EMS Trauma Care Related Equipment Grant

Additional Approved Supplies List:

Adult Intraosseous Supplies
Capnography
External Blood Clotting Supplies
Impedance Threshold devices (ITD)
Eject Helmet Removal System
Scoop Stretcher
Pediatric Resuscitation Items
Commercially made Pelvic Stabilization Devices
Commercially made Tourniquet Devices
Commercially made Eye Irrigation Devices
Pressure infusion bags
Commercially made Chest Decompression Needles
Commercial Washing Machine
Emergency Cricothyrotomy Kit (non-surgical crico kit)
Pulse oximeters and probes
Transport Ventilator
Laptop/Toughbooks
Video Laryngoscopy
Rescue/Evacuation Litter
Rescue Advanced Life Support Skill Mannequin Trainer
Jump Bags
Thermometers
Infusion Pumps
Stair Chair
Replacement AVLS Antennae
Portable, lightweight, patient lifting device (Binder Lift)
Bariatric Ambulance Ramp
Narcotics Lock Box
Two-way Radios
Pediatric Ambulance Child Restraint devices
Batteries & Battery Chargers – for cardiac monitors, stretchers, two-way radios and the like
Adult & Pediatric Airway head mannequins
Combi Extrication Tool
Disposable CPAP units
Utility Terrain Vehicle
Automatic Chest Compression System

JOINT POLICY STATEMENT

EQUIPMENT FOR GROUND AMBULANCES

American Academy of Pediatrics
American College of Emergency Physicians
American College of Surgeons Committee on Trauma
Emergency Medical Services for Children
Emergency Nurses Association
National Association of EMS Physicians
National Association of State EMS Officials

Four decades ago, the Committee on Trauma of the American College of Surgeons (ACS) developed a list of standardized equipment for ambulances. In 1988, the American College of Emergency Physicians (ACEP) published a similar list. The two organizations collaborated on a joint document published in 2000, and the National Association of EMS Physicians (NAEMSP) participated in the 2005 revision. The 2005 revision included resources needed on emergency ground ambulances for appropriate homeland security. All three organizations adhere to the principle that emergency medical services (EMS) providers at all levels must have the appropriate equipment and supplies to optimize out-of-hospital delivery of care. The document was written to serve as a standard for the equipment needs of emergency ground ambulance services both in the United States and Canada.

EMS providers care for patients of all ages who have a wide variety of medical and traumatic conditions. The 2009 revision included updated pediatric recommendations developed by members of the Federal Emergency Medical Services for Children (EMSC) Stakeholder Group and endorsed by the American Academy of Pediatrics (AAP). The EMSC program has developed several performance measures for the program's state partnership grantees. One of the performance measures evaluates the availability of essential pediatric equipment and supplies for basic life support (BLS) and advanced life support (ALS) patient care units. This document is used as the standard for this performance measure. The National Association of State EMS Officials and the Emergency Nurses Association have participated in the latest revision process. The recommendations in this document specifically pertain to ALS and BLS emergency ground ambulance services in the United States.

For purposes of this document, the following definitions have been used: a neonate is 0–28 days old, an infant is 29 days to 1 year old, and a child is >1 year through 11 years old with delineation into the following developmental stages:

Toddlers (1–3 years old)
Preschoolers (3–5 years old)
Middle childhood (6–11 years old)
Adolescents (12–18 years old)

These standard definitions are age based. Length-based systems have been developed to more accurately estimate the weight of children and predict appropriate equipment sizes, medication doses, and guidelines for fluid volume administration.

PRINCIPLES OF OUT-OF-HOSPITAL CARE

The goal of out-of-hospital care is to minimize further systemic injury and manage life-threatening conditions through a series of well-defined and appropriate interventions and to embrace principles that ensure patient safety. High-quality, consistent emergency care demands continuous quality improvement and is directly dependent on the effective monitoring, integration, and evaluation of all components of the patient's care.

Declaration of Interest: Organizations participating in this joint policy statement, and their representatives to the working group that drafted it, report no conflicts of interest.

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Integral to this process is medical oversight of out-of-hospital care by using preexisting patient care protocols (indirect medical oversight), which are evidence based when possible, or by medical control via voice and/or video communication (direct medical oversight). The protocols that guide patient care should be established collaboratively by medical directors for ground ambulance services, adult and pediatric emergency medicine physicians, adult and pediatric trauma surgeons, and appropriately trained basic and advanced emergency medical personnel. Current recommendations of the Institute of Medicine (IOM) encourage each EMS agency to have a pediatric coordinator to specifically coordinate the capability of the service to care for non-adult patients.

Equipment and Supplies

The current guidelines provide a recommended core list of supplies and equipment that should be stocked on ground ambulances to provide the accepted standards of patient care. Equipment requirements will vary, depending on the certification or licensure levels of the providers (as defined by the National EMS Scope of Practice Model 2007 www.ems.gov/education/EMSScope.pdf), local medical direction and jurisdiction, population densities, geographic and economic conditions of the region, and other factors.

The National EMS Scope of Practice Model defines and describes four certification or licensure levels of EMS provider: emergency medical responder (EMR), emergency medical technician (EMT), advanced EMT (AEMT), and paramedic. Each level represents a unique role, set of skills, and knowledge base. The National EMS Scope of Practice Model establishes a framework that ultimately determines the range of skills and roles that an individual possessing a state EMS license is authorized to do in a given EMS system. Individual state EMS rules or regulations that limit provider scope of practice may impact the need for availability of certain pieces of equipment.

The current equipment list is derived from a number of sources, which may be found in the reference list at the end of the document. The use of a proprietary name that is inextricably linked with its product should not be construed as an endorsement.

The following list is divided into equipment for basic life support (BLS) and advanced life support (ALS) emergency ground ambulances. ALS ambulances must have all of the equipment on the required BLS list as well as equipment on the required ALS list. This list represents a consensus of recommendations for equipment and supplies that will facilitate patient care in the out-of-hospital setting.

Required Equipment for BLS Emergency Ground Ambulances

A. Ventilation and Airway Equipment
   1. Portable and fixed suction apparatus with a regulator, per federal specifications
      - Wide-bore tubing, rigid pharyngeal curved suction tip; tonsil and flexible suction catheters, 6F–16F, are commercially available (have one between 6F and 10F and one between 12F and 16F)
   2. Portable oxygen apparatus, capable of metered flow with adequate tubing
   3. Portable and fixed oxygen supply equipment
      - Variable flowmeter
   4. Oxygen administration equipment
      - Adequate-length tubing; transparent mask (adult and child sizes), both non-rebreathing and valveless; nasal cannulas (adult, child)
   5. Bag-valve mask (manual resuscitator)
      - Hand-operated, self-expanding bag; adult (>1000 mL) and child (450–750 mL) sizes, with oxygen reservoir/accumulator, valve (clear, operable in cold weather), and mask (adult, child, infant, and neonate sizes)
   6. Airways
      - Nasopharyngeal (16F–34F; adult and child sizes)
      - Oropharyngeal (sizes 0–5; adult, child, and infant sizes)
   7. Pulse oximeter with pediatric and adult probes
   8. Saline drops and bulb suction for infants

B. Monitoring and Defibrillation

   BLS ground ambulances should be equipped with an automated external defibrillator (AED) unless staffed by advanced life support personnel who are carrying a monitor/defibrillator. The AED should have pediatric capabilities, including child-sized pads and cables OR dose attenuator with adult pads.

C. Immobilization Devices
   1. Cervical collars
      - Rigid for children ages 2 years or older; child and adult sizes (small, medium, large, and other available sizes) OR pediatric and adult adjustable cervical collars
   2. Head immobilization device (not sandbags)
      - Firm padding or commercial device
   3. Upper and lower extremity immobilization devices
      - Joint-above and joint-below fracture (sizes appropriate for adults and children) rigid support, constructed with appropriate material (cardboard, metal, pneumatic, vacuum, wood, or plastic)

4. Impervious backboards (long, short; radiolucent preferred) and extrication device
   - Short extrication/immobilization device (e.g., KED)
   - Long transport (head-to-feet length) with at least 3 appropriate restraint straps (chin strap alone should not be used for head immobilization) and with padding for children and handholds for moving patients

D. Bandages/Hemorrhage Control

1. Commercially packaged or sterile burn sheets
2. Bandages
   - Triangular bandages
3. Dressings
   - Sterile dressings, including gauze sponges of suitable size
   - Abdominal dressing
4. Gauze rolls
   - Various sizes
5. Occlusive dressing or equivalent
6. Adhesive tape
   - Various sizes (including 1″ and 2″) hypoallergenic
   - Various sizes (including 1″ and 2″) adhesive
7. Arterial tourniquet (commercial preferred)

E. Communication

Two-way communication device between ground ambulance, dispatch, medical control, and receiving facility

F. Obstetrical Kit (commercially packaged are available)

1. Kit (separate sterile kit)
   - Towels, 4″ × 4″ dressing, umbilical tape, sterile scissors or other cutting utensil, bulb suction, clamps for cord, sterile gloves, blanket
2. Thermal absorbent blanket and head cover, aluminum foil roll, or appropriate heat-reflective material (enough to cover newborn infant)

G. Miscellaneous

1. Access to pediatric and adult patient care protocols
2. A length-based resuscitation tape OR a reference material that provides appropriate guidance for pediatric drug dosing and equipment sizing based on length OR age
3. Sphygmomanometer (pediatric and adult regular size and large cuffs)
4. Adult stethoscope
5. Thermometer with low-temperature capability
6. Heavy bandage or paramedic scissors for cutting clothing, belts, and boots
7. Cold packs
8. Sterile saline solution for irrigation
9. Two functional flashlights
10. Blankets
11. Sheets (at least one change per cot)
12. Pillows
13. Towels
14. Triage tags
15. Emesis bags or basins
16. Urinal
17. Wheeled cot
18. Stair chair or carry chair
19. Patient care charts/forms or electronic capability
20. Lubricating jelly (water soluble)

H. Infection Control*

1. Eye protection (full peripheral glasses or goggles, face shield)
2. Face protection (e.g., surgical masks per applicable local or state guidance)
3. Gloves, nonsterile
4. Fluid-resistant overalls or gowns
5. Waterless hand cleanser, commercial antimicrobial (towelette, spray, or liquid)
6. Disinfectant solution for cleaning equipment
7. Standard sharps containers, fixed and portable
8. Biohazard trash bags (color coded or with biohazard emblem to distinguish from other trash)
9. Respiratory protection (e.g., N95 or N100 mask—per applicable local or state guidance)

*Latex-free equipment should be available

I. Injury-prevention Equipment

1. Availability of necessary age/size-appropriate restraint systems for all passengers and patients transported in ground ambulances. For children, this should be according to the National Highway Traffic Administration's document: Safe Transport of Children in Emergency Ground Ambulances (www.nhtsa.gov/staticfiles/nti/pdf/811677.pdf)
2. Fire extinguisher
3. Department of Transportation Emergency Response Guide
4. Reflective safety wear for each crewmember (must meet American National Standard for High Visibility Public Safety Vests if working within the right of way of any federal-aid highway. Visit www.reflectivevest.com/federalhighwayruling.html for more information)

Required Equipment: Advanced Life Support (ALS) Emergency Ground Ambulances

For paramedic services, include all of the required equipment listed above, plus the following additional equipment and supplies. For advanced EMT services (and other non-paramedic advanced levels), include all of the equipment from the above list and selected equipment and supplies from the following list, based on scope of practice, local need, and consideration of out-of-hospital characteristics and budget.

A. Airway and Ventilation Equipment
   1. Laryngoscope handle with extra batteries and bulbs
   2. Laryngoscope blades, sizes:
      a. 0–4, straight (Miller), and
      b. 2–4, curved
   3. Endotracheal tubes (if ALS service scope of practice includes tracheal intubation), sizes:
      a. 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, and 5.5 mm cuffed and/or uncuffed, and
      b. 6.0, 6.5, 7.0, 7.5, and 8.0 mm cuffed (1 each), other sizes optional
   4. 10-mL non-Luer Lock syringes
   5. Stylettes for endotracheal tubes, adult and pediatric
   6. Magill forceps, adult and pediatric
   7. End-tidal CO_2 detection capability (adult and pediatric)
   8. Rescue airway device, such as the ETDLA (esophageal–tracheal double-lumen airway), laryngeal tube, disposable supraglottic airway, or laryngeal mask airway (as approved by local medical direction)

B. Vascular Access
   1. Isotonic crystalloid solutions
   2. Antiseptic solution (alcohol wipes and povidone–iodine wipes preferred)
   3. Intravenous fluid bag pole or roof hook
   4. Intravenous catheters, 14G–24G
   5. Intraosseous needles or devices appropriate for children and adults
   6. Latex-free tourniquet
   7. Syringes of various sizes
   8. Needles, various sizes (including suitable sizes for intramuscular injections)
   9. Intravenous administration sets (microdrip and macrodrip)
   10. Intravenous arm boards, adult and pediatric

C. Cardiac
   1. Portable, battery-operated monitor/defibrillator
      - With tape write-out/recorder, defibrillator pads, quick-look paddles or electrode, or hands-free patches, electrocardiogram leads, adult and pediatric chest attachment electrodes, adult and pediatric paddles
   2. Transcutaneous cardiac pacemaker, including pediatric pads and cables
      - Either stand-alone unit or integrated into monitor/defibrillator

D. Other Advanced Equipment
   1. Nebulizer
   2. Glucometer or blood glucose measuring device with reagent strips
   3. Long large-bore needles or angiocatheters (should be at least 3.25″ in length for needle chest decompression in large adults)

E. Medications

   Drug dosing in children should use processes minimizing the need for calculations, preferably a length-based system. In general, medications may include:
   1. Cardiovascular medication, such as 1:10,000 epinephrine, atropine, antidysrhythmics (e.g., adenosine and amiodarone), calcium channel blockers, beta-blockers, nitroglycerin tablets, aspirin, vasopressor for infusion
   2. Cardiopulmonary/respiratory medications, such as albuterol (or other inhaled beta agonist) and ipratropium bromide, 1:1000 epinephrine, furosemide
   3. 50% dextrose solution (and sterile diluent or 25% dextrose solution for pediatrics)
   4. Analgesics, narcotic and nonnarcotic
   5. Anti-epileptic medications, such as diazepam or midazolam
   6. Sodium bicarbonate, magnesium sulfate, glucagon, naloxone hydrochloride, calcium chloride
   7. Bacteriostatic water and sodium chloride for injection
   8. Additional medications, as per local medical director

Optional Equipment

The equipment in this section is not mandated or required. Use should be based on local needs and resources.

A. Optional Equipment for BLS Ground Ambulances
   1. Glucometer or blood glucose test strips (per state protocol and/or local medical control approval)

2. Infant oxygen mask
3. Infant self-inflating resuscitation bag
4. Airways
   a. Nasopharyngeal (12F, 14F)
   b. Oropharyngeal (size 00)
5. CPAP/BiPAP capability
6. Neonatal blood pressure cuff
7. Infant blood pressure cuff
8. Pediatric stethoscope
9. Infant cervical immobilization device
10. Pediatric backboard and extremity splints
11. Femur traction device (adult and child sizes)
12. Pelvic immobilization device
13. Elastic wraps
14. Ocular irrigation device
15. Hot packs
16. Warming blanket
17. Cooling device
18. Soft patient restraints
19. Folding stretcher
20. Bedpan
21. Topical hemostatic agent/bandage
22. Appropriate CBRNE PPE (chemical, biological, radiological, nuclear, explosive personal protective equipment), including respiratory and body protection; protective helmet/jackets or coats/pants/boots
23. Applicable chemical antidote auto-injectors (at a minimum for crew members' protection; additional for victim treatment based on local or regional protocol; appropriate for adults and children)

B. Optional Equipment for ALS Emergency Ground Ambulances
   1. Respirator, volume-cycled, on/off operation, 100% oxygen, 40–50 psi pressure (child/infant capabilities)
   2. Blood sample tubes, adult and pediatric
   3. Automatic blood pressure device
   4. Nasogastric tubes, pediatric feeding tube sizes 5F and 8F, sump tube sizes 8F–16F
   5. Size 1 curved laryngoscope blade
   6. Gum elastic bougies
   7. Needle cricothyrotomy capability and/or cricothyrotomy capability (surgical cricothyrotomy can be performed in older children in whom the cricothyroid membrane is easily palpable, usually by puberty)
   8. Rescue airway devices for children
   9. Atomizers for administration of intranasal medications

Optional Medications

A. Optional Medications for BLS Emergency Ambulances
   1. Albuterol
   2. Epi-pen
   3. Oral glucose
   4. Nitroglycerin (sublingual tablet or paste)
   5. Aspirin

B. Optional Medications for ALS Emergency Ground Ambulances
   1. Intubation adjuncts, including neuromuscular blockers

Interfacility Transport

Additional equipment may be needed by ALS and BLS out-of-hospital care providers who transport patients between facilities. Transfers may be made to a lower or higher level of care, depending on the specific need. Specialty transport teams, including pediatric and neonatal teams, may include other personnel, such as respiratory therapists, nurses, and physicians. Training and equipment needs may be different depending on the skills needed during transport of these patients. There are excellent resources available that provide detailed lists of equipment needed for interfacility transfer, such as *Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients* from the AAP and *The Interfacility Transfer Toolkit for the Pediatric Patient* from the EMSC, ENA, and the Society of Trauma Nurses.

Any ground ambulance that, either by formal agreement or by circumstance, may be called into service during a disaster or mass casualty incident to treat and/or transport any patient from the scene to the hospital or to transfer between facilities any patient other than those within their designated specialty population should carry, at a minimum, all equipment, adult and pediatric, listed under "Required Equipment for All Emergency Ground Ambulances."

Extrication Equipment

In many cases, optimal patient care mandates appropriate and safe extrication or rescue from the patient's situation or environment. It is critical that EMS personnel possess or have immediate access to the expertise, tools, and equipment necessary to safely remove patients from entrapment or hazardous environments. It is beyond the scope of this document to describe the extent of these. Local circumstances and regulations may affect both the expertise and tools that are maintained on an individual ground ambulance, and on any other rescue vehicle that may be needed to accompany an ambulance to an EMS scene. The tools and equipment carried on an individual ground ambulance need to be thoughtfully determined by local features of the EMS system with explicit plans to deploy the needed resources when extrication or rescue is required.

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