# North Carolina Office of Emergency Medical Services

# Transfer of the Pediatric Patient

## Recommendations of the North Carolina EMSC Advisory Committee Office of Emergency Medical Services

November 2009

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# Recommendations for the Transfer of the Pediatric Patient
# North Carolina EMSC Advisory Committee

## Introduction

Most children with traumatic or medical illnesses can be treated by local pediatricians, emergency physicians, and other health care providers. However, certain children will require medical services that go beyond the resources of the local community. Studies have shown that a significant portion of ill or injured children are admitted to community hospitals rather than those likely to have more pediatric resources such as children's hospitals or larger, urban hospitals with pediatric units[1,2]. The use of guidelines in the transfer of these critically ill or injured patients has been shown to not only be beneficial and helpful to healthcare providers, but has been considered essential in providing optimal pediatric patient care[3]. One example is the use of transfer guidelines and field triage guidelines in the care of the traumatically injured patient. Therefore, hospitals that are designated as trauma centers in North Carolina must have transfer guidelines in place as required by the North Carolina EMS and Trauma Rules (10A NCAC 13P .0900.) Pediatric patients present with an added dimension of complexity in terms of care and transfer based on the need for different equipment as well as comfort level for the health care provider. Health care facilities can be better prepared for critically ill or injured children by having plans or guidelines in place to facilitate a timely and appropriate transfer when a child's needs surpass the capabilities of the facility. Recent recommendations by the American Academy of Pediatrics, American College of Emergency Physicians, and other health care organizations support the use of inter-facility transfer guidelines. Therefore, the North Carolina Office of Emergency Medical Services, in collaboration with an ad hoc working group of the Emergency Medical Services for Children Advisory Committee, have developed the following document that hospitals may use as their own pediatric inter-facility transfer guidelines, or as a template or reference to develop their own unique guidelines.

The following document was developed by reviewing publications from the National Highway Traffic Safety Administration, the American Academy of Pediatrics, and Inter-facility guidelines developed by other states.

The following document is NOT included as part of the North Carolina EMS and Trauma Rules. The following document is for hospitals to use as a template when establishing inter-facility transfer guidelines.

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[1]American Academy of Pediatrics, Clinical Report, Facilities and Equipment for the Care of Pediatric Patients in a Community Hospital. *Pediatrics.*2003: 1120-1122.

[2] Athey, J et al. Ability of hospitals to care for pediatric emergency patients. *Pediatric Emergency Care.* 2001.Vol. 17, No. 3: 170-174.

[3] American Academy of Pediatrics, Care of Children in the Emergency Department: Guidelines for Preparedness. *Pediatrics.* 2001. Vol. 107, No. 4: 777-781.

The North Carolina Office of EMS does NOT mandate state designated trauma centers or general hospitals to use these guidelines, but offers this document as a tool for the development of inter-facility transfer guidelines to facilitate optimum care. The N.C. Office of Emergency Medical Services recognizes the varying resources of acute care facilities, including capacity, variations in transport services, and geographic considerations, and furthermore, recognizes that approaches that work for one trauma service or acute care facility may not be suitable for others. The decision to use these guidelines in any particular situation always depends on the independent medical judgment of the health care provider.

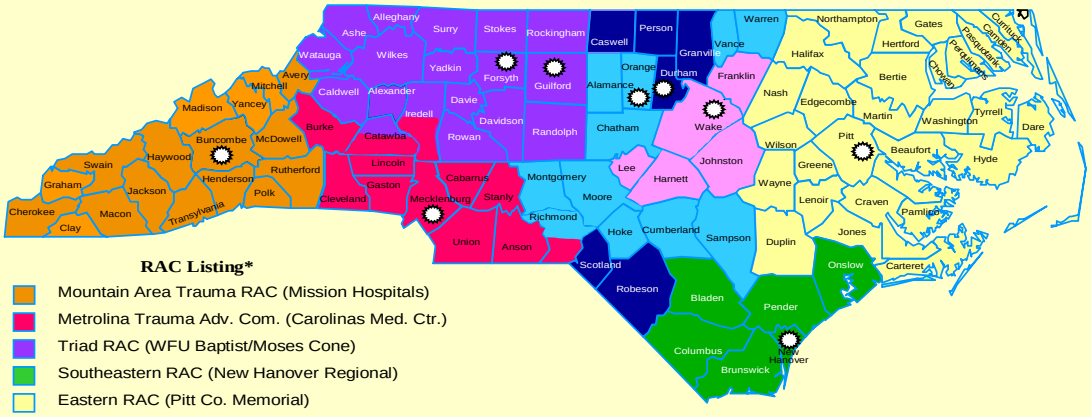
The recommendations contained herein have been formally endorsed by the North Carolina Emergency Nurses Association and the North Carolina College of Emergency Physicians.

# North Carolina Trauma System

The State of North Carolina has adopted three levels of trauma care in order to enhance the care of traumatically injured patients. The level of the trauma center is based on the depth of personnel available at each institution. A map and listing of the different trauma centers across the state has been included below. Non-trauma centers have agreed upon affiliations with a trauma center within their region which assists in the timely transfer of injured patients. Each trauma center must maintain certain standards in order to keep its level designation. When transferring the injured pediatric patient, health care providers must keep in mind the sub-specialty care that will be needed for each individual patient. The determination of the type of care needed (intensive care, orthopedics, neurosurgery, trauma surgery) should assist in determining the appropriate location for transfer.

The following guidelines were taken from the National Highway Traffic Safety Administration's publication on field triage of the injured patient. These patient characteristics are linked to potentially serious conditions that may lead to serious morbidity and mortality and may benefit from evaluation at a local trauma center. Different hospitals have varying age cutoffs for the designation of a pediatric trauma patient. Consultation with the receiving facility staff will help in the process of determining final placement of the patient. Although adolescent patients often approach the size of an adult, they still may possess developmental, emotional, and physical needs that may benefit from nursing and ancillary staff that have specialized training in the care of the pediatric patient.[4] Again, physicians must make decisions based on each individual patient.

**Regional Advisory Committee (RAC) Affiliations by Hospitals**
**July 2009**



**Level I Designation Trauma Centers**

- Carolinas Medical Center, Charlotte
- Duke University Hospital, Durham
- Wake Forest University Baptist Medical Center, Winston-Salem
- Pitt County Memorial Hospital, Greenville
- University of North Carolina (UNC) Hospitals, Chapel Hill
- WakeMed Health & Hospitals, Raleigh Campus

**Level II Designation Trauma Centers**

- Mission Hospitals, Asheville
- Moses H. Cone Memorial Hospital, Greensboro
- New Hanover Regional Medical Center, Wilmington

**Level III Designation Trauma Centers**

- Cleveland Regional Medical Center, Shelby
- Carolinas Medical Center-Northeast Medical Center, Concord
- High Point Regional Health System, High Point

# Pediatric *Trauma* Transfer Guidelines*

## Physiologic Criteria

- Depressed or Deteriorating Glasgow Coma Scale
- Respiratory Distress or Failure (including patients requiring ventilatory support)
- Shock or Hypotension (Compensated or Decompensated)
- Injuries Requiring Blood Transfusion, Vasoactive Meds, or Invasive Monitoring

## Anatomic Criteria

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow and knee;
- Flail chest or significant blunt injury to chest/abdomen
- Two or more proximal long-bone fractures
- Crushed, de-gloved, or mangled extremity
- Neurovascular compromised limb
- Amputation proximal to wrist and ankle
- Pelvic fractures
- Open or depressed skull fracture
- Paralysis

## Mechanism

- Fall > 10 feet or 2-3 times the height of the child
- Intrusion > 12 inches in occupant side or > 18 inches any site
- Ejection from automobile
- Death in passenger compartment
- Vehicle telemetry data consistent with high risk injury
- Automobile versus pedestrian/bicyclist thrown, run over, or with significant impact (>20 mph)
- Motorcycle crash > 20 mph

## Other Criteria

- Injuries that may benefit from pediatric subspecialist
- Children requiring services of intensive care unit

* compiled from MMWR 2009 Jan 23; 58(RR-1):1-35 and various states' inter-facility transfer guidelines, ATLS guideline (see references)

## American Burn Association Transfer Criteria[7]

The American Burn Association has developed criteria for which patients should be transferred to a burn center. Transfers of such patients have been shown to reduce morbidity and mortality. North Carolina currently has two burn centers, the University of North Carolina at Chapel Hill (UNC Hospitals) and Wake Forest University Baptist Medical Center.

- Second Degree Burns (partial thickness) of greater than 10 percent of the body surface area (BSA)
- Third degree burns (full thickness) in any age group
- Burns involving
    1. Signs or symptoms of inhalation injury
    2. Respiratory distress
    3. The face
    4. The ears (serious full thickness burns or burns involving the ear canal or drums)
    5. The mouth and throat
    6. The hands, feet, genitalia, major joints, or perineum
- Electrical injury or burn (including lightening strikes)
- Burns associated with trauma
- Burns in patients with pre-existing medical conditions which may affect recovery or complicate management
- Chemical burns
- Burn injury in patients who will require special social, emotional, or rehabilitative intervention

## Other Criteria for Pediatric Transfer

- Children requiring pediatric intensive care other than for close observation
- Any child who may benefit from consultation with, or transfer to, a Trauma Center or Pediatric Intensive Care Unit

# Pediatric *Medical* Transfer Guidelines*

Children often present with medical conditions that require a higher level of care than can be provided by local health care providers and hospitals due to lack of resources and ancillary staff. Some children also have special needs that can only be addressed at institutions with certain sub-specialists that are not present in all communities. Several states have published guidelines on medical factors that should prompt consultation and referral of patients to higher level of care, such as a tertiary pediatric medical center. Although the list below details certain characteristics, the final decision in transferring a patient is determined by the health care provider using his or her medical judgment.

**Physiologic Criteria**

- Depressed or Deteriorating Neurologic Status
- Respiratory Distress and/or Failure (cyanosis, apnea, moderate or severe retractions, etc.)
- Cardiac Rhythm Disturbances
- Status post Cardiopulmonary Arrest
- Heart Failure
- Shock not responding to treatment
- Need for vasoactive medications
- Severe hypo- or hyperthermia
- Hepatic or Renal Failure
- Children requiring invasive monitoring (arterial pressure, central venous pressure, etc.)

**Other Criteria/Conditions**

- Near drowning with unstable vital signs or respiratory problems
- Status epilepticus
- Potentially dangerous envenomation
- Potentially life-threatening exposure or ingestion of toxic substance
- Severe electrolyte imbalances
- Severe metabolic disturbances
- Severe dehydration
- Potentially life-threatening infections, including serious post-op infections
- Children with conditions that require the expertise of pediatric sub-specialist (cardiology, surgery, endocrinology, rheumatology, etc.)
- Any child with unexplained worsening of a condition that can no longer be managed
- Children requiring intensive care other than for close observation
- Any child who may benefit from consultation with, or transfer to, a Pediatric Intensive Care Unit.

* Adapted from the states of California and Washington Pediatric Consultation and Transfer Guidelines

# Guidelines for Interfacility Transport:
# Transport Team and Method of Transport*

**Decision:** The decision to transfer a patient is based on the previously listed anatomic and/or physiologic criteria in which the care of the patient is above and beyond the ability of the referring institution. Referring institutions need to have established policies and procedures in regard to the transfer process. This should include who talks to whom to initiate the transfer, a policy in regard to a parent or caregiver accompanying the child during the transport, gathering all required documents, and informing family members and giving them directions and/or maps to the receiving facility.

**Method:** The method of inter-facility transport is dependent on many variables. The state of North Carolina holds geographic challenges which will influence the referring provider's decision on moving a patient from one facility to the next. Transport by private vehicle is not encouraged with sick and/or injured children. Two areas to address in this determination of transport team as well as method of transport are patient-related factors and general transport issues. North Carolina EMS and Trauma Rules define a "Specialty Care Transport" as an inter-facility transport of a critically injured or ill patient by a ground ambulance vehicle…at a level of service beyond the scope of a paramedic. For the purposes of this document, a pediatric transport team is considered a specialty care transport team.

**Equipment:** Choosing the type of transport team (i.e. Basic Life Support, Advanced Life Support, or Specialty Care Transport Team) can be challenging given our state's rural nature as well as geographic considerations. The following provides a synopsis of what type of patient can/should be transferred according to their level of care. At all times, the referring facility should be knowledgeable about the transport mode's pediatric capabilities, including pediatric equipment available on board. All ambulances are required to have certain equipment and supplies, including pediatric-specific equipment, but this varies depending on the level at which the EMS service is credentialed. For a listing of equipment and supplies by EMS service level, please see Appendix A. The referring facility must ensure that the patient leaves their facility with all needed pieces of equipment.

**Communication:**

1. Both the referral (sending) and receiving (accepting) facility should have policies in place regarding hospital-to-hospital communication including:
    - Work-up required or not required prior to transport (i.e. CT scan),
    - Helping the referral facility determine mode/method of transport (i.e. air vs. ground), and
    - Patient stabilization requirements for transport.
    - Communication back to the receiving facility in regard to:
        - Patient arrival at the receiving institution with updated patient health status
        - Overall patient outcome
        - The ability to discuss any patient care specifics enabling both facilities to optimize patient care for future transfers.

2. Back-transfer to the referring facility also needs to be discussed for those patients requiring long-term or chronic care post injury/illness. Back-transfer is encouraged if the referring institution has the ability to care for the pediatric patient in the inpatient setting.

3. Families must be given information about the receiving facility, including directions, the phone number of the facility's receiving unit or receiving facility's Emergency Department, and must be provided the patient's belongings. In addition, it is important to retain the family's contact phone number.

*Adapted from the state of Washington Pediatric Consultation and Transfer Guidelines

## Transport Team Configuration: Patient Factors[4,8)]

The referring facility needs to determine the risk for deterioration of the pediatric patient in order to determine the crew composition and ultimately, the method of transport. The following guidelines and categories for risk have been modified for use in North Carolina from the National Highway Traffic Safety Administration (NHTSA) guidelines issued in April 2006. The desired team configuration is based, in general, on the NHTSA guidelines, modified for use in North Carolina, and adapted for pediatrics:

**Stable with no risk for deterioration – Basic Life Support (BLS)**
Oxygen, monitoring of vital signs, pulse oximetry: Requires basic emergency medical care as provided by basic life support skills.

**Stable with low risk of deterioration – Advanced Life Support (ALS)**
Venous access, some IV medications including pain medications (narcotics Paramedic administration only), pulse oximetry, tracheostomy tube change, increased need for assessment and interpretation skills: Requires advanced care such as an advanced life support service.

**Stable with medium risk of deterioration – ALS with consideration of use of Specialty Care Transport Team if available**
3-lead EKG monitoring, basic cardiac medications, e.g., heparin or nitroglycerine; blood draw, maintenance of arterial lines, ventilator operation, maintenance of various catheters, maintenance of central line, venous access femoral line or Swan-Ganz catheter: Requires advanced care such as an advanced life support service, a Specialty Care Transport Team should be given consideration based on the patient's underlying medical condition and reason for transfer.

**Stable with high risk of deterioration – ALS with use of Specialty Care Transport Team highly encouraged if available**
Patients requiring advanced airway but secured, intubated, or on ventilator; patients on multiple vasoactive drips; patients whose condition has been initially stabilized, but has likelihood of deterioration based on assessment or knowledge of provider regarding specific illness/injury: Require advanced care such as an advanced life support service; use of Specialty Care Transport Team is encouraged if available.

**Unstable – ALS with use of Specialty Care Transport Team highly encouraged if available**
Any patient who cannot be stabilized at the referring facility, who is deteriorating or likely to deteriorate, such as patients who require invasive monitoring, balloon pump, who are post-resuscitation, or who have sustained multiple trauma: Requires advanced care as an advanced life support service; use of Specialty Care Transport Service is encouraged if available.

Note: for a listing of trauma centers and hospitals with PICUs, along with contact numbers for initiating patient transfers, please see Appendix C.

For a listing of EMS agencies that do specialty care transports and their contact numbers, please see Appendix D.

## Inter-Facility Transfer Check-list*

Items to send with patient and transfer crew:

□ (2) Face Sheet (name, address, etc.)
□ EMS Run Sheet (if available)
□ Copies of lab work
□ Copies of x-rays, ultrasounds, CT scan, etc. (Forward electronically via VPN network if possible, digital if available; or copies of images)
□ Copy of ECG (if applicable)
□ Radiologist report (if available)
□ Copy of medication administration record
□ Intake and output record for past 24 hours (if applicable) or ED amounts
□ (2) Copies of past 24 hours of vital signs or ED record
□ Copy of signed transport/transfer consent
□ Discharge Dictation (if applicable)

Name of patient:_____age: _____

Diagnosis: _____

Transfer to: _____

Accepting Physician: _____

Transferring Physician: _____

Transferring Hospital: _____

| Transfer Level of Care | Method of Transfer |
|---|---|
| □ EMT-Basic<br>□ EMT-Intermediate<br>□ EMT-Paramedic<br>□ Specialty Care Transport Team | □ Ground EMT-Basic ambulance<br>□ Ground EMT-Intermediate or Paramedic ambulance<br>□ Rotary Wing (helicopter)<br>Name of Service: _____<br>□ Fixed Wing (airplane)<br>Name of Service: _____ |

□ Family given option of being present during transport
□ Family given written directions to facility
□ Family given patient belongings
□ Family contact phone number: _____

*Adapted from the Washington State Pediatric Consultation and Transfer Guidelines

Appendix A

# NCCEP Standards for EMS Equipment

# Standards for EMS Equipment

**B.** The baseline equipment required in all systems (including Specialty Care Transport Programs) with EMS personnel credentialed at the specified level.

**S.** The equipment required in all Specialty Care Transport Programs (in addition to the baseline equipment required in all EMS Systems). All Air Medical Specialty Care Transport Programs and dedicated Neonatal Transport Programs are required to carry and maintain equipment and medications specific to each mission, as defined by medical control and OEMS approved protocols.

**O.** The equipment, which is optional for any system with EMS personnel, credentialed at the specified level.

| EMS Equipment | Conv. | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| **Ventilation and Airway Equipment** | | | | |
| Bag Valve Mask (adult and child size bag with 4 sizes of masks) | B | B | B | B |
| Bulb Syringe | O | B | B | B |
| Blind Insertion Airway Device (BIAD) with 2 sizes (one adult and one pediatric) | | B[5] | B[5] | B[3] |
| Cricothyroidotomy (Surgical) equipment | | | | B[3] |
| Endotracheal tubes (ETT)-cuffed in all 10 sizes from 2.5 through 7.0 | | | B | B |
| Capnometry (Color) ETCO2 detectors | | B[4] | B[4] | B[4] |
| Laryngoscope blades in 4 straight sizes 0-4 and 3 curves sizes 2-4 | | | B | B |
| Laryngoscope handle with extra batteries, bulbs | | | B | B |
| McGill forceps or equivalent with 2 sizes (one adult and one pediatric) | | | B | B |
| Meconium Aspirator adaptor | | | B | B |
| Nasal cannula for Oxygen Delivery with 2 sizes (one adult and one pediatric) | B | B | B | B |
| Nasopharyngeal airways in sizes 14, 18, 20, 22, 24, 26, 28, 30, and 32 | O | B | B | B |
| Nebulizer | | | B | B |
| Needle at least 3.25 in. and large bore for Chest Decompression | | | | B |
| Oropharyngeal airways in 6 sizes 0-5 | B | B | B | B |
| Oxygen Mask (Non-Rebreathing) in 2 sizes (one adult and one pediatric) | B | B | B | B |
| Oxygen Tubing | B | B | B | B |
| Portable Oxygen with variable flow regulator (Portable and Fixed) | B | B | B | B |
| Rigid pharyngeal suction device | B | B | B | B |
| Stylettes for every required Endotracheal tube size | | | B | B |
| Suction apparatus (Portable and Fixed) | B | B | B | B |
| Suction catheters (one between 6 and 10F size, one between 12 and 16F size) | O | B | B | B |
| Syringe in 10ml size (non-luerlock) | | B | B | B |
| Ventilator (Pressure or Volume based with PEEP)* | | | | S, O |
| Wide-bore suction tubing | O | B | B | B |
| **Monitoring and Defibrillation** | | | | |
| Automatic External Defibrillator with 2 pad sizes (one adult and one pediatric) | O | B[1] | B[1] | O |
| Capnography (ETCO2) monitoring, continuous | | B[7] | B[7] | B[7] |

# Standards for EMS Equipment

| EMS Equipment | Conv. | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Glucose Measuring Device | | B[2] | B | B |
| Pacemaker- External | | | | B |
| Pacemaker-Transvenous | | | | S |
| Monitor with 12 lead EKG | | B[6] | B[6] | B[6] |
| Monitor/defibrillator with electrodes and 2 sizes of pads or paddles | | | | B |
| Pulse oximeter with 2 probe sizes (one adult and one pediatric) | O | B[2] | B | B |
| **Immobilization Devices** | | | | |
| Cervical spine immobilization device in at least 3 sizes (small, medium, and large) | O | B | B | B, S[1] |
| CPR Board | B | | | |
| Femur traction device in at least 2 sizes (one adult and one pediatric) | O | B | B | B, S[1] |
| Head immobilization device | O | B | B | B, S[1] |
| Backboards, short and long (Radiolucent preferred) with appropriate restraints (minimum of 3 straps) | O | B[8] | B[8] | B[8], S[1] |
| Spinal immobilization and extrication device | O | B | B | B, S[1] |
| Upper and Lower extremity immobilization devices | O | B | B | B, S[1] |
| **Bandages** | | | | |
| Burn sheet | O | B | B | B |
| Cold packs | O | B | B | B |
| Dressings, bandages, gauze rolls, adhesive tape (must have 2 triangular bandages with 2 safety pins each) | B | B | B | B |
| Heavy scissors for clothing removal | B | B | B | B |
| Occlusive dressing | O | B | B | B |
| Sterile saline solution for irrigation (may use IV solution) | O | B | B | B |
| **Medication Administration** | | | | |
| Alcohol wipes | O | B | B | B |
| Intraosseous needles in at least 2 sizes (one adult and one pediatric) | | | | B |
| IV administration sets | | | B | B |
| IV arm boards | | | B | B |
| IV catheters in at least 4 sizes (14, 18, 20, and 24 Gauge) | | | B | B |
| IV pole/hook | O | O | B[8] | B[8] |
| Needles in various sizes (at least 1 must be 1.5 in. for IM injections) | | | B | B |
| Syringes in at least 3 sizes (1ml, 5ml, and 10ml) | | | B | B |
| Tourniquet | | O | B | B |
| **Obstetrical** | | | | |
| Thermal blanket capable of also covering the head | B | B | B | B |
| Sterile OB kit, scissors, bulb suction, cord clamps | O | B | B | B |
| **Miscellaneous** | | | | |
| Bedpan and urinal | B | B[8] | B[8] | B[8] |
| Broselow Tape or equivalent | B | B | B | B |
| Cellular phone | O | B | B | B |
| Emesis basins | B | B | B | B |
| Lubricating jelly | O | B | B | B |
| Gastric tubes in at least 6 sizes (6, 8, 10, 12, 14, and 16F) | | | | S, O |
| Sheets, pillows, pillow cases, and towels | B | B[8] | B[8] | B[8] |
| Sphygmomanometer (cuffs and device) with at least 3 sizes (pediatric, normal adult, and large adult) | B | B | B | B |
| Stair chair/folding stretcher | O | B[8] | B[8] | B[8], S[1] |
| Stethoscope | B | B | B | B |
| Thermometer with low temperature capability | O | B | B | B |

| EMS Equipment | Conv. | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Triage tags | O | B | B | B, S[1] |
| Wheeled cot with security for patient transport | B | B[8] | B[8] | B[8], S[1] |
| **Injury Prevention Equipment** | | | | |
| Appropriate Restraints for Crew and non-patient passengers | B | B | B | B |
| Fire Extinguisher | B | B | B | B |
| Flashlight with extra batteries | B | B | B | B |
| Heat and cooling source for ambulance compartment | B[8] | B[8] | B[8] | B[8] |
| Thermal blanket or other heat conserving device | B | B | B | B |
| **Infection Control** | | | | |
| Disinfectant hand wash | B | B | B | B |
| Disinfectant solution for cleaning equipment | B | B | B | B |
| Disposable biohazard trash bags | B | B | B | B |
| Eye protection | O | B | B | B |
| Gloves, non-sterile | B | B | B | B |
| N-95 or HEPA Masks | B | B | B | B |
| Jumpsuits/gown | O | B | B | B |
| Latex Allergy Kit (If not using latex free equipment)**** | O | B | B | B |
| Latex Free Gloves | B | B | B | B |
| Masks | B | B | B | B |
| Sharps containers (Fixed and Portable) | O | B | B | B |
| Shoe covers | O | B | B | B |

**Conv. = Convalescent Transport Program, EMT = Emergency Medical Technician, EMT-I = EMT-Intermediate, EMT-P = EMT-Paramedic**

B[1] = Automated External Defibrillators (AED) currently in service may or may not be capable of using pediatric sized pads. As AEDs that are not capable of accepting pediatric pads are retired and replaced, pediatric capable devices should be implemented.
B[2] = Glucose Measuring Devices and Pulse Oximetry must be available to monitor any patient cared for within an EMT-Basic System. This should be monitored by the EMS System Peer Review Process if not required by the EMS System.
B[3] = All EMT-Paramedic Systems must have an airway backup. This can be a any Blind Insertion Airway Device such as the Combitube, King LT, Laryngeal Mask Airway (LMA). It is highly recommended that this airway backup have pediatric sizes. Systems performing Drug Assisted Intubation must also have the ability to perform Surgical Cricothyrotomy. Commercial Cricothyrotomy or Tracheostomy kits that create an airway comparable to a surgical Cricothyrotomy are acceptable.
B[4] = All EMT-Basic, EMT-Intermediate and Paramedic Systems must at a minimum use Capnometry (Color) to confirm the placement of every BIAD or intubation. EMT-Paramedic systems performing Drug Assisted Intubation must use Capnography (numeric or waveform) to confirm tube placement. Waveform Capnography is recommended for this requirement.
B[5] = All EMS System at all levels must have a Blind Insertion Airway Device of some type. This could be a Combitube, King LT, or LMA. BIAD devices with pediatric sizes are highly recommended.
B[6] = It is not required but highly recommended that all EMS Systems at all levels work to have 12 lead ECG capability at the scene of every emergent event.
B[7]= It is not required but highly recommended that all EMS Systems at all levels work to have waveform Capnography capability at the scene of every emergent event.
B[8] = Equipment which is considered optional (not mandatory) to non-transport EMS vehicles.

**S[1]** = Specialty Care Transport Programs are not required to maintain this equipment on every response, but the equipment must be available on a case by case basis dependent on the patient care scenario.

**All Specialty Care Transport Programs which are listed in a counties primary 911 response plan or provide backup 911 primary response service, are required to maintain the same level of skills, medications and equipment which the county system maintains.**

***For the purposes of this document, a "ventilator" is a ventilation device, which attaches to an endotracheal or tracheostomy tube. It is capable of ventilating by a pressure or volume delivery mechanism. It must have adjustments for respiratory rate, volume/pressure settings, and for assisted or full ventilation. It has the capabilities of PEEP or other pressure based manipulations. A "respirator" is any other device that assists with ventilations during a respiratory/cardiac arrest.**

****All EMS Systems must carry at a minimum the equipment associated with the EMT Level unless functioning as a convalescent transport service.**

****All EMS Systems must carry pediatric and adult when size is important. Items that require pediatric sizes are shaded ORANGE.**

*****A Latex Allergy Kit should be composed of all the necessary personal protection equipment and materials necessary to obtain and maintain IV access.**

# Appendix B

**B.** The baseline medications and skills required in all systems and Specialty Care Transport Programs) with EMS personnel credentialed at the specified level.

**S.** The equipment required in all Specialty Care Transport Programs. All Air Medical Specialty Care Transport Programs and dedicated Neonatal Transport Programs are required to carry and maintain equipment and medications specific to each mission, as defined by medical control and OEMS approved protocols.

**O.** These medications and skills are optional.

**This medication list is based on the medications which are used in the NCCEP Protocol documents. This list does not include all of the medications which are approved for use by the NC Medical Board. The NC Medical Board Medication and Skills Formulary can be found online at www.ncems.org/pdf/NCMBApprovedMedSkillsforEMSPersonnel.pdf**

| EMS Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Acetaminophen | O | O | B[9] | B[9] |
| Adenosine | | | | B |
| Beta-agonists (Albuterol, Levalbuterol, etc.) | | B[6] | B | B |
| Amiodarone | | | | B[1] |
| Aspirin | | B[6] | B | B |
| Atropine | O[1] | O[1] | O[1] | B |
| Beta Blockers (Metoprolol, etc.) | | | | B[8] |
| Calcium Channel Blockers (Diltiazem, etc) | | | | B[8] |
| Calcium chloride/gluconate | | | | B |
| Charcoal | | O | O | O |
| Crystalloid solutions (Normal Saline, etc) | | | B | B |
| Diazepam | | | | B[2] |
| Dilaudid | | | | B[9] |
| Diphenhydramine | | O[6] | B | B |
| Dobutamine | | | | S, O |
| Dopamine | | | | B |
| Epinephrine | B[5,6] | B[5,6] | B | B |
| Etomidate | | | | O |
| Fentanyl | | | | B[9] |
| Furosemide | | | | O |
| Glucagon | | | B | B |
| Glucose solutions | | | B | B |
| Haloperidol | | | | O |
| Histamine 2 Blockers (Ranitidine, Cimetidine) | | | O | O |
| Ipratropium | | | O | O |
| Lidocaine | | | | B[1] |
| Lorazepam | | | | B[2] |
| Magnesium sulfate | | | | S, O |
| Metoclopromide | | | | O |

| EMS Medications | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| Methylprednisolone | | | | S, O |
| Midazolam | | | | B[2] |
| Morphine | | | | B[9] |
| Naloxone | | O[6] | B | B |
| Nasal Spray Decongestant | | O[6] | O | O |
| Nitroglycerin | | B[5,6] | B | B |
| Nitrous Oxide | | | | B[9] |
| Nitroprusside sodium | | | | S, O |
| Non-steroidal anti-inflammatory | | O[6] | B[9] | B[9] |
| Ondansetron | | | | O |
| Oxygen | B | B | B | B |
| Oxytocin | | | | S, O |
| Potassium chloride | | | | S, O |
| Pralidoxime | O[1] | O[1] | O[1] | O |
| Prednisone | | | | S, O |
| Promethazine | | | | O |
| Procainamide | | | | S, B[1] |
| Sodium bicarbonate | | | | B |
| Succinylcholine | | | | S, O |
| Vasopressin | | | O | S, O |
| Vecuronium | | | | O |
| Ziprasidone | | | | O |

| EMS Skills | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| 1. 12-Lead Electrocardiogram (ECG) | | B[10] | B[10] | B[10] |
| 2. Airway-BIAD-Combitube | | B[12] | B[12] | B[3] |
| 3. Airway-BIAD-King LT | | B[12] | B[12] | B[3] |
| 4. Airway-BIAD-Laryngeal Mask Airway (LMA) | | B[12] | B[12] | B[3] |
| 5. Airway-CPAP | | | O | S, O |
| 6. Airway-Cricothyrotomy-Surgical | | | | B[3] |
| 7. Airway-Endotracheal Tube Introducer | | | O | O |
| 8. Airway-Foreign Body Obstruction | B | B | B | B |
| 9. Airway Intubation Confirmation-End-Tidal $CO_2$ (color) | | B[4] | B[4] | B[4] |
| 10. Airway-Intubation Confirmation-Esophageal Bulb | | O | O | O |
| 11. Airway-Intubation Drug Assisted (RSI) | | | | S, O |
| 12. Airway-Intubation Nasotracheal | | | O | O |
| 13. Airway-Intubation Oral Tracheal | | | B | B |
| 14. Airway-Nebulizer Inhalation Therapy | | O | O | O |
| 15. Airway-Respirator Operation | | | O | O |
| 16. Airway-Suction Advanced | | | B | B |
| 17. Airway-Suction Basic | | B | B | B |
| 18. Airway-Tracheostomy Tube Change | | | B | B |
| 19. Airway-Ventilator Operation | | | | S, O |
| 20. Arterial Lines-Blood Draw | | | | S, O |
| 21. Arterial Lines-Maintain | | | | S, O |
| 22. Assessment-Adult | B | B | B | B |
| 23. Assessment-Pain | B | B | B | B |
| 24. Assessment-Pediatric | B | B | B | B |
| 25. Blood Glucose Analysis | B[13] | B[13] | B | B |
| 26. Capnography (waveform) | | B[11] | B[11] | B[11] |
| 27. Cardiac External Pacing | | | | B |
| 28. Cardiopulmonary Resuscitation (CPR) | B | B | B | B |
| 29. Cardioversion | | | | B |
| 30. Chest Decompression (Needle) | | | | B |
| 31. Childbirth | | B | B | B |
| 32. CNS Catheter-Epidural Catheter Maintenance | | | | S, O |
| 33. CNS Catheter-Ventricular Catheter Maintenance | | | | S, O |
| 34. Decontamination | B | B | B | B |
| 35. Defibrillation-Automated | B | B | B | O |
| 36. Defibrillation-Manual | | | | B |
| 37. Gastric Tube Insertion | | | | S, O |
| 38. Injections-SQ and IM | | | B | B |
| 39. Orthostatic Blood Pressure | O | O | B | B |
| 40. Pulse Oximetry | B[13] | B[13] | B | B |
| 41. Reperfusion Checklist | B | B | B | B[7] |
| 42. Restraints Physical | | B | B | B |
| 43. Spinal Immobilization | B | B | B | B |
| 44. Splinting | B | B | B | B |
| 45. Stroke Screen | B | B | B | B[7] |
| 46. Temperature Measurement | O | O | B | B |
| 47. Urinary Catheterization | | | | S, O |

| EMS Skills | MR | EMT | EMT-I | EMT-P |
|---|---|---|---|---|
| 48. Venous Access-Blood Draw | | | O | O |
| 49. Venous Access-Central Line Maintenance | | | | S, O |
| 50. Venous Access-Existing catheters | | | | B |
| 51. Venous Access-External Jugular Access | | | B | B |
| 52. Venous Access-Extremity | | | B | B |
| 53. Venous Access-Femoral Line | | | | S, O |
| 54. Venous Access-Intraosseous | | | | B |
| 55. Venous Access-Swan-Ganz Catheter Maintenance | | | | S, O |
| 56. Wound Care-General | B | B | B | B |
| 57. Wound Care-Hemostatic Agent | B | B | B | B |
| 58. Wound Care-Taser Probe Removal | B | B | B | B |
| 59. Wound Care-Tourniquet | B | B | B | B |

B[1] = All EMT-Paramedic systems must carry some form of anti-arrhythmic agent. This must either be amiodarone, lidocaine, or procainamide.
B[2] = All EMT-Paramedic systems must carry some form of injectable benzodiazepine.
B[3] = All EMT-Paramedic Systems must have an airway backup. This can be a Combitube, Laryngeal Mask Airway (LMA) or Surgical Cricothyrotomy. Systems performing Rapid Sequence Induction must have the ability to perform Surgical Cricothyrotomy. Commercial Cricothyrotomy or Tracheostomy kits that create an airway comparable to a surgical Cricothyrotomy are acceptable.
B[4] = All EMT-Intermediate and Paramedic Systems must use either Capnometry (Color) or waveform Capnography to confirm every intubation and invasive airway. EMT-Paramedic systems performing Rapid Sequence Induction must use waveform Capnography to confirm tube placement.
B[5] = Epinephrine in EMT systems may be used in Anaphylaxis only.
B[6] and O[6]= All EMT systems may use Epinephrine, Albuterol, Nitroglycerine, Naloxone, Aspirin, and over the counter medications if they function under medical direction.
B[7] = Stroke Screen and Reperfusion Screens are not required for interfacility transports associated with Neonatal Specialty Care Transport Services.
B[8]= EMT-Paramedic systems must carry either a Calcium Channel Blocker or Beta- Blocker.
B[9]= EMT-Paramedic systems must carry 2 forms of analgesia. This may be a narcotic, and either an NSAID (Ibuprofen, ketorolac, etc.), acetaminophen, or Nitrous Oxide.
B[10]= It is not required but highly recommended that all EMS Systems at all levels work to have 12 lead ECG capability at the scene of every emergent event.
B[11]= It is not required but highly recommended that all EMS Systems at all levels work to have waveform Capnography capability at the scene of every emergent event.
B[12]= All EMS Systems at all levels must carry some version of a Blind Insertion Airway Device. This may be either the Combitube, King LT, or LMA device. It is recommended that at BIAD with pediatric sizes be used. EMT=Basic Systems must fall under medical direction to use BIADs.
B[13]= Glucose Measuring Devices and Pulse Oximetry must be available to monitor any patient cared for within an EMT-Basic System.

O[1] = All EMS personnel, public safety personnel, and first responders may self-administer or administer to a patient, by protocol and under medical direction, Nerve Agent Kits containing Atropine and Pralidoxime through an auto-injector system. EMT-Intermediates may administer immunization injections as a component of a domestic terrorism plan.

**All Specialty Care Transport Programs which are listed in a counties primary 911 response plan or provide backup 911 primary response service, are required to maintain the same level of skills, medications and equipment which the county system maintains.**

***For the purposes of this document, a "ventilator" is a ventilation device, which attaches to an endotracheal or tracheostomy tube. It is capable of ventilating by a pressure or volume delivery mechanism. It must have adjustments for respiratory rate, volume/pressure settings, and for assisted or full ventilation. It has the capabilities of PEEP or other pressure based manipulations. A "respirator" is any other device, which assists with ventilations during a respiratory/cardiac arrest.**

## Appendix C

# Hospital Contact Information

**TRAUMA CENTERS** **(Note: all phone numbers listed are for initiating transfer process)**

**Level I**

Carolinas Medical Center, Charlotte, NC - (704) 512-7878
Duke University Medical Center, Durham NC – 1-800-524-5433
Pitt County Memorial Hospital, Greenville, NC – 1-800-816-7264
UNC Hospitals, Chapel Hill, NC – 1-800-862-6264
Wake Forest University Baptist Medical Center, Winston-Salem, NC - 1-800-277-7654
WakeMed Health and Hospitals, Raleigh, NC – 1-800-982-2217

**Level II**

Memorial Mission Hospital and Asheville Surgery Center, Asheville, NC – (828) 213-0046
Moses H. Cone Health System, Greensboro, NC – (336) 832-5800 or 5801
New Hanover Regional Medical Center, Wilmington, NC – 1-866-282-5465

**Level III**

Carolinas Medical Center – NorthEast, Concord, NC -1-866-333-6362 or (704) 403-4400
Cleveland Regional Medical Center, Shelby, NC – (980) 487-7624
High Point Regional Health System, High Point, NC – (336) 878-6000, ext. 6730

**BURN CENTERS**

UNC Hospitals – Chapel Hill, NC - 1-800-862-6264
Wake Forest University Baptist Medical Center – Winston-Salem, NC -1-800-277-7654

**HOSPITALS WITH PICUs**

Cape Fear Valley Medical Center – Fayetteville, NC - (910) 615-8090
Carolinas Medical Center – Charlotte, NC - (704) 381-6100
Carolinas Medical Center – Northeast – Concord, NC - 1-866-333-6362 or (704) 403-4400
Duke University Medical Center – Durham, NC - 1-800-524-5433
Memorial Mission Hospital – Asheville, NC - (828) 213-0046
Moses Cone Health System – Greensboro, NC - (336) 832-5800 or 5801
New Hanover Regional Medical Center – Wilmington, NC - 1-866-282-5465
Pitt Memorial Hospital – Greenville, NC - 1-800-816-7264
Presbyterian Healthcare – Charlotte, NC – (704) 316-5437 (pediatric ED); (704) 356-0477 (hospitalist service pager); or (704) 356-5096 (pediatric intensivist pager)
University of North Carolina Hospitals – Chapel Hill, NC - 1-800-862-6264
Wake Forest University Baptist Medical Center – Winston-Salem, NC - 1-800-277-7654
WakeMed – Raleigh, NC - 1-800-982-2217

# Appendix D

## Specialty Care Transport Services by Region

**Eastern Region** **(Note: all numbers listed are for arranging for transport)**

Eastcare – Greenville
Ph: 1-800-672-7828 (central communication center)
Pitt EMS System

New Hanover Regional EMS (Vitalink & Airlink)
Ph: 1-800-282-5465
New Hanover EMS System

**Central Region**

Cape Fear Valley Medical Center (Life Link) - Fayetteville
Ph: (910) 615-8090
Cumberland EMS System

Carelink Mobile Critical Care Moses Cone Health System – Greensboro
Ph: 1-800-898-7828
Guilford EMS System

Duke Life Flight – Durham
(ground, neonatal, and air)
Ph: 1-800-362-5433
Durham EMS System

FirstHealth Regional EMS System – Pinehurst
(ground, neonatal)
Ph: 1-800-543-3672
Moore EMS System

High Point Regional Health System - High Point
Ph: (336) 878-6115
Guilford EMS System

Wake Forest University Baptist Medical Center AirCare - Winston-Salem
(ground, neonatal, and air)
Ph: 1-800-336-6224 (AirCare Dispatch) or 1-800-277-7654 (Physician's Access Line)
Forsyth EMS System

## Specialty Care Transport Services Con't

Rex Hospital Transport – Raleigh
Ph: 1-888-784-4579 or (919) 784-4788
Wake EMS System

Southeastern Regional Medical Center – Lumberton
(to be active late July 2009)
Ph: (910) 674-8480 or (910) 671-5000 and ask for ER charge nurse
Robeson EMS System

Surry County EMS - Mount Airy
Ph: (336) 374-3000
Surry EMS System

Novant Health Critical Care Transport - Winston-Salem base
(adult patients only)
1-800-949-2066
Forsyth County EMS System

WakeMed Mobile Care Services- Raleigh
(ground and air)
Ph: 1-800-982-2217
Wake County EMS System

UNC Carolina Air Care- Chapel Hill
(ground and air)
Ph: 1-866-832-6862 or (919) 966-2944
Orange County EMS System and Cumberland EMS System

**Western Region**

Burke County EMS Critical Care
Ph: (828) 437-1170
Burke County EMS System

Carolinas Medical Center Medcenter AIR
(ground and air)
Ph: 1-800-421-9195
Mecklenburg EMS System

Carolinas Medical Center-Northeast
Ph: 1-866-333-6362 or (704) 403-4400
Cabarrus EMS System

## Specialty Care Transport Services Con't

Catawba County EMS
Ph: (828) 465-8473
Catawba County EMS System

Mission Hospitals-Buncombe
Ph: (828) 213-0046
Buncombe EMS System

Novant Health Critical Care Transport
(includes pediatric and neonatal)
Ph: 1-800-949-2066
Mecklenburg EMS System

Wilkes County EMS
Ph: (dispatched through 911)
Wilkes County EMS System

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5. Guidelines for Field Triage of Injured Patients Recommendations of the National Expert Panel on Field Triage. *MMWR* 2009 Jan 23; 58(RR-1):1-35

6. California EMS Authority. Interfacility Pediatric Trauma And Critical Care Consultation And/Or Transfer Guidelines. February 1994

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8. Guide for Interfacility Patient Transfer. National Highway Traffic Safety Administration. DOT HS 810 599 April 2006.

9. Advanced Trauma Life Support Student Course Manual. 8th edition. 2008



State of North Carolina Department of Health and Human Services
Division of Health Service Regulation, Office of Emergency Medical Services
www.ncdhhs.gov/dhsr/EMS/injrchld.htm