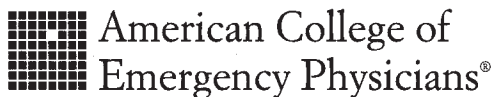


Equipment for Ambulances



Almost four decades ago, the Committee on Trauma (COT) of the American College of Surgeons (ACS) developed a list of standardized equipment for ambulances. Since 1988, the American College of Emergency Physicians (ACEP) has published a similar list. Both of those organizations collaborated on the existing joint document, published in 2000. With this revision, the National Association of EMS Physicians (NAEMSP) has agreed to participate in this collaboration.

All three organizations adhere to the principle that emergency medical technicians (EMTs) at all levels must have the appropriate equipment and supplies to optimize prehospital delivery of care. Since EMTs care for patients of all ages, with a wide variety of medical and traumatic conditions, the ACS COT, ACEP, and NAEMSP have joined to produce this document to serve as a widely accepted standard in the field of emergency ambulance service both in the United States and Canada. Based on the need for increased domestic preparedness, this current revision addresses for the first time those resources needed on ambulances for appropriate terrorism preparedness.

PRINCIPLES OF PREHOSPITAL CARE

High-quality, consistent emergency care demands continuous quality improvement and is directly dependent on effectively monitoring, integrating, and evaluating all components of the patient's care.

The goal of prehospital care is to minimize further systemic insult or injury through a series of well-defined and appropriate interventions.

Integral to this process is medical oversight of prehospital care by preexisting protocol (indirect medical oversight) or by physician via voice and/or video communication (direct medical oversight). The protocols that guide patient care should be established in concert by medical directors for ambulance services, emergency physicians, trauma surgeons, and appropriately trained basic and advanced emergency medical personnel.

EQUIPMENT AND SUPPLIES

The guidelines list the supplies and equipment that should be stocked on ambulances to provide patient care. Previous documents regarding ambulance equipment have referred to essential or minimal equipment necessary to adequately equip an ambulance. However, very little scientific evidence supports requirements for specific equipment and supplies. Equipment requirements will vary, depending on the certification levels of the providers, population densities, geographic and economic conditions of the region, and other factors.

THE FOLLOWING LIST REPRESENTS A CONSENSUS OF RECOMMENDATIONS FOR EQUIPMENT AND SUPPLIES THAT WILL FACILITATE PATIENT CARE ACTIVITIES IN THE OUT-OF-HOSPITAL SETTING.

BASIC LEVEL PROVIDERS

A. VENTILATION AND AIRWAY EQUIPMENT

1. Portable and fixed suction apparatus
 - * Wide-bore tubing, rigid pharyngeal curved suction tip; tonsillar and flexible suction catheters, 5F–14F
2. Portable and fixed oxygen equipment
 - * Variable flow regulator
3. Oxygen administration equipment
 - * Adequate length tubing; mask (adult, child, and infant sizes), transparent, non-rebreathing, and valveless; nasal cannulas (adult, child, and infant sizes)
4. Pocket mask with one-way valve
5. Bag-valve mask
 - * Hand-operated, self-reexpanding bag (adult and infant sizes), with oxygen reservoir/accumulator; clear mask (adult, child, infant, and neonate sizes); valve (clear, disposable, operable in cold weather)
6. Airways
 - * Nasopharyngeal, oropharyngeal (adult, child, and infant sizes)
7. Alternative airway devices (eg, ETLA [esophageal-tracheal double lumen airway]) as approved by local medical direction

B. MONITORING AND DEFIBRILLATION

Automatic external defibrillator is strongly recommended for systems that do not have immediate availability of an advanced life support service. All ambulances should be equipped with an automated external defibrillator unless staffed at all times by advanced life support personnel with a monitor/defibrillator.

C. IMMOBILIZATION DEVICES

1. Cervical collars
 - * Rigid for children ages 2 years or older, infant, 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 (adult and child sizes), rigid-support appropriate material (cardboard, metal, pneumatic, vacuum, wood, or plastic)
5. Radiolucent backboards (long, short) and extrication device
 - * Joint-above and joint-below fracture site (chin strap alone should not be used for head immobilization), adult and child sizes, with padding for children, handholds for moving patients, short (extrication, head-to-pelvis length), long (transport, head to feet), with at least 3 appropriate restraint straps

D. BANDAGES

1. Burn pack
 - * Standard package, clean burn sheets (or towels for children)
2. Triangular bandages
 - * Minimum 2 safety pins each
3. Dressings
 - * Sterile multitrauma dressings (various large and small sizes)
 - * ABDs, 10"×12" or larger
 - * 4"×4" gauze sponges
4. Gauze rolls
 - * Sterile (various sizes)

5. Elastic bandages
 - * Nonsterile (various sizes)
6. Occlusive dressing
 - * Sterile, 3"×8" or larger
7. Adhesive tape
 - * Various sizes (including 2" or 3") hypoallergenic
 - * Various sizes (including 2" or 3") adhesive

E. COMMUNICATION

- * Two-way radio communication (UHF, VHF) between EMT, dispatcher, and medical oversight (physician)
- * Two-way disaster communication
- * Cellular phone

F. OBSTETRICAL

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)
3. Appropriate heat source for ambulance compartment

G. MISCELLANEOUS

1. Sphygmomanometer (infant, pediatric, and adult regular and large, for example, thigh sizes)
2. Stethoscope (pediatric and adult)
3. Length/weight-based chart for pediatric equipment sizing
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-liter bottles or bags)
8. Flashlights (2) with extra batteries and bulbs
9. Blankets
10. Sheets, linen or paper (minimum 4), and pillows
11. Towels
12. Triage tags
13. Disposable emesis bags or basins
14. Disposable bedpan
15. Disposable urinal
16. Wheeled cot (properly secured patient transport system)
17. Folding stretcher
18. Stair chair or carry chair
19. Patient care charts/forms
20. Lubricating jelly (water soluble)
21. Appropriate CBRNE PPE (chemical, biological, radiological, nuclear, explosive personal protective equipment), including respiratory and body protection
22. Applicable chemical antidote autoinjectors (at a minimum for crew members' protection; additional for victim treatment as appropriate)

BASIC LEVEL PROVIDERS (CONTINUED)

H. INFECTION CONTROL*

**Latex-free equipment should be available.*

1. Eye protection (full peripheral glasses or goggles, face shield)
2. Masks
3. Gloves, nonsterile
4. Jumpsuits or gowns
5. Shoe covers
6. Disinfectant hand wash, commercial antimicrobial (towelette, spray, liquid)
7. Disinfectant solution for cleaning equipment
8. Standard sharps containers
9. Disposable trash bags (identifiable color, such as red)
10. HEPA mask

ADVANCED LEVEL PROVIDERS

For EMT-Paramedic, include all the equipment listed for the basic level provider plus the following additional equipment and supplies. For EMT-Intermediate (and other nonparamedic advanced levels), include all the equipment for the basic level provider and selected equipment and supplies from the following list, as appropriate.

A. VASCULAR ACCESS

1. Crystalloid solutions, Ringer's lactate or normal saline solution (1,000-mL bags × 4), 5% dextrose in water (optional) (fluid must be in bags, not bottles)
2. Antiseptic solution (alcohol wipes and povidone-iodine wipes preferred)
3. IV pole or roof hook
4. Intravenous catheters 14G–24G, 1" long
5. Intraosseous needles
6. Tourniquet, rubber bands
7. Syringes of various sizes, including tuberculin
8. Needles, sizes 19G–25G
9. Intravenous administration sets (microdrip and macrodrip)
10. Intravenous arm boards, adult and pediatric

B. AIRWAY AND VENTILATION EQUIPMENT

1. Laryngoscope handle with extra batteries and bulbs, adult and pediatric
2. Laryngoscope blades, sizes 0, 1, and 2, straight; sizes 3 and 4, straight and curved
3. Endotracheal tubes, sizes 2.5–6.0 mm uncuffed and 6.5–8.0 mm cuffed (2 each), other sizes optional
4. Meconium aspirator
5. 10-mL non-Luerlock syringes
6. Stylettes for endotracheal tubes, adult and pediatric
7. Magill forceps, adult and pediatric
8. Lubricating jelly (water soluble)
9. Nasogastric tubes, pediatric sizes 5F and 8F, Salem sump sizes 14F, 16F, and 18F
10. End-tidal CO₂ detectors
 - * Colorimetric or quantitative

I. INJURY PREVENTION EQUIPMENT

1. Appropriate restraints (seat belts, air bags) for patient, crew, and family members
2. Child safety restraints
3. Protective helmet and coat with reflective material (1 each per crew member)
4. Fire extinguisher
5. Hazardous material reference guide
6. Traffic signaling devices (reflective material triangles or other reflective, nonigniting devices)

J. OPTIONAL BASIC EQUIPMENT

1. Pneumatic antishock garment (PASG)
 - * Compartmentalized (legs and abdomen separate), control valves (closed/open), inflation pump, lower leg to lower ribcage (does not include chest)
2. Respirator
 - * Volume-cycled valve, on/off operation, 100% oxygen, 40–50 psi pressure (child/infant capabilities)
3. Appropriate medication as approved by local medical director

C. CARDIAC

1. Portable, battery-operated monitor/defibrillator
 - * With tape write-out/recorder, defibrillator pads, quick-look paddles or hands-free patches, ECG leads, adult and pediatric chest attachment electrodes, adult and pediatric paddles, with capability to provide electrical discharge below 25 watt-seconds.
2. Transcutaneous cardiac pacemaker
 - * 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. Pulse oximetry with pediatric and adult probes

E. MEDICATIONS (PRE-LOAD WHEN AVAILABLE)

Medications used on advanced level ambulances should be compatible with current standards as indicated by the American Heart Association's Emergency Cardiac Care Committee, as reflected in the Advanced Cardiac Life Support Course, or other such organizations and publications (ACEP, ACS, NAEMSP, and so on). In general, medications should include:

- * Cardiovascular medication, such as 1:10,000 epinephrine, atropine, antidysrhythmics, calcium channel blockers, beta-blockers, nitroglycerin tablets, aspirin, pressors
- * Cardiopulmonary/respiratory medications, such as albuterol (or other inhaled beta agonist), 1:1,000 epinephrine, furosemide
- * 50% dextrose solution (and sterile diluent or 25% dextrose solution for pediatrics)
- * Analgesics, narcotic and nonnarcotic
- * Antiepileptic medications, such as diazepam or midazolam
- * Sodium bicarbonate, magnesium sulfate, glucagon, naloxone hydrochloride
- * Bacteriostatic water and sodium chloride for injection
- * Sedation or other intubation adjuncts such as paralytics should only be used with approval and close medical oversight

F. OPTIONAL ADVANCED EQUIPMENT

1. Portable automatic ventilators
2. Blood sample tubes, adult and pediatric
3. Automatic blood pressure device

APPENDIX

EXTRICATION EQUIPMENT

Adequate extrication equipment must be readily available to the emergency medical services responders, but is more often found on heavy rescue vehicles than on the primary responding ambulance.

In general, the devices or tools used for extrication fall into several broad categories: disassembly, spreading, cutting, pulling, protective, and patient-related.

The following is necessary equipment that should be available either on the primary response vehicle or on a heavy rescue vehicle.

Disassembly Tools

- * Wrenches (adjustable)
- * Screwdrivers (flat and Phillips head)
- * Pliers
- * Bolt cutter
- * Tin snips
- * Hammer
- * Spring-loaded center punch
- * Axes (pry, fire)
- * Bars (wrecking, crow)
- * Ram (4 ton)

Spreading Tools

- * Hydraulic jack/spreader/cutter combination

Cutting Tools

- * Saws (hacksaw, fire, windshield, pruning, reciprocating)
- * Air-cutting gun kit

Pulling Tools/Devices

- * Ropes/chains
- * Come-along
- * Hydraulic truck jack
- * Air bags

Protective Devices

- * Reflectors/flares
- * Hard hats
- * Safety goggles
- * Fireproof blanket
- * Leather gloves
- * Jackets/coats/boots

Patient-Related Devices

- * Stokes basket

Miscellaneous

- * Shovel
- * Lubricating oil
- * Wood/wedges
- * Generator
- * Floodlights

Local extrication needs may necessitate additional equipment, that is, water, aerial, or mountain rescue.

REFERENCES

Equipment for Ambulances

ACEP Policy Statement American College of Emergency Physicians
<http://www.acep.org>

Medical Direction of Emergency Medical Services

Resources for Optimal Care of the Injured Patient
American College of Surgeons Committee on Trauma
Chicago 1999, 2006

Equipment for Ambulances