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

Joint Policy Statement: Equipment for Ground Ambulances

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

Equipment for Ambulances

29 performance measures for the Program’s state partnership grantees. One of the performance
30 measures evaluates the availability of essential pediatric equipment and supplies for Basic Life
31 Support (BLS) and Advanced Life Support (ALS) patient care units. This document is used as the
32 standard for this performance measure. The National Association of State EMS Officials and the
33 Emergency Nurses Association has participated in the latest revision process. The
34 recommendations in this document specifically pertain to ALS and BLS emergency ground
35 ambulance services in the United States of America.

36 For purposes of this document, the following definitions have been used: a neonate is 0 to
37 28 days old, an infant is 29 days to 1 year old, and a child is >1 year through 11 years old with
38 delineation into the following developmental stages:

39 Toddlers (1-3 years old)

40 Preschoolers (3-5 years old)

41 Middle Childhood (6-11 years old)

42 Adolescents (12-18 years old)

43

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

Principles of Out-of-hospital Care

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

Equipment for Ambulances

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

62 Equipment and Supplies

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

69 The National EMS Scope of Practice Model defines and describes four certification or
70 licensure levels of EMS provider: Emergency Medical Responder (EMR), Emergency Medical
71 Technician (EMT), Advanced EMT (AEMT), and Paramedic. Each level represents a unique role,
72 set of skills, and knowledge base. The National EMS Scope of Practice Model establishes a
73 framework that ultimately determines the range of skills and roles that an individual possessing a
74 State EMS license is authorized to do in a given EMS system. Individual state EMS rules or
75 regulations that limit provider scope of practice may impact the need for availability of certain
76 pieces of equipment.

Equipment for Ambulances

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

81

82 The following list is divided into equipment for Basic Life Support (BLS) and Advanced Life
83 Support (ALS) emergency ground ambulances. ALS ambulances must have all of the equipment
84 on the required BLS List as well as equipment on the required ALS list. This list represents a
85 consensus of recommendations for equipment and supplies that will facilitate patient care in the
86 out-of-hospital setting.

87

88 **Required Equipment for BLS Emergency Ground Ambulances**

89

90 **A. Ventilation and Airway Equipment**

91

1. Portable and fixed suction apparatus with a regulator, per federal specifications

92

- Wide-bore tubing, rigid pharyngeal curved suction tip; tonsil and flexible suction catheters,
93 6F–16F are commercially available (have one between 6F and 10F and one between 12F
94 and 16F)

95

2. Portable oxygen apparatus, capable of metered flow with adequate tubing

96

3. Portable and fixed oxygen supply equipment

97

- Variable flow meter

98

4. Oxygen administration equipment

99

- Adequate length tubing; transparent mask (adult and child sizes), both non-

100

rebreathing and valveless; nasal cannulas (adult, child)

Equipment for Ambulances

- 101 5. Bag-valve mask (manual resuscitator)
- 102 • Hand-operated, self-expanding bag; adult (>1000 mL) and child (450–
- 103 750 mL) sizes, with oxygen reservoir/accumulator; valve (clear, operable in cold weather);
- 104 and mask (adult, child, infant, and neonate sizes)
- 105 6. Airways
- 106 • Nasopharyngeal (16F–34F; adult and child sizes)
- 107 • Oropharyngeal (sizes 0–5; adult, child, and infant sizes)
- 108 7. Pulse oximeter with pediatric and adult probes
- 109 8. Saline drops and bulb suction for infants

110

111 B. Monitoring and Defibrillation

112 BLS ground ambulances should be equipped with an automated external defibrillator

113 (AED) unless staffed by advanced life support personnel who are carrying a

114 monitor/defibrillator. The AED should have pediatric capabilities, including child-sized

115 pads and cables OR dose attenuator with adult pads.

116

117 C. Immobilization Devices

- 118 1. Cervical collars
- 119 • Rigid for children ages 2 years or older; child and adult sizes (small, medium, large, and
- 120 other available sizes) OR pediatric and adult adjustable cervical collars
- 121 2. Head immobilization device (not sandbags)
- 122 • Firm padding or commercial device
- 123 3. Upper and lower extremity immobilization devices
- 124 • Joint-above and joint-below fracture (sizes appropriate for adults and children), rigid-

Equipment for Ambulances

- 125 support constructed with appropriate material (cardboard, metal, pneumatic, vacuum,
126 wood, or plastic)
- 127 4. Impervious backboards (long, short; radiolucent preferred) and extrication device
- 128 • Short extrication/ immobilization device (eg KED)
 - 129 • Long (transport, head-to-foot length) with at least 3 appropriate restraint straps (chin
130 strap alone should not be used for head immobilization) and with padding for children
131 and handholds for moving patients

132

133 D. Bandages/Hemorrhage Control

- 134 1. Commercially packaged or sterile burn sheets
- 135 2. Bandages
- 136 • Triangular bandages
- 137 3. Dressings
- 138 • Sterile dressings including gauze sponges of suitable size
 - 139 • Abdominal dressing
- 140 4. Gauze rolls
- 141 • Various sizes
- 142 5. Occlusive dressing or equivalent
- 143 6. Adhesive tape
- 144 • Various sizes (including 1" and 2") hypoallergenic
 - 145 • Various sizes (including 1" and 2") adhesive
- 146 7. Arterial tourniquet (commercial preferred)

147

148 E. Communication

Equipment for Ambulances

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

151

152 F. Obstetrical Kit (commercially packaged are available)

153 1. Kit (separate sterile kit)

154 • Towels, 4" x 4" dressing, umbilical tape, sterile scissors or other cutting utensil, bulb
155 suction, clamps for cord, sterile gloves, blanket

156 2. Thermal absorbent blanket and head cover, aluminum foil roll, or appropriate heat-
157 reflective material (enough to cover newborn infant)

158

159 G. Miscellaneous

160 1. Access to pediatric and adult patient care protocols

161 2. A length-based resuscitation tape or a reference material that provides appropriate guidance
162 for pediatric drug dosing and equipment sizing based on length or age

163 3. Sphygmomanometer (pediatric and adult regular and
164 large size cuffs)

165 4. Adult stethoscope

166 5. Thermometer with low temperature capability

167 6. Heavy bandage or paramedic scissors for cutting clothing, belts, and boots

168 7. Cold packs

169 8. Sterile saline solution for irrigation

170 9. Two functional flashlights

171 10. Blankets

172 11. Sheets (at least one change per cot)

Equipment for Ambulances

- 173 12. Pillows
- 174 13. Towels
- 175 14. Triage tags
- 176 15. Emesis bags or basins
- 177 16. Urinal
- 178 17. Wheeled cot
- 179 18. Stair chair or carry chair
- 180 19. Patient care charts/forms or electronic capability
- 181 20. Lubricating jelly (water soluble)

182

183 H. Infection Control*

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

193 *Latex-free equipment should be available

194

195 I. Injury-Prevention Equipment

- 196 1. Availability of necessary age/size appropriate restraint systems for all passengers and

Equipment for Ambulances

- 197 patients transported in ground ambulances. For children, this should be according to the
198 National Highway Traffic Administration's document: Safe Transport of Children in
199 Emergency Ground Ambulances (<https://www.nhtsa.gov/staticfiles/nti/pdf/811677.pdf>)
- 200 2. Fire extinguisher
 - 201 3. Department of Transportation Emergency Response Guide
 - 202 4. Reflective safety wear for each crewmember (must meet American National Standard for
203 High Visibility Public Safety Vests if working within the right of way of any federal-aid
204 highway. Visit <http://www.reflectivevest.com/federalhighwayruling.html> for more
205 information)

206

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

208

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

214

215 **A. Airway and Ventilation Equipment**

- 216 1. Laryngoscope handle with extra batteries and bulbs
- 217 2. Laryngoscope blades, sizes:
 - 218 a. 0–4, straight (Miller), and
 - 219 b. 2–4, curved
- 220 3. Endotracheal tubes (if ALS service scope of practice includes tracheal intubation), sizes:

Equipment for Ambulances

- 221 a. 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, and 5.5 mm cuffed and/or uncuffed, and
- 222 b. 6.0, 6.5, 7.0, 7.5, and 8.0 mm cuffed (1 each), other sizes optional
- 223 4. 10-mL non-Luer Lock syringes
- 224 5. Stylettes for endotracheal tubes, adult and pediatric
- 225 6. Magill forceps, adult and pediatric
- 226 7. End-tidal CO₂ detection capability (adult and pediatric)
- 227 8. Rescue airway device, such as the ETDLA (esophageal-tracheal double lumen airway),
- 228 laryngeal tube, disposable supraglottic airway or laryngeal mask airway (as approved by
- 229 local medical direction)

230

231 B. Vascular Access

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

243

244 C. Cardiac

Equipment for Ambulances

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

251

252 D. Other Advanced Equipment

- 253 1. Nebulizer
- 254 2. Glucometer or blood glucose measuring device with reagent strips
- 255 3. Long large-bore needles or angiocatheters (should be at least 3.25” in length for needle chest
- 256 decompression in large adults)

257

258 E. Medications

259 Drug dosing in children should use processes minimizing the need for calculations, preferably a

260 length-based system. In general, medications may include:

- 261 1. Cardiovascular medication, such as 1:10,000 epinephrine, atropine,
- 262 antidysrhythmics (eg, adenosine and amiodarone), calcium channel blockers,
- 263 beta-blockers, nitroglycerin tablets, aspirin, vasopressor for infusion
- 264 2. Cardiopulmonary/respiratory medications, such as albuterol (or other inhaled beta
- 265 agonist) and ipratropium bromide, 1:1000 epinephrine, furosemide
- 266 3. 50% dextrose solution (and sterile diluent or 25% dextrose solution for pediatrics)
- 267 4. Analgesics, narcotic and nonnarcotic
- 268 5. Anti-epileptic medications, such as diazepam or midazolam

Equipment for Ambulances

- 269 6. Sodium bicarbonate, magnesium sulfate, glucagon, naloxone hydrochloride, calcium chloride
- 270 7. Bacteriostatic water and sodium chloride for injection
- 271 8. Additional medications, as per local medical director

272 **Optional Equipment**

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

275

276 **A. Optional Equipment for BLS Ground Ambulances**

- 277 1. Glucometer or blood glucose test strips (per state protocol and/or local medical control
278 approval)
- 279 2. Infant oxygen mask
- 280 3. Infant self-inflating resuscitation bag
- 281 4. Airways
 - 282 a. Nasopharyngeal (12, 14 Fr)
 - 283 b. Oropharyngeal (size 00)
- 284 5. CPAP/BiPAP capability
- 285 6. Neonatal blood pressure cuff
- 286 7. Infant blood pressure cuff
- 287 8. Pediatric stethoscope
- 288 9. Infant cervical immobilization device
- 289 10. Pediatric backboard and extremity splints
- 290 11. Femur traction device (adult and child sizes)
- 291 12. Pelvic immobilization device
- 292 13. Elastic wraps

Equipment for Ambulances

- 293 14. Ocular irrigation device
- 294 15. Hot packs
- 295 16. Warming blanket
- 296 17. Cooling device
- 297 18. Soft patient restraints
- 298 19. Folding stretcher
- 299 20. Bedpan
- 300 21. Topical hemostatic agent/bandage
- 301 22. Appropriate CBRNE PPE (chemical, biological, radiological, nuclear, explosive personal
- 302 protective equipment), including respiratory and body protection; protective helmet/jackets or
- 303 coats/pants/boots
- 304 23. Applicable chemical antidote auto-injectors (at a minimum for crew members' protection;
- 305 additional for victim treatment based on local or regional protocol; appropriate for adults and
- 306 children)

307

308 B. Optional Equipment for ALS Emergency Ground Ambulances

- 309 1. Respirator, volume-cycled, on/off operation, 100% oxygen, 40–50 psi pressure (child/infant
- 310 capabilities)
- 311 2. Blood sample tubes, adult and pediatric
- 312 3. Automatic blood pressure device
- 313 4. Nasogastric tubes, pediatric feeding tube sizes 5F and 8F, sump tube sizes 8F–16F
- 314 5. Size 1 curved laryngoscope blade
- 315 6. Gum elastic bougies
- 316 7. Needle cricothyrotomy capability and/or cricothyrotomy capability (surgical cricothyrotomy)

Equipment for Ambulances

317 can be performed in older children in whom the cricothyroid membrane is easily palpable,

318 usually by puberty)

319 8. Rescue airway devices for children

320 9. Atomizers for administration of intranasal medications

321

322 Optional Medications

323

324 A. Optional Medications for BLS Emergency Ambulances

325 1. Albuterol

326 2. Epi-pen

327 3. Oral glucose

328 4. Nitroglycerin (sublingual tablet or paste)

329 5. Aspirin

330

331 B. Optional Medications for ALS Emergency Ground Ambulances

332 1. Intubation adjuncts, including neuromuscular blockers

333

334 Interfacility Transport

335 Additional equipment may be needed by ALS and BLS out-of-hospital care providers who

336 transport patients between facilities. Transfers may be made to a lower or higher level of care,

337 depending on the specific need. Specialty transport teams, including pediatric and neonatal teams,

338 may include other personnel such as respiratory therapists, nurses, and physicians. Training and

339 equipment needs may be different depending on the skills needed during transport of these

340 patients. There are excellent resources available that provide detailed lists of equipment needed for

Equipment for Ambulances

341 interfacility transfer, such as *Guidelines for Air and Ground Transport of Neonatal and Pediatric*
342 *Patients* from the AAP and *The Interfacility Transfer Toolkit for the Pediatric Patient* from the
343 EMSC, ENA, and the Society of Trauma Nurses.

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

349

350 Extrication Equipment

351 In many cases, optimal patient care mandates appropriate and safe extrication or rescue from
352 the patient’s situation or environment. It is critical that EMS personnel possess or have immediate
353 access to the expertise, tools, and equipment necessary to safely remove patients from entrapment or
354 hazardous environments. It is beyond the scope of this document to describe the extent of these.

355 Local circumstances and regulations may affect both the expertise and tools that are maintained on
356 an individual ground ambulance, and on any other rescue vehicle that may be needed to accompany
357 an ambulance to an EMS scene. The tools and equipment carried on an individual ground
358 ambulance needs to be thoughtfully determined by local features of the EMS system with explicit
359 plans to deploy the needed resources when extrication or rescue is required.

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Equipment for Ambulances

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362 SELECT READINGS

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