



EQUIPMENT FOR GROUND AMBULANCES

Summary of Changes 2009-2014

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

*This document was written
by Mary Fallat, University of
Louisville School of Medicine
and designed by the EMSC
National Resource Center,
Washington, DC.*

This article summarizes changes made in the recently published ground ambulance equipment list subsequent to when the list was last published in 2009. The current list represents a consensus by the organizations listed to the left, all of which appointed members to a joint task force to assist with defining the current standard for ground ambulances in the United States. The Equipment for Ground Ambulances Joint Policy Statement was published in *Prehospital Emergency Care* 18(1):92-97, 2014.

Section One: Summary of All Changes Made to the Guidelines

The following represent consensus changes with advice from external agencies where appropriate:

1. Representatives from the National Highway Traffic and Safety Administration (NHTSA) recommended using “Ground Ambulances” in the title to differentiate from medical air transport, which is not addressed in this document.
2. The task force decided to target *Prehospital Emergency Care* for publication and the the American College of Emergency Physicians (ACEP) website for posting.
3. The task force agreed that the Guidelines may have utility in other countries, but the practice of basic life support (BLS) and advance life support (ALS) is limited to the United States and the frame of reference of this document is the United States.
4. The introduction was revised to define the scope of BLS and ALS providers using a link to the NHTSA Scope of Practice.
5. The task force agreed to remove all propriety names with the exception of Magill forceps and KED, which are inextricably linked with the product. A disclaimer was added to the text: The use of a proprietary name that is inextricably linked with its product should not be construed as an endorsement.
6. The task force considered adding a comment to remind states/agencies to check on local school policies. For example, if EpiPens are mandated by law in schools, it may be best to also mandate them on EMS transport and update protocols. The task force decided that this should be left up to local and state regulation.
7. With the exception of endotracheal tubes and some airway adjuncts, references to numbers of items were avoided and left up to local control as this was felt to be a barrier to implementation in some states. The use of specific percent solutions was also avoided where relevant.

8. There may be ALS services that do not include certain procedures in their scope of practice and, therefore, these services will not need associated procedural equipment. Exact language prefaces the ALS Requirements section.
9. A vigorous discussion occurred over whether to move the infant self-inflating resuscitation bag to mandatory given the concern that there is a risk of over-ventilating an infant with the pediatric bag and risk of inadequate ventilation if an infant bag is used on a larger child. All suitable sizes of mask are on the list and the concern of cost and low use of the infant bag with an acceptable alternative (i.e. pediatric bag) led the group to keep it optional.

A number of other small-sized pieces of equipment were left on the optional list due to low use and suitable alternatives:

- Infant oxygen mask
 - Infant nasal cannula
 - Small oropharyngeal and nasopharyngeal airway sizes
 - Pediatric backboard
 - Neonatal BP cuff
10. Equipment recommendations do not match the National EMS Scope of Practice Model in a few places (see Section Two). This was addressed with the following language: “The National EMS Scope of Practice Model defines and describes four certification or licensure levels for the 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.”
 11. Clarification of arterial tourniquet was added under Bandages/Hemorrhage Control. Arterial tourniquet differentiates from a “latex free tourniquet” (venous tourniquet) for assisting with intravenous access, which is listed under Vascular access. Some EMS providers have mistakenly confused a real arterial tourniquet with a venous tourniquet. Application of a venous tourniquet could actually worsen hemorrhage by blocking venous return while NOT impairing arterial flow.
 12. The section “Selected References” was changed to “Select Readings” and the task force agreed to:
 - Remove educational courses
 - Remove textbooks
 - Keep position statements and/or expert opinions
 13. The former Extrication Equipment section was eliminated as the extrication equipment generally arrives in a different vehicle. The following text was added.

“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.”

Section Two: Noted Discrepancies Between EMS Scope of Practice and Ambulance Equipment Guidelines

The revised Guidelines statement is discrepant with the Scope of Practice in the following places:

NATIONAL EMS SCOPE OF PRACTICE MODEL	EQUIPMENT FOR GROUND AMBULANCES
<p><i>Minimum psychomotor skills of the EMT</i></p> <p>Use of positive pressure ventilation devices, such as manually triggered ventilators and automatic transport ventilators</p> <p>Oral glucose for suspected hypoglycemia</p> <p>Aspirin for chest pain of suspected ischemic origin</p> <p>Application and inflation of the pneumatic anti-shock garment (PASG) for fracture stabilization</p>	<p>Use of positive pressure ventilation is up to local regulation</p> <p>Oral glucose is in the optional BLS list</p> <p>Aspirin is required in ALS and was added to optional BLS to cover EMS services that have ischemic heart disease protocols</p> <p>PASG is no longer in the list and was left off due to lack of evidence for its use</p>
<p><i>Minimum psychomotor skills of the AEMT</i></p> <p>Administer sublingual nitroglycerin to a patient experiencing chest pain of suspected ischemic origin</p> <p>Administer subcutaneous or intramuscular epinephrine to a patient in anaphylaxis</p> <p>Administer nitrous oxide for pain relief</p>	<p>Sublingual nitroglycerin is in the optional BLS list</p> <p>Use of the Epi-pen is in the optional BLS list</p> <p>Nitrous oxide was not added</p>
<p><i>Minimum psychomotor skills of the Paramedic</i></p> <p>Perform percutaneous cricothyrotomy</p> <p>Perform gastric decompression</p> <p>There are a variety of infusion skills that are listed including: enteral and parenteral administration of approved prescription medications, access of indwelling catheters and implanted central IV ports (assume patient has own supplies), and maintain an infusion of blood or blood products</p>	<p>This is on the optional ALS list</p> <p>This is on the optional ALS list</p> <p>This is felt to be up to local control and is not on the list</p>

Section Three: Specific Guideline Language Changes by Section

The following represents specific guideline language changes in terms of required BLS equipment, required ALS equipment, optional equipment, and removed equipment.

Required BLS Equipment Language Changes

OLD VERSION	NEW VERSION
Venous tourniquet, rubber bands	Latex free tourniquet
Cervical collars <ul style="list-style-type: none"> Rigid for children ages 2 years or older; child and adult sizes (small, medium, large, and other available sizes) 	Cervical collars <ul style="list-style-type: none"> 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
Impervious backboards (long, short; radiolucent preferred) and extrication device <ul style="list-style-type: none"> Short (extrication, head-to-pelvis length) and long (transport, head-to-feet length) with at least three appropriate restraint straps (chin strap alone should not be used for head immobilization) and with padding for children and handholds for moving patients 	Impervious backboards (long, short; radiolucent preferred) and extrication device <ul style="list-style-type: none"> 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
Dressings <ul style="list-style-type: none"> Sterile multitrauma dressings (various large and small sizes) ABDs, 10"x12" or larger 4"x4" gauze sponges or suitable size 	Dressings <ul style="list-style-type: none"> Sterile dressings, including gauze sponges of suitable size Abdominal dressing
Sheets (minimum 4), linen or paper, and pillows	Sheets (at least one change per cot)
Gloves, nonsterile (must meet NFPA 1999 requirements found at http://www.nfpa.org)	Gloves, nonsterile
Flashlights (2) with extra batteries and bulbs	Two functional flashlights
No protocols were required	Access to pediatric and adult patient care protocols
Injury Prevention Equipment <ul style="list-style-type: none"> All individuals in an ambulance need to be restrained (Currently, no national standard exists for the transport of uninjured children.) Protective helmet Fire extinguisher Hazardous material reference guide Traffic signaling devices (reflective material triangles or other reflective, nonigniting devices) Reflective safety wear for each crew member (must meet or exceed ANSI/ISEA performance class II or III if working within the right of way of any federal-aid highway. Visit http://www.reflectivevest.com/federalhighwayruling.html for more information) 	Injury Prevention Equipment <ul style="list-style-type: none"> 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 Ambulance (http://www.nhtsa.gov/staticfiles/nti/pdf/811677.pdf) Fire extinguisher Department of Transportation Emergency Response Guide Reflective safety wear for each crew member (must meet American National Standard for High Visibility Public Safety Vests if working within the right of way of any federal-aid highway. Visit http://www.reflectivevest.com/federalhighwayruling.html for more information)

OLD VERSION	NEW VERSION
Length/weight-based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight	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 ¹

¹Although primarily used by ALS in urban settings, many BLS rural EMS services use the length-based resuscitation tape to guide equipment size and triage to higher levels of care for estimation of weight and receiving facility preparation. Many state managers have put significant resources into ensuring ambulances have this item and felt it was beneficial to keep on the required list for both BLS and ALS. The task force recognized that there is a childhood obesity problem in America in some states and that length or age may not be an accurate surrogate for weight in some individuals. Nevertheless, the length-based tape provides the best field standard available and is the ideal reference. BLS providers are allowed to use a “Quick reference” card based on weight or age. To ensure proper medication dosing, ALS providers should use a “Length /Weight-based tape or wheel”.

Required Advanced

Changed language to accommodate local and regional variation for properly trained personnel to intubate; downgraded to one ETT each size. Some equipment will be essential equipment only if the EMS agency protocol allows for the intubation of children.

Required Advance Language Changes

OLD VERSION	NEW VERSION
Endotracheal tubes, sizes 2.5-5.5mm uncuffed and 6-8mm cuffed (2 each), other sizes optional	Endotracheal tubes (if ALS service scope of practice includes tracheal intubation). Sizes: <ul style="list-style-type: none"> • 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, and 5.5mm cuffed and/or uncuffed • 6.0, 6.5, 7.0, 7.5, and 8.0mm cuffed • 1 each, other sizes optional
End-tidal CO2 detection capability <ul style="list-style-type: none"> • Colorimetric (adult and pediatric) or quantitative capnometry 	End-tidal CO2 detection capability (adult and pediatric)
Crystalloid solutions, such as Ringer’s lactate or normal saline solution (1,000-mL bags x 4); fluid must be in bags, not bottles; type of fluid may vary depending on state and local requirements	Isotonic crystalloid solutions
Large bore needle (should be at least 3.25” in length for needle chest decompression in large adults)	Long, large-bore needles or angiocatheters (should be at least 3.25” in length for needle chest decompression in large adults)
Needles, various sizes (one at least 1½” for IM injections)	Needles, various sizes (including suitable sizes for intramuscular injections)
Medications (pre-loaded syringes when available) <p>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 minimizing the need for calculations, preferably a length-based system.</p>	Medications <p>Drug dosing in children should use processes minimizing the need for calculations, preferably a length-based system.</p>

Optional Basic to Mandatory ALS

OLD VERSION	NEW VERSION
Alternative airway devices (for example, a rescue airway device such as the ETDLA [esophageal-tracheal double lumen airway], laryngeal tube, or laryngeal mask airway) as approved by local medical direction Alternative airway devices for children (Few alternative airway devices that are FDA-approved have been studied in children. Those that have been studied, such as the LMA, have not been adequately evaluated in the prehospital setting.)	Rescue airway devices, such as the ETDLA (esophageal-tracheal double-lumen airway), laryngeal tube, disposable supraglottic airway, or laryngeal mask airway (as approved by local medical direction)

Moved from Required to Optional Basic

OLD VERSION	NEW VERSION
Lower extremity (femur) traction devices (required)	Lower extremity (femur) traction devices (optional) Current literature cites a high degree of misuse that can cause potential harm. If the purpose is to stabilize a fracture in order to minimize discomfort, there are other means such as padding and pain management.
Folding stretcher (required)	Folder stretcher (optional)
Bedpans (required)	Bedpans (optional)

Optional Basic Language Change

OLD VERSION	NEW VERSION
Elastic bandages <ul style="list-style-type: none">Nonsterile (various sizes)	Elastic wraps
Topical hemostatic agent	Topical hemostatic agent/bandage

Optional Advanced

The task force discussed age recommendations for cricothyrotomy as there is no concurrence among current educational courses. The task force decided not to specify a certain age, but to provide references for advanced airway management in children including:

Weiss M, Engelhardt T. Proposal for the management of the unexpected difficult pediatric airway. *Pediatric Anesthesia* 2010 20: 454–464. doi:10.1111/j.1460-9592.2010.03284.x Pertinent is the rescue portion on page 460 and 461 of the article, particularly Table 3, which lists what should be stocked in difficult airway toolkits.

OLD VERSION	NEW VERSION
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 the age of 12 years)	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)

New Additionals to the Optional Basic and Advanced Lists

OPTIONAL BASIC LIST	OPTIONAL ADVANCED LIST
<ul style="list-style-type: none"> • CPAP/BiPAP capability • Pelvic immobilization device* • Ocular irrigation device • Hot packs • Warming blanket • Cooling device • Soft patient restraints 	<ul style="list-style-type: none"> • Gum elastic bougies • Atomizers for administration of intranasal medications

**The task force added pelvic immobilization device under optional. Pelvic fractures, for the most part, cannot be diagnosed by EMS providers. No one has studied the accuracy of a physical exam for picking up a pelvic fracture, especially with EMS providers. PHTLS specifically recommends against manufactured pelvic binders because of a lack of evidence that they improve outcome (even in the hospital). The focus should be on getting the patient en route to the trauma center. There is a potential role for pelvic biners when a pelvic fracture has been diagnosed and EMS is doing an interfacility transport of a hypotensive patient, allowing a pelvic binder (or sheet) to be applied prior to the transfer.*

Deletions from the List

SECTION	DELETION
Required ALS Airway and Ventilation	Meconium aspirator adaptor
Required vascular access	Tuberculin sized syringe Rubber bands
Required infection control	Shoe covers
Required injury prevention	Traffic signaling devices
Required bandages	Safety pins