



## Houston Health Department - EMS Program's Essential Equipment for Ambulances as per *Equipment for Ambulances* April 2009 ACS-ACEP-NAEMSP

Almost 4 decades ago, the Committee on Trauma of the American College of Surgeons (ACS) developed a list of standardized equipment for ambulances. Beginning in 1988, the American College of Emergency Physicians (ACEP) published a similar list. The 2 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 ambulances for appropriate homeland security. All 3 organizations adhere to the principle that emergency medical services (EMS) providers at all levels must have the appropriate equipment and supplies to optimize prehospital delivery of care. The document was written to serve as a standard for the equipment needs of emergency ambulance services in both the United States and Canada.

EMS providers care for patients of all ages, who have a wide variety of medical and traumatic conditions. With permission from the ACS Committee on Trauma, ACEP, and NAEMSP, the current revision includes updated pediatric recommendations developed by members of the federal Emergency Medical Services for Children (EMSC) Stakeholder Group. 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 will be used as the standard for this performance measure. The American Academy of Pediatrics (AAP) has also officially endorsed this list.

For purposes of this document, the following definitions have been used: a neonate is 0 to 28 days old, an

infant is 29 days to 1 year old, and a child is >1 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 PREHOSPITAL CARE

The goal of prehospital care is to minimize further systemic insult or 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.

Integral to this process is medical oversight of prehospital care by using preexisting 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 ambulance services, adult and pediatric emergency medicine physicians, adult and pediatric trauma surgeons, and appropriately trained basic and advanced emergency medical personnel. Current Institute of Medicine (IOM) recommendations

encourage each EMS agency to have a pediatric coordinator to specifically coordinate the capability of the service to care for nonadult patients.

### EQUIPMENT AND SUPPLIES

The guidelines list the supplies and equipment that should be stocked on ambulances to provide the accepted standards of patient care.

The following list is divided into equipment for BLS and ALS 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 equipment and supplies that will facilitate patient care in the out-of-hospital setting.

### REQUIRED EQUIPMENT: BLS AMBULANCES

#### A. Ventilation and Airway Equipment

1. Portable and fixed suction apparatus with a regulator (per federal specifications; see Federal Specification KKK-A-1822F reference)
  - Wide-bore tubing, rigid pharyngeal curved suction tip; tonsillar and flexible suction catheters, 6F–16F, are commercially available (have 1 between 6F and 10F and 1 between 12F and 16F)
2. Portable oxygen apparatus capable of metered flow with adequate tubing
3. Portable and fixed oxygen-supply equipment
  - Variable flow regulator
4. Oxygen-administration equipment
  - Adequate-length tubing; transparent mask (adult and child sizes), both nonbreathing and valveless; nasal cannulas (adult, child)

5. Bag-valve mask (manual resuscitator)
  - Hand-operated, self-reexpanding bag; adult (>1000 mL) and child (450–750 mL) sizes, with oxygen reservoir/accumulator; valve (clear, disposable, 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

All ambulances should be equipped with an automated external defibrillator (AED) unless staffed by ALS personnel who are carrying a monitor/defibrillator. The AED should have pediatric capabilities, including child-sized pads and cables.

### C. Immobilization Devices

1. Cervical collars
  - Rigid for children aged 2 years or older; child and adult sizes (small, medium, large, and other available sizes)
2. Head immobilization device (not sandbags)
  - Firm padding or commercial device
3. Lower extremity (femur) traction devices
  - Lower extremity limb-support slings, padded ankle hitch, padded pelvic support, traction strap (adult and child sizes)
4. 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)

5. Impervious backboards (long, short; radiolucent preferred) and extrication device
  - Short (extrication, head-to-pelvis length) and 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

1. Commercially packaged or sterile burn sheets
2. Triangular bandages
  - Minimum of 2 safety pins each
3. Dressings
  - Sterile multitrauma dressings (various large and small sizes)
  - ABDs, 10 × 12 in or larger
  - 4 × 4-in gauze sponges or suitable size
4. Gauze rolls
  - Various sizes
5. Occlusive dressing or equivalent
  - Sterile, 3 × 8 in or larger
6. Adhesive tape
  - Various sizes (including 1 and 2 in), hypoallergenic
  - Various sizes (including 1 and 2 in), adhesive
7. Arterial tourniquet (commercial preferred)

### E. Communication

Two-way communication device between EMS provider, dispatcher, and medical control

### F. Obstetrical Kit (Commercial Package Is Available)

1. Kit (separate sterile kit)
  - Towels, 4 × 4-in 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)

### G. Miscellaneous

1. Sphygmomanometer (pediatric and adult regular- and large-sized cuffs)
2. Adult stethoscope
3. Length/weight-based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight
4. Thermometer with low temperature capability
5. Heavy bandage or paramedic scissors for cutting clothing, belts, and boots
6. Cold packs
7. Sterile saline solution for irrigation (1-L bottles or bags)
8. Flashlights (2) with extra batteries and bulbs
9. Blankets
10. Sheets (minimum of 4), linen or paper, and pillows
11. Towels
12. Triage tags
13. Disposable emesis bags or basins
14. Disposable bedpan
15. Disposable urinal
16. Wheeled cot (conforming to national standard at the time of manufacture)
17. Folding stretcher
18. Stair chair or carry chair
19. Patient care charts/forms
20. Lubricating jelly (water soluble)
21. Glucometer or blood glucose measuring device with reagent strips
22. Oral glucose
23. EpiPens

### H. Infection Control

1. Eye protection (full peripheral glasses or goggles, face shield)
2. Face protection (for example, surgical masks per

applicable local or state guidance)

3. Gloves, nonsterile (must meet 1999 National Fire Protection Association requirements, which can be found at [www.nfpa.org](http://www.nfpa.org))
4. Coveralls or gowns
5. Shoe covers
6. Waterless hand cleanser, commercial antimicrobial (towelette, spray, liquid)
7. Disinfectant solution for cleaning equipment
8. Standard sharps containers, fixed and portable
9. Disposable trash bags for disposing of biohazardous waste
10. Respiratory protection (for example, N95 or N100 mask—per applicable local or state guidance)

#### I. Injury-Prevention Equipment

1. All individuals in an ambulance need to be restrained (there is currently no national standard for transport of uninjured children)
2. Fire extinguisher
3. Hazardous material reference guide
4. Traffic-signaling devices (reflective material triangles or other reflective, nonigniting devices)
5. Reflective safety wear for each crew member (must meet or exceed American National Standards Institute/International Safety Equipment Association performance class II or III if working within the right of way of any federal-aid highway; visit [www.reflectivevest.com/federalhighwayruling.html](http://www.reflectivevest.com/federalhighwayruling.html) for more information)

## REQUIRED EQUIPMENT: ALS AMBULANCES

For emergency medical technician-paramedic services, include all of the required equipment listed for the basic-level provider, plus the following additional equipment and supplies.

### A. Airway and Ventilation Equipment

1. Laryngoscope handle with extra batteries and bulbs
2. Laryngoscope blades, sizes 0–4, straight (Miller); sizes 2–4, curved, (MacIntosh)
3. Endotracheal tubes, various sizes
4. Syringes, various sizes
5. Stylettes for endotracheal tubes, adult and pediatric
6. Magill (Rovenstein) forceps, adult and pediatric
7. Lubricating jelly (water soluble)
8. End-tidal CO<sub>2</sub>–detection capability
  - Colorimetric (adult and pediatric) or quantitative capnometry

### B. Vascular Access

1. Crystalloid solutions, such as Ringer's lactate or normal saline solution (1000-mL bags × 4); fluid must be in bags, not bottles; type of fluid may vary depending on state and local requirements
2. Antiseptic solution (alcohol wipes and povidone-iodine wipes preferred)
3. Intravenous–fluid pole or roof hook
4. Intravenous catheters, various sizes
5. Intraosseous needles or devices appropriate for children and adults
6. Venous tourniquet, rubber bands

7. Syringes of various sizes, including tuberculin
8. Needles, various sizes (1 at least 1½ in 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, ECG 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

- Nebulizer

### E. Medications (Preloaded Syringes When Available)

Medications used on advanced-level ambulances should be compatible with current guidelines as published by the American Heart Association's Committee on Emergency Cardiovascular Care, as reflected in the Advanced Cardiac Life Support and Pediatric Advanced Life Support courses, or other such organizations and publications (ACEP, ACS, NAEMSP, and so on). Medications may vary depending on state requirements. Drug dosing in children should use processes that minimize the need for calculations, preferably a length-based system