

MEDICAL DIRECTION COMMITTEE
1041 Technology Park Dr, Glen Allen, Virginia
Conference Rooms A and B
April 12, 2012
10:30 AM

Members Present:	Members Absent:	Staff:	Others:
Marilyn McLeod, M. D. - Chair Paul Phillips, D.O. George Lindbeck, M.D. Asher Brand, M.D. Nael Hasan, M.D. Marke Franke, M.D. Allen Yee, M.D. Cheryl Lawson, M.D. Stewart Martin, M.D. Forrest Calland, M.D. Scott Weir, M.D.	Charles Lane, M.D. Christopher Turnbull, M.D. Theresa Guins, M.D. Chief Eddie Ferguson	Gary Brown Scott Winston Michael Berg Tim Perkins Carol Pugh Warren Short Chad Blosser Debbie Akers George Lindbeck, M.D.	Neha Puppala Lynn Barbour John R. Dugan III Gary Critzer Randall Geldreich, M.D. David Cullen Holly Frost E. Reed Smith, M.D.

Topic/Subject	Discussion	Recommendations, Action/Follow-up; Responsible Person
1. Welcome	The meeting was called to order by Dr. McLeod at 10:35 AM	
2. Introductions	Introductions were not necessary.	Meeting Sign-in Roster Attachment "G."
3. Approval of Minutes	Approval of minutes from the January 5, 2012 meeting with one revision; Dr. Weir was present at meeting.	Motion by Dr. Martin, seconded by Dr. Weir to approve with revision. Passed.
4. Drug Enforcement Administration (DEA) & Board of Pharmacy (BOP) Compliance Issues	Mike indicated there have been no drug enforcement actions. There have been reported instances of pharmacies refusing to accept drug boxes if there is any problem with the drug box. Dr. Lindbeck, Scott Winston, Mike Berg and possibly T. Mitchell will be meeting on April 12, 2012 with the Board of Pharmacy to start discussions about working with EMS. Dr. Lindbeck stated EMS does not fit into the paradigm established by the Drug Act of 1973. Dr. Martin inquired about accepting of electronic signatures. Dr. Lindbeck stated he did not see this as a possibility and to date they are not aware of any software that has met the DEA requirements for electronic signature.	

Topic/Subject		Discussion	Recommendations, Action/Follow-up; Responsible Person
5. New Business			
A	VHAC Presentation – John Dugan	John Dugan reported on the status of VHAC. Mission Lifeline is launching the out of hospital cardiac arrest care next week and more information will be forthcoming. May 23 rd in Charlottesville will be the statewide meeting of VHAC. National speakers and invited all to attend. Requested help from the State OMD Committee to engage the other OMD’s in their area to allow the acquisition of 12 leads by EMTs. He has reviewed the protocols of all regions and it is an allowed skill however there are physicians who are not allowing their EMT’s to perform this task.	
B	Trauma Performance Improvement Presentation – Carol Pugh, OEMS	Carol Pugh, Biostatistician for OEMS presented information on Trauma Performance Improvement study that has been conducted on patients who met Step 1 Trauma Triage criteria and destination of those patients.	PowerPoint Presentation Attachment “A” - Pending
C	Physicians Guide to Helicopter EMS Use in Virginia	Allen Yee, M.D. presented the PowerPoint presentation developed under the direction of Dr. Karen Remley as a guide for the use of HEMS in Virginia. Committee agreed that presentation should be tied to the creation of a white paper.	PowerPoint Presentation Attachment “B”
6. Old Business			
A	Regional Council Access to the Image Trend Data Base – George Lindbeck, MD	Dr. Lindbeck stated that this issue has been tied up in the legislative process. The interpretation is that individuals and agencies have permission to obtain this information but this permission did not include the regional councils.	Dr. Lindbeck to provide OEMS with additional information after the meeting. See Addendum 6a
B	Refusal White Paper – Asher Brand, MD	Dr. Brand presented a revised version of the Refusal white paper as modified by comments received from Dr. Calland. Dr. Weir’s modifications were distributed and discussion held. After minor revisions by the committee, motion was entertained to move forward to accept with revision.	Motion by Stewart Martin, M.D. second by Mark Franke to accept white paper. Motion carried. Attachment “C”
C	Roles & Responsibilities of OMDs White Paper –Allen Yee, MD	Dr. Yee presented the revised white paper on the Roles and Responsibilities of Operational Medical Directors. Discussion conducted concerning the paper.	Motion by Stewart Martin, M.D., second by Mark Franke, M.D to accept white paper. Motion carried. “Attachment “D”
D	Minimal State Guidelines Discussion – Marilyn McLeod, M.D.	Dr. McLeod opened a discussion concerning the State Guidelines Project. Requested a clarification on the intent of the project. Dr. Lindbeck stated these would be guidelines for reference only. Gary Brown stated it was not the intent of OEMS to make this regulatory. It was a committee established by the State EMS Advisory Board and should be housed with the State EMS Advisory Board and the MDC. Discussion concerning putting these guidelines into a white paper format that is supported by	Dr. Lindbeck and Dr. McLeod to establish a meeting date.

Topic/Subject		Discussion	Recommendations, Action/Follow-up; Responsible Person
		scientific evidence and housed at the State EMS Advisory Board and MDC committee level. Gary Critzer, GAB Board President requested that Dr. Lindbeck, Dr. McLeod and the OEMS staff liaison meet to establish a proposal and plan for the committee.	
7. Research Notes		No Items presented.	
8. State OMD Issues – George Lindbeck, MD			
A	ACS Ambulance Equipment List	Dr. Lindbeck stated there is a new ACS Ambulance list being developed. Due to computer issues, he will provide the list to OEMS after the meeting. He requested that all members review the new list and comments and provide feedback.	See Addendum 8a
B	AHA Dispatch Recommendations	Dr. Lindbeck to provide a copy of the dispatch guidelines updated provided by AHA.	See Addendum 8b
C	Formulary PowerPoint and Resources	Dr. Lindbeck to provide a copy of a PowerPoint he has put together as a resource for OMD's. He stated that it would be available on the OEMS website as a resource in the near future.	See Addendum 8c
D	OMD Courses for 2012-2013	Dr. Lindbeck stated final meeting for this fiscal year will be conducted on May 3, 2012 in the Bristol area. He is currently talking to the councils about the location for next year's courses. There are two (2) full day courses and then several half day courses offered throughout the state.	
E	RAMPART study	Dr. Lindbeck to provide a copy of the RAMPART study published in NEJM.	See Addendum 8e
F	Tourniquets revisited	Dr. Lindbeck stated he had received an email from Dr. Kragh who had reviewed the White Paper concerning tourniquet use. He will provide a copy of the email to OEMS to be distributed to the committee.	See Addendum 8f
G	Time Critical Illness/Injury Framework	Dr. Lindbeck stated that this issue needs to be addressed as a committee. Requested that committee decide what the next requirements will be; how to come up with the framework on this issue and how to develop a draft on this matter.	
Office of EMS Reports			
	a) EMS Training Funds & Accreditation Update – Chad Blosser	a) Accreditation and EMSTF reports were distributed (Attachment "E"). Chad gave a report on the Paramedic programs in Virginia that are not CoAEMSP accredited and explained the Letter of Review process that has been designed by CoAEMSP. He stated that two (2) are in some state of working toward accreditation and three (3) he has no status on.	See Attachment "E"

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	<p>b) Accreditation at the AEMT level will remain on hold until the regulations have promulgated. There remains an optional EMT accreditation.</p> <p>c) FY13 EMSTF contracts are currently being reviewed by the AG's office. Anticipate release around the May 15 – June 1 time frame.</p>	
<p>b) ALS Programs Issues – Debbie Akers</p>	<p>Continuing to receive applications for initial certification as ALS Coordinators. Continues to encourage candidates to take the Instructor Pretest to move toward the Education Coordinator.</p>	
<p>c) BLS Program Issues – Warren Short</p>	<p>a) Warren stated the next Instructor Institute will be held in Blacksburg in June during VAVRS rescue college. Continue to do an online Instructor update every other month.</p> <p>b) VEMSES update. Reminded OMD's of need to have passed the exam to be eligible to teach the new standards. Pass rate is currently at 60%. Issues on passing the examination appear to be with the multiple guess questions. It is disturbing that ALS providers are having difficulty passing a BLS examination. Questions used were from the old EMT-A examinations with a good discrimination index.</p>	
<p>d) TCC Report – Warren Short</p>	<p>Warren distributed to the committee the Excerpt from the TCC Committee in response to the request of the Advisory Board Chairman (Attachment "F"). Advised MDC that this would be presented at the next GAB meeting.</p>	<p>See Attachment "F"</p>
<p>e) Division of Educational Development Report – Warren Short</p>	<p>a) Warren reported to the committee that the move to National Registry testing is still targeted for a July 1, 2012 deadline date. National Registry is moving forward with adding the additional sites that would offer a test center within a 30 mile radius of the majority of the providers in the state.</p> <p>b) Online CE – Warren reported to the committee the issues that had been encountered with the use of TrainVA and informed them that the site was taken offline at the end of February. The office continues to seek alternative methods for the delivery of these free CE courses. Currently addressing the need to be ADA compliant by offering closed captioning.</p> <p>c) Ethics in EMS – Warren stated that this matter needs to be brought back to the forefront. Discussed the issues that had occurred in Boston, then in Maryland and informed the OMD's that it has now been identified in Virginia with three separate cases in the past few months. Requested that the OMD's be aware of the need to monitor what their instructors are doing in their programs.</p>	
<p>Regulation and Compliance Issues – Michael Berg</p>		
<p>a) Status of Regulations</p>	<p>Mike reported that there has been no action by the Governor on the regulations; however, at the last Advisory Board meeting the committee Dr. Karen Remley sent a request to the Health Secretariat who replied that once the budget was adopted they would make this item a priority. The Office of EMS received an email this week that included information from Jo Hilbert placing the OEMS regulations</p>	

Topic/Subject	Discussion	Recommendations, Action/Follow-up; Responsible Person
	first on the list of items to be addressed by the Governor.	
b) OMD & Compliance Matters	Mike reported that there have been some issues and challenges with some of the OMD's on how EMS works. He has contact Dr. Lindbeck who will be meeting individually with these physicians to assist them in gaining an understanding.	
PUBLIC COMMENT	Gary Critzer offered a congratulatory comment to Dr. Stewart Martin and the agencies of Virginia Beach on their prompt and effective handling of the jet crash on April 6, 2012.	
For The Good Of The Order		
Meeting Dates for 2012	July 12, 2012 October 11, 2012	
Adjournment	1:25 PM	

DRAFT

Addendum to Minutes from Dr. Lindbeck

Addendum 6

Old Business

- a) For the Council access to VPHIB: Paul Sharpe and his group have added an option for non-agency access to VPHIB, apparently just rolled out in the last week or two. There is an option to apply for an account as a member of a Regional Council that would provide access to data for agencies. The account application would be open only to employees of the Regional Council, and would be approved through Paul or Christy Shires. Information can be obtained from Paul or Christy - the OEMS web site has their contact information.

Addendum 8 – State OMD Issues

- a) American College of Surgeons (ACS) ambulance equipment list:
Web site: <http://www.facs.org/trauma/publications/ambulance.pdf>. The pdf is attached.
- b) Attached is a copy of the dispatch guidelines update provided by the AHA.
- c) Attached is a copy of the power point that I put together as a resource for OMD's. It will also be available on the OEMS web site in the near future.
- e) Attached is a copy of the RAMPART study published in NEJM.
- f) Attached is a Word document with the text of the email from Dr Kragh regarding tourniquet use.

ADDENDUM 8A

American College of Surgeons (ACS) ambulance equipment list:

Web site:

<http://www.facs.org/trauma/publications/ambulance.pdf>.



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AMERICAN COLLEGE OF SURGEONS
COMMITTEE ON TRAUMA

AMERICAN COLLEGE OF
EMERGENCY PHYSICIANS

NATIONAL ASSOCIATION
OF EMS PHYSICIANS

PEDIATRIC EQUIPMENT GUIDELINES
COMMITTEE—EMERGENCY
MEDICAL SERVICES FOR CHILDREN
(EMSC) PARTNERSHIP FOR CHILDREN
STAKEHOLDER GROUP

AMERICAN ACADEMY
OF PEDIATRICS

Almost four decades ago, the Committee on Trauma (COT) 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 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 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 prehospital delivery of care. The document was written to serve as a standard for the equipment needs of emergency 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. With permission from the ACS COT, 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 and Advanced Life Support 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 0–28 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 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



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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. Previous documents regarding ambulance equipment referred to essential or minimal equipment necessary to adequately equip an ambulance. 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 is divided into equipment for basic life support (BLS) and advanced life support (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 recommendations for equipment and supplies that will facilitate patient care in the out-of-hospital setting.

Required Equipment: Basic Life Support (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 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 flow regulator
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-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 advanced life support 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 ages 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)



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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 three 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 two safety pins each
3. Dressings
 - Sterile multitrauma dressings (various large and small sizes)
 - ABDs, 10"x12" or larger
 - 4"x4" gauze sponges or suitable size
4. Gauze rolls
 - Various sizes
5. Occlusive dressing or equivalent
 - Sterile, 3"x8" or larger

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 EMS provider, dispatcher, and medical control

F. Obstetrical Kit (commercially packaged is available)

1. Kit (separate sterile kit)
 - Towels, 4"x4" 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 size 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-liter bottles or bags)
8. Flashlights (2) with extra batteries and bulbs
9. Blankets
10. Sheets (minimum 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)

H. Infection Control*

**Latex-free equipment should be available*

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 NFPA 1999 requirements found at <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



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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. Protective helmet
3. Fire extinguisher
4. Hazardous material reference guide
5. Traffic signaling devices (reflective material triangles or other reflective, nonigniting devices)
6. Reflective safety wear for each crewmember (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.)

Required Equipment: Advanced Life Support (ALS) Ambulances

For EMT-Paramedic services, include all of the required equipment listed for the basic level provider, plus the following additional equipment and supplies. For EMT-Intermediate services (and other nonparamedic advanced levels), include all of the equipment for the basic level provider and selected equipment and supplies from the following list, based on local need and consideration of prehospital characteristics and budget.

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, sizes 2.5–5.5 mm uncuffed and 6–8 mm cuffed (2 each), other sizes optional
4. Meconium aspirator adaptor
5. 10-mL non-Luerlock syringes
6. Stylettes for endotracheal tubes, adult and pediatric
7. Magill (Rovenstein) forceps, adult and pediatric
8. Lubricating jelly (water soluble)
9. End-tidal CO₂ detection capability
 - Colorimetric (adult and pediatric) or quantitative capnometry

B. Vascular Access

1. 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
2. Antiseptic solution (alcohol wipes and povidone-iodine wipes preferred)
3. IV pole or roof hook
4. Intravenous catheters 14G–24G
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 (one at least 1 ½" for IM 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



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D. Other Advanced Equipment

1. Nebulizer
2. Glucometer or blood glucose measuring device
 - With reagent strips
3. Large bore needle (should be at least 3.25" in length for needle chest decompression in large adults)

E. Medications (pre-loaded 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 minimizing the need for calculations, preferably a length-based system. In general, medications may include:

- Cardiovascular medication, such as 1:10,000 epinephrine, atropine, antidysrhythmics (for example, adenosine and amiodarone), calcium channel blockers, beta-blockers, nitroglycerin tablets, aspirin, vasopressor for infusion
- Cardiopulmonary/respiratory medications, such as albuterol (or other inhaled beta agonist) and ipratropium bromide, 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, calcium chloride
- Bacteriostatic water and sodium chloride for injection
- Additional medications as per local medical director

Optional Basic Equipment

This section is intended to assist EMS providers in choosing equipment that can be used to ensure delivery of quality prehospital care. Use should be based on local resources. The equipment in this section is not mandated or required.

A. Optional Equipment

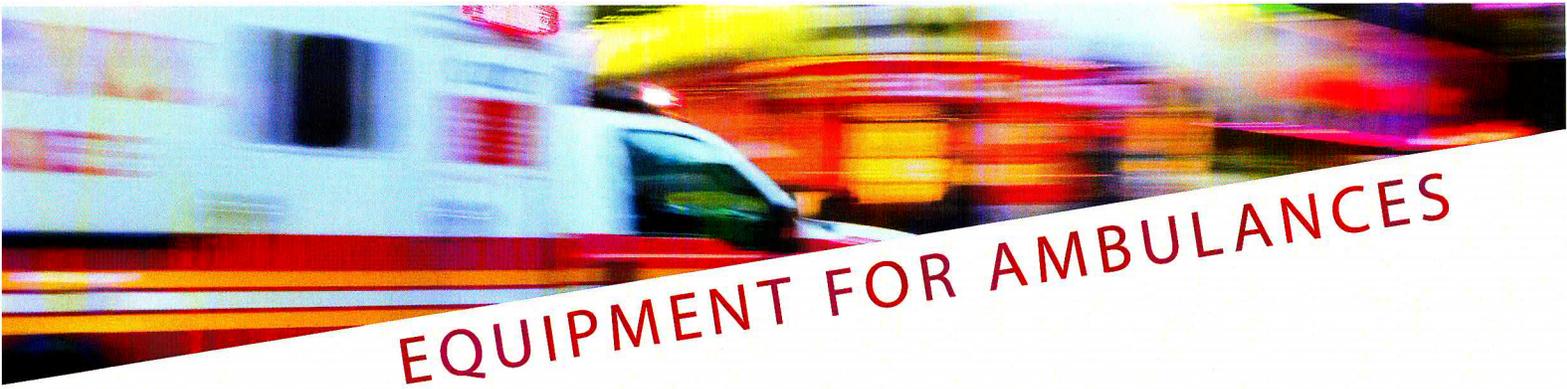
1. Glucometer (per state protocol)
2. Elastic bandages
 - Nonsterile (various sizes)
3. Cellular phone
4. Infant oxygen mask
5. Infant self-inflating resuscitation bag
6. Airways
 - Nasopharyngeal (12, 14 Fr)
 - Oropharyngeal (size 00)
7. Alternative airway devices (for example, a rescue airway device such as the ETDLA [esophageal-tracheal double lumen airway], laryngeal tube, or laryngeal mask airway) as approved by local medical direction.
8. 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).

9. Neonatal blood pressure cuff
10. Infant blood pressure cuff
11. Pediatric stethoscope
12. Infant cervical immobilization device
13. Pediatric backboard and extremity splints
14. Topical hemostatic agent
15. Appropriate CBRNE PPE (chemical, biological, radiological, nuclear, explosive personal protective equipment), including respiratory and body protection
16. Applicable chemical antidote autoinjectors (at a minimum for crew members' protection; additional for victim treatment based on local or regional protocol; appropriate for adults and children)

B. Optional Advanced Equipment

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. Pediatric laryngoscope handle
6. Size 1 curved (MacIntosh) laryngoscope blade



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7. 3.5–5.5 mm cuffed endotracheal tubes
8. 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)

Optional Medications

A. Optional Basic Life Support Medications

1. Albuterol
2. Epi pens
3. Oral glucose
4. Nitroglycerin (sublingual tablet or paste)

B. Optional Advanced Life Support Medications

1. Anxiolytics
2. Intubation adjuncts including neuromuscular blockers

Interfacility Transport

Additional equipment may be needed by ALS and BLS prehospital care providers who transport patients between facilities. Transfers may be done 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 the American Academy of Pediatrics Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients.

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 for water, aerial, or mountain rescue.



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Selected References

American Academy of Pediatrics Section on Transport Medicine. *Guidelines for Air and Ground Transport of Neonatal and Pediatric Patients*, 3rd edition. George A. Woodward, MD, MBA, FAAP (ed). 2007.

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FOOTNOTE: The evidence in children for selected prehospital care interventions or topics was reviewed in preparation for finalizing this ambulance equipment list. These topics included: (a) child safety and booster seats approved for EMS use; (b) alternative airway devices; (c) spinal immobilization devices including collars; and (d) prehospital use of cuffed endotracheal tubes. The results of this evidence evaluation including full citations will be provided in a companion article authored by the primary reviewers of the topics and the EMSC Stakeholders Group. The evidence in all ages for use of arterial tourniquets and hemostatic agents was also reviewed and will be provided in separate consensus review articles.

ADDENDUM 8B

Attached is a copy of the dispatch guidelines update provided by the AHA.

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**Emergency Medical Service Dispatch Cardiopulmonary Resuscitation Prearrival
Instructions to Improve Survival From Out-of-Hospital Cardiac Arrest : A
Scientific Statement From the American Heart Association**

E. Brooke Lerner, Thomas D. Rea, Bentley J. Bobrow, Joe E. Acker III, Robert A. Berg, Steven C. Brooks, David C. Cone, Marc Gay, Lana M. Gent, Greg Mears, Vinay M. Nadkarni, Robert E. O'Connor, Jerald Potts, Michael R. Sayre, Robert A. Swor and Andrew H. Travers

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Emergency Medical Service Dispatch Cardiopulmonary Resuscitation Prearrival Instructions to Improve Survival From Out-of-Hospital Cardiac Arrest

A Scientific Statement From the American Heart Association

Endorsed by the Association of Public-Safety Communications Officials International, International Academies of Emergency Dispatch, National Academies of Emergency Dispatch, National Association of Emergency Medical Technicians, National Association of EMS Physicians, and National Association of State EMS Officials

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Each year, millions of people around the world experience out-of-hospital cardiac arrest (OHCA), a condition characterized by unexpected cardiovascular collapse.^{1,2} OHCA is a leading cause of death. The incidence of treated OHCA is ≈50 to 60 per 100 000 person-years and is comparable throughout many parts of the world. Resuscitation of these patients is challenging and requires a coordinated set of rescuer actions termed the “Chain of Survival.” The links in the Chain of Survival are immediate recognition of cardiac arrest and activation of the emergency response system, early cardiopulmonary resuscitation (CPR), rapid defibrillation, effective advanced life support, and integrated post-cardiac arrest care.³ These actions involve the participation of a spectrum of rescuers, including family members, bystanders, emergency medical service (EMS) dispatchers, pre-hospital care providers, and hospital-based personnel; each group of rescuers has specific motivations, responsibilities, and skills.

Unfortunately, in most communities in the United States and Canada, only 5% to 10% of all OHCA patients in whom resuscitation is attempted survive to discharge from the hospital. In contrast, survival rates can approach 20% (50% for witnessed ventricular fibrillation) in communities where the Chain of Survival is strong.⁴

Efforts to improve survival from OHCA should be aimed at strengthening each link in the Chain of Survival. An important underpinning of successful resuscitation is the interdependence of each of these links. Specifically, the early links, those involving bystanders (immediate emergency activation and early bystander CPR), are essential for the effectiveness of subsequent links. Thus, efforts that can improve early recognition of OHCA and increase bystander CPR are likely to improve survival from OHCA.

When a bystander calls the community emergency response number (eg, 911 in the United States) to request

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medical aid, the call creates an opportunity to improve both identification of OHCA and provision of bystander CPR. This telephone interaction is the initial interface between citizens at the scene and professional emergency responders and can serve as the catalyst for recognition of cardiac arrest and initiation of bystander CPR through formal interrogation of the caller and “just-in-time” education. Just-in-time education in the form of telephone CPR instructions, referred to as CPR prearrival instructions, can provide callers with step-by-step instructions on how to perform CPR. Unfortunately, prearrival instructions are not available to all callers who access the emergency response number. It is difficult to estimate the exact number of lives that could be saved by offering CPR prearrival instructions, but it has been shown that CPR prearrival instructions can potentially double the proportion of arrest patients who receive bystander CPR and in turn help communities achieve bystander CPR in the majority of arrest patients who collapse before EMS arrival.⁵ The survival effectiveness of CPR guided by prearrival instructions appears to approach that of CPR provided by previously trained bystanders.⁶ Therefore, based on the estimate that annually nearly 200 000 of the 300 000 OHCA that occur in the United States do not receive bystander CPR, more comprehensive implementation of CPR prearrival instructions has the potential to save thousands of additional lives each year.⁷

This scientific statement reviews the process of providing CPR prearrival instructions, identifies these instructions as integral to the Chain of Survival, and describes the framework for programmatic best practices for providing CPR prearrival instructions. The statement also emphasizes the importance of monitoring dispatcher performance and providing regular feedback. Specifically, this scientific statement makes 4 main recommendations:

1. Callers to community emergency response numbers (eg, 911) should be formally and systematically questioned to determine whether the patient may have had a cardiac arrest. When a potential cardiac arrest patient is identified, CPR prearrival instructions should be immediately provided to assist bystanders if CPR is not already ongoing.
2. CPR prearrival instructions should be provided in a confident and assertive manner and should include straightforward chest compression-only instructions to achieve early bystander Hands-Only CPR for the adult who suddenly collapses.
3. Individual dispatcher and organizational-level performance can be measured by using a modest set of metrics that can be ascertained through review of the audio dispatch recording.
4. These metrics should be incorporated into an integrated quality assurance program that includes cooperation and collaboration of EMS and hospital stakeholders. The program should provide feedback at the individual and organizational level.

Current American Heart Association Guideline for EMS Dispatch for an Adult Who Collapses Suddenly

The 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular

Care recommend that bystanders immediately call their local emergency response number anytime they find an unresponsive patient and that all dispatchers be appropriately trained to provide CPR prearrival instructions. To deliver effective CPR prearrival instructions, dispatchers should be specifically educated in helping the bystander recognize absent or abnormal breathing to identify the cardiac arrest condition and initiate CPR (Class I, Level of Evidence B). Furthermore, dispatchers should recommend CPR for unresponsive patients who are not breathing normally, because many are in cardiac arrest, and the frequency of serious injury from chest compressions in the nonarrest group is very low (Class I, Level of Evidence B). For adults with sudden cardiac arrest, dispatcher prearrival CPR instructions should consist of Hands-Only CPR (Class I, Level of Evidence B). However, CPR instructions should include rescue breathing when treating adult and pediatric patients with a high likelihood of an asphyxial cause of arrest (eg, drowning). Finally, the EMS system quality-improvement process should include a review of the performance of dispatcher CPR instructions (Class IIa, Level of Evidence B).⁸

Bystander CPR

Bystander CPR is a vital intervention for patients with OHCA. Although bystander CPR can more than double the patient’s chance of survival, in many communities fewer than one-third of OHCA patients receive this lifesaving action before the arrival of EMS.^{2,9} The low incidence of performance of bystander CPR contributes to poor survival rates in most communities. Despite large-scale training efforts, bystander CPR rates have historically remained low. The reasons for this low rate of bystander CPR include, but are not restricted to, difficulty in identifying cardiac arrest, fear of causing harm, the challenge of performing this complex psychomotor task, bystander emotional distress and panic, and bystander reluctance to engage in mouth-to-mouth contact because of perceived unpleasantness or fear of disease transmission.^{10–14} Because the impact of each of these factors may vary across communities, the most efficient and effective set of strategies to increase the performance of bystander CPR may be a coordinated community approach, including public awareness, frequent and ongoing public CPR training, and a structured CPR prearrival instruction program.

The interaction between a bystander who calls an emergency response number to request aid and the dispatcher who takes the call creates an opportunity for the dispatcher to help the caller provide aid and successfully guide the caller past many of the impediments to achieving early bystander CPR. The process includes guiding the caller to identify the arrest, easing the caller’s fear and panic, and directing the caller to begin and continue the psychomotor skills of CPR. CPR prearrival instructions cannot provide the details presented in a formal CPR training course, but they should provide the best balance of implementation and efficacy, especially when the alternative is no CPR.

Telephone Prearrival Instructions for Bystander CPR

Effective CPR prearrival instruction programs can nearly double the rate of bystander CPR performed.^{5,10,14} Even in

communities where the EMS response is exceptionally quick, a structured CPR prearrival instruction program can provide a measurable benefit.¹⁵ Importantly, bystander CPR that results from provision of prearrival instructions can offer a survival benefit comparable to that of unassisted bystander-initiated CPR.⁶

Because of its ubiquitous position in the emergency medical response system, EMS dispatch has an enormous opportunity to provide lifesaving CPR instructions to the public. In contrast to most other forms of resuscitation training and knowledge translation, dispatchers are in direct communication with actual bystanders to cardiac arrest. Dispatchers have a unique opportunity to provide a real-time, high-yield intervention that can have a direct and immediate impact on the survival of the patient with OHCA. Furthermore, the general public expects dispatchers to direct their actions while they wait for help to arrive.¹⁶

Not all EMS dispatch centers offer CPR prearrival instructions. The exact number of dispatch centers within the United States that provide CPR prearrival instructions or transfer callers to receive instruction is unknown.

Facilitating Bystander Recognition of a Patient With Cardiac Arrest

The first and most fundamental step in prearrival CPR instruction is for the bystander and dispatcher to recognize a potential cardiac arrest. Many patients with cardiac arrest do not receive bystander CPR because the arrest is not recognized. A patient's movements are often misinterpreted as signs of life; these are most commonly some form of respiratory effort.^{10,13,14,17} Although patients with cardiac arrest are uniformly unresponsive, up to half initially present with agonal gasps early after collapse.¹⁸ These gasps represent a brain stem response to ischemia and can persist for several minutes.¹⁸ Not surprisingly, callers/bystanders will describe gasping, deep snoring, or slow breathing, which may prevent the identification of cardiac arrest (www.heart.org/dispatchercpr). There are currently no scientifically proven methods for helping callers and dispatchers accurately identify agonal gasping, but the abnormal respirations associated with cardiac arrest may be characterized as any form of abnormal breathing in the unresponsive patient.⁸

Another condition that can make it difficult to recognize a cardiac arrest is brief seizurelike activity (shaking) that occurs immediately after collapse from cardiac arrest.¹⁹ Dispatchers should be aware of this presentation and its potential to inhibit the recognition of arrest.

One key to early recognition is for dispatchers to use a systematic, streamlined set of questions at the beginning of the call.^{19a} A 2-question approach can efficiently achieve this goal (Figure 1), although no single identification strategy will identify all cardiac arrests.²⁰ If the patient is determined to be unresponsive and not breathing or not breathing normally, then the presumptive diagnosis is cardiac arrest and CPR prearrival instructions should be provided to the caller. The initial emergency call receiver should provide CPR prearrival instructions whenever possible or transfer the call to other dispatch personnel who are responsible for this action and will provide instructions. CPR prearrival instructions should

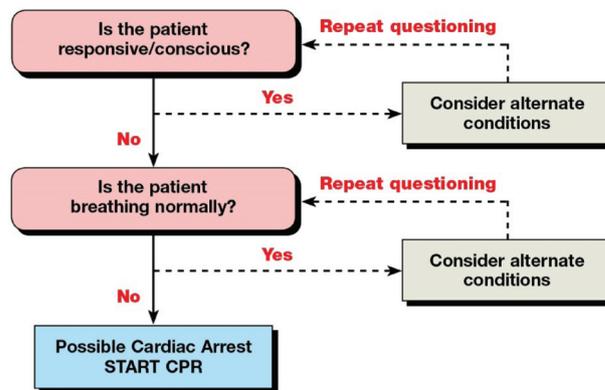


Figure 1. Sample algorithm for identification of a patient with possible cardiac arrest. CPR indicates cardiopulmonary resuscitation.

be provided by designated dispatch personnel with minimal delay.

In some instances, the caller may be uncertain when responding to whether the patient is responsive or breathing normally, or the caller may not know how to make these assessments. In such cases, the dispatcher will need to be prepared to direct the caller with instructions on how to determine responsiveness and assess for normal breathing. For example, the dispatcher may need to follow the question about responsiveness by telling the caller to tap the patient on the shoulder and shout to see if the patient responds. The dispatcher may also ask if the patient appears to be “awake.” To assess for normal breathing, the dispatcher may need to ask the caller to state each time the patient takes a breath to distinguish normal from abnormal (agonal) breathing. The dispatcher may ask if the patient's chest appears to be rising and falling normally, or the dispatcher may ask the caller to put the phone next to the patient so that the dispatcher can listen to the patient's breathing. In some cases of cardiac arrest, the caller may initially state that the patient is responsive and that breathing is normal; however, subsequent information may not be consistent. For example, the caller may state that the patient is conscious but later say that the patient is not breathing. Therefore, the dispatcher should continue to consider the possibility of cardiac arrest, especially when information is inconsistent or an alternative condition is not identified.

Asking questions about the patient's acute condition or long-term health history before asking questions meant to identify cardiac arrest may delay bystander actions by precious minutes and significantly reduce the likelihood of successful resuscitation. Therefore, dispatch protocols should be designed to identify cardiac arrest as early in the interrogation process as possible.

Engaging the Bystander to Provide CPR

CPR prearrival instructions can play a key role in engaging hesitant bystanders to provide CPR. Both the caller and dispatcher alike may be reluctant to initiate CPR because of the fear of causing injury, especially if their training is limited or if they are uncertain about whether the patient is in cardiac arrest.²¹

1. Bring the phone and get **NEXT** to the person if you can.
2. Listen carefully. I'll tell you what to do.
 - Place the person **FLAT** on his **back** on the **floor**.
 - **KNEEL** by the person's side.
 - Put the **HEEL** of your **HAND** on the **CENTER** of the person's **CHEST**.
 - Put your **OTHER HAND ON TOP** of **THAT** hand.
 - **PUSH DOWN FIRMLY, ONLY** on the **HEELS** of your hands, at least **2 inches**.
 - Do this **50** times, just like you're **PUMPING** the chest. Count **OUT LOUD: 1-2-3.....50** (correct rate if needed)
 - **KEEP DOING IT: KEEP PUMPING** the **CHEST UNTIL HELP TAKES OVER**. I'll stay on the line.

Ventilation instructions (for use after 30 compressions when suspected cardiac arrest is secondary to respiratory arrest):

PINCH the **NOSE**; with your other hand, **LIFT** the **CHIN** so that the head **TILTS BACK**. Completely **COVER** the person's **MOUTH** with your **MOUTH**. **GIVE 2 BREATHS** (come back to the phone).

Then go back to the compression instructions. Give cycles of **30 compressions and 2 breaths** until EMS arrives.

Other conditions, such as seizures, hypoglycemia, or intoxication, can be present with unresponsiveness and abnormal breathing. In nearly half of all cases in which dispatchers provide CPR prearrival instructions, the patient will not be in cardiac arrest.²² Serious injury from bystander CPR for people not in cardiac arrest is uncommon ($\approx 1\%–2\%$),^{22,23} but failure to provide bystander CPR to people who are in cardiac arrest can be lethal. Bystanders and dispatchers should be assured that the balance of benefit versus risk greatly favors an assertive approach to beginning CPR whenever a patient is determined to be unresponsive and not breathing or not breathing normally.²²

A major predictor of bystander action is the belief of bystanders that they can successfully perform lifesaving skills.²⁴ Confidence in performing CPR can be influenced by previous training and experience. The circumstances of cardiac arrest are typically unexpected, and bystanders may not have had training in responding to such circumstances, so they feel unprepared to act.²⁵ In addition, the bystander is frequently a family member of the patient, a circumstance that can add to the bystander's emotional distress. The key to overcoming bystander distress and uncertainty is for the caller to be engaged through CPR prearrival instructions that direct action and convey teamwork and assurance. For example, rather than asking the caller, "Would you like to try CPR?" the dispatcher should calmly and confidently state, "We need to start CPR. I will help you." Furthermore, if the caller is concerned about harming the patient, he or she should be told that CPR can only help and will not cause harm. The use of a communication strategy that conveys leadership and confidence may help the bystander focus on the task of CPR.²⁴

Core Content of CPR Prearrival Instructions

A related challenge to bystander CPR may be the difficulty of coordinating multiple psychomotor skills, especially when dispatcher assistance is required. A primary benefit of CPR for adults is the generation of blood flow to the brain and heart during cardiac arrest. Therefore, CPR prearrival instructions for adults who suddenly collapse should be for Hands-

Only CPR. That is, the caller should be instructed to provide rapid, forceful chest compressions with minimal interruptions (examples can be found at www.handsonlycpr.org or www.learn CPR.org). Three previously published randomized clinical trials compared CPR prearrival instructions consisting of dispatcher-assisted compression-only CPR with dispatcher-assisted conventional CPR among adult patients with cardiac arrest, and the results support this recommendation.^{26–28} These trials indicate that Hands-Only CPR provides at least comparable survival benefit overall and may be superior for adults who have a witnessed arrest of cardiac pathogenesis. CPR prearrival instructions for performing Hands-Only CPR enable the rescuer to start chest compressions on average a minute sooner than with conventional CPR and substantially simplifies CPR prearrival instructions and bystander action.¹⁷

Although the main objective of the dispatcher is to rapidly identify the patient with cardiac arrest and start chest compressions as soon as possible, some patients will likely benefit from the addition of rescue breaths to high-quality chest compressions performed with minimal interruptions. These groups predominantly include children (1 year of age until puberty) and adults with a high likelihood of an asphyxial cause of arrest (eg, drowning). On the basis of the interrogation, if the dispatcher suspects that there is a high likelihood that asphyxiation is the cause of the arrest, then conventional CPR (chest compressions plus rescue breaths) prearrival instructions can be provided,^{26–29} but significantly delaying the initiation of chest compressions while trying to determine the precise cause of the arrest is suboptimal. Any CPR is substantially better than no CPR, and Hands-Only CPR will provide at least comparable benefit in the large majority of arrest patients.^{27,30,31} Furthermore, for the majority of adults who suddenly collapse, the cause is cardiac related.

CPR prearrival instructions should direct the bystander to position the patient whenever possible on a firm surface on his or her back. The bystander should then be instructed in proper hand placement on the patient's chest and the proper method for giving chest compressions. Figure 2 provides an example of the steps that can be described to the caller.

Figure 2. Example of cardiopulmonary resuscitation prearrival instructions for an adult who has suddenly collapsed. EMS indicates emergency medical service.

Prearrival instructions should convey to the bystander that they should push hard and fast on the patient's chest with the goal of compressing at a rate of at least 100 times per minute at a depth of at least 2 inches. The optimal word choice to achieve this CPR performance is not well established. For example, the instruction to count out loud for a total of 50 compressions shown in Figure 2 was derived from practical experience. The creators of this sample instruction set felt that having the bystander return to the phone after 50 compressions gives the bystander an explicit goal and an opportunity for the dispatcher to reassess patient responsiveness, reassure the bystander that he or she is helping the patient, and redirect the rescuer regarding technique (eg, to increase the rate of compressions). Case examples of CPR prearrival instructions can be found at www.heart.org/dispatchercpr.

Measurement: The Key to a Successful CPR Prearrival Instruction Program

The cornerstone of success in resuscitation from cardiac arrest is accurate and consistent measurement of each link in the Chain of Survival. Integration of EMS dispatch into this process is essential. The core of the evaluation process is ensuring that all callers who receive instructions on rendering first aid to cardiac arrest patients receive direct, clear, and consistent CPR instructions that help them recognize cardiac arrest and immediately begin and continue CPR until trained rescuers arrive on the scene.

An effective OHCA system of care should integrate CPR prearrival instruction into the overall EMS system, which includes the public, trained EMS personnel, hospitals, and public health programs. In many communities, the OHCA system of care may also include public safety personnel such as law enforcement or other nonmedical first responders who frequently arrive at the patient's side before trained medical rescuers. This system integration ensures that all public safety providers work together with a common goal of rapidly identifying cardiac arrest patients and immediately initiating CPR (and early defibrillation if available) before EMS arrival. Ongoing measurement and improvement of each component of the system is essential to achieve optimal survival.³²

Metrics

Core metrics designed to evaluate and improve dispatch and CPR prearrival instructions for cardiac arrest care include appropriate dispatch of EMS response, dispatch recognition of the arrest, and dispatcher-assisted CPR. Each of these categorical domains involves a time-sensitive component that becomes relevant on successful completion of the categorical measure (Table). The quicker the bystander starts CPR after collapse, the greater the patient's chance of survival, so time components are an important part of the metric.³³

Current evidence indicates that there are important opportunities for dispatch to increase early identification of arrest and provision of bystander CPR.¹¹ Best-practice benchmarks for the core metrics are not well established and are derived from a few dispatch centers with a concerted focus on improving dispatcher care for cardiac arrest. In such systems, up to 25% of all patients with cardiac arrest receive bystander CPR.⁵ It is also important to measure and try to minimize the

Table. Metrics for Evaluation of Dispatch and CPR Prearrival Instructions

Categorical Measure	Time Component
Dispatch of appropriate EMS resources	Interval from receipt of call to EMS dispatch
Adherence to the identification algorithm	Interval from receipt of call to completion of algorithm
Recognition of arrest/provision of CPR prearrival instructions	Interval from receipt of call to provision of CPR instructions
Performance of bystander CPR	Interval from receipt of call to performance of CPR
Primary obstacle to CPR	...

CPR indicates cardiopulmonary resuscitation; EMS, emergency medical services.

time from call receipt to arrest recognition and the initiation of CPR prearrival instruction. Experienced dispatch centers have demonstrated that this interval can be reduced to ≈ 60 seconds.^{5,17} Tracking patients with cardiac arrest to determine which cases dispatchers accurately identified and which were "missed" is a key part of the evaluation process. Because resources and systems vary widely, each dispatch organization should establish local benchmarks and continuously strive for improvement. Although perhaps sensitive, public reporting of these dispatch measures may help efforts to improve care and maximize the lifesaving potential of CPR prearrival instructions.

A vital aspect of review is to understand why bystander CPR is delayed or not initiated. Scene circumstances and bystander abilities are far ranging in cardiac arrest; in some instances, challenges to CPR may be nearly impossible to address, whereas in others there may be dispatch solutions. Careful review of local barriers to bystander CPR will provide insight into specific obstacles and aid in developing approaches to improve the process.^{10-12,17} Important examples of changes that have occurred in some dispatch centers as a consequence of regular case review include the appreciation that early identification must account for agonal gasping, that ventilation instruction and actual performance came at a cost of 1 to 2 minutes delay until chest compressions, and that bystanders are more likely to act when the dispatcher directs the caller, instead of asks the caller, to start CPR.

Dispatcher Feedback

Individual dispatchers need both recognition and feedback on their performance in responding to cardiac arrest. Feedback should include basic points about the call, such as (1) whether the dispatcher recognized the need for CPR early in the call, (2) if the instructions were clearly and promptly stated, and (3) if the bystander provided CPR. This feedback helps identify trends and the need for additional training and scripting. In addition, review of individual audio recordings of cases where CPR prearrival instructions were or should have been provided is a valuable tool to assess the quality of verbal instructions and opportunities for improvement. Individual feedback should be complemented by organizational-level benchmarking that informs the dispatch center about the metrics of the program. Ideally, this information should be sup-

plemented with the ultimate metric, patient outcome data, so that dispatch organizations can measure and receive feedback about the effectiveness of their efforts.

Practical Considerations

An effective quality assurance program for CPR prearrival instructions requires the investment of resources. Each dispatch organization should determine the best programmatic approach to improve dispatch care for OHCA in its setting. Dispatch centers and EMS systems should work together to establish agreed-on CPR prearrival instruction protocols, training, measurement, and ongoing quality-improvement plans. Initial and ongoing CPR instruction training should review the practical challenges and tools to address these challenges. Such training would incorporate best practices derived from the local quality-assurance effort. Ideally, with medical direction oversight, the dispatch quality-assurance program would review all OHCA calls. Because in some instances dispatch cannot confirm OHCA, whenever possible, dispatch should use field EMS information to comprehensively identify OHCA cases. Field EMS organizations should collaborate with dispatch centers to share data and to measure and improve care. The most important source of information for EMS dispatch case review is the dispatch audio recording. Additional information from the EMS report or hospital outcome can also be useful. Dispatch leadership should provide organizational- and individual-level feedback about performance on the evaluated metrics. It is also important to acknowledge exceptionally good performance.³⁴

Knowledge Gaps

The most effective means of identifying OHCA and providing prearrival instructions over the telephone is an area that can be improved with additional research. Several knowledge gaps exist on the topics of bystander CPR and CPR prearrival instructions. The word choice and terminology of dispatcher questions may affect the sensitivity and specificity of identification of arrest. Additional evidence can help direct efforts to motivate callers to initiate CPR and overcome specific barriers (eg, language barriers³⁵) regardless of prior CPR training. Different instruction or word selection by the dispatcher may affect the timing and quality of bystander CPR. Investigation may also identify the best strategies to align the content of CPR (ie, addition of rescue breaths) with the patient's physiological status. Research is required to determine if and how to optimally integrate public access defibrillation into emergency dispatch and the CPR instruction process.³⁶ Finally, programmatic efforts should evaluate the most effective quality-assurance approaches; to date, there is limited research on best practices and bench marks for quality assurance.

Summary

Dispatchers should systematically interrogate all callers to identify cardiac arrest. When a potential cardiac arrest is identified, CPR prearrival instructions should be provided. Dispatcher performance should be monitored and formal feedback provided. Implementing telephone prearrival CPR instructions can significantly strengthen the Chain of Survival and save lives from OHCA.



Disclosures

Author Disclosures

Writing Group Member	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Ownership Interest	Consultant/ Advisory Board	Other
E. Brooke Lerner	Medical College of Wisconsin	None	None	None	None	Serves on the following advisory boards. I do not consider any of these to be relevant to this project. No financial support is received for any of these activities. Associate Editor: Prehospital Emergency Care* Associate Editor: Academic Emergency Medicine* Associate Board: Disaster Medicine and Public Health Preparedness* Medical Advisory Board Member: Brain Trauma Foundation, National Disaster Life Support Foundation, National Disaster Life Support Education Consortium Executive Committee*	None
Joe Acker 3rd	Birmingham Regional Emergency Medical Services System	None	None	None	None	None	None
Robert A. Berg	Children's Hospital of Philadelphia	AHA liaison to the NHLBI Resuscitation Outcomes Consortium† PI for the CHOP site of the NICHD-funded Collaborative Pediatric Critical Care Research Network†	None	Received funds as a speaker at Jean Luis Vincent's Critical Care Medicine meeting in Brussels*	Stock in companies run by money managers (eg, TIAA-CREF)†	None	None
Bentley J. Bobrow	Maricopa Medical Center Arizona Department of Health Services, Bureau of EMS & Trauma System	None	None	None	None	None	None
Steven C. Brooks	University of Toronto, Sunnybrook Health Sciences Centre, St. Michael's Hospital	Heart and Stroke Foundation of Canada Jumpstart Resuscitation Fellowship - peer-reviewed, unrestricted salary support for research on public access defibrillation†	None	None	None	None	None

(Continued)

Author Disclosures, *Continued*

Writing Group Member	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Ownership Interest	Consultant/ Advisory Board	Other
David C. Cone	Yale University School of Medicine	The National Academies of Emergency Dispatch provided an unrestricted research grant in the amount of \$3500. The topic of the study (using dispatch protocols to conserve first-responder resources) is unrelated to the topic of this project.*	None	None	None	None	None
Marc Gay	Centre de Communication Santé Estrie	None	None	None	None	None	None
Lana M. Gent	American Heart Association	None	None	None	None	None	None
Greg Mears	UNC Chapel Hill	None	None	None	None	None	None
Vinay M. Nadkarni	University of Pennsylvania School of Medicine, Children's Hospital of Philadelphia	None	None	None	None	None	None
Robert E. O'Connor	University of Virginia Health System	None	None	None	None	None	None
Jerald Potts	American Heart Association	None	None	None	None	None	None
Thomas D. Rea	University of Washington	Unrestricted research funding from nonprofit foundation to support a randomized trial comparing 2 types of dispatcher instruction: CPR with chest compression alone vs CPR with chest compression plus ventilation—for resuscitation of out-of-hospital cardiac arrest.* Grant from nonprofit foundation to develop dispatcher CPR training materials.*	None	None	None	None	None
Michael R. Sayre	Ohio State University	None	None	None	None	None	None
Robert A. Swor	William Beaumont Hospital	None	None	None	None	None	None
Andrew H. Travers	Emergency Health Services	None	None	None	None	None	None

This table represents the relationships of writing group members that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire that all writing group members are required to complete and submit. A relationship is considered to be "Significant" if (a) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns \$10 000 or more of the fair market value of the entity. A relationship is considered to be "Modest" if it is less than "Significant" under the preceding definition.

*Modest.

†Significant.



Reviewer Disclosures

Reviewer	Employment	Research Grant	Other Research Support	Speakers' Bureau/Honoraria	Expert Witness	Ownership Interest	Consultant/Advisory Board	Other
Carolyn Cason	University of Texas at Arlington	None	None	None	None	None	None	None
Venugopal Menon	Cleveland Clinic	None	None	None	None	None	None	None
Raina Merchant	University of Pennsylvania	None	None	None	None	None	None	None

This table represents the relationships of reviewer that may be perceived as actual or reasonably perceived conflicts of interest as reported on the Disclosure Questionnaire which all reviewers are required to complete and submit. A relationship is considered to be "Significant" if (a) the person receives \$10 000 or more during any 12-month period, or 5% or more of the person's gross income; or (b) the person owns 5% or more of the voting stock or share of the entity, or owns \$10 000 or more of the fair market value of the entity. A relationship is considered to be "Modest" if it is less than "Significant" under the preceding definition.

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KEY WORDS: AHA Scientific Statements ■ resuscitation

ADDENDUM 8C

Attached is a copy of the power point that I put together as a resource for OMD's.

Drug Kits and OMDs

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Medical Director
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Drug Kits

Part and parcel of
the practice of EMS
Virtually
synonymous with
ALS care in the field
Still confusing and
controversial ...



Drug Kits

Virginia Board of Pharmacy



Come under the responsibility of the Virginia Board of Pharmacy (BOP)

The BOP regulates purchasing, distribution, storage, prescribing, dispensing and administration of medications in the Commonwealth

<http://www.dhp.virginia.gov/Pharmacy/default.htm>



Drug Kits

THE PHARMACY ACT AND THE DRUG CONTROL ACT WITH RELATED STATUTES



COMMONWEALTH OF VIRGINIA

Department of Health Professions
VIRGINIA BOARD OF PHARMACY

(804) 367-4456
(804) 527-4423
pharmb@dhp.virginia.gov
www.dhp.virginia.gov/webpage

July 1, 2011

The drug laws of Virginia are available though the BOP on-line:

http://www.dhp.virginia.gov/Pharmacy/pharmacy_laws_regs.htm



Drug Kits

Schedules

Prescription medications have been divided into schedules

The Controlled Substances Act (CSA) was enacted as part of the Comprehensive Drug Abuse and Prevention Control Act of 1970

Created 5 schedules of prescription drugs

Drugs are generally added to schedules by the DEA and the FDA



Drug Kits

Schedule I

High potential for abuse, no accepted medical use in the U.S.

Schedule II

High potential for abuse, accepted for medical use in the U.S., abuse may lead to severe psychic or physical dependence

Schedule III

Potential for abuse is less than above, accepted medical use, abuse may lead to moderate or low physical dependence or high psychic dependence

Schedule IV

Low potential for abuse relative to III, accepted medical use, limited physical or psychological dependence

Schedule V

Low potential for abuse relative to IV, accepted medical use, limited physical or psychological dependence relative to IV



Drug Kits

The Commonwealth further defines Schedule VI:

§ 54.1-3455. Schedule VI.

The following classes of drugs and devices shall be controlled by Schedule VI:

1. Any compound, mixture, or preparation containing any stimulant or depressant drug exempted from Schedules III, IV or V and designated by the Board as subject to this section.
2. Every drug, not included in Schedules I, II, III, IV or V, or device, which because of its toxicity or other potentiality for harmful effect, or the method of its use, or the collateral measures necessary to its use, is not generally recognized among experts qualified by scientific training and experience to evaluate its safety and efficacy as safe for use except by or under the supervision of a practitioner licensed to prescribe or administer such drug or device.
3. Any drug, not included in Schedules I, II, III, IV or V, required by federal law to bear on its label prior to dispensing, at a minimum, the symbol "Rx only," or which bears the legend "Caution: Federal Law Prohibits Dispensing Without Prescription" or "Caution: Federal Law Restricts This Drug To Use By Or On The Order Of A Veterinarian" or any device which bears the legend "Caution: Federal Law Restricts This Device To Sales By Or On The Order Of A _____." (The blank should be completed with the word "Physician," "Dentist," "Veterinarian," or with the professional designation of any other practitioner licensed to use or order such device.)



Drug Kits

The DEA therefore defines Schedules I-V
Any medication not specified is then considered
“unscheduled” by the DEA (Federal Government)

Virginia further specifies Schedule VI,
which includes all medications that the
DEA considers “unscheduled”

These medications and supplies are thus
considered “controlled” in Virginia



Drug Kits

Examples of commonly used drugs in EMS and their schedules:

Schedule II

Injectable narcotics such as morphine, fentanyl

Schedule III

Ketamine

Schedule IV

Injectable benzodiazepines



Drug Kits

The majority of the medications used in EMS practice are therefore “unscheduled” by the DEA

They are almost always Schedule VI under Virginia BOP regulations

Examples include IV fluids and supplies, albuterol, nitroglycerine, D50, anti-arrhythmic drugs, vasopressors, etc.

One exception is epinephrine, which may be personally possessed by providers certified as an EMT or above, by a specific Virginia law



Drug Kits

Participation by pharmacies in an EMS drug kit program is governed by Virginia BOP regulations

The pharmacy may prepare a drug kit for a licensed emergency medical services agency provided:

1. The PIC of the hospital pharmacy shall be responsible for all prescription drugs contained in this drug kit. A pharmacist shall check each drug kit after filling the kit, and initial the filling record certifying the accuracy and integrity of the contents of the kit.



Drug Kits

2. The drug kit is sealed in such a manner that it will deter theft or loss of drugs and aid in detection of such.



Drug Kits

3. Drugs may be administered by an emergency medical technician upon an oral order or written standing order of an authorized medical practitioner in accordance with § 54.1-3408 of the Code of Virginia. Oral orders shall be reduced to writing by the technician and shall be signed by a medical practitioner. Written standing orders shall be signed by the operational medical director for the emergency medical services agency. The emergency medical technician shall make a record of all drugs administered to a patient. This administration record shall be signed by the medical practitioner who assumes responsibility for the patient at the hospital. If the patient is not transported to the hospital or if the attending medical practitioner at the hospital refuses to sign the record, a copy of this record shall be signed and placed in delivery to the hospital pharmacy who was responsible for that kit exchange by the agency's operational medical director within seven days of the administration.



Drug Kits

4. When the drug kit has been opened, the kit shall be returned to the pharmacy and exchanged for an unopened kit. The record of the drugs administered shall accompany the opened kit when exchanged. An accurate record shall be maintained by the pharmacy on the exchange of the drug kit for a period of one year.



Drug Kits

5. The record of the drugs administered shall be maintained as a part of the pharmacy records pursuant to state and federal regulations for a period of not less than two years.

6. Intravenous solutions provided by a hospital pharmacy to an emergency medical services agency may be stored separately outside the drug kit.

<http://lis.virginia.gov/cgi-bin/legp604.exe?000+reg+18VAC110-20-500>



Drug Kits

One-for-one exchanges

When the agency exchanges or obtains a replacement for a prescription drug in the ED without going through the pharmacy

The drug kit is resealed by the provider/agency

Allowed for schedule VI drugs only

Federal (DEA) law/regulation does not allow exchange of Schedule II-V drugs

Requires a CSRC because the agency is considered to be "in possession" of the drugs when they re-seal the drug kit without the pharmacy's involvement



Drug Kits

Virginia BOP regulations allow for the storage of IV solutions and associated supplies, such as IV tubing and catheters, outside of the sealed drug kit

These supplies must still be secured while on EMS units, and stored securely when not in use/on units



Drug Kits

Controlled Substances Registration Certificate (CSRC)

Application is available through the Virginia Board of Pharmacy

http://www.dhp.virginia.gov/Pharmacy/pharmacy_forms.htm#csr

CSRC's are location and agency specific

They require an inspection by the BOP prior to being issued

The BOP may re-inspect the agency at any time



Drug Kits

	COMMONWEALTH OF VIRGINIA
Board of Pharmacy	
9960 Mayland Drive, Suite 300 Henrico, Virginia 23233 www.dhp.virginia.gov/pharmacy	(804) 367-4456 (Tel) (804) 527-4472 (Fax) pharmbd@dhp.virginia.gov (email)

APPLICATION FOR A CONTROLLED SUBSTANCES REGISTRATION CERTIFICATE

Check Appropriate Box(es):

- | | | | |
|---|---------|--|----------|
| <input type="checkbox"/> New | \$90.00 | <input type="checkbox"/> Change of Responsible Party | No Fee |
| <input type="checkbox"/> Change of Ownership | \$50.00 | <input type="checkbox"/> Change of Location/Remodel | \$150.00 |
| <input type="checkbox"/> Change of Trade Name | No Fee | <input type="checkbox"/> Reinstatement | _____ |

Applicant—Please provide the information requested below. (Print or Type) Use full name not initials

Type of Activity—	<input type="checkbox"/> Manufacturer	<input type="checkbox"/> Government Official ²	<input type="checkbox"/> Researcher ²
Check one:	<input type="checkbox"/> Wholesale Distributor/Warehouser	<input type="checkbox"/> Analytic Laboratory ²	<input type="checkbox"/> Hospital ¹
	<input type="checkbox"/> Animal Shelter or Pound	<input type="checkbox"/> Teaching Institute ²	<input type="checkbox"/> Out-patient Clinic ¹
	<input type="checkbox"/> Alternate Delivery Site ¹	<input type="checkbox"/> Ambulatory Surgery Center ²	<input type="checkbox"/> EMS Agency ¹
			<input type="checkbox"/> Other ^{1, 2}
Name of entity	Controlled Substances Schedules Requested: <input type="checkbox"/> I <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> IV <input type="checkbox"/> V <input type="checkbox"/> VI		
Street Address	Area Code and Telephone Number		



Drug Kits

FOR BOARD USE ONLY: Acknowledgement of Inspection Request

Assigned Inspection Date⁵: _____

1. Entities applying under this activity code must submit a description of the processes/business practices for which this registration is being sought, and must have a supervising practitioner as follows:

A practitioner licensed in Virginia shall provide supervision for all aspects of practice related to the maintenance and use of controlled substances as follows:

- In a hospital without an in-house pharmacy, a pharmacist shall supervise.
- In an emergency medical services agency, the operational medical director shall supervise
- For any other person or entity approved by the board, a practitioner of pharmacy, medicine, osteopathy, podiatry, dentistry, or veterinary medicine whose scope of practice is consistent with the practice of the person or entity and who is approved by the board shall provide the required supervision.

2. Persons applying under this activity code must submit, with the application, a protocol which specifically names the controlled substances to be used and provides details as to the intended use of these controlled substances within the work. Additionally, persons applying under this activity code must provide documentation showing competence (curriculum vitae, educational credentials, professional licensure, training documentation) to use the controlled substances within the scope of this activity.

3. Schedule I must be approved by DEA prior to Board approval.

4. If supervising practitioner is a pharmacist, give DEA number of the provider pharmacy supplying drugs.

5. A 14-day notice is required for scheduling an opening or change of location inspection.

An inspector will call the responsible party prior to the requested date to confirm readiness for inspection. If the inspector does not call to confirm the date, the responsible party should call the Enforcement Division at (804) 367-4612 to verify the inspection date with the inspector.



Drug Kits

DEA numbers

A DEA number is required of all practitioners who will prescribe, purchase, store and/or sell controlled drugs

From the DEA perspective, “controlled” is anything on Schedules I-V

From the Virginia BOP perspective, “controlled” is anything on Schedules I-VI

<http://www.deadiversion.usdoj.gov/faq/general.htm#rx-2>

<http://www.deadiversion.usdoj.gov/drugreg/faq.htm>



Drug Kits

EMS Medical Directors should seriously consider having separate DEA numbers if they have agencies that are purchasing and storing medications that are on the DEA schedule

If they are only purchasing/storing medications and supplies that are unscheduled by the DEA (Virginia schedule VI) then separate DEA numbers are probably not as much of an issue



Drug Kits

If the provider has a single DEA number that is used for clinical practice as well as EMS activities, and there is an issue that results in action related to that number, such as suspension, it could then affect all aspects of the medical director's practice(s).



Drug Kits

Theft or loss of drugs

Virginia BOP requirements

http://www.dhp.virginia.gov/Pharmacy/pharmacy_forms.htm#DEA

*from Code of Virginia, Drug Control Act
§54.1-3404*

...

E. Whenever any registrant or licensee discovers a theft or any other unusual loss of any controlled substance, he shall immediately report such theft or loss to the Board. If the registrant or licensee is unable to determine the exact kind and quantity of the drug loss, he shall immediately make a complete inventory of all Schedule I through V drugs. Within thirty days after the discovery of a loss of drugs, the registrant or licensee shall furnish the Board with a listing of the kind, quantity and strength of such drugs lost.



Drug Kits

Theft or loss of drugs

Virginia BOP requirements

Please use the attached DEA 106 form for the complete reporting of theft or loss of drugs. Distribute copies and keep a copy as follows:

- 1 Copy: Virginia Board of Pharmacy**
9960 Mayland Drive, Suite 300
Henrico, VA 23233-1463
804/367-4456
- 2 Copies: Drug Enforcement Administration**
Techworld Plaza
ATTN: Drug Diversion
800 K Street, N.W., Suite 500
Washington, DC 20001
202/305-8888
- 1 Copy: To be maintained at location of drug stock for your records**



Drug Kits

Theft or loss of drugs

DEA requirements

http://www.deadiversion.usdoj.gov/21cfr_reports/theft/index.htm



Drug Kits

Theft or loss of drugs

DEA requirements

<https://www.deadiversion.usdoj.gov/webforms/dtlLogin.jsp>

Although the paper version is still available, DEA encourages registrants to use the updated electronic version. A registrant can still receive a paper copy of the updated form by writing to DEA Headquarters, Attn: Registration/ODR, P.O. Box 2639, Springfield, VA 22152.

- **DEA Form 106 On-line** -
Data will be entered through a **secure connection** to the online application system. **Your web browser must support 128-bit encryption.**
 - See Federal Register Notice - **Reports by Registrants of Theft or Significant Loss of Controlled Substances** for more information.
- **Letter detailing change in reporting requirements**



Drug Kits

Purchase of Schedule II medications requires additional record keeping

Form 222 must be completed by the distributor and the recipient of the medications, and a copy sent to the DEA

Records must be kept documenting the ordering and receipt of Schedule II drugs including package size, number of units, and strength/concentration

Information:

<http://www.deadiversion.usdoj.gov/faq/dea222.htm>

Forms:

<https://www.deadiversion.usdoj.gov/webforms/orderFormsRequest.jsp>



Drug Kits

Electronic signatures

U.S. Department of Justice Drug Enforcement Administration
Office of Diversion Control

Contact Us | Site Map | Search

Electronic Commerce Initiatives > Electronic Prescriptions for Controlled Substances

Home
Registration
Reporting
Info & Legal Resources
Inside Diversion Control

Information and Legal Resources at your fingertips

Got Drugs?

Electronic Prescriptions for Controlled Substances

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

Drug Kits

Electronic signatures

[http://www.deaiversion.us
doj.gov/ecommm/e_rx/index.
html](http://www.deaiversion.us/doj.gov/ecommm/e_rx/index.html)

[http://www.deaiversion.us
doj.gov/fed_regs/rules/2010
/fr0331.pdf](http://www.deaiversion.us/doj.gov/fed_regs/rules/2010/fr0331.pdf)

Federal Register

Wednesday,
March 31, 2010

Part II

Department of Justice

Drug Enforcement Administration

21 CFR Parts 1300, 1304, 1306, and 1311
Electronic Prescriptions for Controlled
Substances; Final Rule

Drug Kits

At this point in time:

Electronic signatures can be used when the software platform used meets Federally specified levels of security to guarantee the legitimacy of the signature

The Pharmacist in Charge (PIC) of a particular pharmacy has the ability to choose whether or not to accept electronic signatures



Check List for Drug Storage

Make sure that your responsibilities for drug purchasing and storage are reflected in your agency contract

Make sure that the agency insurer also specifically acknowledges that medications will be purchased and stored by the agency

Ensure that there is a secure, environmentally controlled area for storage

Access and entry should be controlled

Preferably, individual access should be identified – electronic access versus a single combination for everyone

Ensure that the agency has an identified position responsible for the purchasing/storage/security of prescription drugs



Check List for Drug Storage

Ensure that the wholesaler/supplier that the agency will use is licensed to sell prescription drugs in Virginia

The purchasing of drugs for the agency will require a DEA number

It is strongly encouraged that the OMD acquire a separate DEA number for each EMS agency that is purchasing/storing/distributing drugs on the DEA schedule, and not use their primary practice DEA number

Ensure that the agency has CSRC permits for the storage locations

These permits are location specific

Multiple storage sites would require separate permits

ADDENDUM 8E

Attached is a copy of the RAMPART study published in
NEJM.



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[Original Article]

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Disclosure forms provided by the authors are available with the full text of this article at [NEJM.org](#).

*The Neurological Emergencies Treatment Trials (NETT) investigators are listed in the Supplementary Appendix, available at [NEJM.org](#).

Abstract

Background: Early termination of prolonged seizures with intravenous administration of benzodiazepines improves outcomes. For faster and more reliable administration, paramedics increasingly use an intramuscular route.

Methods: This double-blind, randomized, noninferiority trial compared the efficacy of intramuscular midazolam with that of intravenous lorazepam for children and adults in status epilepticus treated by paramedics. Subjects whose convulsions had persisted for more than 5 minutes and who were still convulsing after paramedics arrived were given the study medication by either intramuscular autoinjector or intravenous infusion. The primary outcome was absence of seizures at the time of arrival in the emergency department without the need for rescue therapy. Secondary outcomes included endotracheal intubation, recurrent seizures, and timing of treatment relative to the cessation of convulsive seizures. This trial tested the hypothesis that intramuscular midazolam was noninferior to intravenous lorazepam by a margin of 10 percentage points.

Results: At the time of arrival in the emergency department, seizures were absent without rescue therapy in 329 of 448 subjects (73.4%) in the intramuscular-midazolam group and in 282 of 445 (63.4%) in the intravenous-lorazepam group (absolute difference, 10 percentage points; 95% confidence interval, 4.0 to 16.1; $P < 0.001$ for both noninferiority and superiority). The two treatment groups were similar with respect to need for endotracheal intubation (14.1% of subjects with intramuscular midazolam and 14.4% with intravenous lorazepam) and recurrence of seizures (11.4% and 10.6%, respectively). Among subjects whose seizures ceased before arrival in the emergency department, the median times to active treatment were 1.2 minutes in the intramuscular-midazolam group and 4.8 minutes in the intravenous-lorazepam group, with corresponding median times from active treatment to cessation of convulsions of 3.3 minutes and 1.6 minutes. Adverse-event rates were similar in the two groups.

Conclusions: For subjects in status epilepticus, intramuscular midazolam is at least as safe and effective as intravenous lorazepam for prehospital seizure cessation. (Funded by the National Institute of Neurological Disorders and Stroke and others; ClinicalTrials.gov number, ClinicalTrials.gov NCT00809146.)

Early termination of prolonged epileptic seizures in response to intravenous administration of benzodiazepines by paramedics in the prehospital setting is associated with better patient outcomes. The randomized, controlled Prehospital Treatment of Status Epilepticus (PHTSE) trial (ClinicalTrials.gov number, NCT00004297) compared diazepam, lorazepam, and placebo given intravenously by paramedics to treat subjects with prolonged convulsive seizures.¹ The trial showed that both these benzodiazepines were an effective prehospital treatment for seizures, as compared with placebo. The proportion of subjects whose seizures were terminated at the time of arrival in the emergency department was 59.1% in the group receiving intravenous lorazepam, 42.6% in the group receiving intravenous diazepam, and 21.1% in the group receiving intravenous placebo.

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Many emergency medical services (EMS) systems, however, have begun to use intramuscular midazolam rather than an intravenous agent, largely because intramuscular administration is faster and is consistently achievable.² This practice has become increasingly common despite the lack of clinical-trial data regarding the efficacy and safety of intramuscular midazolam. Although intravenous lorazepam is the preferred treatment for patients with seizures in the emergency department (and was the most effective treatment in the PHTSE trial), it is rarely used by paramedics in the prehospital setting because of the potential difficulty with intravenous administration, as well as the short shelf-life of lorazepam when it is not refrigerated.³ EMS medical directors need a practical alternative that is at least as safe and effective as intravenous lorazepam. We therefore performed a noninferiority study to determine whether intramuscular midazolam is as effective as intravenous lorazepam, with a similar degree of safety, for terminating status epilepticus seizures before arrival at the hospital.

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Methods

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Study Design

The Rapid Anticonvulsant Medication Prior to Arrival Trial (RAMPART) was a randomized, double-blind, phase 3, noninferiority clinical trial. It was designed and conducted by the Neurological Emergencies Treatment Trials (NETT) network, a multidisciplinary clinical trials infrastructure funded by the National Institute of Neurological Disorders and Stroke (NINDS). The investigators were responsible for all elements of the trial, including design, data collection, and analysis. The authors wrote the manuscript and vouch for the data and analysis. The trial was performed under an Investigational New Drug application with the Food and Drug Administration (FDA). Autoinjectors with active medication and placebo were purchased by the Department of Defense and provided to the NINDS through a cooperative agreement. The Department of Defense had no role in the design of the study, accrual or analysis of data, or preparation of the manuscript. The study was conducted in accordance with the protocol, which is available with the full text of this article at NEJM.org.

RAMPART involved 4314 paramedics, 33 EMS agencies, and 79 receiving hospitals across the United States. Paramedics received continuing medical education in the management of seizures and other neurologic emergencies, as well as supplemental training in human subjects research and protections and in the study protocol, with refresher protocol training provided throughout the trial.

The trial met the exception from informed-consent requirements for emergency research under the FDA code of regulations 21 CFR 50.24.4 Institutional review boards for all entities engaged in this research reviewed local community consultation activity, according to the regulations regarding the exception from informed consent, and provided approval. Subjects or their legally authorized representatives were notified about enrollment in the trial by the study team as soon as possible, usually while the subject was still in the emergency department, and provided written informed consent to allow continued data collection until follow-up was completed.

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Study Subjects

The intended study population included children with an estimated body weight of 13 kg or more and adults requiring treatment with benzodiazepines for status epilepticus in the prehospital setting. Subjects were enrolled if they were having convulsive seizures at the time of treatment by paramedics and were reported by reliable witnesses to have been continuously convulsing for longer than 5 minutes or if they were having convulsive seizures at the time of treatment after having intermittent seizures without regaining consciousness for longer than 5 minutes.

Subjects were excluded for the following reasons: the acute precipitant of the seizures was major trauma, hypoglycemia, cardiac arrest, or a heart rate of less than 40 beats per minute (since these conditions require alternative treatments); they had a known allergy to midazolam or lorazepam; they were known to be pregnant or a prisoner; they were being treated as part of another study; or, preemptively, they opted out of this study by wearing a medical-alert tag marked "RAMPART declined."

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Study Intervention

When they arrived at the scene, the study paramedics rapidly performed an initial assessment and stabilized subjects who were in status epilepticus, according to their local EMS protocols. For subjects who met the eligibility criteria, the paramedics began the study procedure by opening an instrumented box containing a study drug kit. Each kit contained two color-coded, shrink-wrapped study-drug bundles, one for each dose tier; each bundle consisted of one intramuscular autoinjector (Investigational Midazolam Autoinjector [Meridian Medical Technologies]) and one prefilled intravenous syringe (Carpuject System [Hospira]). All adults and those children with an estimated body weight of more than 40 kg received either 10 mg of intramuscular midazolam followed by intravenous placebo or intramuscular placebo followed by 4 mg of intravenous lorazepam. In children with an estimated weight of 13 to 40 kg, the active treatment was 5 mg of intramuscular midazolam or 2 mg of intravenous lorazepam. Blinding and simple randomization with equal numbers of subjects assigned to the two study groups were achieved with the use of a double-dummy strategy, in which each kit was randomly assigned at the central pharmacy to contain either the active intramuscular drug with intravenous placebo or intramuscular placebo with the active intravenous drug. All subjects were treated with the intramuscular autoinjector, after which venous access was immediately achieved and treatment was administered by means of

intravenous syringe. Subjects were considered to be enrolled in the trial when the intramuscular autoinjector was applied, regardless of whether the intramuscular dose was successfully delivered.

A voice recorder was activated by opening the study box. Paramedics were instructed to record oral statements when intramuscular treatment was administered, when intravenous access was obtained, when the intravenous study drug was administered, when any rescue treatments were given, and when convulsions were observed to stop. Each statement was time-stamped by the study box's internal clock. Paramedics also stated whether the subject was convulsing on arrival at the emergency department.

When it was difficult to obtain intravenous access, paramedics were instructed to continue attempts for at least 10 minutes, but they were permitted to use intraosseous access at any time in lieu of intravenous access. For the purposes of this trial, intraosseous access to the vascular space was considered equivalent to intravenous access. Rescue therapy, as dictated by local EMS protocol, was recommended for use in subjects who were still convulsing 10 minutes after the last study medication was administered. If there was a delay in obtaining intravenous access and the subject stopped having seizures before the intravenous study drug could be given, the intravenous study medication was not used. If convulsions resumed later during EMS transport, rescue therapy (according to the local protocol) was to be given.

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Study Outcomes

The primary outcome was termination of seizures before arrival in the emergency department without the need for the paramedics to provide rescue therapy. Subjects did not reach the primary outcome if they were having seizures on arrival in the emergency department or if they received rescue medication before arrival. Termination of seizures on arrival was determined according to the clinical judgment of the attending emergency physician and was based on examination of the subjects, their clinical course, and results of any routine diagnostic testing (Section 6.1 of the protocol). This outcome measure was previously used in the PHTSE trial.^{1,5}

Key secondary outcome measures included the time from study-box opening to termination of convulsions and the time from initiation of active-drug administration to termination of convulsions (among subjects in whom convulsions ceased before arrival in the emergency department), the frequency and duration of hospitalization and of admissions to the intensive care unit, and the frequencies of acute endotracheal intubation and acute seizure recurrence. Acute endotracheal intubation was defined as intubation performed or attempted by EMS personnel or performed within 30 minutes after arrival in the emergency department. Acute seizure recurrence was defined as any further convulsive or electrographic seizures that required additional antiepileptic medications during the first 12 hours of hospitalization in subjects who did not have seizures on arrival in the emergency department. Serious adverse events were recorded through the end of the study for every subject (see Table A2 in the Supplementary Appendix, available at [NEJM.org](#)).

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Statistical Analysis

The primary objective of the study was to show that the proportion of subjects whose seizures were terminated before arrival in the emergency department (without the use of rescue medications) in the intramuscular midazolam group was not inferior to that in the intravenous lorazepam group by more than a prespecified amount (the noninferiority margin). The null hypothesis of inferiority was tested with the use of a one-sided z statistic.⁶ The primary analysis was followed by a one-sided test (conditional on the finding of noninferiority) for superiority at a significance level of 0.025, although this was not prespecified in the protocol. On the basis of published studies of similar patient populations, and accounting for differences in the dose of lorazepam and in the definition of efficacy, we estimated that after an initial dose of intravenous lorazepam had been administered, seizures would be terminated in 70% of subjects before arrival in the emergency department. Sample size was estimated on the basis of the comparison of independent proportions, with two planned interim analyses for futility with respect to the primary outcome; 90% power to show the noninferiority of intramuscular midazolam; a noninferiority margin of 10 percentage points; and a one-sided test with the probability of a type I error of 0.025. The maximum sample size required for randomization was 890 subjects (445 per treatment group). Because some patients have recurring episodes of status epilepticus, the total sample size was inflated by 15% (1024 subjects) to account for inadvertent repeated enrollment of the same subjects. (Repeated enrollments of the same subject were not analyzed.) Secondary outcomes were compared in a superiority framework with the use of a two-sided test with the probability of a type I error of less than 0.05. All analyses were conducted with the intention-to-treat population defined as all subjects randomly assigned to a study medication. A sensitivity analysis was conducted with the per-protocol population, which excluded subjects with any of the following three predefined protocol deviations: eligibility violation, incorrect dose of study medication, or incorrect administration.

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Results

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Subjects and Enrollment

Between June 15, 2009, and January 14, 2011, a total of 893 subjects were enrolled (with a total of 1023 enrollments and a reenrollment rate of 13%) (Figure 1). The two treatment groups were well balanced with respect to demographic and clinical characteristics, dose tier, presence or absence of a history of epilepsy, accuracy of the



Table

diagnosis of status epilepticus (vs. a discharge diagnosis of a nonepileptic spell), and the diagnosis of the underlying cause of status epilepticus (Table 1). The overall number of subjects who were black reflected the proportion of blacks in the subject population from which the sample was drawn.

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Primary Outcome

Seizures were absent without rescue therapy on arrival in the emergency department in 329 of 448 subjects assigned to active treatment with intramuscular midazolam (73.4%) and in 282 of 445 assigned to active treatment with intravenous lorazepam (63.4%) (difference, 10 percentage points; 95% confidence interval [CI], 4.0 to 16.1; $P < 0.001$ for noninferiority and $P < 0.001$ for superiority) (Figure 2). The primary results were similar in the per-protocol analysis. Table 2 shows the number of subjects who were having seizures at the time of arrival in the emergency department and the number who needed rescue medication. Subjects randomly assigned to the intramuscular group were less likely to be having seizures on arrival in the emergency department (regardless of the use or nonuse of rescue therapy) than were those randomly assigned to the intravenous group (proportion of subjects without seizures, 83.9% vs. 76.2%; difference, 7.7 percentage points; 95% CI, 2.5 to 12.9). Inability to start an intravenous infusion was anticipated to be a common reason for failure of intravenous therapy. Among subjects in the intravenous group who did not reach the primary outcome, 31 never received the intravenous study medication because of failure to obtain vascular access, whereas only 5 in the entire intramuscular group did not receive the intramuscular study medication owing to malfunction or misapplication of the autoinjector.

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Secondary and Safety Outcomes

The secondary and safety outcomes were consistent with the primary outcome and reinforced the finding that intramuscular midazolam was noninferior to intravenous lorazepam. The frequencies of endotracheal intubation, recurrent seizures, and other predefined safety outcomes were similar in the two study groups (Table 2). Among subjects admitted to the hospital, the lengths of stay in the intensive care unit and in the hospital did not differ significantly between the groups, but the proportion of subjects admitted was significantly lower (and the proportion discharged from the emergency department was significantly higher) in the intramuscular group than in the intravenous group ($P = 0.01$).

Figure 3 shows the temporal data (the times from administration of active treatment to cessation of convulsions, from box opening to cessation of convulsions, and from box opening to administration of active treatment) for the 317 subjects in the intention-to-treat analysis who met the primary outcome and for whom times of active treatment and of cessation of convulsions were recorded. The median time to administration of active treatment was significantly shorter by the intramuscular route than by the intravenous route (1.2 vs. 4.8 minutes), but the onset of action (i.e., termination of convulsions) occurred sooner after intravenous administration than after intramuscular administration (1.6 vs. 3.3 minutes). The overall interval until termination of convulsions was similar in the two treatment groups.

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Discussion

This double-blind, randomized trial showed that prehospital treatment with intramuscular midazolam was at least as effective as intravenous lorazepam in subjects in status epilepticus ($P < 0.001$ for noninferiority and for superiority). Establishing intravenous access in patients who are having seizures in the prehospital environment can be challenging and time-consuming. Since intramuscular treatments can be given more quickly and reliably than intravenous treatments and have noninferior efficacy, our data support the use of the former route of administration by EMS personnel.

The use by EMS systems of intramuscular midazolam for status epilepticus has been increasing because small studies have indicated its efficacy and because this drug is rapidly absorbed intramuscularly. According to a meta-analysis of small trials, the use of nonintravenous midazolam in the hospital setting compared favorably with intravenous diazepam in the emergency treatment of status epilepticus.⁸ Furthermore, unlike lorazepam, midazolam does not have the problem of poor stability when not refrigerated. Midazolam can be administered by other nonintravenous routes as well, but the intramuscular route is more consistently effective than the intranasal or buccal routes because the drug cannot be blown or spat out by the convulsing patient.

In this noninferiority study, we used lorazepam as an active control. Inclusion of a placebo group would have been unethical, since PHTSE showed unambiguously that benzodiazepines are superior to no treatment in subjects in status epilepticus in the prehospital setting. The clinically important question is whether intramuscular midazolam works well enough for patients in status epilepticus to routinely forgo the intravenous route in order to improve the ease and speed of treatment administered by EMS personnel. The active control drug, the noninferiority margin, the trial setting, and the analysis plan were carefully chosen to avoid the known potential pitfalls and limitations of noninferiority studies.⁷

The doses of midazolam and lorazepam used in this trial are consistent with the most effective doses for the treatment of status epilepticus that are reported in the literature.^{9,10} Although these initial doses are higher than the ones used by many EMS systems and emergency physicians, they are the same as those approved for this indication and are in line with those used by epileptologists. Use of an autoinjector maximized the speed and ease of intramuscular delivery (with a nominal latency period of about 20 seconds for opening the autoinjector and administering the medication) and

Figure 1 1

Table 2

Figure 2



Figure 3

reduced delays in initiating intravenous access.

The relationships among benzodiazepine dose, respiratory depression, and subsequent need for endotracheal intubation are poorly characterized, but higher doses of benzodiazepines may actually reduce the number of airway interventions. Our data are consistent with the finding that endotracheal intubation is more commonly a sequela of continued seizures than it is an adverse effect of sedation from benzodiazepines.¹¹

With regard to the mechanism of drug action, our temporal data are consistent with what would be expected: the intramuscular route delivers the medication more rapidly after the paramedics' arrival at the scene than the intravenous route, but its onset of action is more rapid after intravenous administration than after intramuscular administration. The time saved by using the intramuscular route appears to more than offset the delay in the drug's onset of action. It is interesting to speculate that a difference of just a few minutes with the earlier administration in the intramuscular group may have been enough to drive the slight superiority of the intramuscular route with respect to outcome. However, it is also possible that the difference in outcome between the two treatment groups reflects differences in the efficacy of the agents used rather than in the route of administration. Because this is a pragmatic clinical trial designed to inform EMS clinical practice rather than to elucidate mechanism, the effect of agent and route cannot be meaningfully separated in analyzing these data. Similarly, an autoinjector was used in this study to optimize the speed and efficiency of intramuscular delivery, but it is not possible to determine the importance of using this tool for intramuscular injections, as compared with conventional intramuscular injections.

Our data are consistent with a finding of statistical superiority of intramuscular midazolam. Regardless of whether it is noninferior or superior, this trial supports the clinical decision to use the more pragmatic intramuscular approach in the prehospital treatment of status epilepticus.

In conclusion, intramuscular midazolam is noninferior to intravenous lorazepam in stopping seizures before arrival in the emergency department in patients with status epilepticus treated by paramedics. Intramuscular midazolam is also as safe as intravenous lorazepam. The group of subjects treated with intramuscular midazolam had a higher rate of discharge from the emergency department than the group treated with intravenous lorazepam and had similar or lower rates of recurrent seizures and endotracheal intubation. The intramuscular administration of midazolam by EMS is a practical, safe, and effective alternative to the intravenous route for treating prolonged convulsive seizures in the prehospital setting.

We thank Edward Jauch and Robert Woolson, clinical and statistical consultants; Ken Rockwell, central pharmacy; Henry Wang, medical safety monitor; the data and safety monitoring board: Thomas Bleck (chair), Gail Anderson, James Chamberlain, Joseph Collins, Jeffrey Saver, and Peter Gilbert (NINDS liaison); the Chemical Biological Medical Systems Joint Project Management Office, Department of Defense, for support and for providing autoinjectors through a cooperative agreement with the NINDS; and all the hardworking paramedics on the front line who made this study possible.

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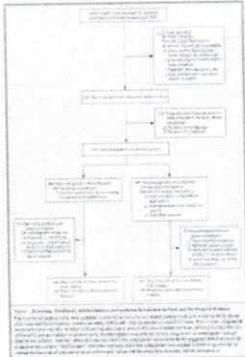


Figure 1

Characteristic	Intravenous (N=44)	Intramuscular (N=44)
Age	Mean (SD)	Mean (SD)
Age range	18-74	18-74
Sex		
Male	20 (45)	20 (45)
Female	24 (55)	24 (55)
Ethnicity		
White	34 (77)	34 (77)
Black	5 (11)	5 (11)
Hispanic	3 (7)	3 (7)
Other	2 (5)	2 (5)
Insurance		
Medicaid	20 (45)	20 (45)
Medicare	15 (34)	15 (34)
Private	9 (20)	9 (20)
None	0 (0)	0 (0)
Insurance type		
Medicaid	20 (45)	20 (45)
Medicare	15 (34)	15 (34)
Private	9 (20)	9 (20)
None	0 (0)	0 (0)
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Medicaid	20 (45)	20 (45)
Medicare	15 (34)	15 (34)
Private	9 (20)	9 (20)
None	0 (0)	0 (0)

Table 1

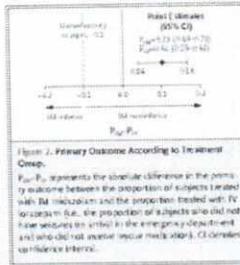


Figure 2

Characteristic	Intravenous (N=44)	Intramuscular (N=44)
Age	Mean (SD)	Mean (SD)
Age range	18-74	18-74
Sex		
Male	20 (45)	20 (45)
Female	24 (55)	24 (55)
Ethnicity		
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Insurance type		
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Table 2

Characteristic	Intravenous (N=44)	Intramuscular (N=44)
Age	Mean (SD)	Mean (SD)
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None	0 (0)	0 (0)
Insurance type		
Medicaid	20 (45)	20 (45)
Medicare	15 (34)	15 (34)
Private	9 (20)	9 (20)
None	0 (0)	0 (0)

Table 2



Figure 3

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ADDENDUM 8F

Attached is a document with the text of the email from
Dr Kragh regarding tourniquet use.

Email from Dr. Kragh regarding tourniquet use:

From: Kragh, John J MIL USA MEDCOM AISR
[mailto:John.Kragh1@us.army.mil]
Sent: Tuesday, February 21, 2012 2:26 PM
To: Brown, Gary (VDH)
Subject: Tourniquets

Mr. Gary Brown,
February 21, 2012

On 21 February 2012, I came across the Virginia Office of Emergency Medical Services' Position Paper: Mechanical Tourniquets and Hemostatic Agents (13 May 2011). I was looking for something else in research surveillance when I found it. I called the office; they referred me to you. I am the subject matter expert in emergency use of tourniquets for the Department of Defense, and so the paper was of interest to me. The translation of knowledge from the military to civilian setting is challenging. I found the paper to be reasonable and worthwhile for its intended use, but there were misconceptions which I thought I should bring to the Office's attention. One important and a few minor problems may be worth reconsidering.

Under tourniquet recommendations, number 2 has the important misconception. The statements are odd and conflicted, perhaps in part because several separate issues are mixed together. I assume you have sidestepped Care Under Fire which is addressed by the Committee on Tactical Combat Casualty Care (<http://www.health.mil/Education And Training/TCCC.aspx>). The first sentence ('Tourniquets should be placed on the proximal thigh...') is contrary to my anatomic knowledge, and the issue is directly addressed in our enclosed work which was cited in the Position Paper. The reason given is odd except when placed over the major joints or the distal Hunter's canal as explained in the enclosed work. In reality, no one has ever placed a tourniquet over major joints to my knowledge while they have over Hunter's canal occasionally. The 1-boned vs. 2-boned segment misconception may be based in some fact given that some historical device designs were flawed, but the misconception has been dispelled in operative tourniquet knowledge (Klenerman L: Tourniquet Manual, Springer, 2003; Kragh JF Jr, Swan KG, Smith DC, Mabry RL, Blackbourne LH. Historical review of emergency tourniquet use to stop bleeding. Am J Surg. Epub Jul 20, 2011). The misconception reappears in emergency care occasionally, but it was re-dispelled by Brodie et al. J R Army Med Corps, 153(4): 310-3, 2007. The enclosed work, again re-dispelled the misconception. There may be an inadvertent mixing of recommendation in the Position Paper if it pertains to Care Under Fire then gives an inapplicable reason. Either way, the recommendation serves mainly to confuse. The anatomic groove in the humerus is for a nerve, not an artery, so the confusion is compounded in the next sentence (Similarly, ...). The evidence conflicts with the final sentence (Advice to place...) in what the military calls Tactical Field Care which is like civilian care (non-Care Under Fire). In number 3 (Commercial ...), the best (most effective) tourniquet is pneumatic (Emergency & Military Tourniquet [EMT]) which has no windlass, and so the sentence dismisses the most effective tourniquet of all (Kragh JF Jr, O'Neill ML, Walters TJ, Dubick MA, Baer DG, Wade

CE, Holcomb JB, Blackbourne LB. The military emergency tourniquet program's lessons learned with devices and designs. Mil Med. 176(10):1144-1152, 2011). Some emergency services have felt compelled by limited resources to recommend using a blood pressure cuff as an improvised tourniquet with duct tape overwrapping (to keep the Velcro from peeling apart) since the EMT is more costly to field initially. Improvisation is not ideal, and some EMS directors used this particular improvisation as a temporary solution before fielding better devices. Specifying setting (self-use or medic-use) may help as the devices have differential performance by setting.

In number 4, Care Under Fire is absent. Tourniquet use after other things fail is in tension with 'as soon as possible'. The former has been evidenced to be lethal when it is 'last resort'; the latter has been evidenced to be lifesaving. This tension underlies the medico-legal conundrum facing EMS directors and providers. Additionally, there are rare cases that simply exsanguinate too fast for attempts with other countermeasures than the tourniquet.

The recommendations of the enclosed work are different than the recommendations of the Position Paper. The differences are not explained. A clear-minded, evidenced-based Position Paper may minimize the challenges of training the population of interest in emergency care. I travel through the Office's area and the next trip is 21 or 25 May 2012, so a visit is possible to discuss these ideas. I am also at john.kragh1@us.army.mil and 210/539-2210. I can send e-copies of some of our or others' works. Thanks for your interest and effort.

May we save as many as possible,

John F. Kragh, Jr., MD

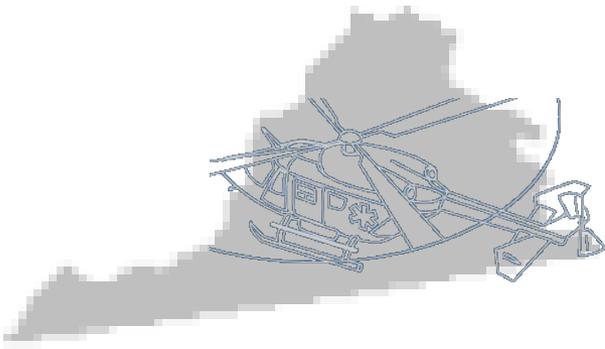
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Attachment A

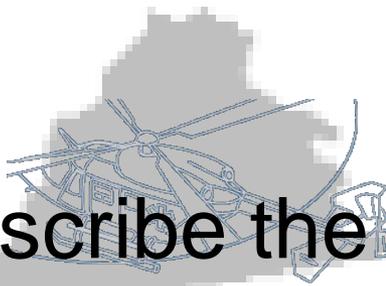
(Pending: Not available at time of printing)

Attachment B

DRAFT



Physician's Guide To Helicopter EMS Use in Virginia



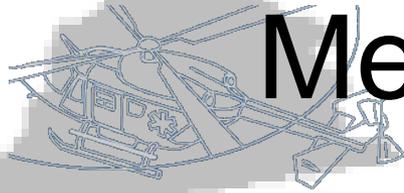
Objectives

- Describe the air medical system (Medevac) in a manner relevant for physicians.
- Elucidate Virginia specific data concerning Medevac utilization in the Commonwealth.
- Define utilization guidelines for Medevac services.
- Identify the coverage of Medevac services in the Commonwealth of Virginia.
- Explain access to Medevac services for all patients.
- Define Medevac response in the event of a



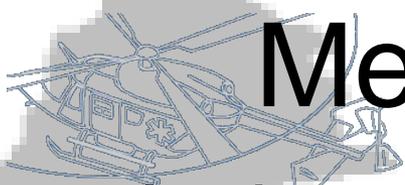
Objectives

Mass Casualty Incident (MCI).



Medevac Defined

In Virginia, we commonly use the term “Medevac” when referring to our air medical evacuation system and/or licensed EMS agencies that provide air medical services. The terms air medical services (AMS), helicopter emergency medical services (HEMS), and other terms are commonly used by other states and national organizations to describe their systems or agencies.

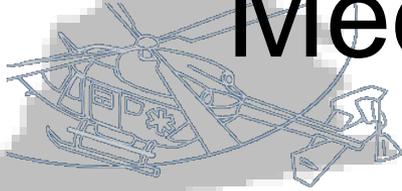


Medevac Defined

In the majority of cases, Medevac refers to EMS agencies operating helicopters, or “rotor-wing” aircraft, performing patient transports from the field to hospitals or directly from hospital to hospital.

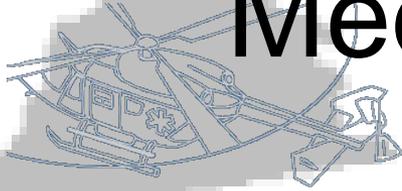
Traditional airplanes, “fixed-wing” aircraft, may also be used for longer distance patient transports and are obviously restricted to operations between airfields or airports.

Medevac Programs



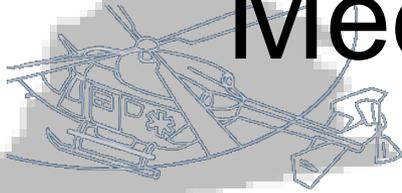
- Medevac programs can be generally divided into three categories:
 - Hospital based
 - Commercial
 - Public service

Medevac Programs



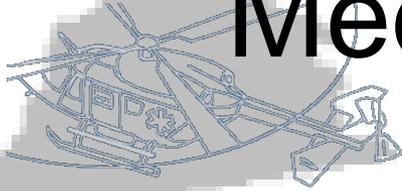
- Hospital based programs
 - Historically, helicopter EMS services began as hospital based services, generally based at large, tertiary care hospitals or health care systems
 - Hospital based services are generally staffed by medical crews from the sponsoring hospital, while the flight services are provided by a contracted operator
 - Hospital based Medevac services frequently function as a component of a comprehensive patient transport program that might include ground transport and specialty (e.g. neonatal) transport services

Medevac Programs



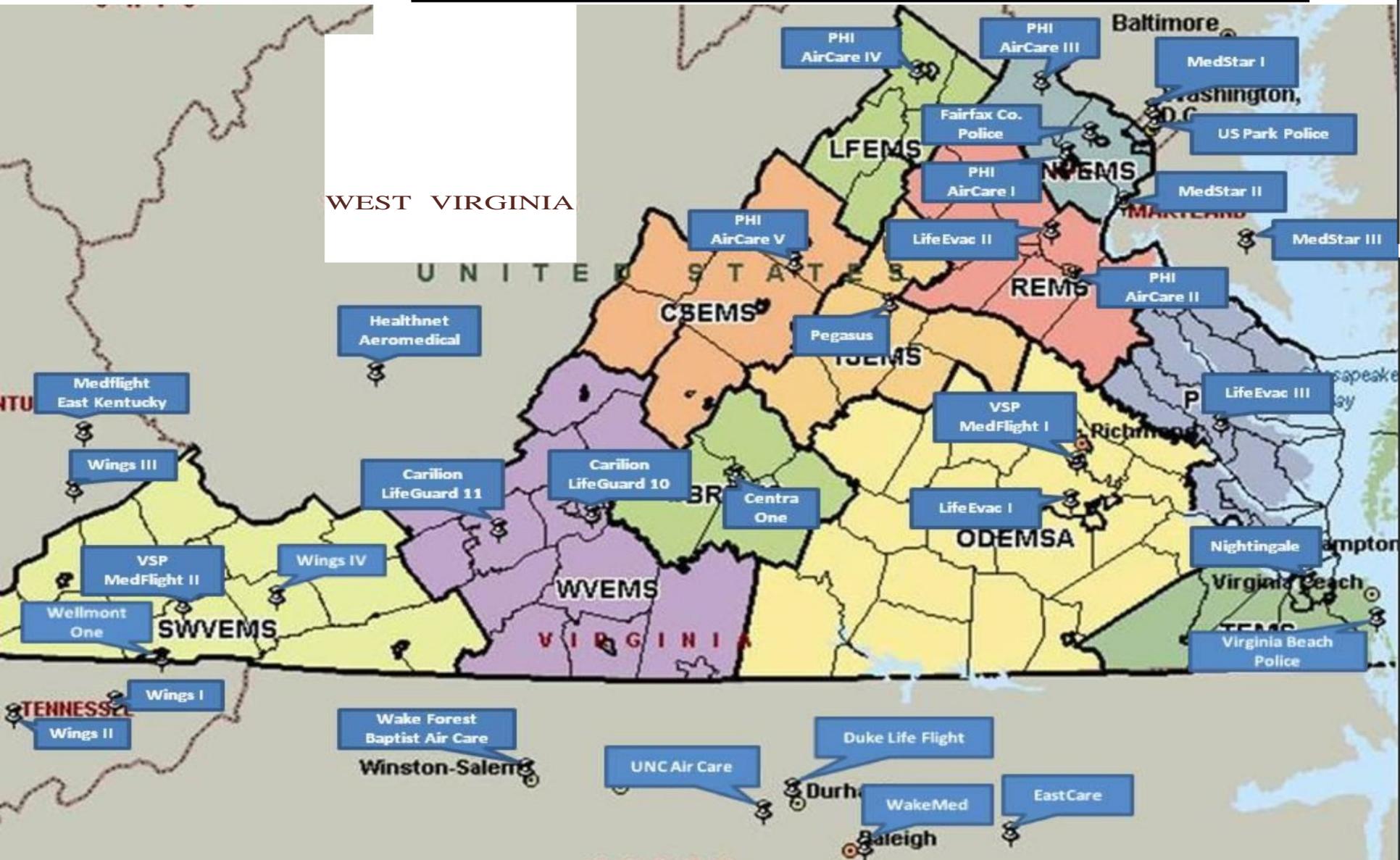
- Commercial
 - Over the past decade, many commercial programs have been established that provide Medevac services without being based at or affiliated with a specific hospital or health care system
 - Commercial programs are generally staffed, both medical and flight crew, and operated by a parent company that may operate Medevac programs at many sites
 - Commercial programs are frequently based at airports or other non-hospital bases

Medevac Programs



- Public service
 - Public service programs are generally operated by agencies of local, state, or federal government and frequently fulfill multiple roles such as EMS, law enforcement, and search and rescue
 - Medical staff may be provided by the operating agency, or provided cooperatively by local EMS agencies
 - Generally public service agencies participate in pre-hospital responses and less frequently in inter-facility transports

Me!c-f!_esources Serving Virginia



Utilization of Medevac Services

- Whether considering field-to-hospital or hospital-to-hospital transfers, the first step in effective utilization of Medevac services is to have a working relationship with the Medevac agencies providing services in a specific area
- All Medevac services have outreach programs and can provide specific in-service training to EMS agencies, EMS providers, hospital staff, and physicians regarding the scope of their services and safe and effective interactions with aircraft and crews

Utilization of Medevac Services

- Areas for coordination with Medevac services include:
 - Communication requirements including requests for transports and in-flight communications
 - Landing zone and safety requirements
 - Scope of practice and resources of the Medevac service



Utilization of Medevac Services

- Specific patient care issues such as medication protocols, IV pumps, monitors, and ventilators

Utilization of Medevac Services

- Physicians and hospital staff should be familiar with the availability of local ground transport services, their scope of care and resources

Utilization of Medevac Services

- When considering the use of Medevac services, physicians should consider several factors in making their decision:
 - Is there a critical need for the timeliness of transfer that a helicopter might offer?
 - It is important remember that the time required to effect a Medevac transfer can be significantly longer than the flight time alone between the transferring and receiving facilities

Utilization of Medevac Services

- Does the Medevac crew provide a level of care that cannot be provided by other local resources?
 - Medevac services typically offer a flight crew experienced in the management of critically ill and injured patients during transports from the scene of illness or injury as well as between hospitals
 - Medevac services may also offer technology not available to other local transport services, such as intra-aortic balloon pumps

Utilization of Medevac Services

- The decision regarding the transport of a patient should be an informed decision considering a number of factors
- Physicians utilizing Medevac services should be aware that there is an increased risk of mishap during transport, and a significant increase in cost of a Medevac transport compared to a ground transport

Utilization of Medevac Services

- Hospital-to-hospital transfers
 - Physicians should be familiar with the hospitals and services that they most frequently refer to; again, those services can provide information that can help make transfers as smooth as possible

Utilization of Medevac Services

- Hospital-to-hospital transfers
 - Although most hospital to hospital transports occur to and from the emergency department, many are from inpatient units (e.g. intensive care units, newborn nurseries, cardiac catheterization labs), requiring familiarity with the process involved of all physicians who might initiate Medevac transfers
 - In some hospitals, requests for Medevac services are coordinated through a specific group of staff familiar with the procedure, such as the emergency department

Utilization of Medevac Services

- Hospital-to-hospital transfers
 - It is important for the transferring physician to remember that activation of a Medevac resource is independent from the physician-to-physician communication and receiving physician acceptance of a transferred patient dictated both by accepted patient care practices and regulations (e.g. EMTALA)
 - Although the initial request for activation of a program may be, and frequently is, delegated by the physician to hospital staff, the transferring physician must participate in transfer arrangements
 - Transporting Medevac units can not complete the transfer until they are notified that a specific physician has accepted the patient and that there is an accepting unit for the patient to be transferred to, unless a prior agreement or process has been established with the receiving facility

Utilization of Medevac Services

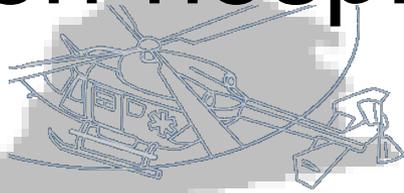
- EMS physicians should work with their EMS agencies, dispatch centers, and providers to develop guidelines for the request of Medevac services
 - Requests should take into account the need for an increased level of care or a specific skill set offered by the Medevac crew, as well as potential time benefits offered by Medevac transport in time-critical illness or injury

Utilization of Medevac Services



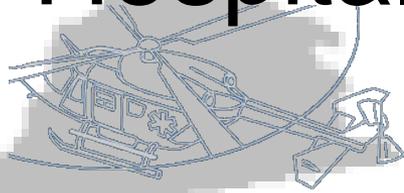
- Ideally, a protocol would be developed for pre-hospital providers to request Medevac services through their dispatch center that would ensure an organized and streamlined approach to requesting services from the closest available Medevac service

Non-hospital Medevac Activation Algorithm

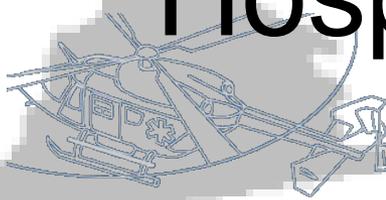


1. First providers notify local EMS (via 911), EMS responds.
2. EMS Dispatch notifies HEMS Dispatch
3. Closest appropriate Helicopter is launched
4. Helicopter contacts Ground EMS (Obtains Landing Zone [LZ] brief)
5. Safe landing
6. Patient contact/assessment/treatment
7. Transport to closest appropriate hospital

Hospital Medevac Activation Algorithm

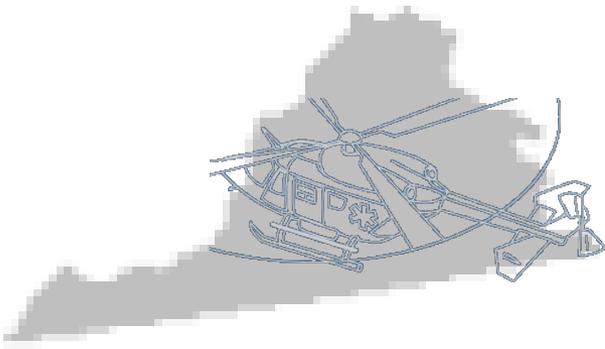


1. Hospital notifies HEMS Dispatch
2. HEMS Dispatch notifies appropriate Helicopter
3. Helicopter contacts Hospital
(Obtains LZ brief)
4. Safe landing
5. Patient contact/assessment/treatment
6. Transport to receiving hospital



Hospital Landing Pad Rendezvous

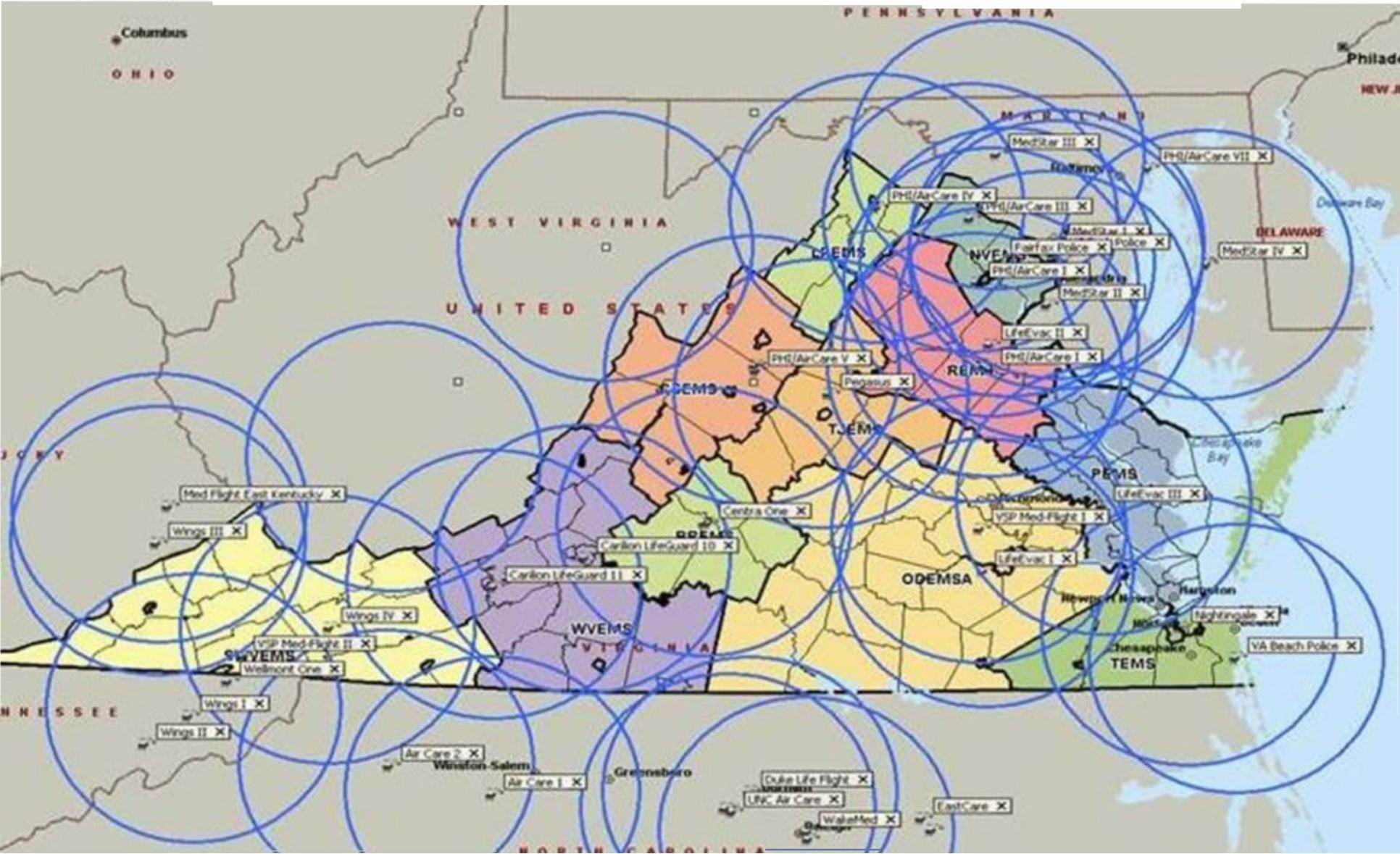
- In some cases, Medevac programs have used hospital landing pads to effect transfer of a patient from a ground EMS unit to a Medevac aircraft
 - The federal government has rendered an opinion that if the landing pad is being used solely to effect transfer of the patient between the EMS unit and the aircraft, then the presence of the EMS unit and patient on hospital grounds does not incur an EMTALA obligation for a screening examination and stabilization

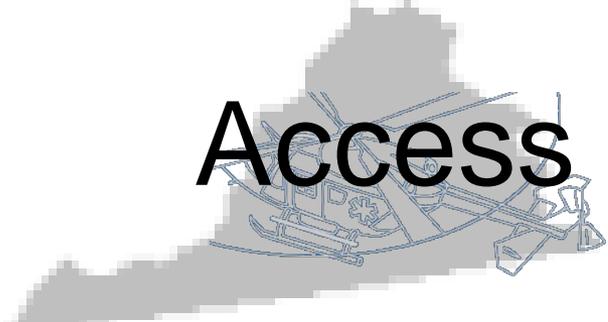


Virginia Commonwealth Medevac Coverage

Virginia Medevac Service Map

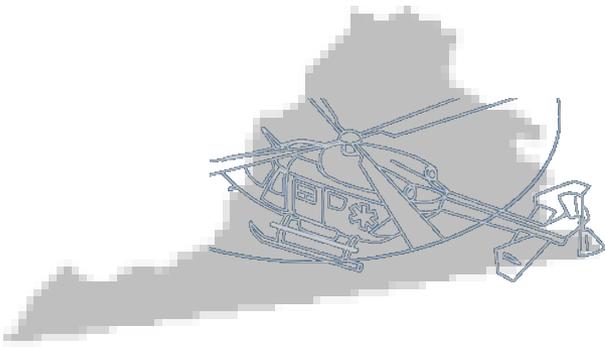
(50 Mile Radius 20-25 minute flight time)





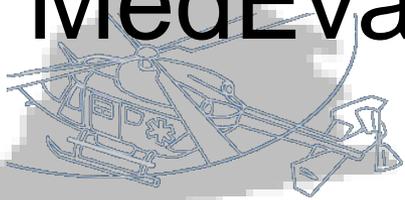
Access to Medevac Service

- HEMS agencies will transport patients regardless of:
 - State of residency
 - Insurance status (patient may be responsible for all or part of bill depending upon insurance coverage)
 - Citizenship

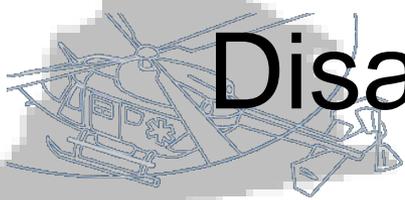


Medevac Response to Mass Casualty Incidents (MCI)

MedEvac Disaster Response Planning

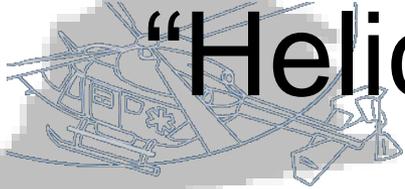


- Listed in EMS surge planning template & toolbox for mass casualty incidents (MCI) in Virginia.
- All regional MCI plans include medevac response (revised and updated yearly).



Disaster Coordination

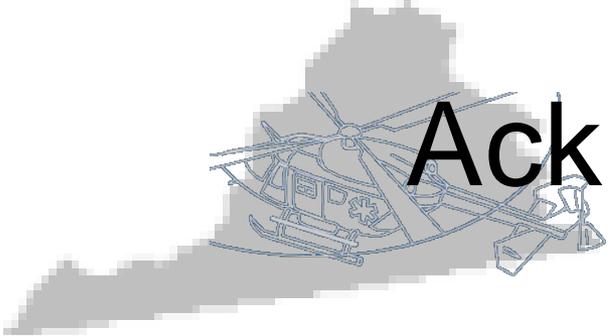
- Virginia WeatherSAFE
 - Web-based module within WebEOC (<https://www.vhha-mci.org/index.cfm>) in the Virginia VHHA Emergency Website.
 - Provides Regional Hospital Coordinating Centers, VDH, and other Emergency Management Officials with an instant update of current available Medevac resources.



“Helicopter Shopping”

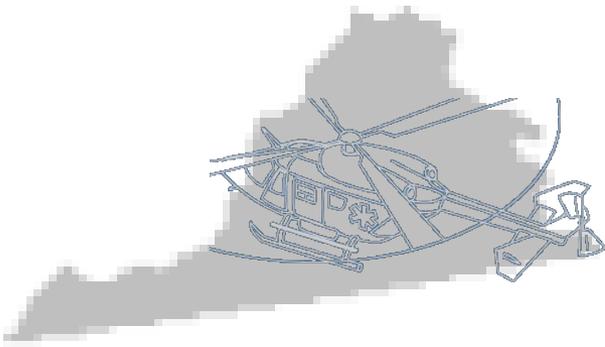
- Refers to the practice of calling, in sequence, various HEMS operators until an operator agrees to accept a flight assignment, without sharing with subsequent operators the reason(s) the flight was declined by the previously called operator(s).¹
- This practice can lead to an unsafe condition in which an HEMS operator initiates a flight.

1 – FAA Letter on Helicopter Shopping



Acknowledgements

This presentation was developed with the cooperation of the Virginia Department of Health's Office of EMS, and the Medevac Agencies in Virginia.



Questions?

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State EMS Medical Director

George.Lindbeck@vdh.virginia.gov

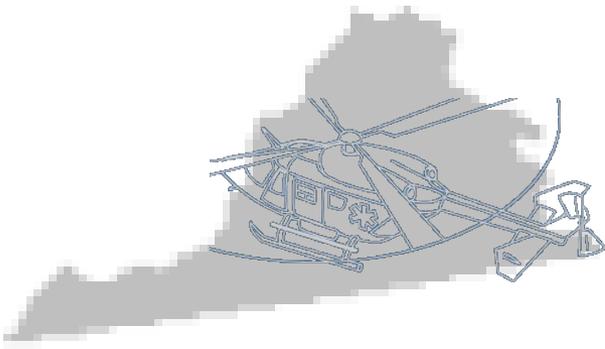
804.888.9112

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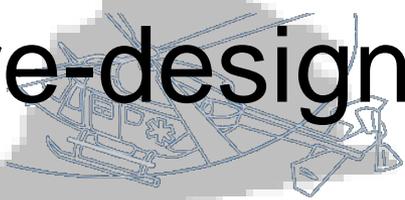
804.888.9100/800.523.6219 (Toll-free)

www.vdh.virginia.gov/OEMS/Medevac/Index.htm



Resources/Reference Material

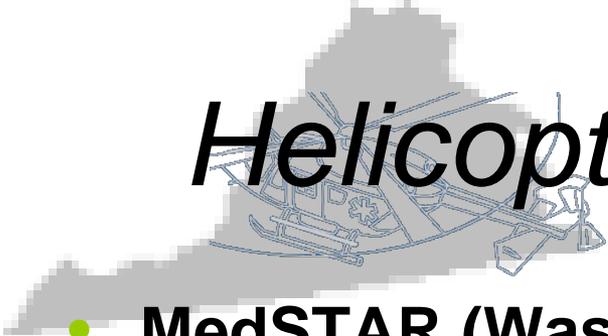
Pre-designated Landing Zone (LZ)



- Pre-designated LZ – A location that has been approved by local EMS and HEMS as a safe location for helicopter landings.
 - These locations are reviewed periodically by designating agencies.
 - Identified Hazards and Coordinates are preset in dispatch information.
 - For medevac, hospital helipads are the most common form of pre-designated landing zones.
 - Other LZs may include areas large enough to accommodate a safe landing, ie. parking lots, ball fields, secure roads.

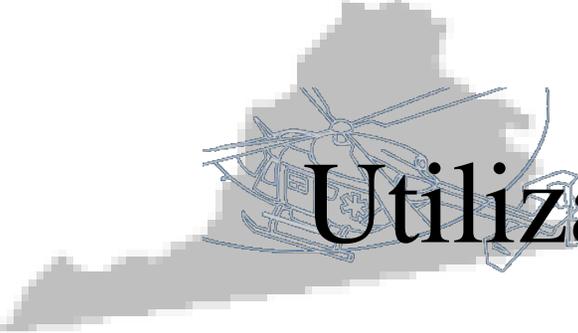
Helicopter Dispatch Centers

- **LifeEvac** 1-877-902-7779
 - VCU Health System/LifeEvac 1 (Dinwiddie)
 - LifeEvac 2 (Fredericksburg)
 - LifeEvac 3 (West Point)
- **VSP Med Flight 1 (Richmond)** 1-800-468-8892
- **VSP Med Flight 2 (Abingdon)** 1-800-433-1028
- **Sentara Nightingale (Norfolk)** 1-800-572-4354
- **UVA-Pegasus (Charlottesville)** 1-800-552-1826
- **PHI AirCare** 1-800-258-8181
 - PHI AirCare 1 (Manassas)
 - PHI AirCare 2 (Fredericksburg)
 - PHI AirCare 3 (Leesburg)
 - PHI AirCare 4 (Winchester)
 - PHI AirCare 5 (Weyers Cave)
- **Carilion Clinic** 1-888-377-7628
 - Life-Guard 10 (Roanoke)
 - Life-Guard 11 (Radford)
- **Fairfax Police (Fairfax)** 1-703-691-2131
- **Virginia Beach Police** 1-757-385-5000
- **Centra One (Lynchburg)** 1-800-258-8181
- **Wings Air Rescue (Marion)** 1-800-WINGS-01



Helicopter Dispatch Centers

- **MedSTAR (Washington D.C)** 1-800-824-6814
- **U.S. Park Police (Washington, DC)** 1-202-619-7105
- **Maryland State Police (Maryland)** 1-410-783-7525
- **Health Net 5 – (Beckley, WV)** 1-800-346-4206
- **Health Net 8 – (Martinsburg, WV)** 1-800-255-2146
- **East Care (Pitt County, NC)** 1-800-672-7828
- **Duke (Durham, Burlington, NC)** 1-800-362-5433
- **WellmontOne (Bristol, TN)** 1-866-884-3117



Utilization Guidelines/Launch Criteria

Several national organizations have developed position papers to further address the allocation and utilization of air medical services:

- www.ampa.org
- www.aams.org
- www.naemsp.org
- **Virginia Office of Emergency Medical Services (OEMS)**
 - Statewide Trauma Triage Plan
 - http://www.vdh.virginia.gov/OEMS/Files_page/trauma/StatewideTraumaTriagePlan.pdf
 - No specific state guidelines for medical scene responses

Attachment C

Patient Non-Transport from Motor Vehicle Collisions

Introduction

Obtaining patient refusals is an area that is often misunderstood by EMS providers. There are misperceptions about when a refusal is necessary and misunderstandings about the meaning of a refusal and the “protection” that such a refusal will provide an EMS provider from potential lawsuit.

This white paper addresses specific areas that frequently provide challenges to EMS providers and their agencies. Some providers feel the need to have all occupants in cars involved in motor vehicle crashes sign medical refusal paperwork. This is problematic in that it is time consuming and increases the time needed to clear the scene and increases the chance of secondary collision.

Appropriate Evaluation

EMS personnel are encouraged to identify every individual in a crash and ask if they would like evaluation. Persons involved in MVC's that are ambulatory at the scene, who appear to have normal mental status and decision making capacity (and are not intoxicated), who are ambulatory and do not appear to have external signs of injury (abrasions, contusions, or injury-related complaints such as headache or back pain) and who decline medical evaluation are not patients and do not require a signature for refusing transportation.

If any physical evaluation is performed (vital signs, examination, etc.) the person is to be considered a patient and complete documentation should be completed.

A person who has been involved in an MVC who has an apparent injury should be asked to sign a refusal if they decline evaluation or transport.

A person involved in a car crash involving high-risk mechanism of injury should be evaluated and documentation completed.

Appropriate documentation of the collision scene might include a summary of the number of total occupants and a statement about there being no complaints or reason to believe that any injury existed in situations where patients did not undergo medical evaluation.

Summary

Patients with normal mental status who are without complaint and who have no apparent injuries may decline medical evaluation at a car collision scene, and are not patients. As such, these individuals should not be required to sign a patient refusal form.

Attachment D

Roles and Responsibilities of Operational Medical Directors

Medical direction is an essential component of any EMS system. Medical directors shall meet qualifications as outlined in Virginia Office of EMS Rules and Regulations section 12VAC5-31-1810. Operational medical directors have specific responsibilities to the agency, EMS provider, and to the citizens within the jurisdictions which they serve. Roles and responsibilities include but are not limited to:

Administrative and regulatory

- be familiar with local, regional, and state, and Federal laws and regulations affecting EMS systems
- be knowledgeable about agency plans
 - Multiple casualty plans
 - Mass casualty plans
 - Mass gathering plans (if applicable)
- be knowledgeable about NIMS
- develop and/or approve field triage guidelines and protocols
 - periodically review and update field triage guidelines and protocols
 - monitor compliance with field performance guidelines
 - patient destination guidelines
- develop, actively participate, and/or provide medical oversight for an effective performance improvement program
- develop, actively participate, and/or provide medical oversight for a comprehensive mechanism for management of patient care incidents
 - complaints
 - allegations of substandard care
 - deviations from established protocols and patient care standards
 - be actively involved in auditing medical care provided by EMS professionals
 - random audits
 - other audits for cause

Educational

- develop and/or monitor counseling, retraining, testing, probation, and field preceptionship of EMS providers and students
- develop and/or monitor continuing education of programs being delivered by their EMS agency to EMS personnel, other healthcare providers, and the public

Clinical

- be familiar with the medical literature which may impact EMS (directly or indirectly)
- be familiar with innovative medical devices which may impact EMS (directly or indirectly)
- provide direct patient care, if applicable to the EMS system
- be a medical resource for infection control issues

be a medical resource for the design of a critical incident debriefing program
be a medical resource for the design of a provider health and welfare program

Operational

be knowledgeable about agency communications with EMS units
be knowledgeable about agency dispatch (EMD)

- be actively involved in the implementation, training, review, and revision of EMD protocols if EMD is under the oversight of the operational medical director

approve the level of prehospital care provided by individuals within an agency
approve the level of prehospital care provided by an EMS agency

develop and/or approve appropriate EMS response times and intervals
function as a liaison between the EMS agency and the medical community

Attachment E

Emergency Medical Services Training Funds Summary

As of April 4, 2012



EMS Training Funds Summary of Expenditures

Fiscal Year 2010	Obligated \$	Disbursed \$
40 BLS Initial Course Funding	\$442,119.00	\$281,079.57
43 BLS CE Course Funding	\$66,360.00	\$37,108.00
44 ALS CE Course Funding	\$194,880.00	\$83,437.50
45 BLS Auxiliary Program	\$128,000.00	\$13,280.00
46 ALS Auxiliary Program	\$476,000.00	\$97,480.00
49 ALS Initial Course Funding	\$844,815.00	\$455,611.54
Total	\$2,152,174.00	\$967,996.61

Fiscal Year 2011	Obligated \$	Disbursed \$
40 BLS Initial Course Funding	\$787,116.00	\$479,569.67
43 BLS CE Course Funding	\$84,000.00	\$37,975.00
44 ALS CE Course Funding	\$235,200.00	\$102,847.50
45 BLS Auxiliary Program	\$98,000.00	\$12,920.00
46 ALS Auxiliary Program	\$391,680.00	\$127,800.00
49 ALS Initial Course Funding	\$1,057,536.00	\$521,138.55
Total	\$2,653,532.00	\$1,282,749.12

Fiscal Year 2012	Obligated \$	Disbursed \$
40 BLS Initial Course Funding	\$786,435.00	\$282,982.78
43 BLS CE Course Funding	\$114,240.00	\$27,938.75
44 ALS CE Course Funding	\$265,440.00	\$57,137.50
45 BLS Auxiliary Program	\$90,000.00	\$7,280.00
46 ALS Auxiliary Program	\$316,000.00	\$112,240.00
49 ALS Initial Course Funding	\$1,336,230.00	\$472,772.14
Total	\$2,908,345.00	\$960,351.17

Accredited Training Site Directory

As of April 4, 2012



Accredited Paramedic¹ Training Programs in the Commonwealth

Site Name	Site Number	# of Alternate Sites	Accreditation Status	Expiration Date
Associates in Emergency Care	15319	4	National – Initial	CoAEMSP
Center for EMS Training	74015	1	State – Full	January 1, 2013
Central Virginia Community College	68006	--	National – Initial	CoAEMSP
J. Sargeant Reynolds Community College	08709	5	National – Initial	CoAEMSP
Jefferson College of Health Sciences	77007	--	National – Continuing	CoAEMSP
Lord Fairfax Community College	06903	--	State – Full	January 1, 2013
Loudoun County Fire & Rescue	10704	--	National – Continuing	CoAEMSP
National College of Business & Technology	77512	--	National – Initial	CoAEMSP
Northern Virginia Community College	05906	1	National – Continuing	CoAEMSP
Patrick Henry Community College	08908	1	State – Full	July 31, 2013
Piedmont Virginia Community College	54006	--	National – Continuing	CoAEMSP
Rappahannock EMS Council Program	63007	--	State – Full	December 31, 2012
Southwest Virginia Community College	11709	4	National – Continuing	CoAEMSP
Southside Virginia Community College	18507	1	State – Full	June 30, 2012
Tidewater Community College	81016	3	National – Continuing	CoAEMSP
VCU School of Medicine Paramedic Program	76011	4	National – Continuing	CoAEMSP

1. Programs accredited at the Paramedic level may also offer instruction at EMT- I, EMT - E, EMT - B, FR, as well as teach continuing education and auxiliary courses.
 - Southside Virginia Community College had its initial CoAEMSP site visit on Dec. 1/2, 2011. They will learn the outcome of their visit in the spring or summer of 2012.
 - The Center for EMS has submitted their CoAEMSP Initial-Accreditation Self Study Report (ISSR) and has a site visit scheduled.
 - There are four (4) state programs still in need of obtaining CoAEMSP accreditation by the January 1, 2013 deadline established by National Registry: Prince William County Fire, Lord Fairfax Community College, Patrick Henry Community College and Rappahannock EMS Council.
 - There are several currently accredited state Intermediate programs which have inquired about becoming accredited at the Paramedic level. These programs are: Central Shenandoah EMS Council and Western Virginia EMS Council. The process for accreditation at the paramedic level in Virginia is described Attachment A and on the OEMS web page at: <http://www.vdh.virginia.gov/OEMS/Training/Paramedic.htm>

Accredited Intermediate¹ Training Programs in the Commonwealth

Site Name	Site Number	# of Alternate Sites	Accreditation Status	Expiration Date
Central Shenandoah EMS Council	79001	--	State – Full	May 31, 2015
Danville Area Training Center	69009	--	State – Full	October 31, 2013
Franklin County Public Safety Training Center	06705	--	State – Full	July 31, 2012***
Fort Lee Fire	14904	--	State – Conditional	November 30, 2011*
Nicholas Klimenko and Associates	83008	--	State – Full	July 31, 2015
James City County Fire Rescue	83002	--	State – Full	February 28, 2014
John Tyler Community College	04115	--	State – Full	February 28, 2012
WVEMS - New River Valley Training Center	75004	--	State – Full	December 31, 2011**
Norfolk Fire Department	71008	--	State – Full	July 31, 2016
Old Dominion EMS Alliance	04114	1	State – Full	August 31, 2012
Rappahannock Community College	11903	1	State – Conditional	July 31, 2012
Roanoke Regional Fire-EMS Training Center	77505	--	State – Full	January 31, 2015
UVa Prehospital Program	54008		State – Full	July 31, 2014

1. Programs accredited at the Intermediate level may also offer instruction at EMT - E, EMT - B, FR, as well as teach continuing education and auxiliary courses.

- * Fort Lee Fire is in the process of scheduling a follow-up visit with OEMS. They are currently not offering any EMS training programs.
- ** WVEMS - New River Valley Training Center obtained a variance granting an extension on their reaccreditation until June 30, 2012.
- *** Franklin County Public Safety Training Center has submitted a variance to OEMS. The variance is still being processed.

Attachment F

**Excerpt from the Training and Certification Committee:
Response to the request by the EMS Advisory Board Chairperson from the February 2012
EMS Advisory Board Meeting To Review options for Funding National Registry Testing**

The Training and Certification Committee, after reviewing all of the available options, proposes the following action item:

Certification candidates who have completed a Virginia approved initial certification Basic Life Support Training Program (FR/EMR and EMT-Basic/EMT) shall have their initial (first attempt) National Registry written certification examination fee paid from the portion of the EMS funds specifically earmarked in Code § 46.2-694 (A.)(13.)(e.).

A review of this process shall be conducted by the EMS Advisory Board every three (3) years or as warranted by changes in the Code of Virginia or Commonwealth of Virginia Budget pertaining to the funding of Emergency Medical Services.

Unanimously Approved March 7, 2012 by the Training and Certification Committee

Supporting Points:

- EMS Regulations in Virginia establish EMT as the minimum required staffing level for an ambulance. If OEMS does not fund the initial cost of testing as a result of utilizing the National Registry (NR) certification examination, it is an unfunded mandate.
- Approximately 5,000 to 6,000 initial EMS certification written examinations are administered annually, at no cost to the candidate at the Basic Life Support (BLS) level. The cost of the National Registry written examination for EMR is \$65 and \$70 for EMT. The anticipated fiscal impact of utilizing the National Registry examination at the EMR and EMT level is between \$325,000 and \$420,000 on an annual basis.

Initial start up costs to develop, administer and process a state developed EMS certification examination at five (5) separate levels will cost approximately \$1M compared to the projected cost to utilize NR examinations. In addition, if NR examinations are utilized in Virginia, there will be less equipment and printing costs for OEMS and more time available for staff to serve our customers and constituents.

- Implementing National Registry testing in Virginia is the final step in meeting all objectives outlined in the *EMS Education Agenda for the Future: A Systems Approach*.
- Funding to cover the cost of initial NR testing at the EMR and EMT levels will come from the portion of the EMS funds specifically earmarked in Code (§ 46.2-694) to pay for the costs associated with the certification and recertification training of emergency medical services personnel. These funds were allocated as a result of HJR 743 (2007) which established the Joint Legislative Subcommittee Studying Incentives for Fire and Rescue Squad Volunteers. Members of the subcommittee recognized the importance of creating a consistent and reliable source of funding to promote the recruitment and retention of EMS personnel by enacting a \$0.25 increase in the \$4-for-life vehicle registration fee.
- The National Registry and Pearson Vue have agreed to open a minimum of 12 additional computer testing locations sites, for a total of 17 sites around the state, in order to reduce the amount of travel required by test candidates.
- As the source of these funds is paid by the citizens of the Commonwealth, and having certified EMS Providers, in either of these EMS levels, is a benefit to all of the citizens of the Commonwealth in the

**Excerpt from the Training and Certification Committee:
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event of a medical, traumatic, natural or man-made emergency, the use of these funds should be available to all testing candidates and not just limited to those who are affiliated with licensed EMS Agencies.

- The State of Maryland, an original member of the Atlantic EMS Council, has implemented the process of paying for initial certification testing.

DRAFT

Attachment G

MEDICAL DIRECTION COMMITTEE MEETING ROSTER
April 12, 2012

Please sign in next to your name.

Region	Representative	Signature
SWVEMS	PAUL PHILLIPS, D.O.	<u>Paul A. Phillips</u>
WVEMS	CHARLES LANE, M.D.	_____
BREMS(CHAIR)	MARILYN MCLEOD, M. D.	<u>present</u>
TJEMS (OEMS)	GEORGE LINDBECK, M. D.	<u>George Lindbeck</u>
CSEMS	ASHER BRAND, M. D.	<u>Asher Brand</u>
LFEMS	CHRISTOPHER TURNBULL, M.D.	_____
REMS	NAEL HASAN, M. D.	<u>Nael Hasan</u>
NVEMS	MARK FRANKE, M. D.	<u>Mark Franke</u>
ODEMSA	ALLEN YEE, M. D.	<u>Allen Yee</u>
PEMS	CHERYL LAWSON, M. D.	<u>Cheryl Lawson</u>
TEMS	STEWART MARTIN, M. D.	<u>Stewart Martin</u>
MAL	FORREST CALLAND, M.D.	<u>Forrest Calland</u>
MAL	SCOTT WEIR, M.D.	<u>Scott Weir</u>
EMS CHILDREN	THERESA GUINS, M.D.	_____
VAGEMSA	CHIEF EDDIE FERGUSON	_____

OEMS STAFF:

GARY BROWN	<u>Gary Brown</u>	WARREN SHORT	<u>Warren Short</u>
SCOTT WINSTON	<u>Scott Winston</u>	CHAD BLOSSER	<u>present</u>
MIKE BERG	<u>Mike Berg</u>	DEBBIE AKERS	<u>Debbie Akers</u>
TIM PERKINS	<u>Tim Perkins</u>	GREG NEIMAN	_____
	<u>George Lindbeck</u>		

