely to have pediatric expertise, equipment, and policies in place for the care of children.
- Children make up 27 percent of all ED visits, but only 6 percent of EDs in the U.S. have all of the necessary supplies for pediatric emergencies.
- Many drugs and medical devices have not been adequately tested on, or dosed properly for, children.
- Of the hospitals that lack the capabilities to care for pediatric trauma patients, only half have written transfer agreements with other hospitals.
- Although pediatric skills deteriorate quickly without practice, continuing education in pediatric care is not required or is extremely limited for many prehospital emergency medical technicians (EMTs).
- Evidence indicates that pediatric treatment patterns vary widely among emergency care providers, that many of these providers do not properly stabilize seriously injured or ill children, that many under treat children in comparison with adults, and that many fail to recognize cases of child abuse.
- These shortcomings are often exacerbated in rural areas, where dedicated, well-intentioned prehospital and ED providers often make do without the specialized pediatric training and resources that most of us would expect to be in place.
- While children have increased vulnerability to disasters—for example, children have less fluid reserve, which leads to rapid dehydration—disaster planning has largely overlooked their needs.”

Based on this and other findings the Future of Emergency Care Institute of Medicine Report recommended:

**“Enhance pediatric presence throughout emergency care.**

- EDs and EMS agencies should have pediatric coordinators to ensure appropriate equipment, training, and services for children.
- Pediatric concerns should be explicit in disaster planning.
- More research is needed to determine the appropriateness of many medical treatments, medications, and medical technologies for the care of children.
- The need to keep children in mind throughout their experience in the emergency health care system
- Development of improved standards and protocols to ensure quality care for pediatric patients. “

In addition the report further supports developing a regional approach to pediatric emergency care and stated:

“Because not all hospitals within a community have the personnel and resources to support the delivery of high-level emergency care, critically ill and injured patients should be directed specifically to those facilities with such capabilities. That is the goal of

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<sup>4</sup> Emergency Care for Children: Growing Pains. Institute of Medicine, National Academies of Science, 2006, Washington, D.C.

regionalization. There is substantial evidence that the use of regionalization of services to direct such patients to designated hospitals with greater experience and resources improves outcomes and reduces costs across a range of high-risk conditions and procedures. A few states have taken steps to regionalize pediatric emergency care, allowing advanced life support ambulances to bring such patients only to hospitals designated as having pediatric capabilities.”

While there are a multitude of reasons for focusing on the community emergency department including the Institute of Medicine findings, the most important reasons for developing community ED competency in the care of the ill or injured infant and child include<sup>5</sup>:

- Many critically ill and injured children are taken directly to community EDs, without using the EMS system. As such they may often arrive at a community ED rather than a specialized Children’s facility and be denied rapid access to pediatric emergency care specialists, and consultation with other pediatric specialists.
- Community EDs will directly see critical infants and children. 60% of children admitted to ICUs in community hospitals are admitted through the ED.
- When infants and children arrive at community ED it is important to have standardized guidelines which promote identification of children who need a higher level of care and/or transfer to specialized centers when indicated so these children are not misdiagnosed and inappropriately discharged.
- Ill and injured infants and children may cause anxiety among ED staff members. Assuring the availability of and access to physician and nursing expertise and appropriate equipment as well as to educational programs in pediatric emergency care can assure a high level of care for pediatric patients and increase proficiency at all levels of care.
- The ED is, in many systems, an important link with pre-hospital providers, through base hospital on-line direction, clinical supervision of providers, and reviews of out-of hospital care.

In an effort to assure that all infants and children who suffer illness or injury are appropriately recognized and receive the care they require, a multi-faceted regional plan is needed<sup>6</sup>. This plan must focus on educating, equipping and certifying as approved for pediatrics community emergency departments where these children will likely be brought first. This focus on the community emergency department must be supported by outreach and education for community based providers. Lastly a regional plan must be developed and implemented to direct infants and children who are in need of assessment and care to either the Children’s Hospital initially or to the community emergency departments approved for pediatrics and transferred as needed.

This document provides the guidelines created for emergency departments to meet in order to be recognized as Emergency Departments Appropriate for Pediatrics (EDAP). Several of the

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<sup>5</sup> American Academy of Pediatrics, Committee on Pediatric Emergency Medicine and the American College of Emergency Physicians, and Pediatric Committee. Care of children in the emergency department: guidelines for preparedness. *Pediatrics*. 107 :777 –781 and *Annals of Emergency Medicine*37:423–427, 2001.

<sup>6</sup> American Academy of Pediatrics, Committee on Pediatric Emergency Medicine and the American College of Emergency Physicians, and Pediatric Committee. Care of children in the emergency department: guidelines for preparedness. *Pediatrics*. 107 :777 –781 and *Annals of Emergency Medicine*37:423–427, 2001.

sections in these guideless and the reference tables are either drawn or adopted from AAP and ACEP Policy Statements (listed in Resources Section).

### **ACKNOWLEDGMENTS**

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## **GUIDELINE**

### **I. Emergency Department Leadership**

#### **A. Medical Director for Pediatrics**

1. The Medical Director for Pediatrics has the following qualifications:
  - a. Meets the qualifications for credentialing by the Hospital as a specialist in pediatric emergency medicine. It is recognized that physicians in this specialty may not always be available in some communities; in these areas the Medical Director for Pediatrics must meet the qualifications for credentialing by the Hospital as a specialist in emergency medicine and demonstrate through experience or continuing education, competence in the care of children in emergency settings including resuscitation.
  - b. Has special interest, knowledge, and skill in emergency medical care of children as demonstrated by training, clinical experience, or focused continuing medical education.
  - c. Maintains competency in pediatric emergency care.
  - d. The Medical Director for Pediatrics may be the ED Director (if they meet the qualifications), a staff physician who is currently assigned other roles in the ED, or may be shared through formal consultation agreements with professional resources from a children's hospital.
2. The Medical Director for Pediatrics is responsible for the following:
  - a. Promote and verify adequate skill and knowledge of ED staff physicians and other ED health care providers (i.e., physician assistants and advanced practice nurses) in the emergency care and resuscitation of infants and children.
  - b. Oversee ED pediatric quality improvement (QI, patient safety, injury and illness prevention, and clinical care activities).
  - c. Assist with development and periodic review of ED policies and procedures and standards for medications, equipment, supplies to assure adequate resources for infants and children.
  - d. Serve as liaison with local pediatricians.
  - e. Serve as liaison to the children's hospital
  - f. Facilitate pediatric emergency education for ED health care providers.
  - g. Ensure that competency evaluations completed by the staff are pertinent to children of all ages.
  - h. Ensure the comprehensive hospital disaster/emergency preparedness plan incorporates the needs of children.
  - i. Collaborate with the nursing coordinator to ensure adequate staffing, medications, equipment, supplies and other resources for children in the ED.

#### **B. A Lead Nurse for Pediatrics is appointed by the ED Nursing Director.**

1. The lead Nurse for Pediatrics has the following qualifications:
  - a. Registered nurse (RN) possessing special interest, knowledge, and skill in the emergency medical care of children as demonstrated by training, clinical experience, or focused continuing nursing education.
  - b. Maintains competency in pediatric emergency care. (See Section V: Quality Improvement/Performance Improvement in the ED)
  - c. Credentialed and has competency verification per the hospital policies and guidelines to provide care to children of all ages.

- d. The Lead Nurse for Pediatrics may be the ED Nurse Director (if they meet the qualifications) a staff nurse who is currently assigned other roles in the ED, such as Clinical Nurse Specialist, or may be shared through formal consultation agreements with the Children's Hospital.
2. The Lead Nurse for Pediatrics is responsible for the following:
    - a. Facilitate ED pediatric QI/PI activities.
    - b. Serve as liaison to appropriate in-hospital and out-of-hospital pediatric care committees.
    - c. Serve as liaison to inpatient nursing as well as to a definitive care hospital, a regional pediatric referral hospital and trauma center, EMS agencies, primary care providers, health insurers, and any other medical resources needed to integrate services for the continuum of care of the pediatric patient.
    - d. Facilitate along with hospital-based educational activities, ED nursing continuing education in pediatrics and assure pediatric specific elements are included in orientation for new staff members.
    - e. Ensure initial and annual competency evaluations completed by the nursing staff are pertinent to children of all ages.
    - f. Ensure that the hospital comprehensive emergency preparedness plan addresses the needs of children.
    - g. Promote patient and family education in illness and injury prevention.
    - i. Assure the availability of pediatric equipment, medications, staffing and other resources through the development and periodic review of ED standards, policies and procedures
    - j. Collaborate with the physician coordinator to ensure that the ED is prepared to care for children of all ages, including children with special health care needs..

## **II. Emergency Department Staffing**

- A. Physicians staffing the ED have the necessary skills, knowledge and education in the emergency evaluation, treatment and safe transfer of children of all ages who may be brought to the ED.
  1. Physicians staffing the ED will have taken prior to working in the ED and maintain certification in the following courses:
    - a. Advanced Pediatric Life Support (preferred) but can substitute Pediatric Advanced Life Support
    - b. Neonatal Resuscitation Program
  2. There will be a Pediatric CME program for physicians staffing the ED. This program should assure that physicians staffing the ED will have taken the following courses every four years (with the goal of one course per year):
    - a. Pediatric Fundamental Critical Care Support
    - b. Advanced Pediatric Life Support
    - c. MFCH Recognition of the Ill Or Injured Infant
    - d. MFCH Initial Treatment and Stabilization for Transport

3. Physicians staffing the ED will have taken each year 4 hours of CME related to Pediatric Emergency Medicine in addition to item #2 above
- B. Nurses have the necessary skill, knowledge and training in providing emergency care to children of all ages who may be brought to the ED.
1. Nurses staffing the ED will have taken prior to working in the ED and maintain certification in the following courses:
    - a. Pediatric Advanced Life Support
    - b. Neonatal Resuscitation Program
  2. There will be a Pediatric CE program for nurses staffing the ED. This program should assure that nurses staffing the ED will have taken the following courses every four years (with the goal of one course per year):
    - a. Pediatric Fundamental Critical Care Support
    - b. ENPC
    - c. MFCH Recognition of the Ill Or Injured Infant
    - d. MFCH Initial Treatment and Stabilization for Transport
  3. Nurses staffing the ED will have taken each year 4 hours of CE related to Pediatric Emergency Medicine in addition to the CE listed in #2 above.
- C. Baseline and periodic competency evaluations completed for all ED clinical staff, including physicians, are age specific and include neonates, infants, children, and adolescents and children with special health care needs. Competencies are determined by each institution's medical staff privileges policy.

### **III. PEDIATRIC PATIENT SAFETY IN THE ED**

The delivery of pediatric care should reflect an awareness of unique pediatric patient safety concerns, and should include the following policies or practices:

- A. All children should be weighed in kilograms (kg) with the exception of children requiring emergent stabilization, and the weight should be recorded in a prominent place on the medical record, such as with the vital signs.
- B. For children requiring resuscitation or emergency stabilization, a standard method for estimating weight in kilograms should be used. (e.g. length-based system).
- C. All infants and children should have a full set of vital signs recorded to include temperature, heart rate, and respiratory rate. Blood pressure and pulse oximetry monitoring should be available for children of all ages based on illness and injury severity.
- D. A process should be in place to identify abnormal vital signs by age of patient and to notify the physician of abnormal values obtained.
- E. Processes for safe medication prescribing and delivery should be established. This should include the use of pre-calculated dosing guidelines for children of all ages.
- F. The ED should provide an environment that is child-safe and supports patient and family-centered care.

- G. Policies for the care of children who arrive without a guardian and confirmation of who is the guardian upon their arrival should be instituted
- H. Policies for the protection and security of children who are potential victims of abuse or neglect should be in place
- I. Environmental controls and policies should be in place to prevent infant and child abductions and elopement.

#### **IV. CONSULTATIVE SERVICES**

- A. Policies and procedures are in place to assure consultation services with appropriate training and credentialed to care for infants and children are available in the following areas where such consultation can be obtained:
  - 1. Anesthesia
  
- B. Policies and procedures are in place to assure consultation services with appropriate training and credentialed to care for infants and children are available in the following areas (or in their absence there is a policy and procedure for immediate transfer to a facility) where such consultation can be obtained:
  - 1. Surgery
  - 2. Urology
  - 3. Neurosurgery
  - 4. Otolaryngology
  - 5. Neurology
  - 6. Cardiology
  - 7. Critical Care

#### **V. TRANSFER PLAN AND AGREEMENTS**

- A. Hospitals should have written pediatric interfacility transfer policies and procedures that at a minimum include the following pediatric components of transfer:
  - 1. Defined process for initiation of transfer, including the roles and responsibilities of the referring facility and referral center (including responsibilities for requesting transfer and communication).
  - 2. Transport plan to deliver children safely and in a timely manner to the appropriate facility capable of providing definitive care.
  - 3. Process for selecting the appropriately staffed transport service to match the patient's acuity level (level of care required by patient, equipment needed in transport, etc.) and appropriate for children with special health care needs.
  - 4. Process for patient transfer (including obtaining informed consent).
  - 5. Plan for transfer of patient information (e.g., medical record and copy of signed transport consent), personal belongings of the patient, and provision of directions and referral institution information to family.
  - 6. Transportation of the parent/legal guardian
- B. Written transfer agreements are in place for at a minimum one tertiary care pediatric specialty facility that will allow for expedient and safe transfer of patient's requiring consultation or care which can not be provided.

## **VI. POLICIES, PROCEDURES, AND PROTOCOLS**

- A. Policies, procedures, and protocols for the emergency care of children are developed and implemented including staff education and monitoring for compliance. These should include, but are not limited to, the following:
1. Triage
  2. Pediatric patient assessment and re-assessment
  3. Documentation of pediatric vital signs, abnormal vital signs and actions to be taken for abnormal vital signs
  4. Sedation and analgesia for procedures, including medical imaging
  5. Consent (including situations in which a parent is not immediately available)
  6. Physical or chemical restraint of patients
  7. Child maltreatment mandated reporting (physical and sexual abuse, sexual assault, and neglect) including conduct of a forensic exam when indicated
  8. Death of the child in the ED
  9. Do not resuscitate orders
  10. Family centered care, including:
    - a. Involving families in patient care decision-making
    - b. Family presence during all aspects of emergency care including resuscitation
    - c. Discharge planning and instruction
    - d. Bereavement counseling.
  11. Communication with patient's medical home or primary health care provider
  12. Medical imaging policies which address age- or weight-appropriate dose reductions for children receiving studies that impart ionizing radiation, consistent with ALARA (as low as reasonably achievable) principles
  13. All-hazard disaster preparedness plan that addresses the following pediatric issues
    - a. A plan that addresses availability of medications, vaccines, equipment, and appropriately trained providers for children in disasters
    - b. A plan that addresses surge capacity for both injured and non-injured children.
    - c. A plan for the decontamination, isolation and quarantine of families and children of all ages.
    - d. A plan to minimize parent-child separation and improved methods for reuniting separated children with their families.
    - e. A plan that includes access to specific medical and mental health therapies, as well as social services, for children in the event of a disaster.
    - f. A plan that ensures that disaster drills include a pediatric mass casualty incident at least once every two years and that all drills include pediatric patients.
    - g. A plan for the care of children with special health care needs.

## **VII. SUPPORT SERVICES FOR THE ED**

- A. The radiology department should have the skills and capability to provide imaging studies of children and have the equipment necessary to do so and guidelines to reduce radiation exposure which are age- and size- specific.
1. The radiology capability of hospitals may vary from one institution to another; however, the radiology capability of a hospital must meet the needs of the

2. A process should be established for the referral of children to appropriate facilities for radiological procedures which exceed the capability of the hospital.
  3. A process should be in place for the timely review and interpretation reporting by a qualified radiologist for medical imaging studies in children.
- B. The laboratory should have the skills and capability to perform laboratory tests for children of all ages, including obtaining samples, and has the availability of micro technique for small or limited sample size.

### **VIII. EQUIPMENT, SUPPLIES, AND MEDICATIONS**

- A. Pediatric equipment, supplies, and medications shall be easily accessible, labeled, safely, and logically organized.
- B. Resuscitation equipment and supplies shall be located in the ED
- C. At least one mobile pediatric crash cart is located in the ED.
- D. ED staff shall be appropriately educated as to the location of all items.
- E. Each ED shall have a method of daily verification of proper location and function of equipment and supplies.
- F. Medication chart, length-based tape, medical software, or other system shall be readily available to ED staff to assure proper sizing of resuscitation equipment and proper dosing of medication.
- G. Tables 2 and 3 outline medications, equipment and supplies necessary for the care of children in the ED and are the minimum which must be kept in the ED.

### **IX. QUALITY IMPROVEMENT**

- A. A pediatric patient care review process is integrated into the ED quality improvement/performance improvement (QI/PI) plan according to the following guidelines:
  - a. Components of the process interface with out-of hospital, ED, trauma, inpatient pediatrics, hospital-wide QI or PI activities.
  - b. The ED QI/PI plan shall include pediatric specific indicators. Minimum components of the QI/PI process should include collecting and analyzing data to discover variances, defining a plan for improvement, and evaluating the success of the QI/PI plan with measures that are outcome based.
  - c. Mechanisms should be in place to monitor professional performance, credentialing, continuing education, and clinical competencies including integration of findings from QI audits and case reviews.

### **X. EMERGENCY PREPAREDNESS**

- A. The needs of children must be included in all aspects of emergency preparedness and all hazards plans.
- B. Hospitals must have the ability to perform decontamination on children including:
  1. The ability to handle nonambulatory children.
  2. Mixing valve to allow for warm water
  3. Ability to handle children with their parents/guardians
- C. Ensure that all agents and equipment that are stocked for natural disasters, terrorism and public health emergencies are either specifically designed and approved for pediatric use or can be appropriately substituted for pediatric use.

- D. Include pediatric patients in all hospital drills and exercises, with at least one annually that causes hospitals to receive predominantly pediatric patients and significantly out of proportion to the normal percentage of pediatric patients they handle

## RESOURCES

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## **Appendix 1: Clinical and professional competency**

Demonstration and maintenance of pediatric clinical competency is essential for all healthcare providers caring for children in the ED. Initial competency may be achieved through a number of continuing education mechanisms listed in the guidelines. Thereafter regular verification of competency will occur through direct observation in the ED, scheduled mock codes or patient simulation, team training exercises, and/or experiences in other clinical settings such as the operating room (i.e. airway management).

Pediatric competency and professional performance evaluations should include, but should not be limited to:

- A. Triage
- B. Illness and injury assessment and management
- C. Pain assessment and treatment, including sedation and analgesia
- D. Airway management
- E. Vascular access
- F. Critical care monitoring
- G. Neonatal and pediatric resuscitation
- H. Trauma care
- I. Burn care
- J. Pediatric Mass casualty events
- K. Medication delivery, and device/equipment safety

**TABLE 2.** Guidelines for medications for use in pediatric patients in EDs\*

<b>Resuscitation Medications</b>
Atropine
Adenosine
Amiodarone
Calcium chloride
Dextrose (D10W, D25W)
Dopamine
Epinephrine (1:1,000; 1:10,000 solutions)
Lidocaine
Magnesium sulfate
Naloxone hydrochloride
Norepinephrine
Prostaglandin
Sodium bicarbonate (4.2%, 8.4%)
Vasopressin

<b>Respiratory Medications</b>
Albuterol (appropriate for both single inhalation and continuous administration)
Ipratropium Bromide
Combined albuterol and ipratropium
Racemic Epinephrine
Oral and parenteral steroids (Prednisone, Dexamethasone, Methylprednisolone)
Terbutaline

<b>Antibiotic Medications (minimum)</b>
Amoxicillin
Ampicillin
Cefotaxime
Ceftriaxone
Oral 3 <sup>rd</sup> Generation Cephalosporin

<b>Analgesic Medications</b>
Topical analgesic appropriate for IV insertion or phlebotomy
Oral narcotic analgesic is liquid formulation
Topical anesthetic for sutures or other invasive procedures

<b>Sedative Medications</b>
Ketamine
Midazolam

<b>Neuromuscular Blocking Medications</b>
Short acting non-depolarizing agent
Succinylcholine

<b>Other Drug Groups</b>
Acetaminophen (oral liquid and suppository)
Activated charcoal
Anticonvulsants (fos-phenytoin and phenobarbitol)
Anti-emetic (oral liquid and ODT)
Diphenhydramine (oral liquid)
Hydrocortisone
Ibuprofen (oral liquid)

### **Appendix 3. Guidelines for minimum pediatric equipment and supplies**

#### **General Equipment**

- Patient warming device
- IV blood/fluid warmer
- Restraint device
- Weight scale, in kilograms only (no pounds), for infants and children
- Tool or chart that incorporates both weight (kilogram) and length to assist physicians and nurses in determining equipment size and correct drug dosing, such as a length-based resuscitation tape
- Pain scale assessment tools appropriate for age

#### **Monitoring Equipment**

- Blood pressure cuffs (neonatal, infant, child, adult-arm and thigh)
- Doppler ultrasound devices
- ECG monitor/defibrillator with pediatric and adult capabilities including pediatric sized pads/paddles
- Hypothermia thermometer
- Pulse oximeter with pediatric and adult probes
- Continuous end tidal CO<sub>2</sub> monitoring device<sup>1</sup>

#### **Respiratory Equipment and Supplies**

- Endotracheal tubes:
  - (uncuffed: 2.5, 3.0 mm)
  - (cuffed and uncuffed: 3.5, 4.0, 4.5, 5.0, 5.5 mm)
  - (cuffed: 6.0, 6.5, 7.0, 7.5, 8.0 mm)
- Feeding tubes (5,8 Fr)
- Laryngoscope blades (curved 2,3; straight 0, 1, 2, 3)
- Laryngoscope handle
- Magill forceps (pediatric and adult)
- Nasopharyngeal airways (infant, child and adult)
- Oropharyngeal airways (sizes 0-5)
- Stylettes for endotracheal tubes (pediatric and adult)
- Suction catheters (infant, child and adult)
- Tracheostomy tubes (Neonatal, Infant and Child ID 2.5-5.0)
- Yankauer suction tip
- Bag-mask device (manual resuscitator), self-inflating, (infant size – 450 ml; and adult size – 1000 ml)
- Clear oxygen masks (standard and non-rebreathing) for an infant, child and adult
- Masks to fit bag-mask device adaptor (neonatal, infant, child and adult sizes)
- Nasal cannulae (infant, child and adult)
- Nasogastric tubes (not feeding tubes) infant ( 8 Fr), child (10 Fr) and adult (14-18 Fr))
- Laryngeal mask airway<sup>2</sup> (sizes 1, 1.5, 2, 2.5, 3, 4, and 5)

## **Vascular Access Supplies and Equipment**

- Arm boards (infant, child and adult sizes)
- Catheter over the needle (14-24 gauge)
- Intraosseous needles or device (pediatric and adult sizes)
- IV administration pumps with ability to regulate rate and volume of infusate appropriate for weights 1-100kg
- Umbilical vein catheters (3.5 and 5.0 Fr) <sup>3</sup>
- Central venous catheters (4.0-7.0 Fr )\*
- IV solutions to include: NS; D<sub>5</sub>.45 NS; D<sub>5</sub>.2 NS; D<sub>5</sub>.33 NS and D<sub>10</sub>W
- Access needles for lifeports in pediatric sizes and lengths (3/4-1”)

## **Urinary Catheters**

- Foley catheters sizes 8fr-12fr

## **Chest Tubes**

- Chest tubes in sizes 8 fr – 32fr

## **Fracture Management Devices**

- Extremity splints including traction splint for femur (pediatric and adult size)
- Spine stabilization method/devices appropriate for children of all ages <sup>4</sup>

## **Specialized Pediatric Trays or Kits**

- Lumbar puncture tray including infant (22g, 1.5 inch), pediatric (22g, 1.5 inch) and adult (18-21g, 3 inch) LP needles
- Difficult airway supplies/kit (to include but not limited to supraglottic airways of all sizes, such as the laryngeal mask airway<sup>2</sup>, needle cricothyrotomy supplies, surgical cricothyrotomy kit)
- Tube thoracostomy tray
- Newborn delivery kit (Kit with equipment for initial resuscitation of a newborn: umbilical clamp, scissors, bulb syringe and towel)
- Urinary catheterization kits

## **Reference Documents**

- Pediatric dosing reference guide
- Table of normal pediatric vital signs values
- Pediatric resuscitation medication and dosage table
- Pediatric WMD treatment agents and dosage table
- Length based tape for weight determination
- Pediatric vaccination chart

<sup>1</sup> End tidal CO<sub>2</sub> monitoring is considered the optimal method of assessing for and monitoring of endotracheal tube placement in the trachea, however for low volume hospitals adult and pediatric CO<sub>2</sub> colorimetric detector devices could be substituted. Clinical assessment alone is not appropriate.

<sup>2</sup> Laryngeal mask airways could be shared with anesthesia but must be immediately accessible to the ED.

<sup>3</sup>Feeding tubes (size 5Fr) may be utilized as a UVC catheter but is not ideal. A method to secure the umbilical catheter, such as an umbilical tie, should also be available

<sup>4</sup>A spinal stabilization device should be a device that can also stabilize the neck of an infant, child or adolescent in a neutral position.

## **Appendix 4 – Course Outlines for MFCH Educational Programs**

### **ED Training Programs**

#### **Recognition of the Ill or Injured Infant – 4 hour program**

##### Objectives:

1. Assure that general emergency medicine physicians can recognize both an actual and potential ill infant
2. Provide the general emergency physician with information on initial evaluation of the potentially ill or injured infant
3. Educate the general emergency physician on assessment and historical findings which should trigger a referral to a children’s hospital

##### Lectures

1. Pediatric Assessment
2. Recognizing the “Red Flags” and “Clues” of an ill or injured infant
3. What are normal assessments and vital signs, What is due to agitation and what is due to illness
4. Initial presentations of ill infants
5. Congenital and in-born problems which present after a newborn goes home
6. Initial treatment of the ill or injured infant
7. Steps and Key Points to know when it is OK to discharge and when to refer to Children’s Hospital for further evaluation

#### **Initial Treatment and Stabilization for Transport – 4 hour program**

##### Objectives:

1. Assure that general emergency medicine physicians can provide the initial care of the ill or injured infant
2. Provide the general emergency physician with information on stabilization and preparation for transportation

##### Lectures

1. Initial care of the critical infant
2. Keys to initial care of the airway, breathing and circulation
3. Essential interventions prior to transport
4. Equipment and pharmaceutical needs for the care of children
5. Preparing your ED for the ill or injured infant

#### **Advanced Pediatric Life Support – 2 day program**

##### Objectives:

1. Provide the general emergency medicine physicians with assessment information on a variety of pediatric emergencies
2. Educate the general emergency physician with information on stabilization and preparation for transportation

##### Lectures

1. Pediatric Assessment
2. Airway Procedures
3. Cardiovascular Procedures
4. Pediatric Airway in Health and Disease

5. Central Nervous System
6. Medical Emergencies
7. Cardiovascular System
8. Trauma I Lecture
9. Nontraumatic Surgical Emergencies
10. Children With Special Health Care Needs
11. Metabolic Disease
12. Toxicology, Ingestions and Smoke Inhalation
13. Child Maltreatment

ED Pediatric CME – 1 hour sessions

Objectives:

1. Assure that general emergency medicine physicians is kept current on the recognition of ill or injured infants and their initial care

Lectures

1. All of the topics covered in the above listed courses presented as one hour sessions