

The Maryland
Medical Protocols
for Emergency Medical Services Providers

Effective July 1, 2017

**Maryland Institute for
Emergency Medical Services Systems**



The complete “Maryland Medical Protocols for
Emergency Medical Services Providers”
is also available on the Internet at
www.MIEMSS.org.

Protocols are occasionally amended during the year.
Please check the MIEMSS website to be sure you have
the most up-to-date version.

The edition date appears on the lower
portion of the page.

This text was produced from materials from the Division of State Documents (DSD), Office of the Secretary of
State, State of Maryland. Only text obtained directly from the DSD is enforceable under Maryland law.
For copies of the official text, call the DSD at 1-800-633-9657.

To All Health Care Providers in the State of Maryland:

Re: 2017 revisions, updates, and additions to *The Maryland Medical Protocols for EMS Providers*

EMS providers will be able to download the full document from the MIEMSS website at www.miemss.org and will be receiving a single copy of the 2017 pocket protocols.

The EMS Board has approved these protocols for implementation on July 1, 2017. Prior to July 1, all EMS providers must complete the Maryland EMS Update: 2017 (visit the Online Training Center) that will highlight the new material.

Some major protocol additions, deletions, and changes have been made this year. The spreadsheet of these changes is for reference only and the information located in the full protocol book is the official medical reference for EMS providers.

Protocol Changes:

- Terbutaline has been removed from the Advanced Life Support formulary.
- The Termination of Resuscitation Protocol has been modified with a new ALERT to allow providers, in consultation with a Pediatric Base Station, to stop efforts on children in rare circumstances.
- A new Syncope Protocol has been added for adult and pediatric patients.
- A new Overdose/Poisoning: Carbon Monoxide/Smoke Inhalation Protocol has been added, which includes more formal direction for referral to the Hyperbaric Medicine Specialty Center. This new protocol replaces the treatment for carbon monoxide/smoke inhalation patients that was previously covered in the Overdose: Inhalation Protocol.
- The Fibrinolytic checklist has been removed in the evaluation of stroke patients at the recommendation of the State Stroke Committee. The Fibrinolytic checklist should still be used in the STEMI patient evaluation.
- The site identification criteria for intraosseous (IO) insertion has been improved.
- The Pelvic Stabilization Binder Device Pilot Protocol has been expanded to allow for appropriately-sized pediatric pelvic binder use.
- The Sexual Assault Protocol has been enhanced and Maryland Coalition Against Sexual Assault (MCASA) recognized hospitals are identified as appropriate destinations for these patients.
- The medical consultation requirement has been removed for the administration of midazolam for the bucking endotracheal intubated patient protocol.
- The Transport to Freestanding Emergency Medical Facility Pilot Protocol has been expanded to allow EMS to transport stable Priority 2 patients to a freestanding emergency medical facility with a required medical consultation.
- The Mobile Integrated Community Health (MICH) Pilot Protocol was expanded following a successful review of the Queen Anne's MICH pilot.
- The Mark I/Duodote Optional Supplemental Program has been revised in order to reflect consistency with the standardized dosing that is delivered with the CHEMPACK.

Richard L. Alcorta, MD, FACEP
State EMS Medical Director
Acting Co-Executive Director, MIEMSS

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C. HEALTH CARE FACILITY CODES

Code	Health Care Facility Name
345	10th Street Medical Center, Ocean City
346	26th Street Medical Center, Ocean City
379	63rd Street Medical Center, Ocean City
380	75th Street Medical Center, Ocean City
527	Adventist Behavioral Health, Rockville
384	Adventist Healthcare Germantown Emergency
529	Adventist Rehabilitation Hospital, Rockville
492	Alleghany General Hospital, Alleghany, PA
397	Altoona Rehabilitation Hospital, PA
231	Andrew Rader Clinic, VA
221	Anne Arundel Medical Center (Base Station, Cardiac Interventional, Primary Stroke)
550	Annie M. Warner Hospital, PA
381	Atlantic General Hospital (Base Station, Primary Stroke)
590	Baltimore City Public Service Infirmiry
222	Baltimore Washington Medical Center (UM) (Base Station, Cardiac Interventional, Primary Stroke)
567	Bashline Memorial Osteopathic Hospital, PA
350	Bayhealth Kent General, DE (Cardiac Interventional)
359	Bayhealth Medical Center, Milford Hospital, DE
234	Beebe Medical Center Millville Center, DE
358	Beebe Medical Center Sussex County, DE
208	Bon Secours Hospital
353	Bowie Health Center
235	Brooke Lane Psychiatric Center
236	Brunswick Medical Center
553	Bryn Mawr Hospital
752	Bryn Mawr Rehabilitation Hospital
771	Calvert County Nursing Home Center
266	Calvert Memorial Hospital (Base Station, Primary Stroke)
554	Carlisle Regional Medical Center, PA
219	Carroll Hospital Center (Base Station, Cardiac Interventional, Primary Stroke)
276	Chambersburg Hospital, PA
291	Charles Regional (UM)
284	Charlestown Area Medical Center, WV
241	Chemtrec Chemical Manufacturers Association Chemical Transportation Emergency Center, DC
296	Chestertown (UMSRH) (Base Station)
243	Chestnut Lodge Hospital
225	Children's Hospital and Center for Reconstructive Surgery, Baltimore

Code	Health Care Facility Name
756	Children's Hospital of Philadelphia, PA
317	Children's National Health System, DC (Neonatal, Pediatric Base Station, Pediatric Burn, Pediatric Trauma)
304	Christiana Hospital (CCHS), DE (Cardiac Interventional)
341	City Hospital, Martinsburg, WV
757	Cooper Trauma Center, NJ
293	Deer's Head Hospital Center
256	DeWitt Army Hospital, VA
342	District of Columbia General Hospital, DC (Neonatal)
329	Doctor's Community Hospital (Base Station, Primary Stroke)
257	Dominion Hospital, VA
294	Dorchester (UMSRH)
310	Dover U.S. Air Force Clinic, DE
491	Eastern Neurological Rehabilitation Hospital
331	Eastern Shore State Hospital
297	Easton (UMSRH) (Base Station, Primary Stroke)
258	Finan Center
279	Fort Detrick Medical Center
522	Fort Washington Hospital
203	Franklin Square (MedStar) (Base Station, Cardiac Interventional, Primary Stroke)
239	Frederick Memorial Hospital (Base Station, Cardiac Interventional, Perinatal)
286	Fulton County Medical Center, PA
322	Garrett Regional Medical Center (WVU) (Base Station)
580	Geisinger Medical Center, PA
335	George Washington University Hospital, DC
337	Georgetown University (MedStar), DC
240	Gettysburg Hospital, PA
759	Gladys Spellman Specialty Hospital and Nursing Center
226	Good Samaritan Hospital (MedStar) (Base Station, Primary Stroke)
559	Grant Memorial Hospital, WV
217	Greater Baltimore Medical Center (Base Station, Primary Stroke, Neonatal)
316	Greater Southeast Community Hospital, DC
348	Groupe Memorial Hospital
363	Hadley Memorial Hospital, DC
560	Hagerstown State Hospital
561	Hampshire Memorial Hospital, WV
242	Hanover Hospital, PA
211	Harbor Hospital (MedStar) (Base Station, Primary Stroke)
220	Harford Memorial Hospital (UMUCH) (Base Station, Primary Stroke)

Code	Health Care Facility Name
562	Harryon State Hospital
399	HealthSouth Chesapeake Rehabilitation Center
490	HealthSouth Rehabilitation Hospital, Altoona, PA
398	HealthSouth Rehabilitation Hospital, Mechanicsburg , PA
267	Highland State Health Facility Psychiatric Unit
444	Holy Cross Germantown Hospital
244	Holy Cross Hospital (Base Station, Cardiac Interventional, Primary Stroke)
450	Hospice of Baltimore, Gilchrist Center, Towson
223	Howard County General Hospital (JHM) (Base Station, Cardiac Interventional, Primary Stroke)
270	Howard University Hospital, DC
268	HSC Pediatric Center, DC
230	Inova Alexandria Hospital, VA
340	Inova Fair Oaks Hospital, VA
305	Inova Fairfax Hospital, VA
326	Inova Loudoun Hospital, VA
287	Inova Mount Vernon Hospital, VA
349	Isle of Wight Medical Center
273	Jefferson Memorial Hospital, Arlington, VA
314	Jefferson Memorial Hospital, Ranson, WV
201	Johns Hopkins Bayview (Adult Burn, Adult Trauma, Base Station, Cardiac Interventional, Neonatal, Perinatal, Comprehensive Stroke)
766	Johns Hopkins Bayview Medical Center Transitional Care Unit
761	Johns Hopkins Comprehensive Geriatric Center
204	Johns Hopkins Hospital Adult (Adult Trauma, Base Station, Cardiac Intervention, Eye Trauma, Comprehensive Stroke)
706	Johns Hopkins Hospital Inpatient Rehabilitation Center
704	Johns Hopkins Pediatric (Pediatric Base Station, Pediatric Burn, Pediatric Trauma)
451	Joseph Richey Hospice - Joseph Richey House - Baltimore (Gilchrist Hospice Care)
461	J.W. Ruby Memorial Hospital, Morgantown, WV
274	Kennedy-Krieger Institute
277	Keswick Multi-Care Center
262	Kimbrough Ambulatory Care Center, Fort Meade
563	King's Daughters Hospital, WV
259	Kirk U.S. Army Health Clinic, Aberdeen
403	Lancaster General Hospital, PA
564	Lancaster Osteopathic Health Foundation, PA
352	Laurel Regional Hospital
773	Laurel Regional Hospital–Rehabilitation
565	Leesburg Hospital, VA

Code	Health Care Facility Name
278	Levindale Hebrew Geriatric Center and Hospital
205	Liberty Medical Center Psychiatric Center
255	Lincoln Memorial Hospital
354	Malcolm Grow U.S. Air Force Medical Center
280	Mary Washington Hospital, VA
281	Maryland Penitentiary Hospital
300	Maryland Poison Information Center at UMAB
285	Masonic Eastern Star Home, DC
566	McConnellsburg Hospital
332	McCready Memorial Hospital (Base Station)
339	McGuire Veterans Administration Medical Center, VA
774	Medlink Hospital of Capitol Hill, DC
327	MedStar Washington Hospital Center, DC (Adult Trauma, Burn, Cardiac Interventional)
404	Memorial Hospital, PA
207	Mercy Medical Center (Base Station, Neonatal, Perinatal, Primary Stroke)
389	Meritus Medical Center (Adult Trauma, Base Station, Cardiac Interventional, Primary Stroke)
799	Meritus Medical Center, Comprehensive Inpatient Rehabilitation Services
499	Meritus Medical Center, Psychiatric Unit
798	Meritus Medical Center, Skilled Nursing Facility
206	Midtown (UM) (Base Station, Primary Stroke)
271	Monongalia General Hospital, WV
228	Montebello Center - Baltimore
264	Montgomery Medical Center (MedStar) (Base Station, Primary Stroke)
292	Mount Washington Pediatric Hospital
400	Myersdale Medical Center, PA
351	Nanticoke Memorial Hospital, DE (Cardiac Interventional)
295	National Capital Poison Center, Washington, DC
334	National Hospital for Orthopedics and Rehabilitation, VA
308	National Institute of Mental Health
356	National Institutes of Health Clinical Center
309	National Rehabilitation (MedStar) at Irving Street, Washington, DC
751	Nemours/Alfred I. DuPont Hospital for Children
307	Newark Emergency Center, Newark, DE
568	Newark Hospital, NJ
762	Newmedico Rehabilitation
753	Northampton-Accomac Memorial Hospital
313	Northeast Georgetown Medical Center
315	Northern Virginia Doctor's Hospital, VA
218	Northwest Hospital Center (Base Station)

Code	Health Care Facility Name
344	Novant Health Prince William Medical Center, VA
408	Peninsula Regional Medical Center (Adult Trauma, Base Station, Cardiac Interventional, Primary Stroke)
419	Penn State Children's Hospital, Hershey, PA
301	Penn State Milton Hershey Medical Center, PA
318	Perkins State Hospital
569	Pittsburgh Institute for Rehabilitation
362	Pocomoke City Medical Center
361	Pocomoke Family Health Center
338	Police and Fire Clinic, DC
325	Potomac Hospital, VA
401	Potomac Valley Hospital, WV
232	Prince George's Hospital Center (Adult Trauma, Cardiac Interventional, Base Station, Neonatal, Primary Stroke)
288	Providence Hospital, DC
378	Psychiatric Institute of Washington, DC
364	Psychiatric Institute of Montgomery County
634	R Adams Cowley Shock Trauma Center (UM) (Adult Trauma, Base Station, Hyperbaric, Neurotrauma)
570	Reading Medical Center, PA
227	Rehabilitation and Orthopaedic Institute (UM)
571	Riverside Hospital, DE
311	Riverside Hospital, VA
572	Sacred Heart Hospital, PA
573	Saint Agnes Burn Center, PA
212	Saint Agnes Hospital (Base Station, Cardiac Interventional, Neonatal, Perinatal, Primary Stroke)
366	Saint Elizabeth's Hospital, DC
303	Saint Francis Hospital, WV
460	Saint Francis Healthcare, Wilmington, DE
213	Saint Joseph Medical Center (UM) (Base Station, Cardiac Interventional, Primary Stroke)
405	Saint Joseph Hospital, PA
367	Saint Luke Institute
333	Saint Mary's Hospital (MedStar) (Base Station, Primary Stroke)
455	Salisbury Genesis Center
582	Select Specialty Hospital, Laurel Highlands, PA
265	Shady Grove Adventist Hospital (Base Station, Cardiac Interventional, Primary Stroke)
368	Sheppard and Enoch Pratt Hospital
387	Shore Emergency Center at Queenstown (UMSRH) (Base Station)
324	Sibley Memorial Hospital (JHM), DC
750	Sinai Head Injury Rehabilitation Hospital

Code	Health Care Facility Name
210	Sinai Hospital of Baltimore (Adult Trauma, Base Station, Cardiac Interventional, Neonatal, Perinatal, Primary Stroke)
770	Sinai Rehabilitation Hospital
772	Solomon's Nursing Center
360	Southern Chester County Medical Center, PA
343	Southern Maryland Hospital (MedStar) (Base Station, Cardiac Interventional, Primary Stroke)
369	Spring Grove State Hospital
406	Springfield State Hospital
370	Springwood Psychiatric Institute, VA
521	State Post Mortem Examiner's (Morgue)
452	Stella Maris Hospice, Dulaney Valley Road, Timonium
453	Stella Maris Hospice at Mercy Medical Center, Baltimore
249	Suburban Hospital (JHM) (Adult Trauma, Base Station, Cardiac Interventional, Primary Stroke)
371	Tawes-Bland Bryant Nursing Center
574	Taylor Hospital, WV
312	Taylor Manor Hospital
372	TB Clinic, Baltimore City Health Department
373	Tidewater Memorial Hospital, VA
254	University Specialty Hospital (formerly Deaton Hospital and Medical Center of Christ Lutheran Church)
374	U.S. Naval Medical Clinic, Annapolis
576	U.S. Public Health Services Hospital, Baltimore
375	U.S. Soldier's and Airmen's Home, DC
298	Union Hospital of Cecil County (Base Station)
214	Union Memorial Hospital (MedStar) (Base Station, Cardiac Interventional, Hand/Upper Extremity, Primary Stroke)
215	University of Maryland Medical Center (Base Station, Cardiac Interventional, Neonatal, Perinatal, Comprehensive Stroke)
575	University of Pennsylvania Hospital
551	University of Pittsburgh Medical Center Bedford Memorial, PA
224	Upper Chesapeake Medical Center (UMUCH) (Base Station, Cardiac Interventional, Primary Stroke)
407	Upper Shore Mental Health Center
246	Veterans Administration Medical Center, Baltimore
306	Veterans Administration Medical Center, Ellsmere, DE
376	Veterans Administration Medical Center, DC
275	Veterans Administration Medical Center, Martinsburg, VA
357	Veterans Administration Medical Center, Perry Point
577	Veterans Administration Medical Center, Wilmington, DE
233	Virginia Hospital Center, VA
238	Walter P. Carter Center

Code	Health Care Facility Name
377	Walter Reed, Forest Glenn Annex
355	Walter Reed National Military Medical Center, Bethesda
282	War Memorial Hospital, Berkeley Springs, WV
552	War Memorial Hospital, Berkeley Springs, WV
328	Washington Adventist Hospital (Base Station, Cardiac Interventional)
269	Waynesboro Hospital, Waynesboro, PA
323	West Virginia University Hospital, WV
290	Western Maryland Center, MD
395	Western Maryland Regional Medical Center (Adult Trauma, Base Station, Cardiac Interventional, Primary Stroke)
776	Western Maryland Regional Medical Center, Psychiatric Unit
402	Western Pennsylvania University Hospital, PA
299	Wilmington Hospital (CCHS), DE
283	Winchester Medical Center
578	Woodrow Wilson Rehabilitation Center, VA
579	Yale - New Haven Hospital
272	York Hospital, PA
765	York Rehabilitation Hospital, PA
888	Other Facility

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MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS (Continued)

Primary Stroke (Continued)

- Sinai Hospital of Baltimore
- Southern Maryland Hospital (MedStar), Clinton
- Suburban Hospital (JHM), Bethesda
- Union Hospital of Cecil County, Elkton
- Union Memorial Hospital (MedStar), Baltimore
- Upper Chesapeake Medical Center (UMUCH), Bel Air
- Washington Adventist Hospital, Takoma Park
- Western Maryland Regional Medical Center, Cumberland

Comprehensive Stroke

- Johns Hopkins Bayview Medical Center, Baltimore
- The Johns Hopkins Hospital, Baltimore
- University of Maryland Medical Center, Baltimore

Cardiac Interventional

- Anne Arundel Medical Center, Annapolis
- Baltimore Washington Medical Center (UM), Glen Burnie
- Bayhealth Kent General, Dover, DE
- Carroll Hospital Center, Westminster
- Christiana Care Health System, Newark, DE
- Franklin Square Medical Center (MedStar), Baltimore
- Frederick Memorial Hospital, Frederick
- Holy Cross Hospital, Silver Spring
- Howard County General Hospital (JHM), Columbia
- Johns Hopkins Bayview Medical Center, Baltimore
- MedStar Washington Hospital Center, Washington, DC
- Meritus Medical Center, Hagerstown
- Nanticoke Memorial Hospital, Seaford, DE
- Peninsula Regional Medical Center, Salisbury
- Prince George's Hospital Center, Cheverly
- Saint Agnes Hospital, Baltimore
- Saint Joseph Medical Center (UM), Baltimore
- Shady Grove Adventist Hospital, Rockville
- Sinai Hospital of Baltimore
- Southern Maryland Hospital (MedStar), Clinton
- Suburban Hospital (JHM), Bethesda
- The Johns Hopkins Hospital, Baltimore
- Union Memorial Hospital (MedStar), Baltimore
- University of Maryland Medical Center, Baltimore
- Upper Chesapeake Medical Center (UMUCH), Bel Air
- Washington Adventist Hospital, Takoma Park
- Western Maryland Regional Medical Center, Cumberland

MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS (Continued)

Maryland Sexual Assault Forensic Examination (SAFE) Hospitals

SAFE hospital programs recognized by the Maryland Coalition Against Sexual Assault (MCASA)

- Anne Arundel Medical Center (Adult)
- Atlantic General Hospital (Pediatric and Adult)
- Baltimore Washington Medical Center (UM) (Pediatric and Adult)
- Calvert Memorial Hospital (Adult)
- Carroll Hospital Center (Pediatric and Adult)
- Charles Regional Medical Center (UM) (Pediatric and Adult)
- Chestertown Medical Center (UMSRH) (Adult)
- Dorchester Medical Center (UMSRH) (Pediatric and Adult)
- Easton Medical Center (UMSRH) (Pediatric and Adult)
- Franklin Square Medical Center (MedStar) (Pediatric)
- Frederick Memorial Hospital (Pediatric and Adult)
- Garrett Regional Medical Center (WVU) (Pediatric and Adult)
- Greater Baltimore Medical Center (Adult)
- Harford Memorial Hospital (UMUCH) (Pediatric and Adult)
- Howard County General Hospital (JHM) (Pediatric and Adult)
- Mercy Medical Center (Adult)
- Meritus Medical Center (Pediatric and Adult)
- Peninsula Regional Medical Center (Pediatric and Adult)
- Prince George's Hospital Center (Pediatric and Adult)
- Saint Mary's Hospital (MedStar) (Pediatric and Adult)
- Shady Grove Adventist Hospital (Pediatric and Adult)
- Union Hospital of Cecil County (Adult)
- University of Maryland Medical Center (Pediatric)
- Western Maryland Regional Medical Center (Pediatric and Adult)

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E. PROTOCOL KEY



1. Basic Life Support Level Care



2. Advanced Life Support Level Care



3. Requires Medical Consultation



4. Pediatric Care

NOTE: ALL PROVIDERS (BLS and ALS) SHOULD CHECK ALL PEDIATRIC SECTIONS FOR NECESSARY CARE.

Description	Age
Newly Born	Up to 1 hour
Neonate	1 hour to 28 days
Infant	> 28 days to 1 year
Toddler	1 to < 2 years
Preschooler	2 to 4 years
School-Age	5 to 12 years
Adolescent	13 to 18th birthday



5. Caution/Warning/Alert

II. GENERAL PATIENT CARE (GPC)

A. RESPONSE

Review the dispatch information and select appropriate response.

B. SCENE ARRIVAL AND SIZE-UP

1. Consider Body Substance Isolation (BSI).
2. Consider Personal Protective Equipment (PPE).
3. Evaluate the scene safety.
4. Determine the number of patients.
5. Consider the need for additional resources.

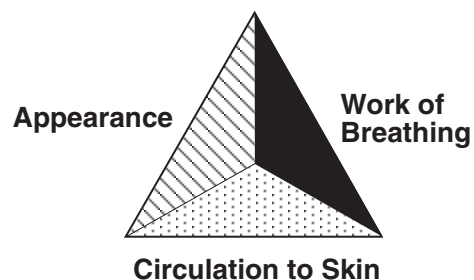
C. PATIENT APPROACH

1. Determine the Mechanism of Injury (MOI)/Nature of Illness (NOI).
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures.

D. INITIAL ASSESSMENT



CORRECT LIFE-THREATENING PROBLEMS AS IDENTIFIED.
STABILIZE CERVICAL SPINE WHEN APPROPRIATE.



FOR PEDIATRIC PATIENTS, CONSIDER USING THE PEDIATRIC ASSESSMENT TRIANGLE.

1. Assess mental status
 - a) **A**lert
 - b) Responds to **V**erbal stimuli
 - c) Responds to **P**ainful stimuli
 - d) **U**nresponsive
2. Airway
 - a) Open and establish airway using appropriate adjunct.
 - b) Place patient in appropriate position.
 - c) Suction airway as needed, including tracheostomy tubes.



IF A PATENT AIRWAY CANNOT BE ESTABLISHED, THE PATIENT MUST BE TRANSPORTED TO THE NEAREST APPROPRIATE HOSPITAL-BASED EMERGENCY DEPARTMENT **OR DESIGNATED FREESTANDING EMERGENCY MEDICAL FACILITY**. ONCE THE PATIENT PRESENTS TO THE HOSPITAL **OR DESIGNATED FREESTANDING EMERGENCY MEDICAL FACILITY** FOR TREATMENT OF AN EMERGENCY CONDITION, TREATMENT AND TRANSFER DECISIONS ARE THE RESPONSIBILITY OF THE HOSPITAL UNDER APPLICABLE LAW. THE PROVIDER SHOULD STAND BY TO BE AVAILABLE FOR AND ASSIST WITH TRANSFER OF THE PATIENT IF THE HOSPITAL DETERMINES SUCH A TRANSFER IS APPROPRIATE.




IN INFANTS AND YOUNG CHILDREN, INSPIRATORY STRIDOR IS AN INDICATION OF UPPER AIRWAY FOREIGN BODY OR PARTIAL AIRWAY OBSTRUCTION. REQUEST ALS RENDEZVOUS. TRANSPORT THE PATIENT RAPIDLY AND CAUTIOUSLY AND HAVE FOREIGN BODY AIRWAY REMOVAL EQUIPMENT READY FOR IMMEDIATE USE IN CASE THE PATIENT'S AIRWAY BECOMES OBSTRUCTED.

3. Breathing

- a) Determine if breathing is adequate. Assess oxygen saturation (SpO_2) with portable pulse oximeter (required on all transport units since 2012).
 - (1) If patient's ventilations are not adequate, provide assistance with 100% oxygen using Bag-Valve-Mask (BVM).
 - (i) For all ages except neonates, 1 breath every 5 seconds (8–12 breaths/min) (manually-activated positive pressure oxygen delivery device is not recommended for this group)
 - (ii) For a neonate, 1 breath every 3 seconds (higher rates may be required)
 - (2) The decision to oxygenate will be based on the patient's clinical condition.
 - (i) SpO_2 greater than or equal to 94% is considered normoxia in adults and children. Supplemental oxygen is not needed if SpO_2 greater than or equal to 94% unless the patient is in respiratory distress, acutely dyspneic, or suffering from suspected CO poisoning. Patients in severe respiratory distress may benefit from high flow oxygen from a nonre-breather (NRB).

Note: Respiratory distress is present if the patient has retractions, nasal flaring, wheezing, stridor, or difficulty speaking.
 - (ii) Unless in respiratory distress, avoid administration of high flow oxygen to patients presenting with the following conditions:
 - (a) STEMI/Angina
 - (b) CVA/stroke
 - (c) Post arrest
 - (iii) CO exposure: Apply 100% oxygen via NRB mask. Maintain SpO_2 at 100%.

Percent O ₂ Saturation	Ranges	General Patient Care
94–100%	Normal	Give oxygen as necessary
91–93%	Mild Hypoxia	Give oxygen as necessary
86–90%	Moderate Hypoxia	Give 100% oxygen Assisting Ventilations if necessary
less than or equal to 85%	Severe Hypoxia	Give 100% oxygen Assist Ventilations If indicated, Intubate

 INACCURATE OR MISLEADING SpO₂ READINGS MAY OCCUR IN THE FOLLOWING PATIENTS: HYPOTHERMIC, HYPOPERFUSION (SHOCK), CO POISONING, HEMOGLOBIN ABNORMALITY, ANEMIA, AND VASOCONSTRICTION.

- (3) If available, utilize EtCO₂ waveform monitoring in intubated patients (required on all ALS transport units for advanced airway management since 2015).
 - (4) Consider carbon monoxide measurement, if available.
- b) Hyperventilate the head-injured patient only if signs/symptoms of herniation are present, including posturing, loss of pupillary light response, dilation of one or both pupils, vomiting, hypertension, bradycardia, and/or irregular respirations.
- (1) If hyperventilating, use the following rates
 - Adult (including adolescent 13 years of age or older): 20 breaths per minute
 - Child (1-12 years of age): 30 breaths per minute
 - Infant (less than 1 year of age): 35 breaths per minute
 - (2) If hyperventilating, use EtCO₂ monitoring if available.

 NEVER WITHHOLD OXYGEN FROM A PATIENT IN RESPIRATORY DISTRESS!

DEVICE	FLOW RATE	CONCENTRATION
Nasal Cannula	2–6 lpm	24–44%
Venturi Mask	Variable	24–60%
Partial Rebreather Mask	6–10 lpm	35–60%
Simple Face Mask	6–10 lpm	35–60%
Pocket Mask	12–15 lpm	50–60%
Non-Rebreather Mask	12–15 lpm	80–100%
Bag-Valve-Mask	12–15 lpm	90–100%



4. Circulation

ONCE CONFIRMED PULSELESS, HIGH-QUALITY CONTINUOUS CPR WITH FREQUENT PROVIDER ROTATION IS AN ESSENTIAL COMPONENT IN THE SUCCESSFUL RESUSCITATION OF THE ARRESTED PATIENT. THIS MAY BE ACCOMPLISHED THROUGH MANUAL OR MECHANICAL MEANS, AS APPROPRIATE, IN ADULTS. MECHANICAL METHODS OF COMPRESSION ARE NOT INDICATED FOR INFANTS OR CHILDREN WHO HAVE NOT YET REACHED THEIR 13TH BIRTHDAY. **(NEW '17)**

PERFORM CPR WHILE PREPARING FOR RHYTHM ANALYSIS AND DEFIBRILLATION.



- a) **Assess pulse. (NEW '17)**
- (1) Patients within the first hour after delivery, refer to Newly Born Protocol.
 - (2) Patients from one hour after birth up to those who have not reached their 13th birthday, refer to the Universal Algorithm for Pediatric Emergency Cardiac Care for BLS.
 - (3) Patients greater than 13 years of age, refer to the Universal Algorithm for Adult Emergency Cardiac Care for BLS.

High Quality CPR Reference Chart for All Ages			
Component	Adults and Adolescents	Children (Age 1 Year to Puberty)	Infants (Age Less Than 1 Year, Excluding Newborns)
Compression-ventilation ratio without advanced airway	1 or 2 rescuers 30:2	1 rescuer 30:2 2 or more rescuers 15:2	
Compression-ventilation ratio WITH advanced airway	Continuous compressions at a rate of 100-120/min Give 1 breath every 6 seconds (10 breaths/min)		
Compression rate	100-120/min		
Compression depth	At least 2 inches (5 cm) Compression depth should be no more than 2.4 inches (6 cm)	At least one-third anterior-posterior diameter of chest About 2 inches (5 cm)	At least one-third anterior-posterior diameter of chest About 1½ inches (4 cm)
Hand placement	2 hands on the lower half of the breastbone (sternum)	2 hands or 1 hand (optional for very small child) on the lower half of the breastbone (sternum)	1 rescuer 2 fingers in the center of the chest, just below the nipple line 2 or more rescuers 2 thumb-encircling hands in the center of the chest, just below the nipple line

- b) Assess for and manage profuse bleeding.
- c) Assess skin color, temperature, and capillary refill.

5. Disability

- a) Perform Mini-Neurologic Assessment (Pulse/Motor/Sensory).
- b) Spinal protection
 - (1) The provider shall determine the appropriate method to use in spinal protection of the patient. Infant or child car seats may NOT be used as a spinal immobilization device for the pediatric patient.
 - (2) Patients who have a blunt trauma with a high-energy mechanism of injury that has potential to cause spinal cord injury or vertebral instability **and** one or more the following should receive spinal protection.
 - (a) Midline spinal pain, tenderness, or deformity
 - (b) Signs and symptoms of new paraplegia or quadriplegia
 - (c) Focal neurological deficit
 - (d) Altered mental status or disorientation
 - (e) Distracting injury



In addition to the above indicators for adults, the below apply to children who have not yet reached their 15th birthday.

- (f) Neck pain or torticollis
 - (g) High impact diving incident or high risk motor vehicle crash (head on collision, rollover, ejected from the vehicle, death in the same crash, or speed greater than 55 mph)
 - (h) Substantial torso injury
 - (i) Conditions predisposing to spine injury
- (3) If NO to all of the above, transport as appropriate.



IF PATIENT IS UNABLE TO COMMUNICATE OR APPROPRIATELY RESPOND TO THE ABOVE QUESTIONS, APPLY SPINAL PROTECTION PROTOCOL.

6. Exposure

To assess patient's injuries, remove clothing as necessary, considering condition and environment.

7. Assign Clinical Priority

- a) Priority 1 — Critically ill or injured person requiring immediate attention; unstable patients with life-threatening injury or illness.
- b) Priority 2 — Less serious condition yet potentially life-threatening injury or illness, requiring emergency medical attention but not immediately endangering the patient's life.
- c) Priority 3 — Non-emergent condition, requiring medical attention but not on an emergency basis.
- d) Priority 4 — Does not require medical attention.
- e) In the event of a multiple casualty incident, the Simple Triage And Rapid Treatment (START and/or JumpSTART) technique will be instituted for rapid tagging and sorting of patients into priority categories for both treatment and transport.

8. Normal Vital Signs Chart

AGE	ESTIMATED WEIGHT	HEART RATE	RESPIRATORY RATE	SYSTOLIC B/P
Premature	Less than 3 kg	160	Greater than 40	60
Newborn	3.5 kg	130	40	70
3 mo.	6 kg	130	30	90
6 mo.	8 kg	130	30	90
1 yr.	10 kg	120	26	90
2 yrs.	12 kg	115	26	90
3 yrs.	15 kg	110	24	90
4 yrs.	17 kg	100	24	90
6 yrs.	20 kg	100	20	95
8 yrs.	25 kg	90	20	95
10 yrs.	35 kg	85	20	100
12 yrs.	40 kg	85	20	100
14 yrs.	50 kg	80	18	110
ADULT	Greater than 50 kg	80	18	120

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HISTORY AND PHYSICAL EXAMINATION


TRAUMA PATIENT

MEDICAL PATIENT

Significant MOI	Non-Significant MOI	Unresponsive Patient	Responsive Patient
Rapid Trauma Assessment	Determine Chief Complaint	Rapid Physical Examination	Obtain History of Episode
D Head	D Perform	D Head	D Onset
C Crepitation	C Focused Examination of the Injured Site and Areas Compatible with Given MOI	C Neck	C Provocation
A Chest		A JVD	A Quality
P Crepitation		P Medical Alert Device	P Radiation
B Respiration		B Chest	B Severity
T Paradoxical Motion		T Breath Sounds	T Time
L Breath Sounds		L Abdomen	Baseline Vital Signs
S Abdomen		S Rigidity	Obtain SAMPLE History
D Distention		D Distention	
C Pelvis/GU		C Pelvis/GU	
A Pain on Motion		A Blood, Urine, Feces	
P Blood, Urine, Feces		P Extremities	
T Extremities		T MSP	
L Pulse/Motor/Sensory		L Medical Alert Device	
S Posterior		S Posterior	
Baseline Vital Signs	Baseline Vital Signs	Baseline Vital Signs	Focused Physical Exam
Obtain SAMPLE History	Obtain SAMPLE History	Obtain History of Episode	DCAPBTL S
S Signs & Symptoms	S Signs & Symptoms	S Provocation	Check areas suggested by MOI and SAMPLE .
A Allergies	A Allergies	A Quality	
M Medications	M Medications	M Radiation	
P Pertinent History	P Pertinent History	P Severity	
L Last Oral Intake	L Last Oral Intake	L Time	
S Events Prior	S Events Prior	Obtain SAMPLE History	

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

E. HISTORY AND PHYSICAL EXAMINATION/ASSESSMENT

1. Conduct a Focused Examination/Detailed Examination/Ongoing Assessment.
2. Collect and transport documentation related to patient's history (example: Emergency Information Form, Medic Alert, EMS DNR/MOLST, or jurisdictional form).
3.  Obtain an EKG when appropriate.



ALL HEALTH CARE PROVIDERS ARE OBLIGATED BY LAW TO REPORT CASES OF SUSPECTED CHILD OR VULNERABLE ADULT ABUSE AND/OR NEGLECT TO EITHER THE LOCAL POLICE OR ADULT/CHILD PROTECTIVE SERVICE AGENCIES. DO NOT INITIATE REPORT IN FRONT OF THE PATIENT, PARENT, OR CAREGIVER (MD CODE, FAMILY LAW, § 5-704). UNDER MARYLAND LAW, EMS PROVIDERS ARE PROTECTED FROM LIABILITY IF THEY MAKE A REPORT OF CHILD/VULNERABLE ADULT ABUSE AND NEGLECT IN GOOD FAITH (COURTS AND JUDICIAL PROCEEDINGS ARTICLE § 5-620). **(NEW '17)**

F. TREATMENT PROTOCOLS

1. Refer to **ALL** appropriate protocols.
2. Patients who have had an impaled conducted electrical weapon used on them will be transported to the nearest appropriate facility without dart removal (exception: Tactical EMS). ANY conducted electrical weapon dart impalement to the head, neck, hands, feet, or genitalia must be stabilized in place and evaluated by a physician. An assessment must be conducted to determine if the patient meets Excited Delirium Syndrome.
3. Providers may assist the patient or primary caregiver in administering the patient's prescribed rescue medication.
 - a) BLS providers may assist with the administration of the patient's fast-acting bronchodilator MDI and sublingual nitroglycerin.
 - b) ALS providers may administer the patient's prescribed benzodiazepine for seizures, Factor VIII or IX for Hemophilia A or B, or reestablish IV access for continuation of an existing vasoactive medication.
 - c) Providers should obtain on-line medical direction to administer other prescribed rescue medications not specifically mentioned in *The Maryland Medical Protocols for EMS Providers* (e.g., hydrocortisone (Solu-cortef) for adrenal insufficiency). The rescue medication must be provided by the patient or caregiver and the label must have the patient's name and the amount of medication to be given.



DO NOT ADMINISTER ORAL MEDICATIONS (EXCEPT GLUCOSE PASTE) TO PATIENTS WITH AN ALTERED MENTAL STATUS.



-
4. For pediatric patients
 - a) Pediatric section of the treatment protocol will be used for children who have **not** reached their 15th birthday (trauma) or their 18th birthday (medical), except as otherwise stated in the treatment protocol.
 - b) Medication dosing
 - (1) Pediatric doses apply to patients weighing less than 50 kg.
 - (2) For pediatric patients equal to or greater than 50 kg, utilize adult dosing.

- c) The developmental age of the infant/child must be considered in the communication and evaluation for treatment.

Destination consideration:

For those patients who are 18 years of age or older who receive specialized care at a pediatric facility, consider medical consultation with a Pediatric Base Station for patient destination.

- d) Infants and children must be properly restrained prior to and during transport.
- e) When appropriate, family members should remain with pediatric patients.

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G. COMMUNICATIONS

1. Communications with and through EMRC/SYSCOM are recorded. In addition, as part of the quality assurance and quality improvement process, communications with hospitals are frequently recorded. Therefore, you should assume that all your communications among EMS providers, hospitals, public safety communications centers, and EMRC/SYSCOM are being recorded.
2. All Priority 1 patients require on-line medical consultation through EMRC on a recorded line (radio or phone).



ANY PATIENT WHOM THE PROVIDER IDENTIFIES AS MEETING ANY "SPECIALTY" ALERT (E.G., TRAUMA, STEMI ALERT, STROKE ALERT, SEPSIS ALERT) REQUIRES AN ON-LINE MEDICAL CONSULTATION THROUGH EMRC ON A RECORDED LINE (RADIO OR PHONE).

3. All Priority 2 patients who have persistent symptoms or need further therapeutic intervention(s) require on-line medical consultation through EMRC on a recorded line (radio or phone).
4. Notification ("information only call" that can be through EOC or EMS communication system following local standard operating procedures) should be made to the receiving hospital for Priority 2 or Priority 3 patients whose symptoms have resolved and whose vital signs are within normal limits.



ON-LINE MEDICAL CONSULTATION MAY BE OBTAINED AT ANY TIME FOR ANY PATIENT, IF DESIRED BY THE PREHOSPITAL EMS PROVIDER. PEDIATRIC AND SPECIALTY CONSULTATION IS ENCOURAGED FOR TRAUMA AND MEDICAL PATIENTS. CONSULTATION WITH PEDIATRIC AND SPECIALTY CENTERS SHALL OCCUR SIMULTANEOUSLY WITH A BASE STATION CONSULT.

5. If medical consultation is genuinely unavailable, or if the time necessary to initiate consultation significantly compromises patient care, the provider shall proceed with additional protocol directed care, so long as transport will not be significantly delayed. "Exceptional Call" must be indicated on the Patient Care Report (PCR).
6. Core essentials for communications:
 - a) Assigned patient priority (1 to 4)
 - b) Age
 - c) Chief complaint
 - d) Provider impression
 - e) Pertinent patient signs and symptoms (e.g., HR, RR, BP, Pulse Ox, and GCS) (be specific—do not use within normal limits or stable in description)
 - f) Pertinent physician findings
 - g) ETA

In addition, for specialty center patients:

Trauma

- h) Patient Trauma Decision Tree Category (Alpha, Bravo, Charlie, Delta)
- i) Number of victims if more than one
- j) Describe mechanism

Stroke

- k) Last known well time
- l) Specific neurological findings (sensory, motor, cognitive)
- m) Upon positive assessment using the Cincinnati Stroke Scale, a STROKE alert shall be made and the LAMS score will be included in the consult.

STEMI

- n) 12-Lead interpretation
- o) Duration of symptoms



CONSIDER ACTIVATION OF THE GO-TEAM FOR SERIOUSLY INJURED PATIENTS WHO REQUIRE A PROLONGED EXTRICATION AND WHO MEET THE INDICATIONS FOR GO-TEAM ACTIVATION.

7. Mass Casualty Incident (MCI) Communications
 - a) When a local jurisdiction declares an MCI, it is extremely important to maximize patient care resources and reserve EMS communications for emergent situations. Except for extraordinary care interventions, EMS providers may perform all skills and administer medications within protocol during a declared MCI. When the MCI condition is instituted, the Exceptional Call box must be checked on the PCR.
 - b) During an MCI, the EMS Officer-in-Charge (OIC) shall designate an EMS Communicator who shall establish appropriate communications.
 - c) Reference the Multiple Casualty Incident/Unusual Incident Protocol.

H. REASSESSMENT

1. Reassess unstable patients frequently (recommended every 5 minutes).
2. Reassess stable patients at a minimum of every 15 minutes.
3. Reassess patients being discharged to home or long-term care at the beginning and end of the transport or more frequently, at the provider's discretion.

I. DISPOSITION

1. Destination
 - a) Priority 1 patients shall be triaged according to Maryland Medical Protocols to the closest appropriate hospital-based emergency department, designated trauma, or designated specialty referral center. Critically unstable patients in need of immediate life-saving interventions that cannot be provided in the field shall, with the approval of EMS system medical consultation, be diverted to the closest facility (including freestanding emergency medical facility) capable of immediately providing those interventions.
 - b) Priority 2 patients shall be triaged according to the Maryland Medical Protocols to the closest appropriate hospital-based emergency department, designated trauma or designated specialty referral center unless otherwise directed by EMS system medical consultation. Stable Priority 2 patients may be referred to a freestanding emergency medical facility. **(NEW '17)**
 - c) Stable Priority 3 or 4 patients who do not need a time-critical intervention may be transported to the local emergency department or freestanding emergency medical facility.
 - d) Patients Under Investigation (PUI) for an Emerging Infectious Disease (EID) at a residence should be transported directly to an Assessment Hospital unless total transport time is no longer than 45 minutes greater than transport to the nearest Frontline Hospital ED. If transport time is longer than 45 minutes greater than transport to the nearest Frontline Hospital ED, the patient must be transported to the closest appropriate Frontline hospital. Priority 1 and Priority 2 patients with unresolved symptoms that cannot be managed outside the hospital should be taken to the closest Frontline Hospital. Receiving hospital notification of all suspected PUI patients should be done as early as possible to allow for hospital staff to prepare. Helicopter transport is NOT indicated for the PUI patient.
 - e) For Priority 2 and Priority 3 patients not meeting a specialty center destination care protocol, the EMS provider should ask if the patient has had a hospital admission (inpatient service) within the last 30 days. If the answer is yes, the EMS provider should transport (repatriate) the patient to that hospital as long as that hospital is not more than 15 additional minutes further than nearest hospital (or

greater if allowed for by the EMS Operational Program).

2. Mode of transport (air, land, water)

- a) Medevac patients with indications for specialty referral center should be flown to the appropriate type of specialty center if not more than 10–15 minutes further than the closest trauma center. (Patients with an airway, breathing, or circulatory status who would be jeopardized by going an additional 10–15 minutes should go to the closest trauma center.)
- b) Consider utilization of a helicopter when the patient's condition warrants transport to a trauma or specialty referral center and the use of a helicopter would result in a clinically significant reduction in time compared with driving to a trauma/specialty center.



ALL REQUESTS FOR SCENE HELICOPTER TRANSPORTS SHALL BE MADE THROUGH SYSCOM. FOR TRAUMA DECISION TREE CATEGORY CHARLIE OR DELTA, RECEIVING TRAUMA CENTER MEDICAL CONSULTATION IS REQUIRED WHEN CONSIDERING WHETHER HELICOPTER TRANSPORT IS OF CLINICAL BENEFIT.

- c) If the time of arrival at the trauma or specialty referral center via ground unit is less than 30 minutes, there will generally not be a benefit in using the helicopter, especially for Trauma Decision Tree categories Charlie and Delta.
- d) Refer to the Trauma Decision Tree when considering use of aeromedical transport. Provide SYSCOM with the patient's category (Alpha, Bravo, Charlie, or Delta).
- e) On-line medical direction should be obtained from the local trauma center and the specialty referral center when transport to the specialty center would require more than 10–15 minutes additional transport time.
 - (1) Pediatric Trauma Patients: Indications as per the pediatric section of the Trauma Protocols.
 - (2) Spinal Trauma Patients: Indications as per Spinal Protection Protocol.
 - (3) Burn Patients: Indications as per Burn Protocol. Special note: Isolated burn patients without airway injury or other associated trauma should normally be flown to a burn center, regardless of the location of the closest trauma center.
 - (4) Hand Injury Patients: Indications as per Hand Trauma Protocol. Special note: Medevac patients with appropriate indications for hand center referral should normally be flown to the hand center, regardless of the location of the closest trauma center.

3. Status

Evaluate the need for emergent versus non-emergent transportation.



DO NOT WAIT ON-SCENE FOR ADVANCED LIFE SUPPORT. ATTEMPT TO RENDEZVOUS EN ROUTE TO THE HOSPITAL.

J. TRANSFER OF CARE/RENDEZVOUS AND TRANSITION OF PATIENT CARE ALS TO BLS

The ALS provider-patient relationship is established when the ALS provider initiates patient assessment and

1. ALS medication(s)* is/are administered or
2. ALS procedure(s)* is/are performed or
3. Upon ALS provider assessment of the patient there is potential risk of deterioration.

* Based on the medication or procedure as listed in the protocol pages 182–185

ALS providers may only terminate their EMS provider-patient relationship when they are assured that the patient will continue to receive care at the same or greater levels, or when they have documented with on-line medical direction that the patient's condition has improved and that patient care may be transferred safely to an EMS provider with a lower scope of practice.

BLS providers have the right to decline the transition of patient care. When consensus between the providers cannot be gained, ALS shall get on-line medical direction.

Providers will relay assessment findings and treatment provided to the individual(s) assuming responsibility for the patient(s).

K. DOCUMENTATION

A Patient Care Report (PCR) will be completed and delivered to the receiving facility as soon as possible, ideally upon transfer of care. If this is not immediately possible, providers must provide documentation of the patient's prehospital care on a template and in a format provided or approved by MIEMSS for inclusion in the patient care record before leaving the receiving facility, then deliver the completed PCR within 24 hours after dispatch, in compliance with COMAR 30.03.04.04.

Only the unit that pronounces death will select the "Dead on Scene" option in the PCR (eMEDS®) and thus all other units will report "Operational Support Only." If no interventions are performed, the highest level EMS provider on scene will pronounce death and document "Dead on Scene." If BLS care was rendered by a BLS unit and then termination of resuscitation and pronouncement of death occurred, the BLS unit will select "Dead at Scene with BLS Intervention" option on the eMEDS® PCR. If ALS care was rendered by an ALS unit and then termination of resuscitation and pronouncement of death occurred, the ALS unit will select "Dead at Scene with ALS Intervention" option on the eMEDS® PCR.

L. CONFIDENTIALITY

Patient confidentiality must be maintained at all times.

M. PROFESSIONAL CONDUCT

All patients should be treated with dignity and respect in a calm and reassuring manner.

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B. ALTERED MENTAL STATUS: SEIZURES

1. Initiate General Patient Care.

2. Presentation

Seizures are a neuromuscular response to an underlying cause such as: epilepsy, hypoxia, hypoglycemia, hypoperfusion, head injury, CVA, alcohol or drug abuse. Consider recent history of possible illness, infection, fever, or stiff neck.



DO NOT ATTEMPT TO FORCE ANY DEVICE INTO THE PATIENT'S MOUTH IF THE PATIENT IS STILL SEIZING.



3. Treatment

a) If the patient is still seizing:

- (1) DO NOT RESTRAIN.
- (2) Protect patient from further injury.
- (3) Consider cause of seizure activity.

b) When seizure activity has stopped:

- (1) Identify and treat injuries.
- (2) If patient is a known diabetic, glucose paste (10–15 grams) should be administered between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.



c) Use glucometer and treat accordingly.

d) Consider midazolam.

If patient has no IV or IO in place, administer midazolam 5 mg IN or IM.
If IV/IO is already in place: 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg.



REDUCE BY 50% FOR PATIENTS 69 YEARS OR OLDER.



If IV unavailable, 5 mg IM may be administered.

Additional doses up to a maximum total dose 10 mg require medical consultation for all providers.

If patient seizures are refractory to treatment, consider IO administration of midazolam.

If midazolam is not available, consider diazepam.


2.5 mg increments SLOW IVP/IM (IM requires all providers to obtain medical consultation).

B. ALTERED MENTAL STATUS: SEIZURES (Continued)

Maximum total dose 10 mg

If patient is in status, consider IO administration of diazepam.

If suspected severe nerve agent exposure, providers may administer midazolam 5 mg IM or diazepam (CANA) without medical consultation.

- e) Establish IV access with LR.
- f) If patient is pregnant, actively seizing, consider magnesium sulfate 4 grams IV/IO over 10 minutes (mixed in 50 - 100 mL of approved diluent).
- g)  If seizures persist, consult for second dose of magnesium sulfate.



IF PATIENT IS PREGNANT, USE MIDAZOLAM FOLLOWED BY MAGNESIUM SULFATE. MEDICAL CONSULTATION REQUIRED FOR PREGNANT PATIENTS WHO MAY REQUIRE LARGER DOSES OF MIDAZOLAM TO CONTROL SEIZURES.



IF, FOLLOWING ADMINISTRATION OF MAGNESIUM SULFATE, PATIENT EXHIBITS SIGNS OF TOXICITY, CONSIDER ADMINISTRATION OF CALCIUM CHLORIDE. CONSIDER CALCIUM CHLORIDE 500 MG IVP FOR RESPIRATORY DEPRESSION, DECREASED REFLEXES, FLACCID PARALYSIS, AND APNEA FOLLOWING MAGNESIUM SULFATE ADMINISTRATION. MEDICAL CONSULTATION REQUIRED.



-
- h) If the patient is still seizing:

- (1) DO NOT RESTRAIN.
- (2) Protect from further injury.
- (3) Consider underlying cause of seizure.

- i) When seizure activity has stopped:

- (1) Identify and treat any injuries.
- (2) If patient is a known diabetic, glucose paste (10–15 grams) should be administered between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.



- j) Use glucometer and treat accordingly.
- k) The paramedic may assist patients with the administration of their prescribed benzodiazepine.


B. ALTERED MENTAL STATUS: SEIZURES (Continued)

- l) Consider midazolam for seizures lasting greater than 10 minutes.
If patient has no IV or IO in place:
Administer midazolam 0.2 mg/kg IN or IM. Maximum total dose 5 mg.

If IV or IO is already in place:
Administer midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes. Maximum total dose 5 mg.
- m) If patient is pregnant, actively seizing, consider magnesium sulfate 4 grams IV/IO over 10 minutes (mixed in 50 - 100 mL of approved diluent).
- n) Establish IV/IO access with LR.
- o) Administer fluid bolus, if appropriate
20 mL/kg of LR IV/IO.



FOR A CHILD ACTIVELY SEIZING, ADMINISTER MIDAZOLAM IN/IM AND RESERVE IO FOR LIFE-THREATENING ILLNESS.

- p) Additional doses up to a maximum total dose 5 mg require medical consultation for all providers.
 -  If patient's seizures are refractory to treatment, consider IO administration of midazolam.
If midazolam is not available, consider diazepam for seizures lasting greater than 10 minutes (paramedic may perform without consult for patients with active seizures).
Up to 0.2 mg/kg rectal
Maximum total dose 10 mg
OR
0.1 mg/kg in 2.5 mg increments SLOW IVP/IO/IM (IM requires all providers to obtain medical consultation.)
Maximum total dose 5 mg
If suspected severe nerve agent exposure, providers may administer midazolam as above or diazepam (CANA) without medical consultation.

4. Continue General Patient Care.

C. ALTERED MENTAL STATUS: UNRESPONSIVE PERSON

1. Initiate General Patient Care.

2. Presentation

Patients may exhibit confusion, focal motor sensory deficit, unusual behavior, unresponsiveness to verbal or painful stimulus.



ALCOHOL CAN CAUSE ALTERED MENTAL STATUS BUT IS NOT COMMONLY A CAUSE OF TOTAL UNRESPONSIVENESS TO PAIN.



3. Treatment

a) Obtain pulse oximetry, if available.

b) Administer glucose paste (10–15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.

c) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.

2 mg intranasal atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)



d) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone

0.4–2 mg IVP/IO (titrated)/IM/IN (If delivery device is available—divide administration of the dose equally between the nares to a maximum of 1 mL per nare)

Maximum single dose 0.4–2 mg

e) Establish IV access with LR.

Administer fluid bolus, if appropriate.


20 mL/kg of LR IV

f) Titrate to a systolic pressure of 100 mmHg.

g) Consider obtaining blood sample using closed system.

h) Use glucometer and treat accordingly.

i) Consider an additional dose of naloxone.

j)  Consider additional fluid administration

Maximum 2,000 mL without medical consultation.

F. CARDIAC EMERGENCIES: CARDIAC GUIDELINES



1. The following algorithmic and standard formatted sections pertain to cardiac emergencies. Several guidelines apply to all algorithms when assessing and treating cardiac patients. These guidelines are:
 - a) When the patient's condition changes, indicating the transition to a new treatment algorithm, the new treatment shall take into account prior therapy (e.g., previously administered medications).
 - b) As BLS/ALS guidelines indicate, definitive airway control is preferable; if this can be achieved, along with other initial interventions, then the earlier the better. However, defibrillation is more important initially if the patient can be ventilated without intubation.
 - c) Cardiac Arrest: **(NEW '17)**
Immediately start CPR with C-A-B (compressions – airway – breathing) and apply AED or manual defibrillator as soon as possible; shock if indicated. Continue compressions while charging.
The goal is to defibrillate as soon after stopping CPR as possible (ideally for manual defibrillator, in less than 5 seconds).
After single shock, immediately restart CPR (do not perform pulse or EKG rhythm check) for 2 minutes, then assess for pulse and rhythm and apply single shock if indicated. Repeat this sequence of single shocks and 2 minutes of CPR.



SOME AEDs MAY NOT CURRENTLY DELIVER THE REFERENCED JOULE SETTING NOR ALLOW FOR SINGLE SHOCK DELIVERY. THE AED INDUSTRY WILL BE IMPLEMENTING THESE CHANGES OVER TIME, WHICH WILL BE A MULTI-YEAR PROCESS. WHEN IN DOUBT FOLLOW THE AED PROMPT.

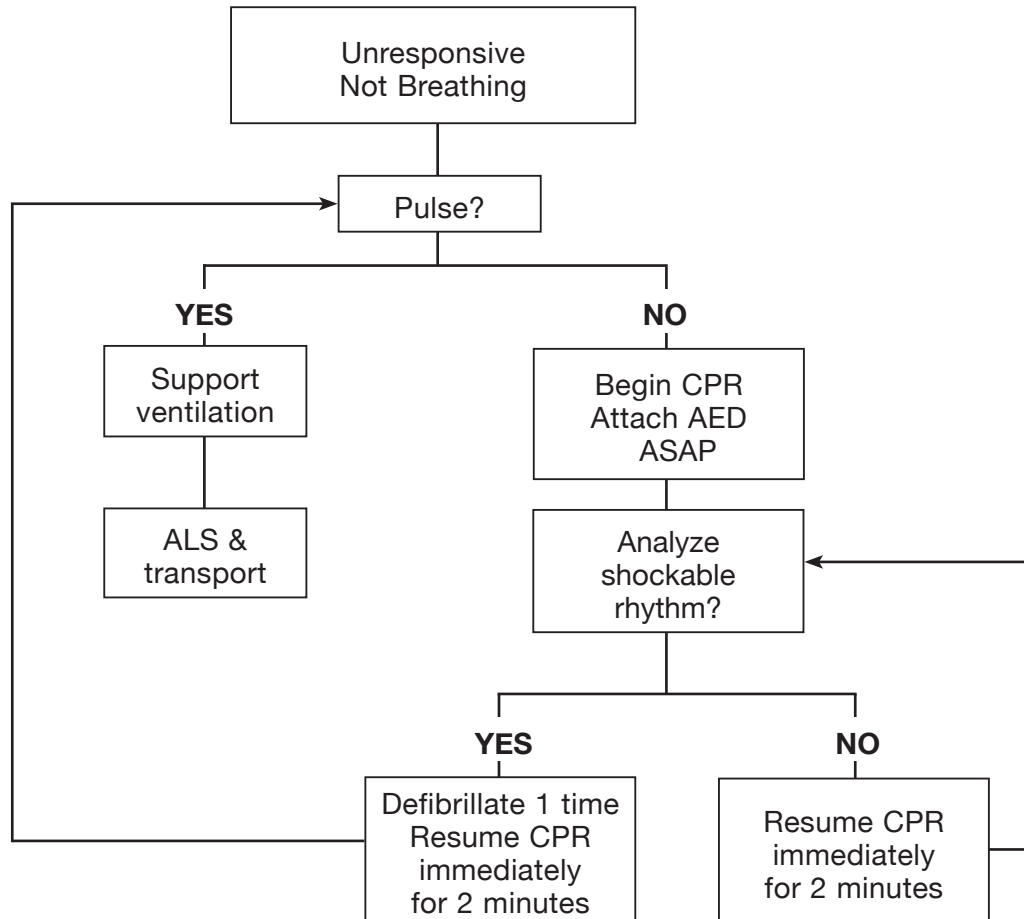


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- d) Only in a pediatric or neonatal arrest situation, naloxone, atropine, and epinephrine, can be administered via the ET route. Medications administered for pediatric patients via the endotracheal tube route shall be 2–2.5 times the IV dose for naloxone, and atropine, and ten times the IV dose for epinephrine (1:1,000). All ET medications shall be diluted in 5 mL of LR for pediatric patients.



2.

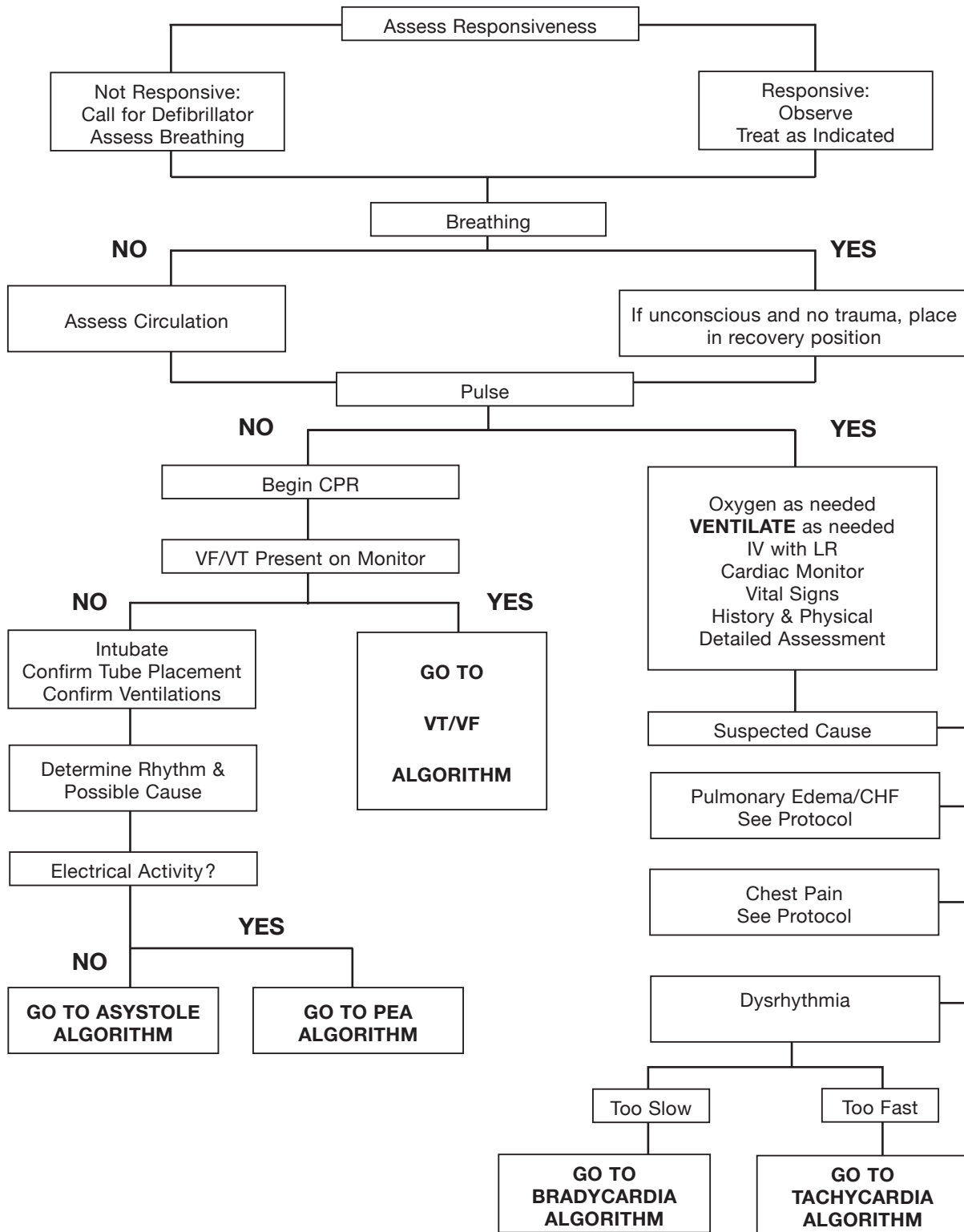
UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR BLS





3.

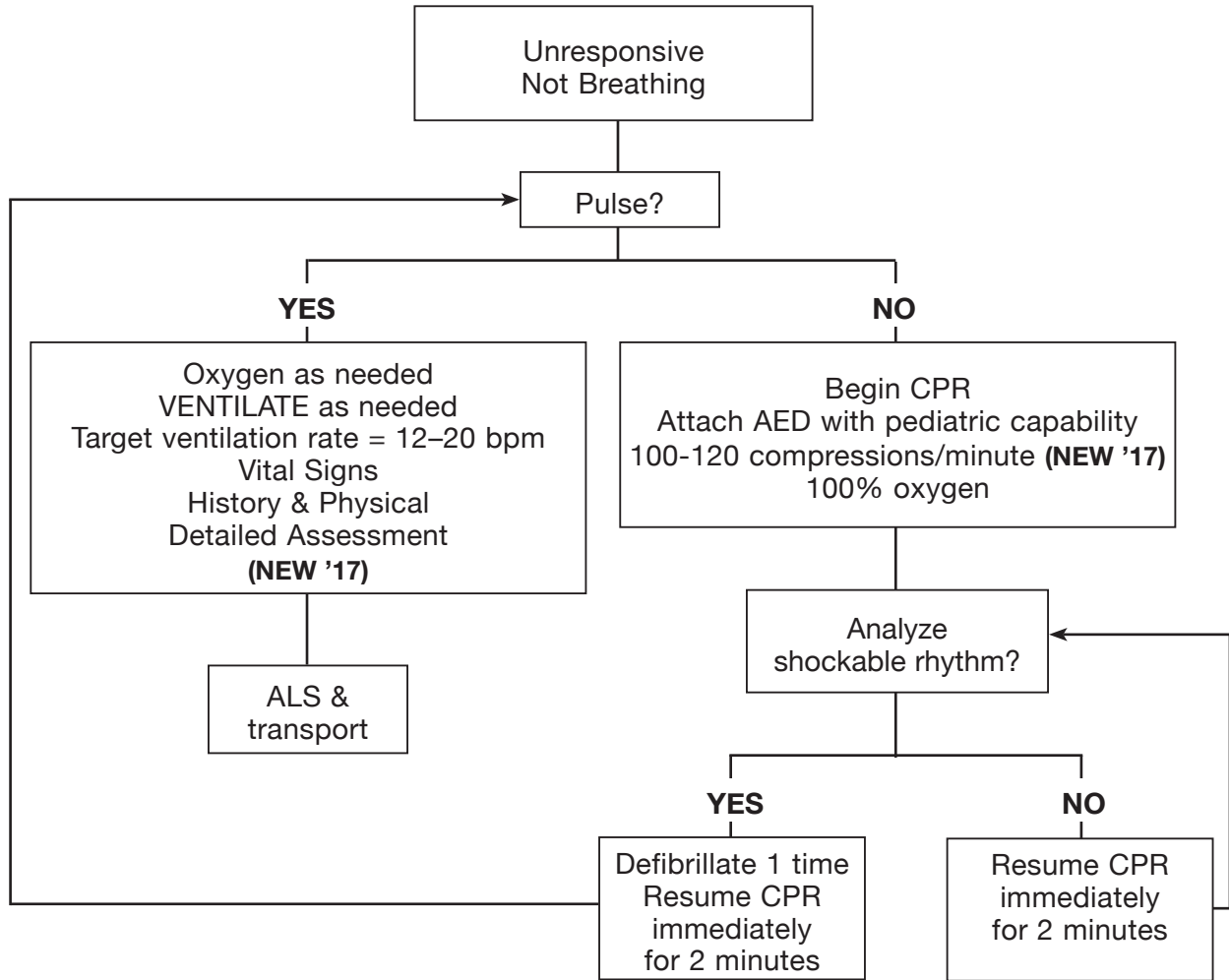
UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR ALS





4.

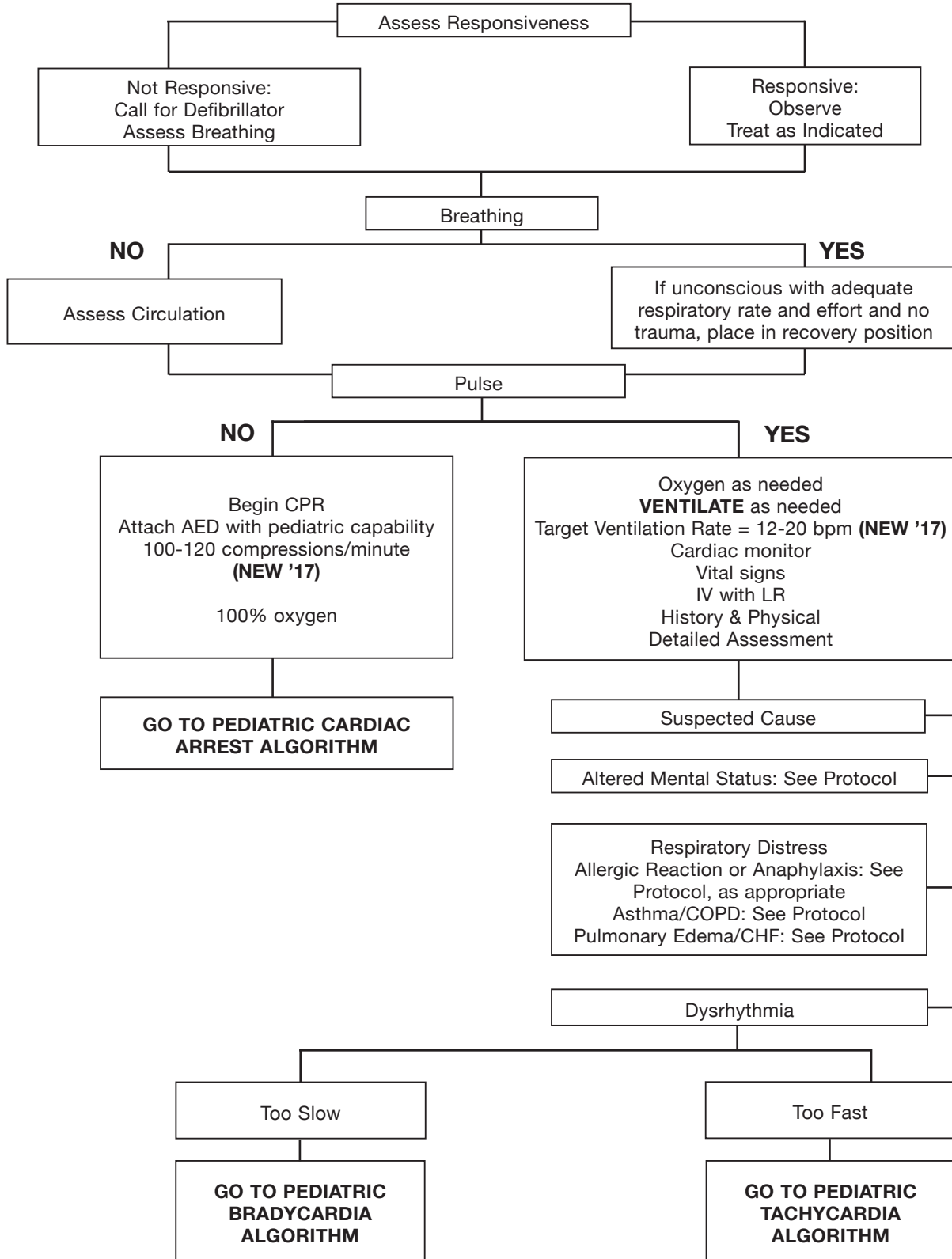
**UNIVERSAL ALGORITHM FOR PEDIATRIC
(GREATER THAN 1 HOUR AND LESS THAN 13 YEARS OF AGE)
EMERGENCY CARDIAC CARE FOR BLS
(If less than 1 hour old, refer to Newly Born Protocol)
(NEW '17)**





5.

**UNIVERSAL ALGORITHM FOR PEDIATRIC
(GREATER THAN 1 HOUR AND LESS THAN 13 YEARS OF AGE)
EMERGENCY CARDIAC CARE FOR ALS
(If less than 1 hour old, refer to Newly Born Protocol) (NEW '17)**



G. CARDIAC EMERGENCIES: BRADYCARDIA

1. Initiate General Patient Care.

2. Presentation

Patient may present with a slow heart rate and chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, congestive heart failure, and/or acute myocardial infarction.

3. Treatment



a) Place patient in position of comfort.

b) Assess and treat for shock, if indicated.

c) Continuously monitor airway and reassess vital signs every 5 minutes.




d) Establish IV access with LR.

e) If patient is hemodynamically unstable: initiate transcutaneous pacing (TCP).

f) If TCP is unsuccessful or not available, administer atropine:

0.5–1 mg IVP

Atropine should be given in repeat doses in 3–5 minute intervals up to a total of 0.04 mg/kg.

g)  Consider dopamine
2–20 **mcg**/kg/min

h)  If patient is hemodynamically stable and in Type II, second-degree AV Block or third-degree AV Block:

(1) Consider/prepare for TCP.

(2) If patient develops discomfort with TCP
Administer opioid per Pain Management Protocol.

OR


Consider midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg.

(Reduce by 50% for patients 69 years or older.)

i) Refer to appropriate algorithm.

H. CARDIAC EMERGENCIES: TACHYCARDIA

1. Initiate General Patient Care.
2. Presentation
Patient may present with chest pain, shortness of breath, decreased level of consciousness, low blood pressure, hypoperfusion, pulmonary congestion, congestive heart failure, and/or acute myocardial infarction.

3.  Treatment
 - a) Place patient in position of comfort.
 - b) Assess and treat for shock, if indicated.
 - c) Continuously monitor airway and reassess vital signs every 5 minutes.



-
- d) Establish IV access with LR.
 - e) Verify presence of pulse.
 - f) If no pulse present, treat as pulseless VF/VT.
 - g) If patient is hemodynamically unstable with a ventricular rate greater than 150, prepare for immediate cardioversion.
 - h) If patient is hemodynamically stable, identify rhythm and proceed to appropriate algorithm.




-
- i) Place patient in position of comfort.
 - j) Assess and treat for shock, if indicated.
 - k) Continuously monitor airway and reassess vital signs every 5 minutes.



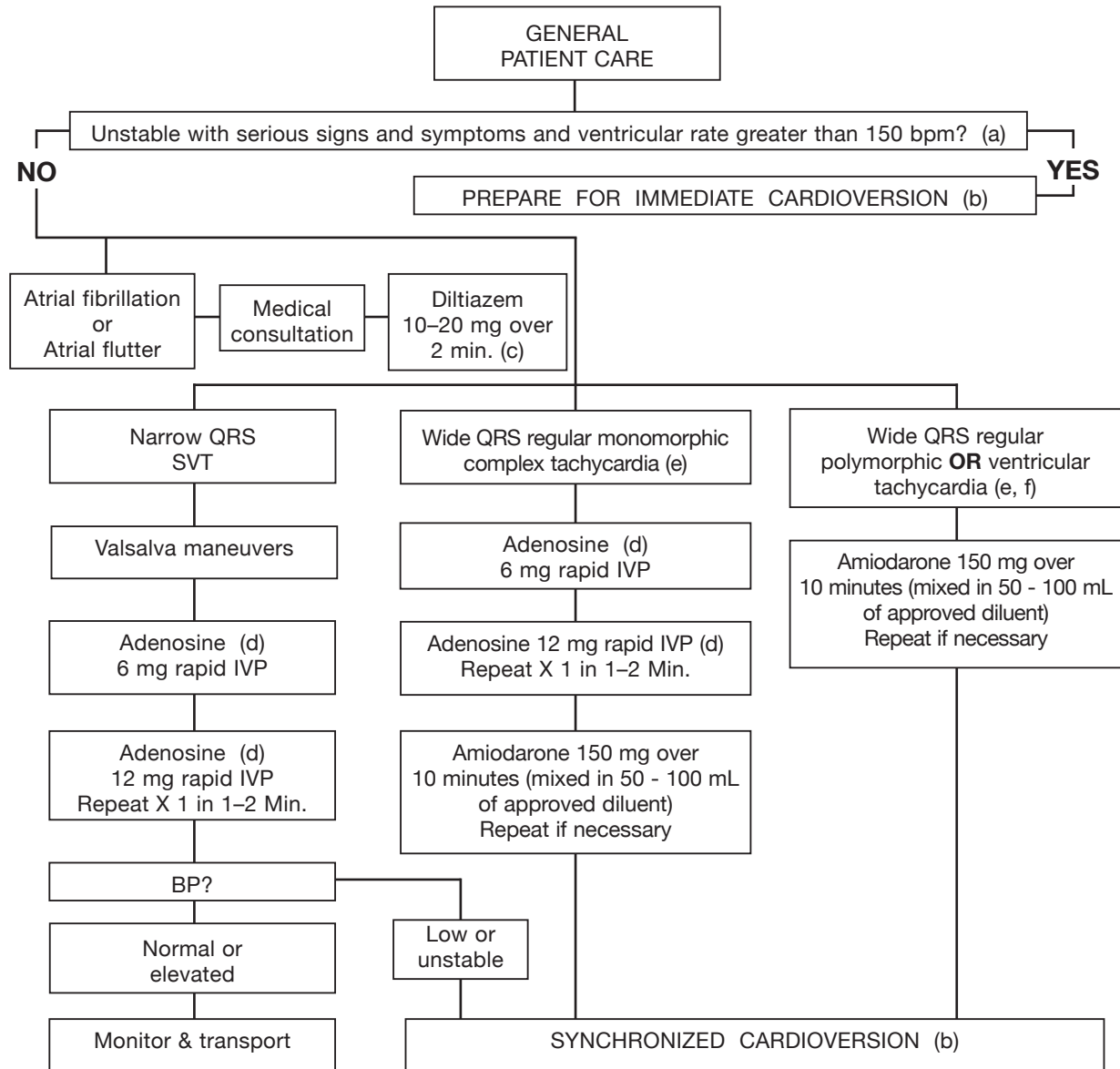
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- l) Establish IV access with LR.
 - m) Verify presence of pulse.
 - n) If no pulse present, treat as pulseless VF/VT.

H. CARDIAC EMERGENCIES: TACHYCARDIA (Continued)

- o)  If patient is hemodynamically unstable with a ventricular rate greater than 220 for an infant or 180 for a child, prepare for immediate cardioversion.
(NEW '17)
 - p) If patient is hemodynamically stable, identify rhythm and proceed to appropriate algorithm.
4. Continue General Patient Care.




5.

ADULT TACHYCARDIA ALGORITHM

(a) - Unstable condition must be related to the tachycardia. Signs and symptoms may include chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, CHF, and/or AMI.

(b) - Consider sedation (midazolam). However, overall patient status, including BP, may affect ability to administer sedative.

(c) -  Consider calcium chloride 500 mg IVP for hypotension induced by diltiazem. Medical consultation required. If rate does not slow in 15 minutes, administer a second dose of diltiazem (15-25 mg over 2 minutes). Medical consultation required.

(d) - Be prepared for up to 40 seconds of asystole.

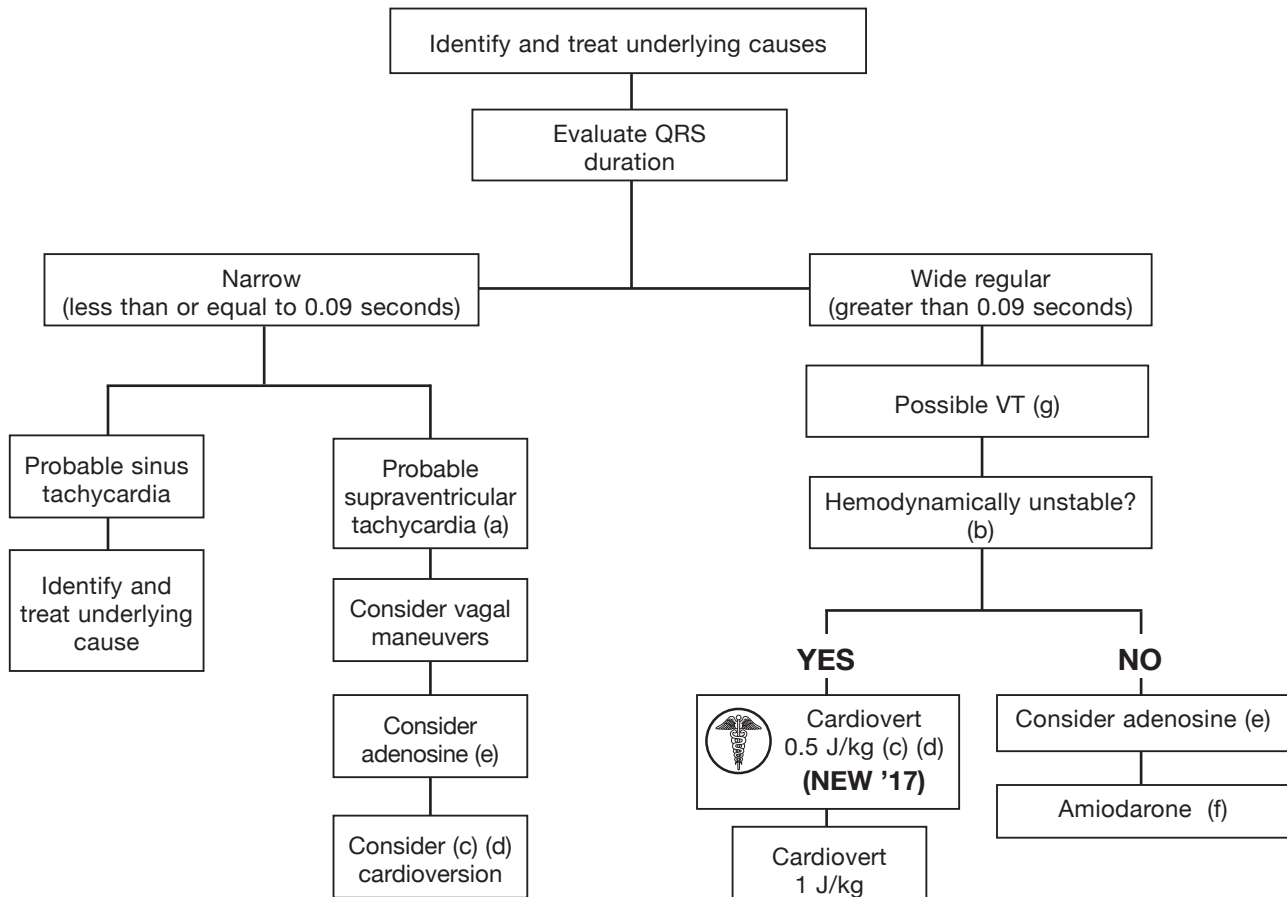
(e) - If **irregular**, **DO NOT** administer amiodarone or adenosine. Cardiovert if unstable.

(f) - If torsades de pointes, administer magnesium sulfate (1-2 grams IV/IO over 2 minutes).



6.


PEDIATRIC TACHYCARDIA ALGORITHM (If less than 1 hour old, refer to the Newly Born Protocol)




(a) - Ventricular Heart Rates in excess of: Infant 220 bpm or Pediatric 180 bpm

(b) - Hemodynamically unstable is defined as a systolic blood pressure less than 60 in neonates (patients from birth to 28 days old), less than 70 in infants (patients less than 1 year of age), less than $[70 + (2 \times \text{years}) = \text{systolic BP}]$ for patients greater than 1 year of age, altered mental status with hypoperfusion evidenced by delayed capillary refill, pallor, or peripheral cyanosis.

(c) - If calculated joules setting is lower than cardioversion device is able to deliver, use the lowest joules setting possible or obtain medical consultation.

(d) -  Considering sedation (midazolam with medical consultation). However, overall patient status, including BP, may affect ability to administer sedative.


(e) - Adenosine: 0.1 mg/kg rapid IV/IO, maximum 6 mg. Second and third doses 0.2 mg/kg rapid IV/IO, maximum single dose 12 mg. Be prepared for up to 40 seconds of asystole. (Contraindicated in polymorphic or irregular wide complex tachycardia)

(f) -  Amiodarone: 5 mg/kg IV/IO over 20 minutes (mixed in 50 - 100 mL of approved diluent). Obtain 12-lead EKG prior to administration of amiodarone.

(g) If torsades de pointes, administer magnesium sulfate (25 mg/kg IV/IO to a maximum of 2 grams over 2 minutes).

I. CARDIAC EMERGENCIES: CARDIAC ARREST

1. Initiate General Patient Care.
2. Presentation
Patient must be unconscious, apneic, and pulseless.

3.  Treatment
 - a) Perform CPR.



ONCE CONFIRMED PULSELESS, HIGH-QUALITY CONTINUOUS CPR WITH FREQUENT PROVIDER ROTATION IS AN ESSENTIAL COMPONENT IN THE SUCCESSFUL RESUSCITATION OF THE ARRESTED PATIENT. THIS MAY BE ACCOMPLISHED THROUGH MANUAL OR MECHANICAL MEANS, AS APPROPRIATE, IN ADULTS. MECHANICAL METHODS OF COMPRESSION ARE NOT INDICATED FOR INFANTS OR CHILDREN WHO HAVE NOT YET REACHED THEIR 13TH BIRTHDAY. **(NEW '17)**.

PERFORM CPR WHILE PREPARING FOR RHYTHM ANALYSIS AND DEFIBRILLATION.

- b) Utilize AED as appropriate.
- c) Transport
 - (1) If no shock indicated, consider Termination of Resuscitation Protocol or transport immediately.
 - (2) If shock indicated, defibrillate and resume CPR. Consider Termination of Resuscitation Protocol or transport ASAP.
 - (3) If ROSC, refer to ROSC Protocol.
 - (4) If no ROSC, consider Termination of Resuscitation Protocol or transport to the closest appropriate facility.



- d) Identify rhythm and treat according to appropriate algorithm.
- e) If no ROSC, consider Termination of Resuscitation Protocol or transport to the closest appropriate facility.
- f) If ROSC, refer to ROSC Protocol.



- g) Perform CPR.
- h) Utilize AED as appropriate (see AED Procedure).
- i) If no shock indicated, continue CPR and transport ASAP.
- j) If shock indicated, defibrillate, continue CPR, and transport ASAP.



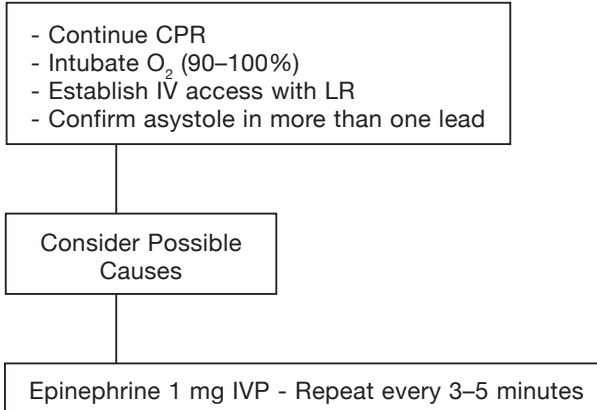
For patients who have not reached their 18th birthday:

- k) Identify rhythm and treat according to appropriate algorithm.
- l) If no ROSC, transport to the closest appropriate facility.
- m) If ROSC, perform 12-Lead EKG and transport the patient to Children's National Health System or Johns Hopkins Children's Center by ground or medevac. If arrival time is greater than 30 minutes to either of these destinations, transport to the closest appropriate ED.





4.

ADULT ASYSTOLE ALGORITHM




Consider possible causes of asystole.
 (Parenthesis) = Possible Therapies and Treatments


Hypovolemia	(Volume Infusion) (c)
Cardiac Tamponade	(Volume Infusion) (c)
Tension Pneumothorax	(Needle Decompression Thorocostomy–NDT)
Massive Pulmonary Embolism	
Massive AMI	
Drug Overdose	(a,b)
Hypoxia	(Ventilation)
Hypothermia	(Warming)
Acidosis	(a)
Hyperkalemia	(a,b)

- (a) -  Sodium bicarbonate 1 mEq/kg, with medical consultation. See sodium bicarbonate.
- (b) -  Calcium chloride, 0.5–1 gram IVP, with medical consultation. See calcium chloride.
- (c) - Volume infusion is 20 mL/kg.

J. RETURN OF SPONTANEOUS CIRCULATION (ROSC) (continued)

- l) If VF or VT during arrest and amiodarone not yet given, consider amiodarone 150 mg IV/IO over 10 minutes (mixed in 50 - 100 mL of approved diluent).^(a)
- m) Initiate transport to appropriate facility. Most patients should go to a Cardiac Interventional Center. Consider helicopter transport.
 - (1) Except as under (2) below, most patients should be transported to a Cardiac Interventional Center.
 - (2) Transport to nearest ED
 - (a) If obvious non-cardiac cause for arrest (e.g., drowning, asphyxiation, opiate overdose), (If cause for arrest is in any way uncertain, patient must be transported to Cardiac Interventional Center, except as under b and c below)
OR
 - (b) If transport time to Cardiac Interventional Center is more than 45 minutes greater than transport time to nearest ED,
OR
 -  (c) With medical consultation, if patient's clinical instability will not allow for safe transport to Cardiac Interventional Center due to transport time.
 - (3) Medical Consultation may assist with determination of destination.



-
- (4) Except as under (5) below, most pediatric patients should be transported to Children's National Health System or Johns Hopkins Children's Center. Consider helicopter transport.
 - (5) Transport to nearest ED
 - (a) If transport time to Children's National Health System or Johns Hopkins Children's Center is more than 30 minutes greater than transport time to nearest ED,
OR
 -  (b) With medical consultation, if patient's clinical instability will not allow for safe transport to one of the above centers due to transport time.



ALL POST-CARDIAC ARREST PATIENTS ARE PRIORITY 1, AND REQUIRE MEDICAL CONSULTATION. PEDIATRIC PATIENTS REQUIRE CONSULTATION WITH A PEDIATRIC BASE STATION AND MAY ASSIST IN DESTINATION DETERMINATION.

4. Continue General Patient Care.

- (a) Presence of a perfusing sinus rhythm is necessary for the administration of amiodarone for the ROSC patient post VF/VT conversion.

K. TERMINATION OF RESUSCITATION (Medical and Traumatic)



IF ANY DOUBT EXISTS, INITIATE RESUSCITATION AND TRANSPORT

1. PURPOSE

This protocol is designed to guide the provider in determining a futile resuscitation and managing the patient after this determination.

2. PROCEDURE


a) Exclusions to this protocol.

- (1) If arrest is believed to be secondary to hypothermia or submersion, treat according to appropriate protocol and transport to the nearest appropriate facility.
- (2) If patient is pregnant, treat according to appropriate protocol and transport to the nearest appropriate facility.
- (3) If patient has not reached their 18th birthday, treat according to appropriate protocol and transport to the nearest appropriate facility.



IF PATIENT HAS NOT REACHED THEIR 18TH BIRTHDAY, TERMINATION OF RESUSCITATION MAY BE CONSIDERED IN RARE CIRCUMSTANCES. CONTACT A PEDIATRIC BASE STATION (AT JOHNS HOPKINS CHILDREN'S CENTER OR CHILDREN'S NATIONAL HEALTH SYSTEM) FOR ONLINE MEDICAL DIRECTION PRIOR TO TERMINATION. IF ONLINE CONSULTATION WITH A PEDIATRIC BASE STATION IS NOT POSSIBLE, TREAT ACCORDING TO APPROPRIATE PROTOCOL. **(NEW '17)**


b) Medical Arrest

- (1) EMS providers may terminate resuscitation without medical consult when all three criteria are met.
 - (a) The arrest was not witnessed by an EMS provider (and patient is unresponsive, pulseless, and apneic). **AND**
 - (b) There is no shockable rhythm identified by an AED or there is asystole or PEA on a manual cardiac monitor. **AND**
 - (c) There is no return of spontaneous circulation (ROSC) prior to decision to terminate resuscitation despite appropriate field EMS treatment that includes 15 minutes of minimally-interrupted EMS CPR. **OR**
- (2)  EMS providers may terminate resuscitation with medical consult when there is no ROSC prior to decision to terminate resuscitation despite appropriate field EMS treatment that includes 15 minutes of minimally-interrupted CPR in the presence of an arrest witnessed by an EMS provider or the presence of a shockable rhythm.

c) Trauma Arrest

- (1) EMS providers may terminate resuscitation without medical consult when both criteria are met. (If medical etiology is suspected, use "Medical Arrest" above.)
 - (a) There are no signs of life. **AND**
 - (b) The patient is in asystole. **OR**

K. TERMINATION OF RESUSCITATION (Medical and Traumatic) (Continued)

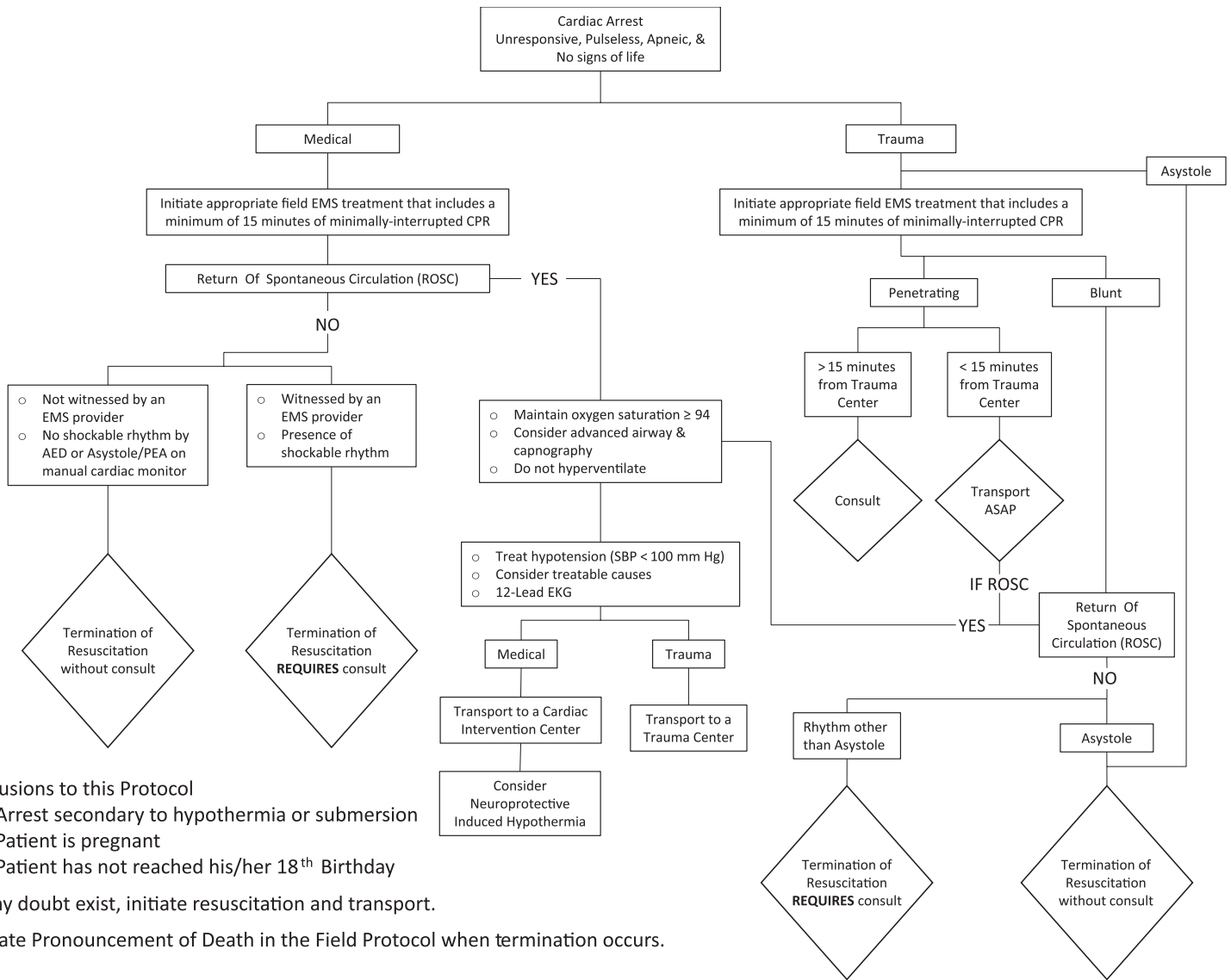
- (2)  EMS providers may terminate resuscitation with medical consult when both criteria are met in either blunt or penetrating trauma.
- (a) Blunt
 - (i) There are no signs of life. **AND**
 - (ii) The patient is in a rhythm other than asystole and there is no ROSC despite 15 minutes of appropriate treatment that includes 15 minutes of minimally-interrupted CPR.
 - (b) Penetrating
 - (i) There are no signs of life. **AND**
 - (ii) The patient is in a rhythm other than asystole and there is no ROSC. If less than 15 minutes from a trauma center, transport the patient. If transport time exceeds 15 minutes, consult.



THERE ARE SOME CAUSES OF TRAUMATIC CARDIOPULMONARY ARREST (E.G., PENETRATING TRAUMA) THAT MAY BE REVERSED IF APPROPRIATELY AND EMERGENTLY MANAGED. THEREFORE, EMS PROVIDERS SHOULD FOLLOW APPROPRIATE PROTOCOLS FOR TRAUMATIC ARREST INCLUDING APPROPRIATE AIRWAY MANAGEMENT AND CONSIDERATION FOR BILATERAL NEEDLE DECOMPRESSION THORACOSTOMY. HOWEVER, EVEN WITH THE APPLICATION OF THESE MANEUVERS, ASYSTOLE AND PULSELESSNESS FOR GREATER THAN 10 MINUTES ARE INDEPENDENT PREDICTORS OF MORTALITY.

- d) Pronouncement of Death in the Field Protocol.

TERMINATION OF RESUSCITATION ALGORITHM



Exclusions to this Protocol

- Arrest secondary to hypothermia or submersion
- Patient is pregnant
- Patient has not reached his/her 18th Birthday

If any doubt exist, initiate resuscitation and transport.

Initiate Pronouncement of Death in the Field Protocol when termination occurs.

L. PRONOUNCEMENT OF DEATH IN THE FIELD

1. PURPOSE



This protocol is designed to guide the EMS provider in pronouncing death in the field.

Health General Article §5-202 provides that:

- a) An individual is dead if, based on ordinary standards of medical practice, the individual has sustained either:
 - (1) Irreversible cessation of circulatory and respiratory functions; or
 - (2) Irreversible cessation of all functions of the entire brain, including the brain stem.

2. INDICATIONS

EMS providers may pronounce the death of a patient when one or more of the following criteria has been met.

- a) Decapitation
- b) Rigor mortis
- c) Decomposition
- d) Dependent lividity
- e)  Pulseless, apneic patient in a multi-casualty incident where system resources are required for the stabilization of living patients
- f)  Pulseless, apneic patient with an injury not compatible with life (with the exception of an obviously pregnant female where resuscitation attempts should be initiated and the patient transported to the nearest appropriate facility)
- g) The EMS provider has terminated resuscitation per the Termination of Resuscitation Protocol.

3. PROCEDURE

- a) Confirm that the patient is unresponsive, pulseless, and apneic.
- b) The patient who meets criteria in 2.e may be “black” tagged during triage (by a BLS or ALS provider), but asystole must be confirmed by ALS provider before a formal pronouncement of death.
- c) The patient who meets criteria in 2.f must be confirmed to be in asystole by ALS provider before a formal pronouncement of death. If the condition of the remains precludes obtaining a cardiac rhythm to confirm asystole (e.g., incineration, severe disruption of the torso, etc.), this must be documented on the patient care report.
- d) Document the exact time and location of the pronouncement of death.
- e) Notify law enforcement and follow local jurisdictional policies or, if death is pronounced during transport, deliver patient to emergency department and follow hospital policies.

M. EMS DNR/MOLST



AS OF JANUARY 1, 2002, A COPY OF THE MARYLAND EMS DNR ORDER FORM CAN BE ACCEPTED IN LIEU OF THE ORIGINAL.

AS OF OCTOBER 1, 2011, THE MARYLAND MOLST FORM CAN BE ACCEPTED IN LIEU OF THE MARYLAND EMS/DNR FORM.

1. PREFACE EMS/DNR Order or MOLST forms, bracelets, and necklaces will recognize three patient options for care prior to arrest: (pg. 15 ch. A)
 - a) **Option A (ALS) (MOLST A1)**—Maximal (Restorative) Care (with intubation) Before Arrest, then DNR
 - b) **Option A (DNI) (MOLST A2)**—Comprehensive Efforts to Prevent Arrest But Do Not Intubate, then DNR
 - c) **Option B (BLS) (MOLST B)**—Limited (Palliative) Care Only Before Arrest, then DNR
2. VALID EMS/DNR or MOLST BRACELET WITH INSERT or AUTHORIZED METAL EMBLEM HAS THE SAME EFFECT AS THE FORM. (pg. 17 ch. D)
 - a) Typically only one EMS/DNR device is needed to initiate the EMS/DNR Protocol.
 - b) EMS providers should only request a second instrument (e.g., a bracelet when a form has already been presented) if there is reason to question the validity of the first produced notification device.
3. RECIPROCITY (pg. 19 ch. E)
 - a) A standardized EMS/DNR Order from another state may be honored.
 - b) Out-of-state EMS/DNR Orders shall be followed to the full extent that is permissible by the Maryland Medical Protocols for Emergency Medical Services Providers. If there is misunderstanding with family members or others present at the scene or if there are other concerns about following the out of state EMS/DNR Order, contact online medical direction for assistance.
 - c) See chart in “EMS/DNR Program” booklet for how other states will treat Maryland devices.
4. ORAL EMS/DNR ORDERS (pg. 19 ch. G)
 - a) EMS providers may follow an oral EMS/DNR Order directly from a Maryland-licensed physician (MD or DO) or nurse practitioner who is physically present “on-site.” EMS shall not accept orders from private physician attendings or nurse practitioner by telephone.
 - b) **EMS providers may follow an oral EMS/DNR Order from a Maryland-licensed physician “on-line” via the EMS Communications System (e.g., radio or telephone consult that is routed through a public service access point (PSAP) for audio recording).**
5. ACCEPTABLE AND UNACCEPTABLE EMS/DNR ORDERS (pg. 19 ch. H)
 - a) The following are acceptable for implementing the EMS/DNR Protocol:
 - (1) Original Maryland EMS/DNR Order Form

M. EMS DNR/MOLST (Continued)

- (2) Copy of the Maryland EMS/DNR Order Form (including an electronic copy on a computer or device for patient care decisions. The sending facility is required to provide a copy of the EMS/DNR Order or MOLST to the transport crew (listed in the instructions of the MOLST form and COMAR 10.01.21.03)). **(NEW '17)**
 - (3) Other State EMS/DNR Order Form
 - (4) Maryland EMS/DNR Bracelet Insert
 - (5) Medic Alert DNR Bracelet or Necklace
 - (6) Oral DNR Order from EMS System Medical Consultation
 - (7) Oral DNR Order from other on-site physician or nurse practitioner
 - (8) Maryland MOLST Form
 - (9) Maryland MOLST Bracelet
 - b) The following **are not** acceptable for implementing the EMS/DNR Protocol:
 - (1) Advance directives without an EMS/DNR Order
 - (2) Facility-specific DNR orders
 - (3) Notes in medical records
 - (4) Prescription pad orders
 - (5) DNR stickers
 - (6) An oral request from someone other than a physician or nurse practitioner
 - (7) An oral order from an attending physician or nurse practitioner who is not on site
 - (8) Any other device or instrument not listed above as acceptable
6. VALIDITY OF EARLIER VERSIONS OF EMS/DNR ORDERS (pg. 22 ch. K)
- a) Older versions of EMS/DNR Orders — i.e., initial version (1995 and first revision, 4/1/96) — **continue to be valid and need not be updated** unless the patient or authorized decision maker wishes to take advantage of new features available in the newer forms.
 - b) EMS providers should treat older versions of EMS/DNR order (pre 7/1/98) as “Option B (BLS) - Limited (Palliative) Care Only Before Arrest, Then DNR.”
7. REVOCATION OF AN EMS/DNR ORDER (pg. 24 ch. M)
- a) An EMS/DNR Order may be revoked at any time by:
 - (1) Physical cancellation or destruction of all EMS/DNR Order devices; or
 - (2) An oral statement by the patient made directly to emergency medical services personnel requesting only palliative care or resuscitation. If the patient revokes an EMS/DNR order orally, the EMS/DNR Order notification devices do not need to be destroyed. EMS providers should thoroughly document the circumstances of the revocation. An oral revocation by a patient is only good for the single response or transport for which it was issued.
 - b) An authorized decision-maker, other than the patient, cannot revoke an EMS/DNR Order **orally**. Because of the difficulty in identifying authorized decision makers in emergent situations, it is incumbent upon an authorized decision maker who has authority to revoke an EMS/DNR Order to either destroy or withhold all EMS/DNR Order devices, if they wish resuscitation for the patient.

M. EMS DNR/MOLST (Continued)

- c) Section 5-610 of the Health Care Decision Act (Health General Article, Annotated Code of Maryland) makes willful concealment, cancellation, defacement, obliteration, or damage of an advance directive (including EMS/DNR Orders), without the patient's or authorized decision maker's consent, a misdemeanor subject to a fine not exceeding \$10,000, imprisonment not exceeding one year, or both.
8. ANTICIPATED LOCATIONS FOR EMS/DNR ORDER FORMS: (pg. 25 ch. N)
EMS personnel shall be directed to look for an EMS/DNR Order in the following places:
- a) About a patient's wrist, hung from a necklace, or safety-pinned to a patient's clothing.
 - b) At medical facilities, in the patient's chart.
 - c) In residences and domicile facilities, by the bedside, behind the patient's bedroom door, or on the refrigerator door.
 - d) In schools and educational institutions, in the nurse's office, health room, or with the student's attendant caregiver/aide.
 - e) Family or caregivers will be expected to retrieve the original EMS/DNR Order prior to the ambulance's arrival.
9. IDENTIFICATION OF PATIENT (pg. 25 ch. O)
- a) If the patient is able, the patient can self-identify during the initial assessment.
 - b) If the patient is unable to communicate, then family, caregivers, or bystanders can identify the patient for EMS providers.
 - c) If an EMS/DNR vinyl bracelet with insert or metal emblem (bracelet or necklace) is attached to a patient (on wrist, pendant from neck, pinned to clothing, etc.) the patient's identity can be reasonably assumed by EMS providers.
 - d) If an EMS/DNR vinyl bracelet insert or metal emblem (bracelet or necklace) is found detached from the patient, EMS personnel must treat it as an EMS/DNR Order form and identify the subject of the EMS/DNR Order as the patient. A valid bracelet insert alone, without the vinyl bracelet, is a valid EMS/DNR Order so long as EMS providers confirm the patient's identity (pg. 17 ch. D).
 - e) If EMS personnel are unable to ascertain with reasonable certainty, when required to do so, that the subject of the EMS/DNR Order is the patient, they may resuscitate the patient.
10. HEALTH PROVIDER/EMS PERSONNEL IMMUNITY (pg. 26 ch. R)
- a) General immunity provisions, such as Good Samaritan immunity for volunteers and sovereign immunity for government employees, may apply under specific circumstances.

M. EMS DNR/MOLST (Continued)

- (3) If, despite these efforts, the patient becomes pulseless or stops breathing spontaneously, EMS providers shall then withhold or withdraw cardiopulmonary resuscitation (including, but not limited to, CPR, cardiac pacing, defibrillation), withdrawal of active ventilatory assistance upon cardiac arrest, and withholding or withdrawal of drug therapy (e.g., chemical resuscitation).
- e) **OPTION A (DNI) (MOLST A2) – COMPREHENSIVE EFFORTS TO PREVENT ARREST BUT DO NOT INTUBATE, THEN DNR**
- (1) Option A (DNI) is exactly the same as Option A, which may include limited ventilatory support by CPAP or BiPAP, but Do Not Intubate.
 - (2) Therefore, inappropriate care for “Option A (DNI) – Comprehensive Efforts to Prevent Arrest but Do Not Intubate, then DNR” would be nasal or oral intubation.



IF MAXIMAL CARE IS SELECTED AND THE PATIENT’S CONDITION REQUIRES ALS, AN ALS UNIT SHOULD BE REQUESTED IF FEASIBLE GIVEN THE LOCATION OF THE INCIDENT RELATIVE TO THE NEAREST APPROPRIATE FACILITY, THE AVAILABILITY OF AN ALS UNIT, AND ITS ABILITY TO ARRIVE OR RENDEZVOUS IN A MEDICALLY APPROPRIATE PERIOD OF TIME.

- f) **OPTION B (MOLST B)– PALLIATIVE CARE PROTOCOL**
- (1) Supportive Care for Control of Signs and Symptoms
 - (a) Respiratory distress
 - (i) Open the airway using non-invasive means (e.g., chin lift, jaw thrust, finger sweep, nasopharyngeal airway, oropharyngeal airway, and Heimlich maneuver, **but** no laryngoscopy, no Magill forceps, no cricothyroidotomy, and no tracheostomy).
 - (ii) Administer O₂ as follows:
 - a. If the patient is not on a ventilator and would benefit from oxygen therapy, provide passive oxygen via nasal cannula or non-rebreather mask (but no positive pressure oxygen via ambu bag, demand valve, or ventilator).
 - b. If the patient is found on an outpatient ventilator and is not in cardiac arrest, maintain ventilatory support during transport to the hospital.
 - c. If the patient is found on an outpatient ventilator and is in cardiac arrest, contact on-line medical direction to consult about disconnecting the ventilator.
 - (iii) Maintain an open airway by non-invasive means (e.g., chin lift, jaw thrust, finger sweep, nasopharyngeal airway, oropharyngeal airway, and Heimlich maneuver, but no laryngoscope, no Magill forceps, no cricothyroidotomy, and no tracheostomy).
 - (iv) Suction as necessary.
 - (v) Position for comfort.

M. EMS DNR/MOLST (Continued)

- (b) External bleeding
 - (i) Standard treatment (direct pressure with dressing, tourniquet)
 - (ii) No IVs
- (c) Immobilize fractures using skills and devices that minimize pain.
- (d) Uncontrolled pain or other symptoms (e.g., severe nausea)
 - (i) Allow patient, family, or health care providers (other than the prehospital provider) to administer patient's prescribed medications. Such health care providers administering medication will not have to accompany the patient to the hospital.
 - (ii) Patient controlled analgesia (PCA) systems for pain medication delivery and other patient-controlled medication (PCM) systems shall be left in place in DNR patients and monitored to the extent possible according to the provider's level of certification or licensure.
 - (iii) For the patient with significant pain and/or pain with a prolonged transport, opioid may be administered.
- (e) Existing IV lines may be in place and if so, shall be monitored to the extent possible according to the provider's level of certification and licensure.
- (2) Inappropriate Care for a Palliative Care Patient
 - (a) Cardiac monitoring, including 12-lead EKG, pacing, cardioversion, and defibrillation
 - (b) Initiation of IV therapy (except for morphine and fentanyl administration for pain control as in 1 (d) (iii))
 - (c) EMS-initiated medications (except oxygen, and morphine or fentanyl administration for pain control as in 1 (d) (iii))
 - (d) CPR
 - (e) Intubation (alternative airway device, endotracheal, nasotracheal, or gastric tube)
 - (f) Active ventilatory assistance, unless on an outpatient ventilator (pg. 32 ch. 5)
- g) TRANSPORT
 - (1) Upon request of the patient, family, or caregivers and in lieu of transport to a hospital-based emergency department, EMS providers may transport Option B EMS/DNR patients who require transportation for pain control or symptom management or respite care to a specified inpatient hospice facility.
 - (2) A current list of those facilities is available from the MIEMSS Program Development Office 410-706-4367 (4DNR). The receiving status of a particular facility can be ascertained from EMRC (24 hours a day) by EMS radio, EMSTEL, or red phone, or by calling 800-492-3805.

M. EMS DNR/MOLST (Continued)

- (3) The State EMS Board may authorize additional facilities under 6.2.2 or 6.2.4 (pp. 35-36), if recognized in the future by DHMH in accordance with 42 CFR 418.98 and 42 CFR 418.100. EMS jurisdictions and commercial ambulance services will be notified by MIEMSS of any facilities that become eligible and elect to receive patients by ambulance, become ineligible, or elect to discontinue their participation.
 - (4) Take a copy of EMS/DNR Order or MOLST form, vinyl bracelet with insert, or metal emblem (bracelet or necklace) to the hospital with the patient. If returning the patient from a previous transport, be sure to request a copy of the EMS/DNR Order form, vinyl bracelet with insert, or metal emblem (bracelet or necklace) from the staff. The sending facility is required to provide a copy of the EMS/DNR Order or MOLST to the transport crew (listed in the instructions of the MOLST form and COMAR 10.01.21.03). **(NEW '17)**
- h) COMMUNICATIONS
- (1) Consultation requirements for Option A EMS/DNR patients shall be dictated by the Maryland EMS Medical Protocols in accordance with the patient's medical needs. EMS providers shall notify the hospital of the patient's EMS/DNR status (i.e., Option A) and the identity of patient's physician or nurse practitioner.
 - (2) No consultation is required for the Option B EMS/DNR patients. The receiving hospital or inpatient hospice facility should be notified to expect the patient and prepare accordingly. Also make the hospital or inpatient facility aware of the patient's EMS/DNR status (i.e., Option B) and the identity of the patient's physician or nurse practitioner.
 - (3) If there is misunderstanding with family members or others present at the scene or if there are other concerns about following the EMS/DNR Order and the patient's condition permits, contact the physician or nurse practitioner signing the order, or the patient's hospice program, or on-line medical direction for assistance.
- i) DOCUMENTATION
- (1) If possible, make or retain a copy of the EMS/DNR Order or MOLST form and attach it to the official copy of the patient care report that is kept by the EMS service. **Having a copy of the EMS/DNR Order or MOLST form can significantly reduce documentation requirements.** Encourage sending facilities to provide you with an additional copy of the EMS/DNR order or MOLST form with the patient's transfer documents. **(NEW '17)**

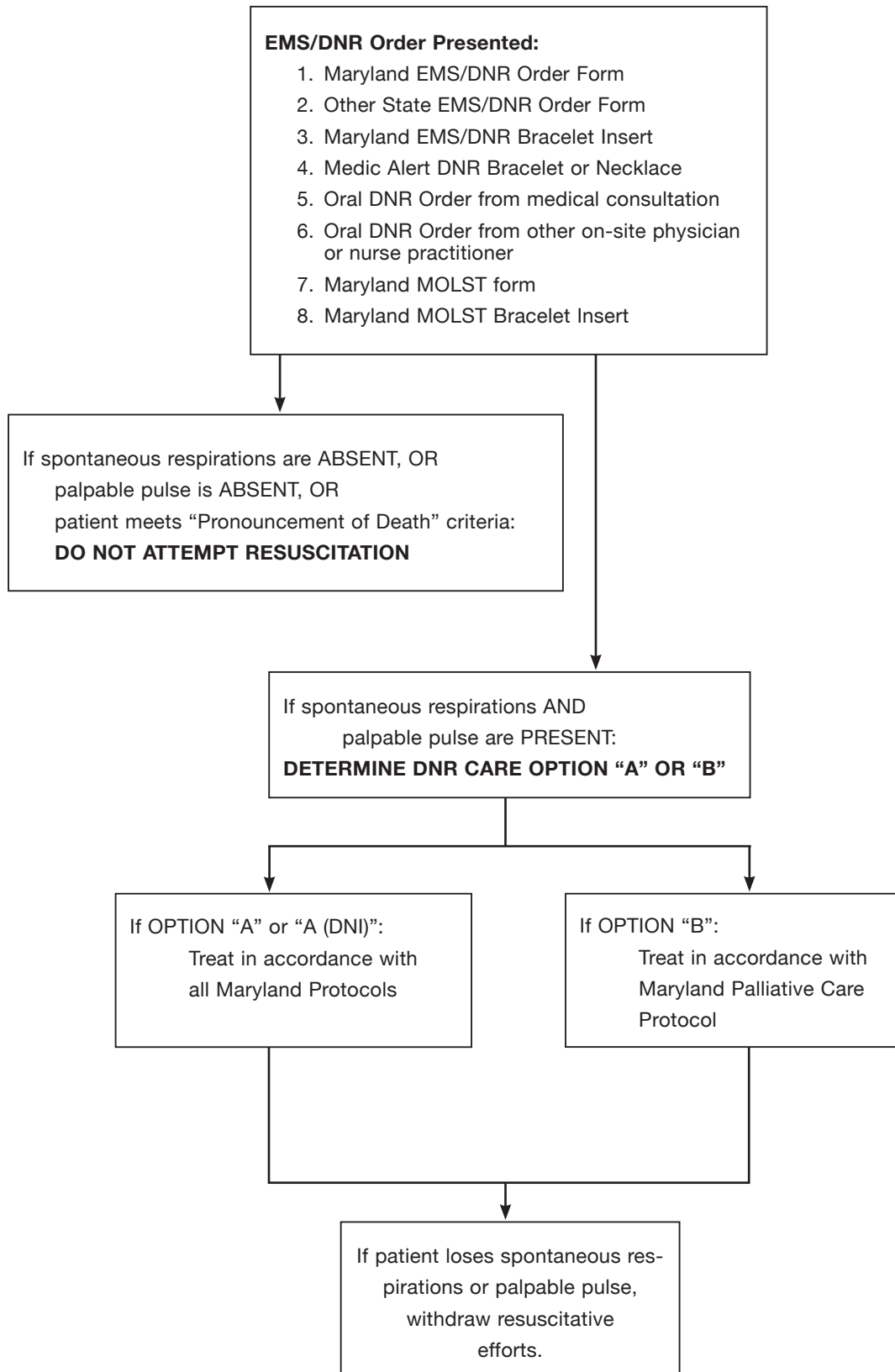
M. EMS DNR/MOLST (Continued)

- (2) If the EMS/DNR Protocol is initiated:
 - (a) Document, in the narrative section:
 - (i) Who gave you the EMS/DNR Order or MOLST form (as an applicable person physically providing the written order, name of on-site physician or nurse practitioner, or name of on-line medical direction physician) or
 - (ii) Where the EMS/DNR Order or MOLST form was found;
 - (b) Document the EMS/DNR order number, the effective date of the order, the name of the patient, the patient's date of birth, and the name of the physician, nurse practitioner, or physician assistant who signed the order;
 - (c) Document the time the EMS/DNR Protocol was initiated;
 - (d) Document any care rendered;
 - (e) If the patient arrests while under your care, document the time the patient lost spontaneous respirations or palpable pulse, if able to determine, and
 - (f) If the patient arrests while under your care, document the chain of custody until the body is out of custody of EMS.
- (3) If resuscitation protocols are initiated, document:
 - (a) Care rendered as per normal practice;
 - (b) The reason the EMS/DNR Protocol was not initiated, if relevant (e.g., unable to find EMS/DNR Order, EMS/DNR is not or does not appear to be valid, patient request);
 - (c) If resuscitation was started because there was reasonable doubt as to the validity of an EMS/DNR Order;
 - (i) The EMS/DNR Order number, the effective date of the order, the name of the patient, the patient's date of birth, and the name of the physician, nurse practitioner, or physician assistant signing the order; and
 - (ii) Who gave you the EMS/DNR Order or where the EMS/DNR Order or MOLST form was found.
- (4) Transfer any EMS/DNR Order or MOLST form to the appropriate authorities (e.g., to hospital or in-patient hospice personnel of the facility where the patient was transferred or, if the patient is deceased, to the physician/police/medical examiner). If possible at the receiving facility, and if not already done, make a copy of the EMS/DNR Order or MOLST form.
DO NOT RETAIN an original EMS/DNR Order or MOLST form.

M. EMS DNR/MOLST (Continued)

- (5) If a copy of the EMS/DNR Order or MOLST form is available to EMS providers, it should be attached to the official copy of the patient care report that is retained by the EMS service. **(NEW '17)**
 - (6) A vinyl bracelet with insert or metal emblem (bracelet or necklace) shall be left where found on the patient. Bracelets or metal emblems shall not be removed without the permission of the patient or the patient's authorized decision maker and, when possible, shall be returned with the patient to the sending facility (see pg.16 ch. C of the EMS/DNR Program booklet).
- j) **PATIENT DISPOSITION IF NOT TRANSPORTED**
If the EMS/DNR Protocol is implemented and the patient is not transported because the patient arrested at the response site, EMS personnel shall:
- (1) Follow local operational procedures for handling deceased patients **(see "How to Best Tell the Worst News" on pp. 105–106 of the EMS/DNR program booklet);**
 - (2) Do **not** remove an EMS/DNR vinyl bracelet or metal emblem (bracelet or necklace) from the deceased patient;
 - (3) Law enforcement personnel or a representative of the medical examiner's office needs to be notified only in the case of sudden or unanticipated death that occurs:
 - (a) By violence
 - (b) By suicide
 - (c) As a result of an accident
 - (d) Suddenly, if the deceased was in apparent good health, or
 - (e) In any suspicious or unusual manner.

N. EMS DNR Flowchart



P. CARDIAC EMERGENCIES: HYPERKALEMIA (RENAL DIALYSIS/FAILURE OR CRUSH SYNDROME)

1. Initiate General Patient Care.

2. Presentation

Certain conditions may produce an elevated serum potassium level that can cause hemodynamic complications.

3. Treatment



a) Patients must meet the following criteria:

(1) Suspected hyperkalemia patient

(a) Renal dialysis/failure with poor or non-functioning kidneys or

(b) Crush syndrome or patients with functional kidneys by history

AND

(2) Hemodynamically unstable renal dialysis patients or patients suspected of having an elevated potassium with bradycardia and wide QRS complexes.

b) Place patient in position of comfort.


c) Assess and treat for shock, if indicated.

d) Continuously monitor airway and reassess vital signs every 5 minutes.




e) Establish IV access with LR.

f) Initiate Bradycardia Protocol.

g)  Consider calcium chloride 0.5–1 gram SLOW IVP over 3–5 minutes.
Maximum dose 1 gram or 10 mL.


h)  Consider sodium bicarbonate 50 mEq IV over 5 minutes.

i)  Consider albuterol 20 mg (high dose) via nebulizer
(if available).



FLUSH IV WITH 5 ML OF LR BETWEEN CALCIUM AND SODIUM BICARBONATE ADMINISTRATION.

j) Crush syndrome or patients with functional kidneys by history



 Consider sodium bicarbonate 50 mEq SLOW IV over 5 minutes and then initiate drip of sodium bicarbonate 100 mEq in 1,000 mL to run over 30–60 minutes (reserve for patient suspected of crush syndrome or patients with functional kidneys by history).

P. CARDIAC EMERGENCIES: HYPERKALEMIA (Continued)




- k) Place patient in position of comfort.
- l) Assess and treat for shock, if indicated.
- m) Continuously monitor airway and reassess vital signs every 5 minutes.



- n) Establish IV access with LR.
- o) Initiate Bradycardia Protocol.
- p)  Administer calcium chloride 20 mg/kg (0.2 mL/kg) slow IVP/IO (50 mg/min)
Maximum dose 1 gram or 10 mL.
- q)  Consider albuterol via nebulizer
 - (1) For patients 2 years of age or greater, administer albuterol 2.5 mg.
 - (2) For patients less than 2 years of age, administer albuterol 1.25 mg.



FLUSH IV WITH 5 ML OF LR BETWEEN CALCIUM AND SODIUM BICARBONATE ADMINISTRATION.

- r) Crush syndrome or patients with functional kidneys by history
 -  Consider sodium bicarbonate 1 mEq/kg IV over 5 minutes. Maximum dose 50 mEq. (Reserve for patient suspected of crush syndrome or patients with functional kidneys by history.) For patients less than 1 year of age, must be diluted (1:1) with LR.

4. Continue General Patient Care.

R. CARDIAC EMERGENCIES: ST ELEVATION MYOCARDIAL INFARCTION (STEMI) (Continued)

- d) If patient does not have EKG ST elevations greater than 1 mm in two contiguous leads, the patient shall be transported to the closest appropriate facility.
- e) If a patient presents with IWMI, obtain a tracing of V4R to rule out right ventricular involvement. If ST elevation noted in V4R, withhold nitrates. The triad of RVMI often includes clear lung sounds, hypotension, and JVD. 40% of IWMI have right ventricular involvement. If hypotensive with clear lung sounds, administer 250–500 mL of LR.



For additional bolus, perform medical consultation.



CONSULT A PEDIATRIC BASE STATION FOR CHILDREN WITH ST ELEVATIONS WHO HAVE **NOT** REACHED THEIR 18TH BIRTHDAY.

Fibrinolytic Therapy Checklist for STEMI

Use this checklist if a STEMI patient cannot be delivered to a Cardiac Interventional Center within 45 minutes greater than transport to the nearest ED. All of the “**YES**” boxes and all of the “**NO**” boxes must be checked before a patient should be transported to the nearest emergency department.

INCLUSION CRITERIA

(All of the “**YES**” boxes must be checked)

YES

- 18 years of age or older
- Signs and symptoms of STEMI
- Patient cannot be delivered to a Cardiac Interventional Center within 45 minutes greater than transport to the nearest ED

EXCLUSION CRITERIA

(If any of the “**NO**” are unchecked, provider **must consult** with a Cardiac Interventional Center and nearest ED to determine most appropriate receiving facility.)

PATIENT HAS NO:

- | | |
|--|--|
| <input type="checkbox"/> Active internal bleeding (e.g., GI or urinary bleeding within the last 21 days) | <input type="checkbox"/> Within 14 days of major surgery or serious trauma |
| <input type="checkbox"/> Known bleeding disorder | <input type="checkbox"/> History of intracranial hemorrhage |
| <input type="checkbox"/> Within 3 months of intracranial surgery, serious head trauma, or stroke | <input type="checkbox"/> Witnessed seizure at onset |
| | <input type="checkbox"/> History of cancer of the brain |

S. SUDDEN INFANT DEATH SYNDROME (SIDS)



1. Initiate General Patient Care.

2. Presentation

The unexpected arrest of an apparently healthy infant in which resuscitation is unsuccessful and there is no attributable cause of death.

The infant is often discovered by a caretaker in the early morning hours after having been uneventfully laid down to sleep the night before.



3. Treatment

a) Perform an initial patient assessment, assign a treatment priority, and perform CPR, if indicated.



RIGOR MORTIS MAY BE PRESENT (SEE PRONOUNCEMENT OF DEATH IN THE FIELD PROTOCOL).

b) Move patient to the transport unit.

c) Establish communications and obtain medical direction.



d) If physician consultation is genuinely unavailable, monitor cardiac rhythm and treat according to the appropriate algorithm(s).

e) Transport quickly to the closest appropriate facility.



SIDS IS ONE OF THE LEADING CAUSES OF DEATH IN THE 1-12 MONTH AGE GROUP AND SEEMS TO PEAK AT 2 TO 4 MONTHS OF AGE.

HOW YOU INTERACT WITH THE FAMILY MAY HAVE A SIGNIFICANT IMPACT ON HOW THEY DEAL WITH THE LOSS OF THE INFANT. BE CAUTIOUS OF STATEMENTS OR ACTIONS THAT MAY BE JUDGMENTAL.

SPECIAL ATTENTION SHOULD BE PAID TO THE CONDITION OF THE INFANT, INCLUDING THE PRESENCE OF ANY MARKS OR BRUISES, AND TO PRESERVATION OF THE ENVIRONMENT, INCLUDING ANY BED CLOTHING AND THE CONDITION OF THE ROOM.

RIGOR MORTIS MAY BE PRESENT (SEE PRONOUNCEMENT OF DEATH IN THE FIELD PROTOCOL).

4. Continue General Patient Care.

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AA. NAUSEA AND VOMITING

1. Initiate General Patient Care.

2. Presentation

Patients presenting with nausea and/or vomiting due to underlying injury, medical condition, active motion sickness, or medication side effect/complication.

Under certain injury or medical conditions, vomiting or intense nausea can complicate the existing injury or medical condition. Preventative administration of an anti-nausea/anti-emetic should be considered (e.g., penetrating eye injury, high risk for aspiration, side effects of opioid administration).



3. Treatment

- a) Place patient either in position of comfort or in left lateral position if not prevented by spinal protection or packaging.
- b) Perform acupressure on P6 point either digitally or with commercial wrist band.



-
- c) Establish IV access with LR, if appropriate.
 - d) Administer fluid bolus, if appropriate.
20 mL/kg of LR IV
Titrate to a systolic pressure of 100 mmHg.
 - e) Adult : Administer ondansetron 8 mg SLOW IV over 2–5 minutes OR 4–8 mg IM OR 8 mg orally disintegrating tablet (ODT)
May repeat once without medical consultation.



For third repeat dose to a patient with maximum total dose of 24 mg.



-
- f) Establish IV access with LR, if appropriate.
 - g) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid bolus of 20 mL/kg LR IV/IO.
 - h) Pediatric:
For patients 28 days – 12 years old: Administer ondansetron 0.1 mg/kg SLOW IV over 2–5 minutes
For patients 13–18 years of age: Administer ondansetron 8 mg ODT OR 8 mg SLOW IV over 2–5 minutes
OR
If no IV: Administer ondansetron 0.1 mg/kg IM (with max single dose of 8 mg);
May repeat once without medical consultation.



For third repeat dose to a patient with maximum total dose of 0.3 mg/kg or 24 mg, whichever is lower.

4. Continue General Patient Care.

BB. NON-TRAUMATIC SHOCK: HYPOPERFUSION

1. Initiate General Patient Care.

2. Presentation

The body responds in various ways to a state of inadequate blood flow to meet the oxygen demands of the cells. A patient may exhibit an altered mental status; cool, clammy skin; diaphoresis; dilated pupils; a rapid, weak pulse; shallow, labored respirations; general weakness; and/or a decreasing pulse pressure.




3. Treatment


a) Continue General Patient Care.




b) Establish IV access with LR.

(1) If lungs are clear, administer fluid bolus.
20 mL/kg of LR IV
Titrate to a systolic pressure of 100 mmHg.

(2) If rales are present, administer fluid bolus.
Maximum of 250 mL of LR IV
Titrate to a systolic pressure of 100 mmHg.
 More fluid requires medical consultation.

c)  Consider dopamine (2–20 mcg/kg/min).
Titrate to a systolic pressure of 100 mmHg.

d)  Consider additional fluid administration.
Maximum Dose 2,000 mL without medical consultation.

BB. NON-TRAUMATIC SHOCK: HYPOPERFUSION (Continued)



- e) The pediatric patient may present hemodynamically unstable or with hypoperfusion evidenced by hypotension and signs such as altered mental status, delayed capillary refill greater than 2 seconds, pallor, and/or peripheral cyanosis. Hypotension is defined as a systolic blood pressure less than 60 in neonates (patients birth to 28 days of age), less than 70 in infants (patients less than 1 year of age), less than $[70 + (2 \times \text{years}) = \text{systolic BP}]$ for patients greater than 1 year of age.

- f)  Continue General Patient Care.




- g) Establish IV/IO access with LR.


If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid bolus of 20 mL/kg LR IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg LR IV/IO.

OR

For volume-sensitive children administer initial fluid bolus of 10 mL/kg LR IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 10 mL/kg LR IV/IO.

Volume-sensitive children include: neonates (birth to 28 days), children with congenital heart disease, chronic lung disease, or chronic renal failure.

- h)  Third and subsequent fluid boluses at 20 mL/kg IV/IO.

- i)  Consider dopamine.
2–20 **mcg**/kg/min IVP/IO
Titrate to age-specific vital signs.

4. Continue General Patient Care.

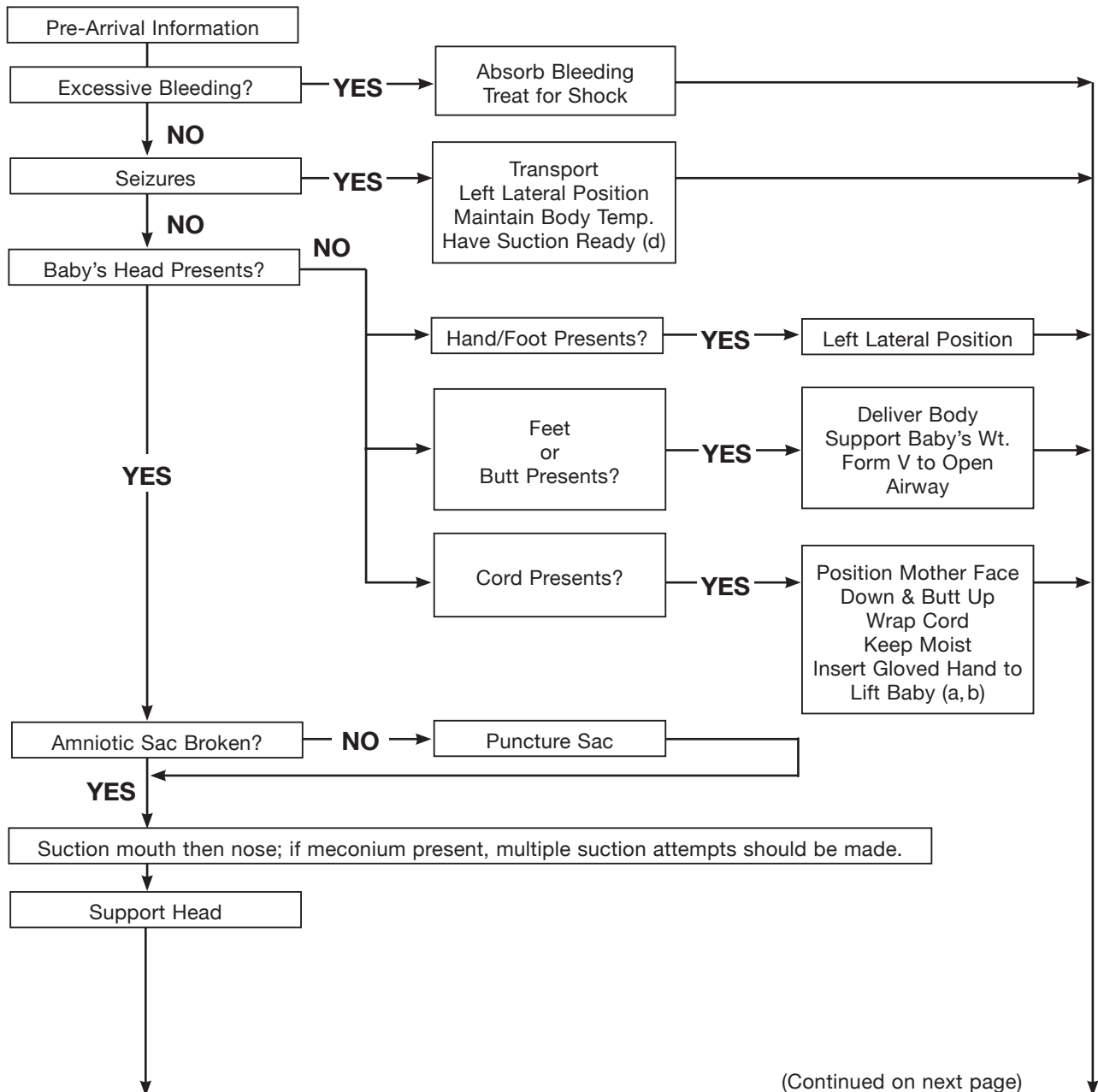
CC. OBSTETRICAL/GYNECOLOGICAL EMERGENCIES: CHILDBIRTH ALGORITHM

1. Initiate General Patient Care.

2. Presentation

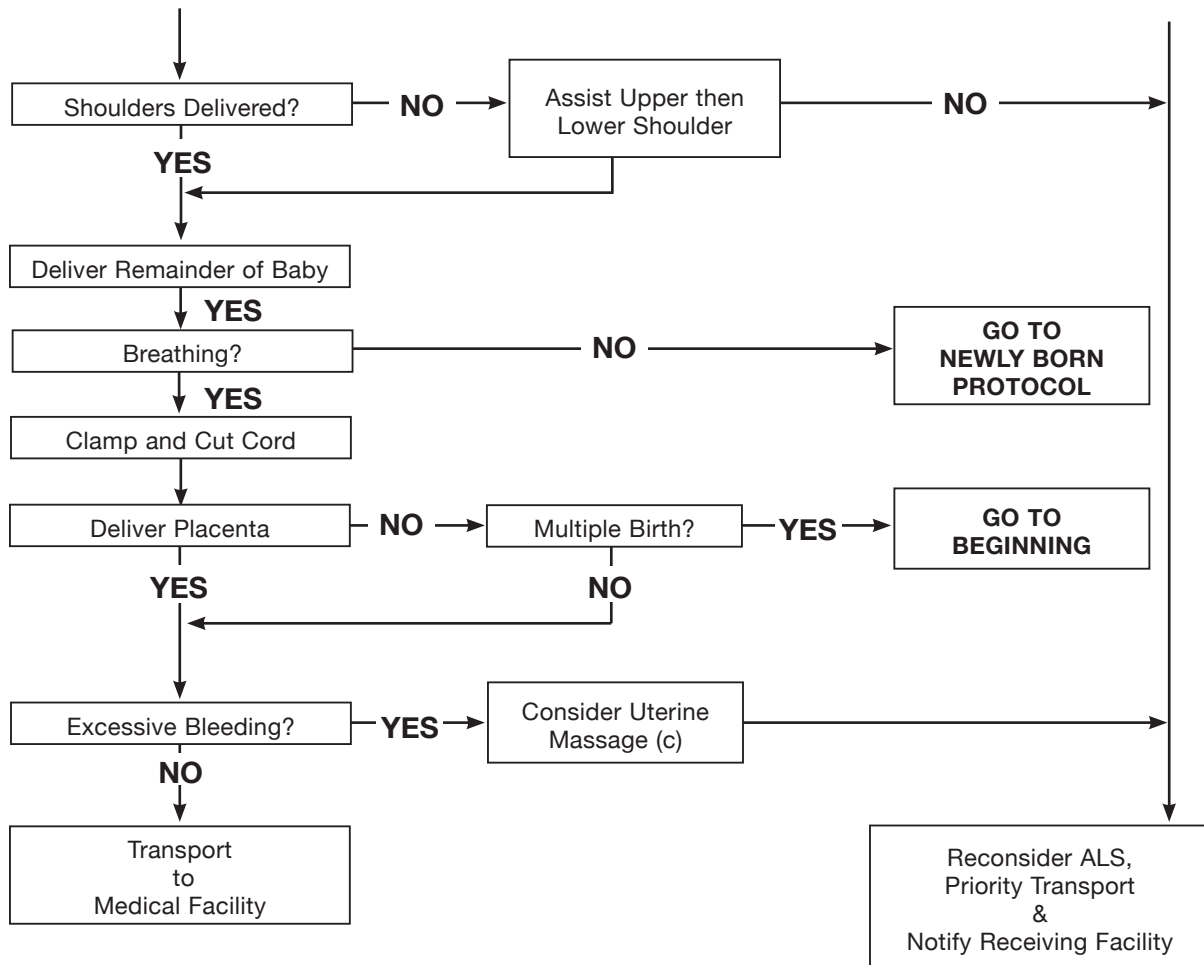
Patient presents pregnant, with contractions and/or pain, accompanied by bleeding or discharge, crowning during contraction, the feeling of an impending bowel movement, and/or a rock-hard abdomen.

3. Treatment




(Continued on next page)

**CC. OBSTETRICAL/GYNECOLOGICAL EMERGENCIES:
 CHILDBIRTH ALGORITHM (Continued)**



(a) - Keep presenting part of baby off the cord. Monitor and attempt to maintain the pulse in the cord.

(b) - Position of mother: 

(c) - Uterine massage is performed with the heel of the hand applying firm pressure from the pubis toward the umbilicus only. This massage is continued until bleeding diminishes. Transport rapidly.

(d) - Go to Seizure Protocol: Consider midazolam.

4. Continue General Patient Care.

DD. NEWLY BORN PROTOCOL (LESS THAN 1 HOUR OLD)

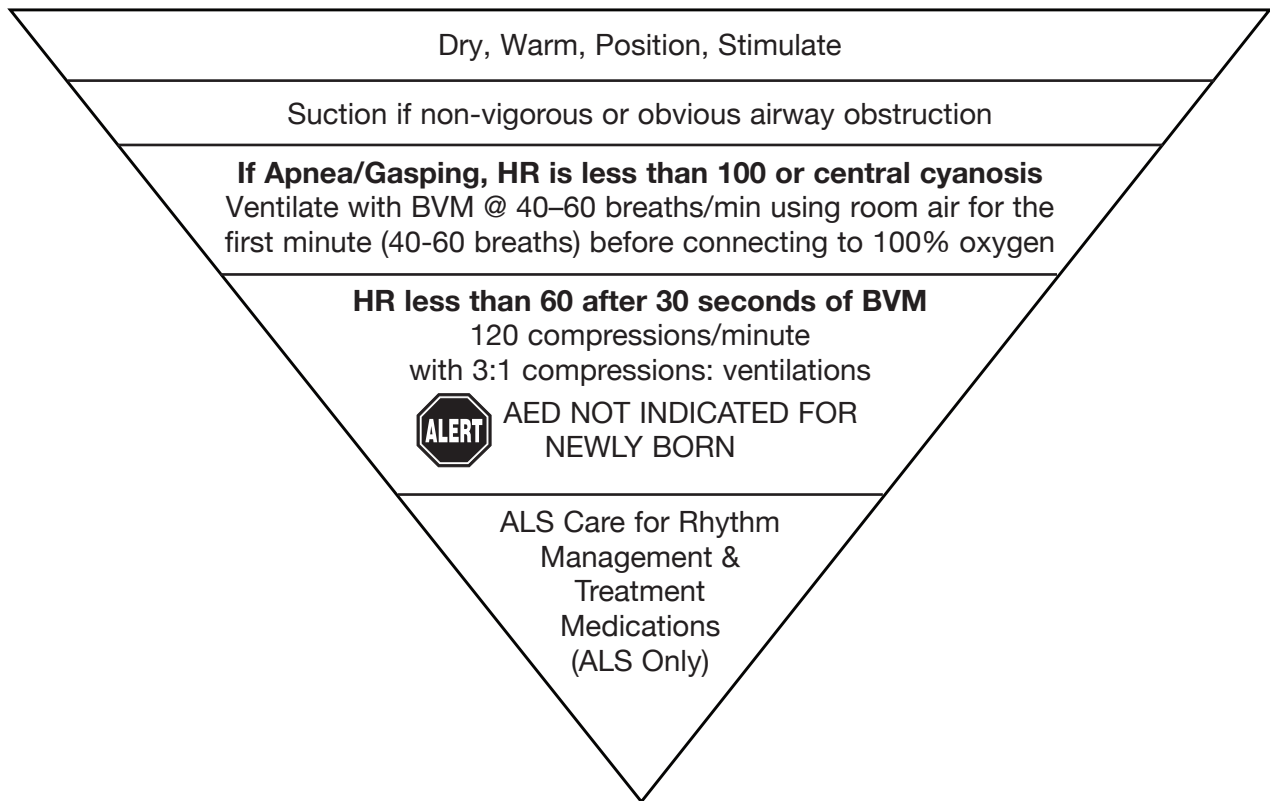


1. Initiate General Patient Care.

2. Presentation

This protocol applies to the infant within the first hour after delivery.

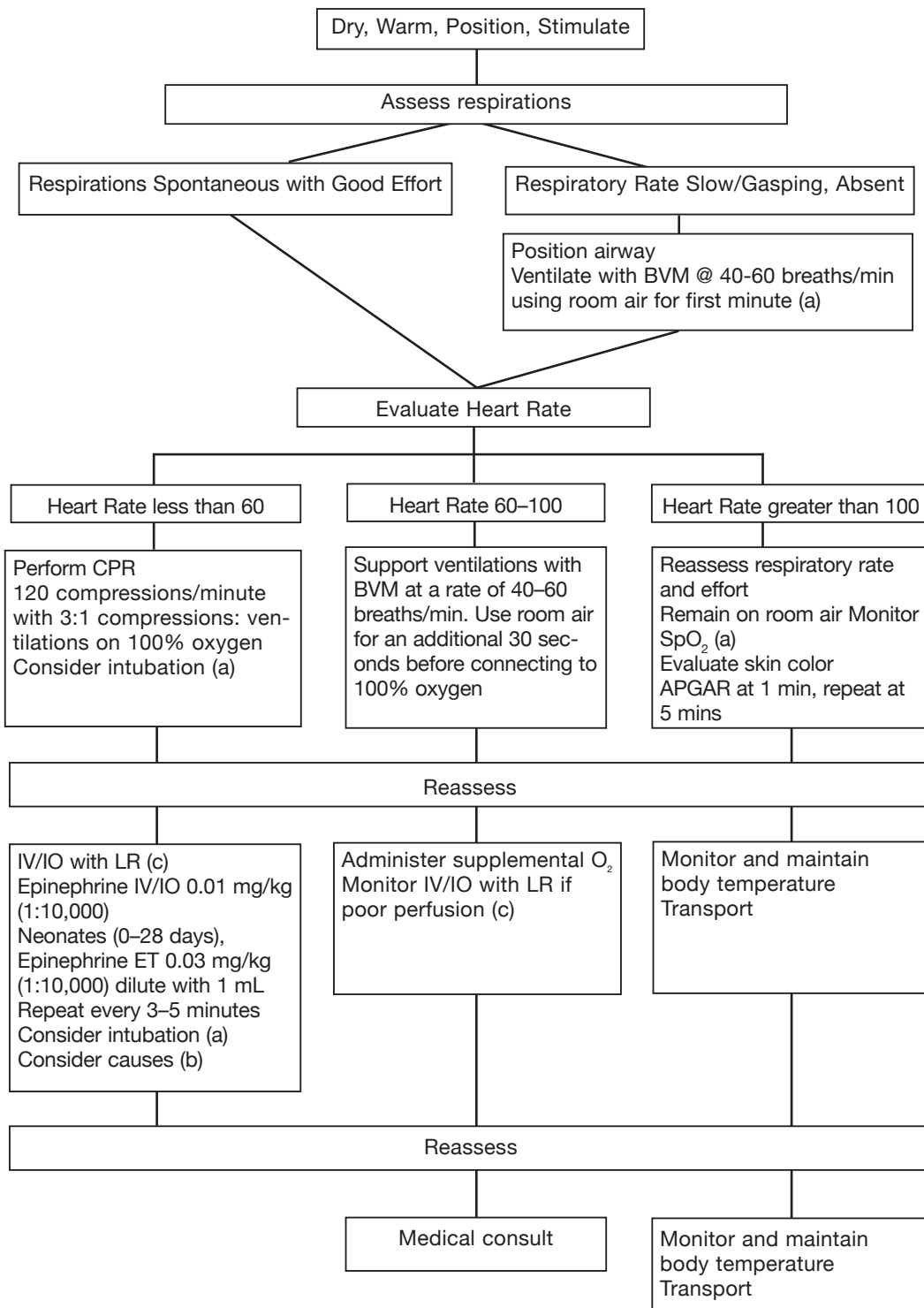
UNIVERSAL ALGORITHM FOR THE NEWLY BORN FOR BLS





3.

UNIVERSAL ALGORITHM FOR NEWLY BORN FOR ALS



DD. NEWLY BORN PROTOCOL (Continued)

(a) - Acceptable Target SpO₂ after Birth

- 1 min – 60-65%
- 2 min – 65-70%
- 3 min – 70-75%
- 4 min – 75-80%
- 5 min – 80-85%
- 10 min – 85-95%

(b) - Consider possible causes of depressed newborn.

(Parenthesis = possible therapies and treatments)

Respiratory depression (Premature infants less than 32 weeks gestation will likely require ongoing BVM ventilations due to immature lungs.)

Hypoglycemia (Threshold for treatment = 30 mg/dL) (D10W 2–4 mL/kg IV/IO (D10W is prepared by mixing one part of D50W with four parts LR.))

Hypothermia (Warming)

Hypovolemia (Volume infusion – see “c”, below)

(c) - Volume infusion is 10 mL/kg.

4. APGAR Chart

APGAR Chart

SIGN	0	1	2
MUSCLE TONE (ACTIVITY)	LIMP	SOME FLEXION	ACTIVE, GOOD FLEXION
PULSE	ABSENT	LESS THAN 100/MIN	GREATER THAN 100/MIN
REFLEX IRRITABILITY* (GRIMACE)	NO RESPONSE	SOME GRIMACE OR AVOIDANCE	COUGH, CRY OR SNEEZE
COLOR (APPEARANCE)	BLUE, PALE	PINK BODY, BLUE HANDS/FEET	PINK
RESPIRATIONS	ABSENT	SLOW/IRREGULAR, INEFFECTIVE	CRYING, RHYTHMIC EFFECTIVE
<i>*Nasal or Oral Suction Catheter Stimulus</i>			

EE. OBSTETRICAL/GYNECOLOGICAL EMERGENCIES: VAGINAL BLEEDING

1. Initiate General Patient Care.
2. Presentation
Unusually heavy vaginal bleeding as a result of possible pregnancy, miscarriage, postpartum bleeding, or sexual assault. Patient may exhibit the signs and symptoms of hypoperfusion.




3. Treatment
 - a) Place absorbent pads underneath patient.
 - b) Treat for hypoperfusion.
 - c) If post-partum bleeding, consider uterine massage from pubis toward umbilicus only.
 - d) Reconsider ALS.



PRODUCTS OF CONCEPTION SHOULD BE BROUGHT TO THE HOSPITAL!

DO NOT PULL CONCEPTUAL PRODUCTS FROM VAGINAL OPENING WITHOUT MEDICAL CONSULTATION!



-
- e) Establish IV access with LR, if appropriate.
 - f) Administer fluid bolus, if appropriate.
20 mL/kg of LR IV
Titrate to a systolic pressure of 100 mmHg.
 - g)  Consider additional fluid administration.
Maximum dose 2,000 mL without medical consultation.
4. Continue General Patient Care.

FF. OVERDOSE/POISONING: CARBON MONOXIDE/SMOKE INHALATION (NEW '17)

1. Initiate General Patient Care.

2. Presentation

Carbon monoxide (CO) is an odorless, colorless gas that is most commonly a product of incomplete combustion. Carbon monoxide poisoning occurs when a victim is exposed to high levels of carbon monoxide, frequently seen in house fires, malfunctioning furnaces, with suicide attempts, or others.

Presentation may vary depending on the concentration, method, and duration of exposure to the agent. Symptoms may include but are not limited to: headache, dizziness, and nausea and vomiting, most frequently. Symptoms can also include: chest pain, altered mental status, dyspnea, and/or seizures



PULSE OXIMETRY MAY NOT BE ACCURATE FOR CARBON MONOXIDE VICTIMS. PATIENTS MAY HAVE NORMAL SpO₂ LEVELS WITH CARBON MONOXIDE TOXICITY.

PATIENTS WITH BURNS AND TRAUMA SHOULD BE REFERRED TO THE NEAREST APPROPRIATE TRAUMA SPECIALTY CENTER.



3. Treatment

- a) Remove patient from toxic environment by appropriately trained personnel using proper level PPE.
- b) Decontaminate as appropriate.
- c) Administer high-flow oxygen.
- d) Treat respiratory and/or cardiac symptoms.
- e) Consider Hyperbaric Center referral.



- f) Consider obtaining blood sample using closed system, particularly if transcutaneous carboxyhemoglobin measurement is not available.
- g) Establish vascular access.
 - (1) If hypoperfusion exists, administer 20 mL/kg bolus of LR. May repeat once without consult.



(a) Consider additional fluid administration.


- (2) Consider following Overdose/Poisoning: Cyanide Protocol (if participating) for smoke inhalation patients.



-
- h) Remove patient from toxic environment by appropriately trained personnel using proper level PPE.
 - i) Decontaminate as appropriate.
 - j) Administer high-flow oxygen.
 - k) Treat respiratory and/or cardiac symptoms.
 - l) Consider Hyperbaric Center referral.

FF. OVERDOSE/POISONING: CARBON MONOXIDE/SMOKE INHALATION (Continued)



- m) Consider obtaining blood sample using closed system, particularly if transcutaneous carboxyhemoglobin measurement is not available.
- n) Establish vascular access.
 - (1) If hypoperfusion exists, administer 20 mL/kg bolus of LR. May repeat once without consult.
 -  (a) Consider additional fluid administration.
 - (2) Consider following Overdose/Poisoning: Cyanide Protocol (if participating) for smoke inhalation patients.
- o) Hyperbaric Medicine Specialty Center Referral: Indications for Referral
 - (1) Patients with exposure to products of combustion (smoke) or carbon monoxide who have a carboxyhemoglobin value of greater than 25% **with or without symptoms**
 - OR**
 - (2) Patients with **PROVEN** exposure to products of combustion (smoke) or carbon monoxide who have **any** of the following diagnostic indicators:
 - (a) Patient (transcutaneous or blood) carboxyhemoglobin value of greater than 15%
 - (b) Alarm of EMS or fire agency maintained passive carbon monoxide monitor
 - (c) Targeted atmospheric carbon monoxide value 100 ppm or greater in the patient environment**and one or more of the following:**
 - (d) History of loss of consciousness during exposure (may have since resolved)
 - (e) GCS persistently less than or equal to 13
 - (f) Rapid decline of neurological symptoms including actively seizing patients with appropriate airway stabilization
 - (g) Pregnancy
 - (h) Chest pain
 - (i) Extremes of age
 - (j) Per provider discretion



FETAL HEMOGLOBIN HAS A VERY HIGH AFFINITY FOR CARBON MONOXIDE AND PREGNANT MOTHER MAY BE ASYMPTOMATIC, YET FETAL LEVELS MAY BE DANGEROUSLY HIGH. ENCOURAGE THE PATIENT TO BE EVALUATED AT HOSPITAL.



PATIENTS WHO DO NOT MEET CRITERIA IN O)(1) OR (2) ABOVE SHOULD BE TRANSPORTED TO THE CLOSEST HOSPITAL-BASED EMERGENCY DEPARTMENT..

- p) Contraindications for Referral to the Hyperbaric Medicine Specialty Center
 - (1) Transport time to the Hyperbaric Medicine Specialty Center greater than one hour
 - (2) Patients in cardiac arrest
 - (3) Patients who have return of spontaneous circulation post-arrest
4. Continue General Patient Care.

GG. OVERDOSE/POISONING: ABSORPTION

1. Initiate General Patient Care.

2. Presentation

Patient may exhibit any of the following: nausea, vomiting, diarrhea, altered mental status, abdominal pain, rapid heart rate, dyspnea, seizures, arrhythmias, sweating, tearing, defecation, constricted/dilated pupils, rash, or burns to the skin.



3. Treatment

a) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.

b) Identify agent and mechanism of exposure.

c) Decontaminate as appropriate.

d) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.
2 mg intranasal atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

Consider additional doses of naloxone.



e) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**

Administer naloxone


0.4–2 mg IVP/IO (titrated)/IM/IN (If delivery device is available—divide administration of the dose equally between the nares to a maximum of 1 mL per nare)


Maximum single dose 0.4–2 mg

f) Consider repeating naloxone.



g) Establish IV access with LR in a clean area, if appropriate.

h)  If **organophosphate poisoning**, consider atropine
2–4 mg IV or IM every 5–10 minutes.

i)  Consider antidote to specific agent if available.






j)  Consider antibiotic specific to agent in mass casualty incident, if available.

HH. OVERDOSE/POISONING: INGESTION (Continued)

- g)  If **beta-blocker** overdose, consider glucagon.
1 mg every 5 minutes IVP
- h)  If **calcium channel blocker** overdose, consider calcium chloride.
0.5–1 gram SLOW IVP over 10 minutes
Max dose of 1 gram



CALCIUM CHLORIDE IS CONTRAINDICATED IN A CALCIUM CHANNEL BLOCKER OVERDOSE PATIENT TAKING DIGOXIN.

- i)  If **organophosphate poisoning**, consider atropine.
2–4 mg IVP or IM every over 10 minutes
Max dose of 1 gram
- j)  If **tricyclic** overdose, consider sodium bicarbonate.
1 mEq/kg IVP bolus initially with 0.5 mEq/kg at 10 minute intervals
- k)  Consider antidote to specific agent if available.
- l)  Consider antibiotic specific to agent in mass casualty incident, if available.
- m) Identify substance and amount ingested.
- n)  Consider activated charcoal **without** Sorbitol 1 gram/kg PO.



- o) If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose, Administer naloxone.




28 days to 4 years: Administer naloxone 0.8–1 mg IN atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

5 years to adult: Administer naloxone 2 mg IN atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

Consider additional doses of naloxone.





HH. OVERDOSE/POISONING: INGESTION (Continued)



- p) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.
0.1 mg/kg SLOW IVP/IO (titrate)/IN (Divide administration of the IN dose equally between nares to a maximum of 1 mL per nare.)
Maximum single dose 2 mg
ET dose 0.2–0.25 mg/kg
- q) Establish IV/IO access with LR in a clean area, if appropriate.
- r)  **If dystonic, extrapyramidal, or mild allergic reaction,**
consider diphenhydramine 1 mg/kg IVP/IO or IM.
Maximum single dose 25 mg
- s)  **If beta-blocker overdose,** consider glucagon.
1 mg IVP (5 years of age up to patient's 18th birthday)
0.5 mg IVP (28 days - 4 years of age)
Every 5 minutes as necessary
- t)  **If calcium channel blocker overdose,** consider calcium chloride.
20 mg/kg (0.2 mL/kg) SLOW IVP/IO (50 mg/min)
Maximum dose 1 gram



CALCIUM CHLORIDE IS CONTRAINDICATED IN A CALCIUM CHANNEL BLOCKER OVERDOSE PATIENT TAKING DIGOXIN.

- u)  **If organophosphate poisoning,** consider atropine.
0.02 mg/kg IVP/IO or IM
Maximum single dose 2 mg
May be repeated every 5–10 minutes
- v)  **If tricyclic overdose,** consider sodium bicarbonate.
1 mEq/kg SLOW IVP/IO (for less than 1 year, dilute 1:1)
- w)  Consider antidote to specific agent if available.
- x)  Consider antibiotic specific to agent in mass casualty incident, if available.

4. Continue General Patient Care.

II. OVERDOSE/POISONING: INHALATION

1. Initiate General Patient Care.

2. Presentation

Presentation may vary depending on the concentration and duration of exposure. Symptoms may include, but are not limited to, the following: nausea, vomiting, diarrhea, altered mental status, abnormal skin color, dyspnea, seizures, burns to the respiratory tract, stridor, sooty sputum, known exposure to toxic or irritating gas, sweating, tearing, constricted/dilated pupils, and/or dizziness.



PULSE OXIMETRY MAY NOT BE ACCURATE FOR TOXIC INHALATION VICTIMS!

IF PATIENT HAS EXPOSURE TO CARBON MONOXIDE/SMOKE INHALATION, REFER TO CARBON MONOXIDE/SMOKE INHALATION PROTOCOL. **(NEW '17)**



3. Treatment

a) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.

b) Identify agent and mechanism of exposure.


c) Decontaminate as appropriate.




d) Consider obtaining blood sample using closed system, if indicated.

e) Establish IV access with LR in a clean area, if appropriate.

f)  If **organophosphate poisoning**, consider atropine 2–4 mg IVP or IM every 5–10 minutes.

g)  Consider antidote to specific agent if available.




h)  Consider antibiotic specific to agent in mass casualty incident, if available.

II. OVERDOSE/POISONING: INHALATION (Continued)



- i) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.
- j) Identify agent and mechanism of exposure.
- k) Decontaminate as appropriate.



- l) Establish IV/IO access with LR in a clean area, if appropriate.
- m)  If **organophosphate poisoning**, consider atropine. 0.02 mg/kg IV/IO or IM every 5–10 minutes.
- n)  Consider antidote to specific agent if available.
- o)  Consider antibiotic specific to agent in mass casualty incident, if available.

4. Continue General Patient Care.

JJ. OVERDOSE/POISONING: INJECTION

1. Initiate General Patient Care.

2. Presentation

Patient may exhibit any of the following: local pain, puncture wounds, reddening skin, local edema, numbness, tingling, nausea, vomiting, diarrhea, altered mental status, seizures, muscle twitching, hypoperfusion, metallic or rubbery taste.



3. Treatment

- a) Identify markings (insects, bites, needlestick, etc.).
- b) Do not apply distal and/or proximal constricting bands for a poisonous snakebite to an extremity. Do remove any jewelry on the affected extremity.
- c) Assist patient experiencing moderate to severe allergic reaction symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine (1:1,000) 0.5 mg in 0.5 mL IM or patient's prescribed fast-acting bronchodilator.



IF THE SNAKE IS **DEAD**, AND IF IT IS PRACTICAL, DELIVER IT WITH ITS HEAD INTACT. DEAD SNAKES STILL BITE!






- d) Immobilize extremity.
- e) Apply cool packs for relief of pain only.
- f) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.
2 mg IN atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

Consider additional doses of naloxone.



-
- g) Establish IV access with LR; administer 20 mL/kg bolus in uninjured extremity. Titrate to a systolic pressure of 100 mmHg.
 - h) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.
0.4–2 mg SLOW IVP/IO (titrate)/IM/IN (If delivery device is available, divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)
Titrate to adequate respiratory effort.

JJ. OVERDOSE/POISONING: INJECTION (Continued)

- i)  If **organophosphate poisoning**, consider atropine. 2–4 mg IVP or IM every 5–10 minutes.
 - j)  Consider antidote to specific agent if available.
 - k)  Consider antibiotic specific to agent in mass casualty incident, if available.
- 
- 
-




- l) Identify markings (insects, bites, needlestick, etc.).
- m) Do not apply distal and/or proximal constricting bands for a poisonous snakebite to an extremity. Do remove any jewelry on the affected extremity.
- n) Assist patient experiencing moderate to severe allergic reaction symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine (1:1,000) 0.15 mg in 0.15 mL IM or patient's prescribed fast-acting bronchodilator.
- o) If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.

28 days to 4 years: Administer naloxone 0.8–1 mg IN atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

5 years to adult: Administer naloxone 2 mg IN atomizer (Divide administration of the dose equally between the nares to a maximum of 1 mL per nare.)

Consider additional doses of naloxone.



-
- p) Establish IV access with LR; administer 20 mL/kg bolus in uninjured extremity. Titrate to a systolic pressure of 100 mmHg.
 - q) If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose,**
Administer naloxone.
0.1 mg/kg SLOW IVP/IO (titrate)/IN (Divide administration of the IN dose equally between nares to a maximum of 1 mL per nare.)
Maximum single dose 2 mg
ET dose 0.2–0.25 mg/kg
 - r)  If **organophosphate poisoning**, consider atropine. 0.02 mg/kg IV/IO or IM every 5–10 minutes
 - s)  Consider antidote to specific agent if available.
 - t)  Consider antibiotic specific to agent in mass casualty incident, if available.

4. Continue General Patient Care.

KK. OVERDOSE/POISONING: STIMULANT TOXICITY

1. Initiate General Patient Care.
2. Presentation
 - a) Moderate toxicity:
 - Patient exhibits chest pain, hypertension, supraventricular tachycardia, moderate anxiety, respiratory distress, and/or hallucinations
 - b) Moderate to severe toxicity:
 - Includes the symptomatology described above along with severe agitation, seizures, and hyperthermia



3. Treatment
 - a) Ensure scene is secure and safe from paraphernalia.
 - b) Initiate patient care.
 - c) Identify amount, route, and time the stimulant was introduced into the body if possible.



-
- d) Establish IV access with LR. Consider blood draw if possible.
 - e) Consider midazolam.
 - 0.1 mg/kg in 5 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg
 - (Reduce by 50% for patients 69 years or older)
 - If IV unavailable, 5 mg IN/IM may be administered.
 - IN administration max 1 mL per nare
 - f) Initiate Chest Pain Protocol and treat accordingly with unstable angina or suspected MI.



Larger doses may be needed to treat stimulant toxicity. Additional doses require medical consultation.



SUPRAVENTRICULAR TACHYCARDIA (SVT) MAY RESOLVE WITH THE ADMINISTRATION OF MIDAZOLAM. TREATING SVT DUE TO STIMULANT TOXICITY WITH ADENOSINE WILL NOT WORK SINCE THE SUBSTANCE CAUSING THE SVT WILL STILL BE IN THE SYSTEM AND CAUSE REFRACTORY SVT AFTER THE ADENOSINE HAS WORN OFF.

KK. OVERDOSE/POISONING: STIMULANT TOXICITY (Continued)



- g) Ensure scene is secure and safe from paraphernalia.
- h) Initiate patient care.
- i) Identify amount, route, and time the stimulant was introduced into the body if possible.



- j) Establish IV access with LR.
- k) Consider midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes with maximum single dose of 5 mg.
If IV unavailable, administer 0.2 mg/kg IN to a maximum single dose of 2 mg or 0.2 mg/kg IM to maximum single dose of 5 mg.
IN administration max 1 mL per nare



Additional doses (up to a maximum total dose of 5 mg) require medical consultation.

- 4. Continue General Patient Care.

MM. PAIN MANAGEMENT (Continued)

- b) Allow patient to remain in position of comfort unless contraindicated.
- c) Monitor airway and vitals signs every 5 minutes for unstable patients.
- d) Mild pain



- (1) Indications for pain management
 - (a) Isolated musculoskeletal injuries such as sprains and strains
 - (b) Pain related to childhood illnesses such as headache, ear infection, and pharyngitis
- (2) Contraindications for pain management with acetaminophen
 - (a) Head injury
 - (b) Hypotension
 - (c) Administration of acetaminophen or medications containing acetaminophen within the previous four hours
 - (d) Inability to swallow or take medications by mouth
 - (e) Respiratory distress
 - (f) Persistent vomiting
 - (g) Known or suspected liver disease
 - (h) Allergy to acetaminophen
- (3) Administer acetaminophen to patients ages 2 years and above judged to be in mild to moderate discomfort. (2–5 on FACES scale) by child or parent.
 - (a) Standard unit dosing of liquid preparation:
 - (i) Less than 2 years of age: Not indicated
 - (ii) 2–4 years: Unit dose 160 mg/5 mL
 - (iii) 5–12 years: TWO unit doses of 160 mg/5 mL each for a total of 320 mg/10 mL
 - (iv) 13 years and older: FOUR unit doses of 160 mg/5 mL each for a total of 640 mg/20 mL OR in a form of 325 mg pill or tablet X 2 for a total of 650 mg with sips of water as tolerated by the patient.




ADMINISTRATION OF ACETAMINOPHEN FOR MILD TO MODERATE PAIN DOES NOT ELIMINATE THE NEED FOR TRANSPORT OF THE PATIENT TO THE HOSPITAL TO RECEIVE A COMPREHENSIVE EVALUATION OF THE CAUSE OF THEIR PAIN AND APPROPRIATE DEFINITIVE TREATMENT. **(NEW '17)**




-
- e) Moderate to severe pain
 - (1) Indications for pain management
 - (a) The patient reports moderate to severe pain.
 - (b) In the provider's judgment, the patient will benefit from treatment with an opioid analgesic, including patients who are MOLST and/or EMS/DNR patients or being pre-medicated for a procedure **(NEW '17)**.


MM. PAIN MANAGEMENT (Continued)

- (2) Contraindications for pain management
 - (a) Hypersensitivity or known allergy to the medication (morphine or fentanyl)
 - (b) Uncorrected respiratory distress or hypoxemia refractory to supplemental oxygen
 - (c) Uncorrected hypotension, defined as a persistent systolic pressure less than 90 mmHg
- (3) Administer agent
 - (a) Morphine IV/IM
 - (i) Administer 0.1 mg/kg maximum single dose of 20 mg.
 - (ii) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of morphine 0.05 mg/kg to a maximum additional dose of 10 mg.
 - (iii)  Obtain on-line medical direction for additional doses, if required.


OR

- (b) Fentanyl IV/IN/IM. IN administration max 1 mL per nare
 - (i) Administer 1 **mcg**/kg to a maximum initial dose of 200 **mcg**.
 - (ii) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of fentanyl 1 **mcg**/kg to a maximum dose of 200 mcg.
 - (iii)  Obtain on-line medical direction for additional doses, if required.



-
- (c) Morphine IV/IM
 - (i) Administer 0.1 mg/kg to a maximum initial dose of 20 mg.
 - (ii) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of morphine 0.05 mg/kg to a maximum additional dose of 10 mg.
 - (iii)  Obtain on-line medical direction for additional doses, if required.

OR

- (d) Fentanyl IV/IN/IM. IN administration max 1 mL per nare
 - (i) Administer 1 **mcg**/kg to a maximum initial dose of 200 **mcg**. Administer at a rate of 0.5 **mcg**/kg/min.
 - (ii) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of fentanyl 1 **mcg**/kg to a maximum dose of 200 **mcg**.
 - (iii)  Obtain on-line medical direction for additional doses, if required.

MM. PAIN MANAGEMENT (Continued)



CHEST PAIN THAT IS THOUGHT TO BE DUE TO ACUTE CORONARY SYNDROME SHOULD INITIALLY BE MANAGED WITH NITROGLYCERIN. IF PAIN REMAINS REFRACTORY TO NITROGLYCERIN, CONSIDER THE USE OF OPIOID ANALGESIA. AVOID OPIOIDS FOR PATIENTS WITH SUSPECTED EXACERBATION OF CONGESTIVE HEART FAILURE.

USE OPIOID ANALGESIA WITH CAUTION IN THE MANAGEMENT OF THE MULTIPLE TRAUMA PATIENT. OBSERVE FOR EVIDENCE OF HYPOTENSION AND CORRECT AS NEEDED WITH FLUID BOLUSES. REASSESS VITAL SIGNS AFTER ADMINISTRATION OF THE MEDICATION.

USE OPIOID ANALGESIA WITH CAUTION IN THE MANAGEMENT OF PATIENTS WITH ALTERED MENTAL STATUS. OBSERVE FOR RESPIRATORY DEPRESSION AND TAKE STEPS AS NEEDED TO ENSURE A STABLE AIRWAY.

4. Repeat - Measure level of pain and monitor the patient's level of pain during subsequent treatment and transport.
5. Transport




PATIENTS RECEIVING A NEW OPIOID (EITHER WITHIN 1 HOUR OR GREATER THAN 1 DOSE WITHIN ANY TIME FRAME) FROM ALS OR BY THE SENDING FACILITY MUST BE TRANSPORTED BY ALS.

6. Continue General Patient Care.



NN. ALLERGIC REACTION

1. Initiate General Patient Care.
2. Presentation
 - a) An allergic reaction is an exaggerated response of the body's immune system to any substance.
 - b) Allergic reactions may range from mild to severe life-threatening anaphylactic reactions.
 - (1) **MILD:** Local swelling and itching at the site
 - (2) **MODERATE:** Hives and/or mild wheezing
 - (3) **SEVERE:** Diffuse wheezing, pharyngeal swelling, dyspnea, hypoperfusion, abnormal skin color, stridor, and/or loss of peripheral pulses



3. Treatment
 - a) Assist patient experiencing moderate symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine auto-injector or manual (1:1,000) 0.5 mg in 0.5 mL IM or patient's prescribed fast-acting bronchodilator.
 - b) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.
 - c)  Consider additional doses of epinephrine (1:1,000) 0.5 mg in 0.5 mL IM or prescribed fast-acting bronchodilator.



-
- d) Moderate Distress
Administer epinephrine 1:1,000.
0.5 mg in 0.5 mL
May repeat every 5 minutes for total of 3 doses for severe reactions.
 Additional doses of epinephrine require medical consultation.
 - (1) Establish IV access with LR; administer 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mmHg.
 - (2) Administer diphenhydramine.
50 mg SLOW IVP or IM
 Additional doses of diphenhydramine require medical consultation.
 - (3) Administer a combination of albuterol/Atrovent via nebulizer.
Albuterol 2.5 mg and Atrovent 500 **mcg**
 - (4) If further treatments are indicated, an additional albuterol-only nebulizer may be given.

NN. ALLERGIC REACTION (Continued)

e)  Mild Allergic Reaction


- (1) Consider diphenhydramine.
25 mg SLOW IVP or IM
OR
Consider epinephrine 1:1,000.
0.5 mg in 0.5 ML

- (2) Consider additional fluid administration.
Maximum dose 2,000 mL without medical consultation



- f) Assist patient experiencing moderate or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine (1:1,000).
Less than 5 years of age 0.15 mg in 0.15 mL IM
Greater than 5 years of age 0.5 mg in 0.5 mL IM
or patient's prescribed fast-acting bronchodilator.

- g) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.

- h)  Consider additional doses of epinephrine (1:1,000)
Less than 5 years of age 0.15 mg in 0.15 mL IM
Greater than 5 years of age 0.5 mg in 0.5 mL IM
or fast-acting bronchodilator.



- i) Moderate Distress
Less than 5 years of age 0.15 mg in 0.15 mL IM.
Greater than 5 years of age 0.5 in 0.5 mL IM.
May repeat every 5 minutes for total of 3 doses for severe reactions.



- Additional doses of epinephrine require medical consultation.
(1) Establish IV/IO access with LR.

NN. ALLERGIC REACTION (Continued)

- (2) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid bolus of 20 mL/kg LR IV/IO.
If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg LR IV/IO.

Administer diphenhydramine.

1 mg/kg SLOW IVP/IO or IM

Maximum single dose 50 mg



Additional doses of diphenhydramine require medical consultation

- (3) A combination of albuterol/Atrovent via nebulizer:
- **For an infant less than 1 year of age**, administer albuterol 1.25 mg via nebulizer; Atrovent is contraindicated.
 - **For a child 1 year of age or greater, but less than 2 years of age**, administer albuterol 1.25 mg and Atrovent 250 mcg.
For a patient 2 years of age or greater, administer albuterol 2.5 mg and Atrovent 500 mcg.
- (4) If further treatments are indicated, an additional albuterol-only nebulizer may be given.

- j)  Mild Allergic Reaction

Consider diphenhydramine.

1 mg/kg SLOW IVP or IM

Maximum single dose 25 mg

OR

Consider epinephrine 1:1,000.


0.15 mg in 0.15 mL

4. Continue General Patient Care.

OO. ANAPHYLAXIS

1. Initiate general patient care.
2. Presentation
 - a) Anaphylaxis is a condition defined by respiratory and/or cardiovascular collapse resulting from an exaggerated response of the body's immune system to any substance.
 - b) Anaphylaxis is likely to present with one or more of the following:
 - (1) Acute onset of illness after exposure to a known allergen with two or more of the following:
 - (a) urticaria of skin and/or mucosa or acute swelling/edema (eg, tongue, airway, stridor, lips)
 - (b) respiratory compromise
 - (c) hypotension
 - (d) persistent GI symptoms of vomiting, abdominal pain, or diarrhea
 - (2) Acute onset of illness after exposure to a **known** allergen with hypotension



3. Treatment
 - a) Assist patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine auto-injector or manual (1:1,000) 0.5 mg in 0.5 mL IM or patient's prescribed fast-acting bronchodilator.
 - b)  Consider additional doses of epinephrine (1:1,000) 0.5 mg in 0.5 mL IM.
 - c) Additional treatments to consider AFTER administration of the initial dose of epinephrine
 - (1) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.




-
- d) Administer epinephrine
 - (1) 0.3 mg IM in the lateral thigh via epinephrine auto-injector or epinephrine (1:1,000) 0.5 mg in 0.5 mL IM
 - (2) May repeat every 5 minutes for a total of 3 doses for severe reactions.
 - (3) For patients who are in extremis with severe hypotension or impending respiratory failure, consider initiating an epinephrine drip after having administered 3 doses of IM epinephrine.
 - (a) Mix 1 mg of epinephrine (either 1:1,000 or 1:10,000) in a 1 liter bag of LR IV/IO. Initiate an infusion with a wide open macro drip titrating to a systolic pressure of greater than 90 mmHg. When drip administered, this will be reported as an exceptional call.

OO. ANAPHYLAXIS (Continued)

- e) Additional treatments to consider AFTER administration of the initial dose of epinephrine
- (1) Albuterol/Atrovent via nebulizer: Albuterol 2.5 mg and Atrovent 500 mcg; may repeat albuterol neb 2.5 mg one time
 - (2) Diphenhydramine 50 mg SLOW IVP or IM
 - (3) Establish IV access with LR
 - (4) Administer 20 mL/kg bolus for hypotension
 - (5) Dexamethasone 10 mg IV/IO



- f) Assist patient experiencing severe symptoms with the patient's prescribed or EMS service's epinephrine:
- (1) Less than 5 years of age: 0.15 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.15 mg in 0.15 mL IM
 - (2) 5 and greater: administer 0.3 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.5 mg in 0.5 mL IM
 - (3)  Consider additional doses of epinephrine (1:1,000) 0.5 mg in 0.5 mL IM.
 - (4) Additional treatments to consider AFTER administration of the initial dose of epinephrine
 - (a) Albuterol MDI inhaler (2 puffs) may be repeated once within 30 minutes.



- (5) Less than 5 years of age: administer 0.15 mg in 0.15 mL IM
 - (6) 5 and greater: administer 0.5 mg in 0.5 mL IM
 - (7) May repeat every 5 minutes for a total of 3 doses for severe reactions.
- g) Additional treatments to consider AFTER administration of the initial dose of epinephrine
- (1) Albuterol/Atrovent via nebulizer
 - (a) For an infant less than 1 year of age, administer albuterol 1.25 mg via nebulizer; Atrovent is contraindicated.
 - (b) For a child 1 year of age or greater, but less than 2 years of age, administer albuterol 1.25 mg and Atrovent 250 mcg.
 - (c) For a child 2 years of age or greater, administer albuterol 2.5 mg and Atrovent 500 mcg.
 - (d) If further respiratory treatments are needed, an additional albuterol-only nebulizer may be given.
 - (2) Diphenhydramine 1 mg/kg SLOW IVP or IM
 - (3) Establish IV access with LR
 - (4) Administer 20 mL/kg bolus for hypotension
 - (5) Dexamethasone 0.5 mg/kg to a maximum of 10 mg IV/IO

4. Continue General Patient Care.

PP. RESPIRATORY DISTRESS: ASTHMA/COPD

1. Initiate General Patient Care.
2. Presentation



Patient may exhibit any of the following: wheezing and/or crackles, abnormal respiratory rate, rapid heart rate, stridor, grunting, cyanosis, mottled skin, altered mental status, nasal flaring, retractions, accessory muscle use, dyspnea, diminished or absent breath sounds, and/or tripod positioning.




3. Treatment




CONSIDER MEDICAL CONSULTATION FOR PATIENTS GREATER THAN 45 YEARS OF AGE OR PATIENTS WITH A CARDIAC HISTORY.

- a) Assist patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed fast-acting bronchodilator or prescribed epinephrine auto-injector.
- b)  Use of the EMS service's manual epinephrine (1:1,000) 0.5 mg in 0.5 mL or 0.3 mg via epinephrine auto-injector IM requires medical consultation.
- c) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.
- d)  Consider additional doses of patient's prescribed fast-acting bronchodilator or manual epinephrine (1:1,000) 0.5 mg in 0.5 mL or 0.3 mg via epinephrine auto-injector IM.



- e) Establish IV access with LR on all Priority 1 or 2 patients and all patients with a history of cardiac disease.
- f) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, continuous positive airway pressure (CPAP), or BVM while receiving medication via nebulizer.
- g) Administer a combination of albuterol/Atrovent via nebulizer.
Albuterol 2.5 mg and Atrovent 500 mcg
- h) If further treatments are indicated, an additional albuterol-only nebulizer may be given.
- i) Consider CPAP if patient continues to deteriorate in spite of above nebulized treatments. Continue inline nebulizations.
- j) Consider the administration of epinephrine 1:1,000.
0.3 mg IM in the lateral thigh via epinephrine auto-injector or
0.5 mg in 0.5 mL IM
May repeat every 5 minutes for a total of 3 doses for severe reactions.
OR
- k) For moderate to severe exacerbations, consider the administration of dexamethasone 10 mg IV/PO.
- l)  For moderate to severe exacerbations, consider the administration of magnesium sulfate 1–2 grams, mixed in 50–100 mL of approved diluent, IV/IO over 10–20 minutes.

PP. RESPIRATORY DISTRESS: ASTHMA/COPD (Continued)


- m)  Consider additional doses of epinephrine or albuterol. **(NEW '17)**



- n) Assist patient(s) experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's epinephrine (1:1,000) 0.15 mg in 0.15 mL IM or patient's prescribed fast-acting bronchodilator.



MEDICAL CONSULTATION IS REQUIRED IF THE PATIENT HAS CONGENITAL HEART OR CHRONIC LUNG DISEASE.

- o) Fast-acting bronchodilator (2 puffs) may be repeated once within 30 minutes.
- p)  Consider additional doses of patient's prescribed fast-acting bronchodilator or epinephrine (1:1,000) 0.15 mg in 0.15 mL IM.




- q) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer.
- r) Administer a combination of albuterol/Atrovent via nebulizer:
- (1) **For an infant less than 1 year of age**, administer albuterol 1.25 mg via nebulizer; Atrovent is contraindicated.
 - (2) **For a child 1 year of age or greater, but less than 2 years of age**, administer albuterol 1.25 mg and Atrovent 250 mcg.
 - (3) **For a patient 2 years of age or greater**, administer albuterol 2.5 mg and Atrovent 500 mcg.
- s) If further treatments are indicated, an additional albuterol-only nebulizer may be given.

AND/OR



MEDICAL CONSULTATION IS REQUIRED IF THE PATIENT HAS CONGENITAL HEART OR CHRONIC LUNG DISEASE.


- t) Administer epinephrine 1:1,000.
Less than 5 years of age: 0.15 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.15 mg in 0.15 mL IM
5 years and greater: administer 0.3 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.5 mg in 0.5 mL IM
May repeat every 5 minutes for a total of 3 doses for severe reactions.

- u)  Consider magnesium sulfate 50 mg/kg IV/IO to a max of 2 grams given over 10–20 minutes (mixed in 50 - 100 mL of approved diluent).



MAGNESIUM ADMINISTRATION OFTEN CAUSES HYPOTENSION IN CHILDREN. CONSIDER ADMINISTERING BOLUS 20 ML/KG OF LACTATED RINGER'S WITH THE ADMINISTRATION OF MAGNESIUM.

- v) For moderate to severe exacerbations, consider the administration of dexamethasone 0.5 mg/kg PO/IV up to a maximum dose of 10 mg.

- w)  Consider additional doses of albuterol or epinephrine.

4. Continue General Patient Care.

SS. SEPSIS: ADULT

1. Initiate General Patient Care
2. Presentation
 - a) Infection can cause a systemic response resulting in fever, altered mental status, shock including or excluding hypotension, and death. Early recognition and treatment with aggressive fluids, when not contraindicated, and early hospital notification may improve survival rates and patient outcomes.
 - b) The following patient populations are considered especially high risk for sepsis and should have their temperature measured:
 - (1) Altered mental status
 - (2) Patients in long term care facilities (nursing home)
 - (3) Indwelling catheters
 - (4) Oncology patients
 - (5) Solid organ transplant
 - (6) Bed ridden
 - c) For an adult patient, 18 years of age and older, to qualify for this protocol, they must have a suspected source of infection AND also present with at least two of the following criteria:
 - (1) Temp greater than 100.4°F (38°C) or less than 95.9°F (35.5°C)
 - (2) HR greater than 100 bpm
 - (3) RR greater than 25 (or EtCO₂ less than or equal to 32 mmHg)
 - (4) Hypotension (systolic BP less than 90 mmHg)
 - (5) Point of care lactate reading greater than or equal to 4 mmol/L (if available)
 - d) Patients with hypotension or altered mental status should be considered to have septic shock and treated and transported rapidly. Patients may be treated under this protocol if they do not meet the above criteria with medical consultation.



IF PATIENT MEETS ABOVE SEPSIS CRITERIA, THIS PATIENT IS A PRIORITY 1 OR 2 PATIENT AND REQUIRES NOTIFICATION OF THE NEAREST APPROPRIATE FACILITY AS SOON AS POSSIBLE TO ALLOW FOR HOSPITAL PREPARATION. DURING THE CONSULTATION WITH THE RECEIVING FACILITY, THE PROVIDER SHALL USE THE VERBIAGE, "SEPSIS ALERT" AS THE UNIVERSAL METHOD OF NOTIFYING THE FACILITY THAT THE PATIENT MEETS THE SEPSIS INCLUSION CRITERIA



3. Treatment
 - a) Place patient in position of comfort, or supine if hypotension is present.
 - b) Carefully monitor airway and respiratory status, manage as required using the appropriate respiratory distress protocol (especially for patients with suspected pneumonia).



-
- c) Initiate large bore IV. If large bore IV not available, consider a second peripheral IV with the intention of not causing delay in transport and reserve the use of IO for priority 1 patient. If transport time is greater than 20 minutes and IV access is unsuccessful, consider placement of an IO (especially for septic shock). Consider performing a blood draw if time permits.

SS. SEPSIS: ADULT (Continued)

- d) If lungs are clear, and patient does not have a history of CHF or end stage renal failure, provide 2 L of LR wide open. Reassess every 500 mL for shortness of breath, blood pressure, and SpO₂ saturation changes.

OR

- e) If patient is fluid sensitive (i.e., has a history CHF, pulmonary edema, or end stage renal disease) infuse 250 mL and carefully monitor and reassess. Repeat 250 mL once if no worsening of respiratory status is noted to a max of 500 mL (consultation may be obtained to provide more fluid).
- f) If available, perform point of care lactate testing (Jurisdictional Pilot Program only).



FLUID LIMITS OR DOSES MAY BE MODIFIED WITH CONSULTATION.

- g) Place patient on cardiac monitor and perform 12-lead (do not delay IV therapy or fluid bolus).




If hypotension persists after 2 L of LR are provided, consider an additional 2 L of LR (up to a maximum of 30 mL/kg total, including the first 2 L bolus) and/or dopamine 2–20 **mcg**/kg/min (paramedic only). Titrate to a Mean Arterial Pressure of 65 mmHg or systolic BP of 90 mmHg.

(NEW '17)


- 4. Continue General Patient Care.

TT. SEPSIS: PEDIATRIC (Continued)

- f)  **If patient's vital signs do not improve after 20 mL/kg fluid**, consider additional 20 mL/kg LR boluses (up to a max of 60 mL/kg total, including first bolus, in one hour).



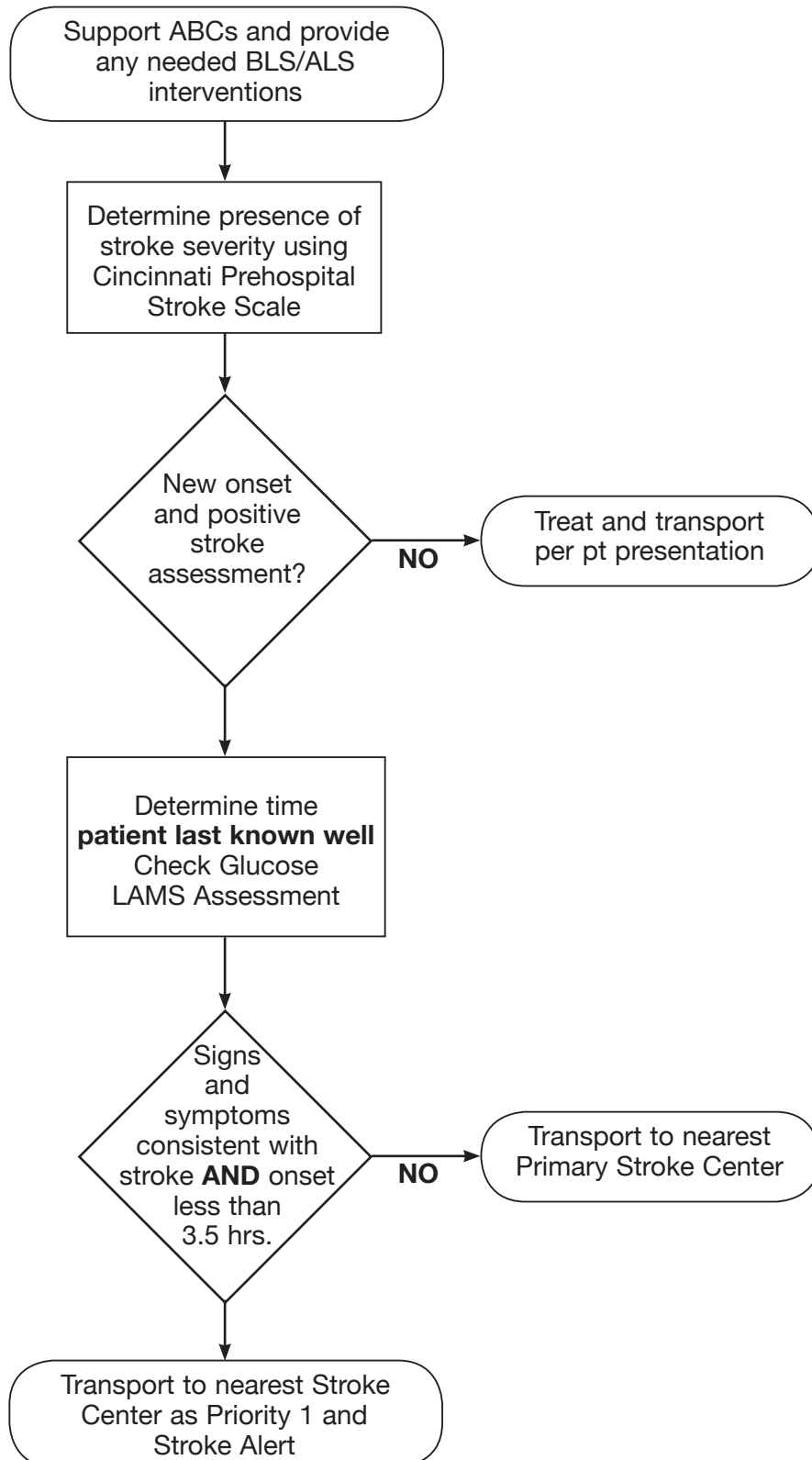
FLUID LIMITS OR DOSES MAY BE MODIFIED WITH CONSULTATION.

- g)  Dopamine 2–20 **mcg/kg/min** IV/IO. Titrate to age-specific vital signs.
(NEW '17)
- h) Consider initiation of a second IV. Initiation of second IV shall not delay transport.
- i) Patients with fever or known or suspected infection and hypotension or altered mental status should be considered to have septic shock and treated and transported rapidly.

4. Continue General Patient Care.

UU. STROKE: NEUROLOGICAL EMERGENCIES

EMS STROKE ALGORITHM



UU. STROKE: NEUROLOGICAL EMERGENCIES (Continued)

1. Initiate General Patient Care.

2. Presentation

Patient may present with numbness or weakness (often on one side only), difficulty speaking, blurred vision, dizziness, or a severe, unexplained headache. May be accompanied by seizures or altered mental status.

The Cincinnati Prehospital Stroke Scale

(Kothari R, et al. Acad Emerg Med 1997; 4:9866-990.)

Facial Droop (have patient show teeth or smile):

- Normal – both sides of face move equally
- Abnormal – one side of face does not move as well as the other side

Arm Drift (patient closes eyes and holds both arms straight out for 10 seconds):

- Normal – both arms move the same or both arms do not move at all (other findings, such as strength of grip, may be helpful)
- Abnormal – one arm does not move or one arm drifts down compared with the other

Abnormal Speech (have the patient say “you can’t teach an old dog new tricks”):

- Normal – patient uses correct words with no slurring
- Abnormal – patient slurs words, uses the wrong words, or is unable to speak

If Cincinnati Prehospital Stroke Scale is positive, perform the Los Angeles Motor Scale (LAMS). Relay LAMS score to the receiving hospital during Stroke Alert notification.

The Los Angeles Motor Scale (LAMS)

Facial droop	
Absent	0
Present	1
Arm drift	
Absent	0
Drifts down	1
Falls rapidly	2
Grip strength	
Normal	0
Weak grip	1
No grip	2



3. Treatment

- a) Position patient with head elevated at 30 degrees.
- b) If the patient has a positive Cincinnati Stroke Scale AND can be delivered to the hospital **within 3.5 hours*** of when patient was last known well, transport the patient to the closest Designated Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital.

UU. STROKE: NEUROLOGICAL EMERGENCIES (Continued)




IF PATIENT MEETS ABOVE STROKE CRITERIA, THIS PATIENT IS A PRIORITY 1 PATIENT AND REQUIRES NOTIFICATION OF THE NEAREST DESIGNATED STROKE CENTER AS SOON AS POSSIBLE TO ALLOW HOSPITAL PREPARATION. DURING THE CONSULTATION WITH THE RECEIVING FACILITY, THE PROVIDER SHALL USE THE VERBIAGE, “STROKE ALERT” AS THE UNIVERSAL METHOD OF NOTIFYING THE FACILITY THAT THE PATIENT MEETS THE STROKE INCLUSION CRITERIA.

*STROKE TREATMENTS ARE TIME SENSITIVE. REDUCTION IN TIME OF SYMPTOM ONSET TO TREATMENT IMPROVES OUTCOMES

WHILE STROKES DURING PREGNANCY OR SHORTLY AFTER GIVING BIRTH ARE RARE, THERE HAS BEEN A SIGNIFICANT RISE REPORTED IN THE LITERATURE. MOTHERS-TO-BE AND POSTPARTUM MOTHERS HAVE AN INCREASED RISK.




- c) Use glucometer and treat if glucose less than 70 mg/dl.
- d) Establish IV access with LR.
- e)  If the patient is hypotensive, obtain medical consultation.
- f) Consider obtaining blood sample using closed system.
- g) Do not treat hypertension in the field.



THE CAUSES OF STROKES IN CHILDREN ARE DIFFERENT FROM ADULTS. WHILE STROKES ARE UNCOMMON IN CHILDREN, THEY DO OCCUR AND ARE MOST OFTEN CAUSED BY ONE OF THE FOLLOWING CONDITIONS: CONGENITAL HEART DEFECTS, INFECTIONS (INCLUDING CHICKEN POX, MENINGITIS, OR ENCEPHALITIS), BRAIN INJURY, OR BLOOD DISORDERS (SUCH AS SICKLE CELL DISEASE). STROKES IN CHILDREN ARE MOST OFTEN SEEN IN INFANTS BUT DO OCCUR IN CHILDREN OF ANY AGE.

CHILDREN WITH STROKE SYMPTOMS WHO HAVE NOT REACHED THEIR 18TH BIRTHDAY SHALL BE TREATED UNDER THE PEDIATRIC PROTOCOL. CONSULT WITH A LOCAL BASE STATION AND A PEDIATRIC BASE STATION TO ARRANGE TRANSPORT TO A MARYLAND PEDIATRIC TRAUMA CENTER




- h) Administer oxygen at 2–6 liters via nasal cannula (unless hypoxic or in respiratory distress).
- i) Position patient with head elevated at 30 degrees.
- j)  If a child presents with a SUSPECTED stroke (e.g., sickle cell patient), consult with the nearest Pediatric Base Station and local Base Station.



- k) Use glucometer and treat accordingly.
(See Section IV, Glucometer Protocol.)

UU. STROKE: NEUROLOGICAL EMERGENCIES (Continued)

- l) Establish IV access with LR.
 - m)  If the patient is hypotensive, obtain medical consultation.
 - n) Consider obtaining blood sample using closed system.
 - o) Do not treat hypertension in the field.
4. Continue General Patient Care.

UU2. SYNCOPE (NEW '17)

1. Initiate General Patient Care.

2. Presentation

A patient of greater than 24 months of age who has had a loss of consciousness associated with an inability to maintain postural tone. The episode may spontaneously and completely resolve without medical intervention. **For children less than 24 months of age, refer to ALTE Protocol.**

3. Treatment



- a) Place patient in position of comfort.
- b) Perform Cincinnati Stroke Scale. If any segment is positive, go to Stroke: Neurological Emergencies Protocol.



-
- c) Place patient on cardiac monitor.
 - d) Obtain 12-lead EKG.



HISTORY, PHYSICAL EXAMINATION, AND 12-LEAD EKG SHOULD ALL BE USED TO DETERMINE THE PATIENT'S RISK OF AN ADVERSE OUTCOME. PATIENTS WITH HISTORY OR EVIDENCE OF HEART FAILURE, STRUCTURAL CARDIAC ANOMALY, AND/OR ABNORMAL FINDING ON EKG ARE AT HIGHER RISK FOR ADVERSE OUTCOMES.

- e) Establish IV access.
- f) Use glucometer and treat accordingly.
- g) Administer 20mL/kg bolus of LR to treat systolic blood pressure persistently less than 90 mmHg.



-
- h) Place patient in position of comfort.



-
- i) Place patient on cardiac monitor.
 - j) Obtain 12-lead EKG for patients 13 years of age and older, or have not returned to baseline, or high risk factors as listed in the ALERT.



SYNCOPE IN CHILDREN CAN SOMETIMES BE ASSOCIATED WITH SERIOUS MEDICAL CONDITIONS. PATIENTS WITH HISTORY OR EVIDENCE OF HEART FAILURE, STRUCTURAL CARDIAC ANOMALY, AND/OR ABNORMAL FINDING ON EKG ARE AT HIGHER RISK FOR ADVERSE OUTCOMES.

- k) Establish IV access, if appropriate.
- l) Use glucometer and treat appropriately.
- m) Administer 20mL/kg bolus of LR to treat age-defined hypotension..

4. Continue General Patient Care

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VI. TRAUMA PROTOCOL: BURNS

1. Initiate General Patient Care.
2. Presentation
 - a) The primary objectives in burn care by EMS providers are to stop the burning process, establish IV access, avoid hypothermia, and transport patients quickly and safely to a burn center. While patients with large burns (greater than 20%), facial burns, and/or significant smoke inhalation often require endotracheal intubation and mechanical ventilation during their resuscitation and care, airway compromise in the first few hours following a burn is uncommon.
 - (1) In adults, prehospital tracheal intubation following acute burns is generally unnecessary unless signs of respiratory failure are present (symptomatic airway obstruction, shock, altered mental status, hypoxemia while receiving supplemental oxygen, or dyspnea, etc.).
 - (2) Pediatric airways are smaller than adult airways and require frequent and thorough assessment for signs of respiratory distress. Intubate if necessary.
 - b) Burns are the body's response to injuries to the skin, muscles, bone, nerves, and blood vessels caused by thermal, chemical, electrical, radiation, or light source. Patients may exhibit any of the following: reddening of the skin, deep and intense pain, blisters, mottled appearance, and/or charred black or brown areas with severe or no pain.
 - c) Indications for Referral to a Burn Center
 - (1) All third degree burns (full thickness)
 - (2) Second degree burns (partial thickness) greater than 10% total body surface area
 - (3) Burns of the face, hands, feet, major joints, genitalia, or perineum
 - (4) Electrical burns, including lightning or contact with high voltage (greater than 120 volts)
 - (5) Suspected inhalation injury of toxic smoke (Monitor the patients with suspected inhalation injury for delayed airway obstruction, respiratory distress, or oxygen desaturation as the patient may need emergent airway management.)
 - (6) Circumferential burns involving the extremities or torso
 - (7) Chemical burns should be transported to the closest appropriate hospital for decontamination prior to referral to a burn center



PATIENTS WITH BURNS AND TRAUMA SHOULD BE REFERRED TO THE NEAREST APPROPRIATE TRAUMA CENTER FOR INITIAL CARE.

CHILDREN WHO MEET BURN INCLUSIVE CRITERIA WHO HAVE NOT REACHED THEIR 15TH BIRTHDAY SHOULD BE TRANSPORTED TO A PEDIATRIC BURN CENTER.

IF PATIENT HAS EXPOSURE TO CARBON MONOXIDE/SMOKE INHALATION, REFER TO CARBON MONOXIDE/SMOKE INHALATION PROTOCOL. **(NEW '17)**



3. Treatment
 - a) Extract the patient from burning vehicles or buildings if safe to do so and move patient to a place of relative safety.

GLASGOW COMA SCALE

Eye Opening

Spontaneously	4
To Voice	3
To Pain	2
No Response	1

Motor Response

To Verbal Command - Obeys	6
To Painful Stimulus - Localizes Pain	5
Flexion - Withdraw	4
Flexion - Abnormal	3
Extension	2
No Response	1

Verbal Response

Less than 2 years old	2-5 years old	Greater than 5 years old	
5 SMILES/COOS/CRIES	APPROPRIATE WORDS	ORIENTED AND CONVERSES	5
4 CRIES	INAPPROPRIATE WORDS	DISORIENTED AND CONVERSES	4
3 INAPPROPRIATE CRIES/SCREAMS	CRIES/SCREAMS	INAPPROPRIATE WORDS	3
2 GRUNTS	GRUNTS	INCOMPREHENSIBLE SOUNDS	2
1 NO RESPONSE	NO RESPONSE	NO RESPONSE	1

Glasgow Coma Score

Total (3-15)

ZZ. TRAUMA PROTOCOL: SEXUAL ASSAULT (NEW '17)

1. Initiate General Patient Care.

2. Presentation

Patient may present with no overt evidence of trauma, or may present with the following injuries:

- a) Abrasions, contusions, and/or bleeding
- b) Signs of forcible restraint
- c) Petechiae of the face and conjunctiva, secondary to strangulation
- d) Facial injuries, including eye injuries, broken teeth, swollen jaw, or cheekbone
- e) Vaginal or rectal bleeding or pain



PATIENTS MEETING THE SPECIALTY CENTER CRITERIA OR IN NEED OF TIME-SENSITIVE EMERGENT CARE SHOULD BE PREFERENTIALLY TRANSPORTED TO THE SPECIALTY CENTER OR NEAREST EMERGENCY DEPARTMENT FOR MANAGEMENT, EVEN IF THIS IS NOT A MARYLAND COALITION AGAINST SEXUAL ASSAULT (MCASA) RECOGNIZED FACILITY. MCASA RECOGNITION SHOULD NOT SUPERCEDE SPECIALTY CENTER NEEDS.



ALL HEALTH CARE PROVIDERS ARE OBLIGATED BY LAW TO REPORT CASES OF SUSPECTED CHILD OR VULNERABLE ADULT ABUSE AND/OR NEGLECT TO EITHER THE LOCAL POLICE OR ADULT/CHILD PROTECTIVE SERVICE AGENCIES. DO NOT INITIATE REPORT IN FRONT OF THE PATIENT, PARENT, OR CAREGIVER (MD CODE, FAMILY LAW, § 5-704). UNDER MARYLAND LAW, EMS PROVIDERS ARE PROTECTED FROM LIABILITY IF THEY MAKE A REPORT OF CHILD/VULNERABLE ADULT ABUSE AND NEGLECT IN GOOD FAITH (COURTS AND JUDICIAL PROCEEDINGS ARTICLE § 5-620).



3. Treatment

- a) If practical, allow patient to speak with a provider with whom they are most comfortable.
- b) Maintain non-judgmental, caring attitude.
- c) Preserve the crime scene and clothing articles, if practical.
- d) Do not perform an examination of the genitals or rectum unless necessary to stabilize the patient.
- e) Dress wounds (do not attempt to clean).
- f) Discourage any self-treatment (shower, washing, changing clothes, brushing teeth).
- g) Treat injuries according to presentation.



IF POSSIBLE, TRANSPORT THE PATIENT TO THE APPROPRIATE MARYLAND COALITION AGAINST SEXUAL ASSAULT (MCASA) RECOGNIZED FACILITY FOR THE SEXUAL ASSAULT FORENSIC EXAM (S.A.F.E.). PROVIDERS SHOULD USE THE TERM "SAFE PATIENT" WHEN NOTIFYING THE RECEIVING FACILITY OF THE TRANSPORT.



-
- h) Patients under **13** years of age should be transported to an MCASA-recognized pediatric facility for the Sexual Assault Forensic Exam.

4. Continue General Patient Care.

Spinal Protection: The act of protecting the spinal cord from further injury

Standing Orders: Orders, rules, regulations, or procedures prepared as guidelines in the preparation and carrying out of medical and surgical procedures

Sublingually: Under the tongue

Symptom: Any subjective evidence of disease or of a patient's condition (such as evidence perceived by the patient)

Symptomatic: The subjective evidence or indication of illness, disease, or physical disturbance of patient's condition

Syncope: A fainting spell. It usually follows a feeling of lightheadedness and may often be prevented by lying down. Syncope may also result from any number of heart, neurologic, or lung disorders.

System Medical Director: Means any of the following: Executive Director of MIEMSS, State EMS Medical Director, Associate State Medical Director for Pediatrics, Regional Medical Directors, Associate Regional Pediatric Medical Directors, EMS Operational Program Medical Directors, and Assistant EMS Operational Program Medical Directors

TOI: Type of Incident to which EMS providers may be called upon to respond (e.g., ill and/or injured patients, hazardous materials incidents, fires, mass casualty incidents)

Tracheostomy: An incision into the trachea (windpipe) that forms a temporary or permanent opening called a stoma. A tube is inserted through the opening to allow passage of air and removal of secretions.

Vagal: Pertaining to the vagus nerve (the tenth cranial nerve, which is essential for speech, swallowing, and slowing of the heart rate)

VF: Ventricular Fibrillation

Volume-Sensitive Children: Children who need smaller fluid bolus volumes due to special needs including: neonates (1 hour to 28 days of age), congenital heart diseases, chronic lung disease, or chronic renal failure

VT: Ventricular Tachycardia

Vulnerable Adult: An adult who lacks the physical or mental capacity to provide for his or her daily needs (Digest of Criminal Law)

B. PROCEDURES, MEDICAL DEVICES, AND MEDICATIONS FOR EMS AND COMMERCIAL SERVICES

PROCEDURE	EMR	EMT	CRT-(I)	PM
ADMINISTRATION OF MEDICATIONS				
Buccal, Oral, Sublingual	-	SO	SO	SO
SC, IV, Rectal, Nebulizer	-	-	SO	SO
Intramuscular	-	OSP	SO	SO
Intranasal	OSP	SO	SO	SO
Intraosseous	-	-	SO	SO
Intradermal PPD (Public Safety Personnel only)	-	-	-	OSP
AIRWAY MANAGEMENT				
Alternative Airway Device (e.g., EasyTube®)	-	-	SO	SO
BiPAP	-	-	-	OSP
Carbon Dioxide Detector (ALS required)	-	SO	SO	SO
Capnograph (ALS required since 2015)	-	-	SO	SO
CPAP	-	-	SO	SO
Cricothyroidotomy	-	-	-	PP
Direct Laryngoscopy	-	-	SO	SO
Gastric Tube (BLS "Burp," ALS insert)	-	-	SO	SO
Laryngeal Tube Airway (King LTS-D™)	-	-	OSP	OSP
Nasotracheal Intubation	-	-	-	SO
Oropharyngeal/Nasopharyngeal Airway	SO	SO	SO	SO
Orotacheal Intubation	-	-	SO	SO
Needle Decompression Thoracostomy (NDT)	-	-	SO/MC	SO/MC
Pulse Oximeter	-	SO	SO	SO
Suction	SO	SO	SO	SO
Ventilator	-	-	-	OSP
Video Laryngoscopy	-	-	PP	PP
CHEMICAL RESTRAINT	-	-	SO/MC	SO
ELECTROCARDIOGRAM				
Standard Limb Leads	-	-	SO	SO
12-Lead	-	PP	SO	SO
ELECTRICAL THERAPY				
Automated External Defibrillator	SO	SO	SO	SO
Cardioversion (NEW '17)	-	-	SO/MC	SO/MC
Defibrillation	-	-	SO	SO
Transcutaneous Cardiac Pacing	-	-	SO	SO
GLUCOMETER	-	OSP	SO	SO
HIGH PERFORMANCE CPR	SO	SO	SO	SO
INTRAVENOUS THERAPY				
External Jugular Access & Maintenance	-	-	SO	SO
Intraosseous Infusion & Maintenance	-	-	SO	SO
Peripheral IV Access/Saline Lock/Blood Drawn	-	OSP	SO	SO
Peripheral IV Maintenance	-	SO	SO	SO
PRONOUNCEMENT OF DEATH	-	SO	SO	SO
SKELETAL STABILIZATION/IMMOBILIZATION	SO	SO	SO	SO
BLEEDING MANAGEMENT: TOURNIQUET / HEMOSTATIC DRESSING	SO	SO	SO	SO

SO Standing Order
OSP Optional Supplemental Program

MC Medical Consultation Required
PP Pilot Program **REA** Research

B. PROCEDURES, MEDICAL DEVICES, AND MEDICATIONS FOR EMS AND COMMERCIAL SERVICES (Continued)

PROCEDURE	EMR	EMT	CRT-(I)	PM
VALSALVA MANEUVER	-	-	SO	SO Apnea
Monitors	-	SO	SO	SO
Arterial Lines and Cardiac Sheaths	-	-	-	-
Chemotherapy Administration/Drip	-	-	-	-
Chest tubes with Chest Drainage System	-	-	-	-
Chest tubes with Heimlich Valve	-	-	SO	SO
Colostomy bag	-	SO	SO	SO
External Orthopedic Fixators	-	SO	SO	SO
Foley catheter	-	SO	SO	SO
Foley catheter with irrigation	-	SO	SO	SO
Gastrostomy and jejunal feeding tubes (Non-infusing)	-	SO	SO	SO
HALO Cervical Immobilization	-	SO	SO	SO
IABP InterAortic Balloon Pump	-	-	-	-
Ileostomy tube (Non-infusing)	-	SO	SO	SO
iStat	-	-	-	REA
PICC —peripherally inserted central catheter or CVA —central venous access line, capped only	-	SO	SO	SO
PICC —peripherally inserted central catheter or CVA —central venous access line, subclavian/femoral or internal jugular may be monitored if fluid/medication being administered meets protocol. The ALS provider may access the line in a life-threatening emergency.	-	-	SO	SO
Intraventricular/Intracranial Monitor	-	-	-	-
Left Ventricular Assist Device (LVAD) Scene (BLS & ALS)	-	SO	SO	SO
Left Ventricular Assist Device (LVAD) Interfacility	-	-	-	-
Nasogastric and Orogastic tubes (Existing, Non-infusing, or Capped)	-	SO	SO	SO
Nephrostomy Tubes	-	SO	SO	SO
Peak Expiratory Flow Meter	-	-	SO	SO
Pelvic Binder Device	-	PP	PP	PP
Portable Outpatient Fixed Medication Pump/PCA Pump	-	SO	SO	SO
Peritoneal Dialysis (Non-active, Capped)	-	SO	SO	SO
Physical Restraint	-	SO	SO	SO
Sengstaken-Blakemore tube	-	-	-	-
Suprapubic catheter	-	SO	SO	SO
Surgical drains	-	SO	SO	SO
Swan-Ganz	-	-	-	-
Tracheostomy (Existing)	-	SO	SO	SO
Transtracheal O ₂ (Outpatient/Existing)	-	SO	SO	SO
Transvenous Pacemaker (Temporary Transvenous)	-	-	-	-
Ventilators (Acute, Chronic, Scene)	-	-	-	OSP
Ventricular Peritoneal Shunt	-	SO	SO	SO
Wound vacuum device	-	SO	SO	SO

SO Standing Order
OSP Optional Supplemental Program

MC Medical Consultation Required
PP Pilot Program **REA** Research

B. PROCEDURES, MEDICAL DEVICES, AND MEDICATIONS FOR EMS AND COMMERCIAL SERVICES (Continued)

MEDICATIONS	EMR	EMT	CRT-(I)	PM
Acetaminophen	-	SO	SO	SO
Activated Charcoal (Without Sorbitol)	-	MC	MC	MC
Adenosine	-	-	SO	SO
Albuterol/Fast-acting bronchodilator MDI (patient's prescribed)	-	SO/MC	SO/MC	SO/MC
Albuterol Sulfate Nebulizer	-	-	SO/MC	SO/MC
Amiodarone	-	-	SO/MC	SO/MC
Antimicrobial (Pre-established interfacility only)	-	-	-	OSP
Aspirin	-	SO	SO	SO
Atropine Sulfate	-	-	SO/MC	SO/MC
Atrovent	-	-	SO	SO
Calcium Chloride (10% Solution)	-	-	MC	MC
Dexamethasone	-	-	SO	SO
Dextrose	-	-	SO	SO
Diazepam	-	-	MC	SO/MC
Diltiazem	-	-	MC	MC
Diluent D5W, NS, LR (NEW '17)	-	-	SO	SO
Diphenhydramine Hydrochloride	-	-	SO/MC	SO/MC
Dopamine Hydrochloride	-	-	MC	MC
Epinephrine Auto-Injector	OSP	SO/MC	SO	SO
Epinephrine Nebulizer	-	-	MC	MC
Epinephrine (1:1,000) Vial or Syringe	-	OSP	SO	SO
Epinephrine 1:10,000	-	-	SO	SO
Etomidate (Amidate)	-	-	-	PP
Fentanyl	-	-	OSP	OSP
Glucagon	-	-	SO/MC	SO/MC
Glycoprotein IIb/IIIa	-	-	-	OSP
Haldol	-	-	SO	SO
Hemophilia Blood Factor (VIII or IX)	-	-	SO	SO
Heparin (Interfacility transport only)	-	-	-	OSP
Hydroxocobalamin	-	-	OSP	OSP
Lidocaine	-	-	SO	SO
Magnesium Sulfate	-	-	SO/MC	SO/MC
MARK I/DuoDote (Atropine & 2 PAM)	OSP	OSP	OSP	OSP
Midazolam (Versed)	-	-	SO/MC	SO/MC
Morphine Sulfate	-	-	SO/MC	SO/MC
Morphine Sulfate (Infusion)	-	-	-	MC
Naloxone (IN) Public Safety	OSP	SO	SO	SO
Naloxone (IV, IM, ET)	-	-	SO	SO
Nitroglycerin Paste	-	-	SO	SO
Nitroglycerin (tablet /spray) (patient's prescribed)	-	SO	SO	SO

SO Standing Order

OSP Optional Supplemental Program

MC Medical Consultation Required

PP Pilot Program

REA Research

B. PROCEDURES, MEDICAL DEVICES, AND MEDICATIONS FOR EMS AND COMMERCIAL SERVICES (Continued)

MEDICATIONS	EMR	EMT	CRT-(I)	PM
Nitroglycerin (tablet/spray)	-	-	SO	SO
Ondansetron	-	-	SO/MC	SO/MC
Oral Glucose	-	SO	SO	SO
Oxygen	SO	SO	SO	SO
Peripheral Parenteral Nutrition (PPN) or Total Parenteral Nutrition (TPN) non-medicated	-	SO	SO	SO
Purified Protein Derivative (Public Safety Personnel only)	-	-	-	OSP
Sodium Bicarbonate	-	-	MC	MC
Sodium Bicarbonate (Infusion)	-	-	MC	MC
Succinylcholine (Anectine)	-	-	-	PP
Vaccines (Hepatitis and Influenza) (Public Safety Personnel only)	-	-	-	OSP
Vecuronium (Norcuron)	-	-	-	PP

SO Standing Order

OSP Optional Supplemental Program

MC Medical Consultation Required

PP Pilot Program

REA Research

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C. BLS PHARMACOLOGY



1. ACETAMINOPHEN

a) Indications

Patients ages 2 years and above judged to be in mild to moderate discomfort (e.g., 2–5 on FACES scale) **(NEW '17)**

b) Adverse Effects

Not clinically significant

c) Precautions

Administration of acetaminophen for mild to moderate pain does not eliminate the need for transport of the patient to the hospital to receive a comprehensive evaluation of the cause of the pain and appropriate definitive treatment.

d) Contraindications

- (1) Head Injury
- (2) Hypotension
- (3) Administration of acetaminophen or medications containing acetaminophen within the previous four hours



MANY COMMON COLD PREPARATIONS CONTAIN ACETAMINOPHEN.

- (4) Inability to swallow or take medications by mouth
- (5) Respiratory distress
- (6) Persistent vomiting
- (7) Known or suspected liver disease (including patients suspected of current alcohol ingestion)
- (8) Allergy to acetaminophen
- (9) Patients less than 2 years of age

e) Preparations Use Unit Dose Only

(DO NOT USE MULTIDOSE BOTTLE OF LIQUID)

Unit dose 160 mg/5 mL liquid

Unit dose 325 mg pill or tablet

f) Dosage

- (1) Less than 2 years of age: Not indicated
- (2) 2–4 years: Unit dose 160 mg/5 mL
- (3) 5–12 years: TWO unit doses of 160 mg/5 mL each for a total of 320 mg/10 mL
- (4) 13 years and above: FOUR unit doses of 160 mg/5 mL each for a total of 640 mg/20 mL OR in a form of 325 mg pill or tablet x2 for a total of 650 mg with sips of water as tolerated by the patient.



2. ACTIVATED CHARCOAL (WITHOUT SORBITOL)

a) Indications

Poisoning by mouth

b) Adverse Effects

May indirectly induce vomiting and cause nausea

c) Precautions

Does not adsorb all drugs and toxic substances

d) Contraindications

- (1) Altered mental status
- (2) Patients who have received an emetic

e) Preparations

- (1) 25 grams/125 mL bottle
- (2) 50 grams/250 mL bottle



Dosage

- (1) Adult: Administer 1 gram/kg
- (2) Pediatric: Administer 1 gram/kg



POISON INFORMATION CENTER RECOMMENDATIONS SHOULD BE SOLICITED IN CONJUNCTION WITH MEDICAL CONSULTATION, BUT MEDICATION ORDERS CAN ONLY BE ACCEPTED FROM AN APPROVED BASE STATION OR CONSULTATION CENTER.



5. EPINEPHRINE (1:1,000)

a) Indications

- (1) Moderate to severe allergic reaction with respiratory distress or mild allergic reaction with history of life-threatening allergic reaction
- (2) Pediatric patients with severe asthma

b) Adverse Effects

- (1) Tachycardia/Palpitations
- (2) Angina
- (3) Headache
- (4) Nausea/Vomiting
- (5) Dizziness
- (6) Hypertension
- (7) Nervousness/Anxiety
- (8) Tremors

c) Precautions



Unless in severe allergic reaction or severe asthma, medical consultation must be obtained before administering to pregnant, cardiac, or adult asthma patients.

d) Contraindications

None in the presence of anaphylaxis


e) Preparations

- Epinephrine
(Patient prescribed or EMS supplied)
- (1) Vial: 1 mg in 1 mL (1:1,000)
 - (2) Preloaded Syringe
 - (a) Adult: 0.5 mg in 0.5 mL
 - (b) Pediatric: 0.15 mg in 0.15 mL



MEDICAL CONSULTATION IS REQUIRED FOR THE ADMINISTRATION OF EPINEPHRINE TO ADULT ASTHMA PATIENTS.

f) Dosage

- (1) **Patients 5 years of age or greater:**
Adult: 0.5 mg in 0.5 mL IM
- (2) **Patients less than 5 years of age:**
Pediatric: 0.15 mg in 0.15 mL IM
- (3)  Additional doses may be administered with medical consultation.



6. EPINEPHRINE AUTO-INJECTOR

a) Indications

- (1) Moderate to severe allergic reaction with respiratory distress or mild allergic reaction with history of life-threatening allergic reaction
- (2) Pediatric patients with severe asthma

b) Adverse Effects

- (1) Tachycardia/Palpitations
- (2) Angina
- (3) Headache
- (4) Nausea/Vomiting
- (5) Dizziness
- (6) Hypertension
- (7) Nervousness/Anxiety
- (8) Tremors

c) Precautions



Unless in severe allergic reaction or severe asthma, medical consultation must be obtained before administering to pregnant, cardiac, or adult asthma patients.

d) Contraindications

None in the presence of anaphylaxis

e) Preparations

- Epinephrine Auto-injector (single or multi-dose) only
(Patient prescribed or EMS supplied)
- (1) Adult: 0.3 mg
 - (2) Pediatric: 0.15 mg



MEDICAL CONSULTATION IS REQUIRED FOR THE ADMINISTRATION OF EPINEPHRINE AUTO-INJECTOR TO ADULT ASTHMA PATIENTS.

f) Dosage

- (1) Less than 5 years of age: 0.15 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.15 mg in 0.15 mL IM
- (2) 5 years and greater: administer 0.3 mg IM in the lateral thigh via epinephrine auto-injector or manual administration 0.5 mg in 0.5 mL IM
- (3) Additional doses may be administered with medical consultation.



8. NITROGLYCERIN

(Patient Prescribed, Patient Assisted)


a) Indications

- (1) Patient must have own prescribed sublingual nitroglycerin.
- (2) Chest pain

b) Adverse Effects

- (1) Hypotension
- (2) Headache
- (3) Dizziness
- (4) Tachycardia

c) Precautions

- (1) Reassess blood pressure before and after administration.
- (2)  If systolic blood pressure drops more than 20 mmHg, obtain medical consultation before further administration.



d) Contraindications

- (1) Blood pressure below 90 mmHg systolic
- (2) Heart rate less than 60
- (3) Medication not prescribed for the patient
- (4) Pediatric patient under age 13
- (5) Any patient having taken medication for Pulmonary Artery Hypertension (e.g., Adcirca™ or Revatio™) or erectile dysfunction (e.g., Viagra™, Levitra™, or Cialis™) within the past 48 hours. Medical consultation is required to override this contraindication.

e) Preparations

Spray or tablet

f) Dosage

- (1) Adult: One tablet or one spray sublingually
 - (a) Repeat in 3 to 5 minutes if chest pain persists
 - (b) Maximum of three doses (a combination of patient-administered and EMT-administered) of nitroglycerin
- (2)  Pediatric: (nitroglycerin contraindicated for children under age 13)
- (3)  Additional doses may be administered with medical consultation.



9. ORAL GLUCOSE

a) Indications

- (1) Altered mental status with known diabetic history
- (2) Unconscious for an unknown reason

b) Adverse Effects

Not clinically significant

c) Precautions

Patient without gag reflex may aspirate.

d) Contraindications

Not clinically significant

e) Preparations

10–15 grams of glucose (contained in 24, 30, or 37.5 gram tube)

f) Dosage

- (1) Adult: Administer 10–15 grams of glucose paste between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.
- (2) Pediatric: Administer 10–15 grams of glucose paste between the gum and cheek; this may be accomplished through several small administrations. Consider single additional dose of glucose paste if not improved after 10 minutes.



10. OXYGEN (NEW '17)

a) Pharmacology

- (1) Increases oxygen content of the blood
- (2) Improves tissue oxygenation
- (3) Decreases energy expended for respirations

b) Pharmacokinetics

Changing the percentage of inspired oxygen results in an increased blood and tissue level equilibration within 5–20 minutes.

c) Indications

- (1) If evidence of hypoxia (Less than 94% SpO₂)
- (2) Respiratory distress
- (3) Cardiopulmonary arrest
- (4) Trauma
- (5) Suspected CO exposure
- (6) Dyspnea

d) Contraindications

Not clinically significant

e) Adverse Effects

High concentrations of oxygen will reduce the respiratory drive in some COPD patients; these patients should be carefully monitored.

f) Precautions

- (1) Never withhold oxygen from those who need it.
- (2) Oxygen should be given with caution to patients with COPD.
- (3) Simple or partial rebreather face masks must be supplied with a minimum 6 lpm.
- (4) Non-breather (NRB) face masks must be supplied with a minimum 12 lpm.

g) Dosage

- (1) Adult: Administer 12–15 lpm via NRB mask or 2–6 lpm via nasal cannula, as needed.
CO exposure: Administer 100% oxygen via NRB mask. Maintain SpO₂ at 100%
- (2) Pediatric: Administer 12–15 lpm via NRB mask or 2–6 lpm via nasal cannula, as needed.
CO exposure: Administer 100% oxygen via NRB mask. Maintain SpO₂ at 100%

Percent O ₂ Saturation	Ranges	General Patient Care
94–100%	Normal	Give oxygen as necessary
91–93%	Mild Hypoxia	Give oxygen as necessary
86–90%	Moderate Hypoxia	Give 100% oxygen Assisting Ventilations if necessary
less than or equal to 85%	Severe Hypoxia	Give 100% oxygen Assist Ventilations If indicated, Intubate



INACCURATE OR MISLEADING SpO₂ READINGS MAY OCCUR IN THE FOLLOWING PATIENTS: HYPOTHERMIC, HYPOPERFUSION (SHOCK), CO POISONING, HEMOGLOBIN ABNORMALITY, ANEMIA, AND VASOCONSTRICTION.

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D. ALS PHARMACOLOGY



1. ACETAMINOPHEN

a) Indications

Patients ages 2 years and above judged to be in mild to moderate discomfort (e.g., 2–5 on FACES scale)

b) Adverse Effects

Not clinically significant

c) Precautions

Administration of acetaminophen for mild to moderate pain does not eliminate the need for transport of the patient to the hospital to receive a comprehensive evaluation of the cause of the pain and appropriate definitive treatment.

d) Contraindications (NEW '17)

- (1) Head Injury
- (2) Hypotension
- (3) Administration of acetaminophen or acetaminophen containing medications within the previous four hours



MANY COMMON COLD PREPARATIONS CONTAIN ACETAMINOPHEN.

- (4) Inability to swallow or take medications by mouth
- (5) Respiratory distress
- (6) Persistent vomiting
- (7) Known or suspected liver disease (including patients suspected of current alcohol ingestion)
- (8) Allergy to acetaminophen
- (9) Patients less than 2 years of age

e) Preparations Use Unit Dose Only

(DO NOT USE MULTIDOSE BOTTLE OF LIQUID)

Unit dose 160 mg/5 mL liquid

Unit dose 325 mg pill or tablet

f) Dosage

- (1) Less than 2 years of age: Not indicated
- (2) 2–4 years: Unit dose 160 mg/5 mL
- (3) 5–12 years: TWO unit doses of 160 mg/5 mL each for a total of 320 mg/10 mL
- (4) 13 years and above: FOUR unit doses of 160 mg/5 mL each for a total of 640 mg/20 mL OR in a form of 325 mg pill or tablet x2 for a total of 650 mg with sips of water as tolerated by the patient.



2. ACTIVATED CHARCOAL (WITHOUT SORBITOL)

a) Pharmacology

Variable drug or toxin absorption when ingested

b) Pharmacokinetics

Adsorbs poisons and prevents toxins from entering body systems

c) Indications

Poisoning by mouth

d) Contraindications

- (1) Altered mental status
- (2) Patients who have received an emetic

e) Adverse Effects

Not clinically significant

f) Precautions

Does not adsorb all drugs and/or toxic substances

g) Dose


- (1) Adult: Administer 1 gram/kg
- (2) Pediatric: Administer 1 gram/kg



POISON INFORMATION CENTER RECOMMENDATIONS SHOULD BE SOLICITED IN CONJUNCTION WITH MEDICAL CONSULTATION, BUT MEDICATION ORDERS CAN ONLY BE ACCEPTED FROM AN APPROVED BASE STATION OR CONSULTATION CENTER.



g) Dosing

- (1) Adult with pulse: 150 mg IV/IO over 10 minutes (mixed in 50 - 100 mL of approved diluent). May repeat once.
- (2) Adult without pulse VF/VT/(torsades after magnesium sulfate): 300 mg IV/IO.
May repeat one time
150 mg IV/IO
- (3)  Pediatric with pulse: 5 mg/kg IV/IO over 20 minutes (mixed in 50 - 100 mL of approved diluent)
- (4) Pediatric without pulse: 5 mg/kg IV/IO; max single dose 300 mg. May repeat twice to a maximum of 15 mg/kg.



6. ASPIRIN

a) Pharmacology

- (1) Platelet inhibitor
- (2) Anti-inflammatory

b) Pharmacokinetics

Blocks platelet aggregation

c) Indications

Chest pain when acute myocardial infarction is suspected

d) Contraindications

Known hypersensitivity

e) Adverse Effects

- (1) Heartburn
- (2) Nausea and vomiting
- (3) Wheezing

f) Precautions

GI bleeding and upset

g) Dosage

- (1) Adult: 324 mg or 325 mg chewed
- (2) Pediatric: Not indicated



9. CALCIUM CHLORIDE (10% SOLUTION)

a) Pharmacology

- (1) Increase cardiac contractile state and ventricular automaticity
- (2) Is useful in reversing cardiac arrhythmias due to hyperkalemia (often seen in renal dialysis patients)

b) Pharmacokinetics

Rapid onset of action with IV administration

c) Indications

- (1) Hyperkalemia
- (2) Hypocalcemia
- (3) To treat adverse effects caused by calcium channel blocker overdose
- (4) Hypotension secondary to diltiazem administration
- (5) Respiratory depression, decreased reflexes, flaccid paralysis, and apnea following magnesium sulfate administration

d) Contraindications

- (1) Not indicated in cardiac arrest except when hyperkalemia, hypocalcemia, or calcium channel toxicity is highly suspected
- (2) Patient currently taking digoxin with suspected calcium channel blocker overdose

e) Adverse Effects

- (1) Bradycardia may occur with rapid injection.
- (2) Syncope, cardiac arrest, arrhythmia, bradycardia

f) Precautions

- (1) Use with caution on patients taking digitalis, as calcium may increase ventricular irritability and precipitate digitalis toxicity.
- (2) If given with sodium bicarbonate, calcium will precipitate.
- (3) Calcium salts may produce coronary and cerebral artery spasm.

g) Dosage (NEW '17)

- (1) Adult: Administer 0.5–1 gram SLOW IVP over 10 minutes.
Maximum dose 1 gram
Administer 500 mg SLOW IVP for: hypotension following diltiazem administration.
Respiratory depression, decreased reflexes, flaccid paralysis, and apnea following magnesium sulfate administration
- (2) Pediatric: Administer 20 mg/kg (0.2 mL/kg) SLOW IVP/IO (50 mg/min)
Maximum dose 1 gram



10. DEXAMETHASONE

a) Indications

- (1) Moderate to severe asthma exacerbation
- (2) Croup

b) Adverse Effects

- (1) Headache
- (2) Edema
- (3) Vertigo
- (4) Fluid retention
- (5) Adrenal insufficiency and immunosuppression with long-term use
- (6) HTN
- (7) CHF
- (8) Nausea and vomiting
- (9) Dyspepsia
- (10) Anaphylaxis

c) Precautions

- (1) Caution with diabetes
- (2) Known TB
- (3) Osteoporosis
- (4) Hepatic impairment
- (5) CHF
- (6) Seizure disorder

d) Contraindications

- (1) Hypersensitivity to drug
- (2) Known systemic fungal infection
- (3) Premature infants

e) Dosage (IV solution used for PO administration)

- (1) Adult: 10 mg IV (preferred, if established) or PO
- (2) Pediatric:
 - (a) Asthma: 0.5 mg/kg PO (preferred) or IV to a maximum of 10 mg
 - (b) Croup: 0.5 mg/kg PO/IM/IV to a maximum of 10 mg



13. DILTIAZEM (CARDIZEM)

a) Class

Calcium channel blocker

b) Actions

- (1) Inhibits the movement of calcium ions across cardiac muscle cells
- (2) Decreases conduction velocity and ventricular rate

c) Indications

Symptomatic atrial fibrillation and atrial flutter

d) Contraindications

- (1) Hypotension below 90 mmHg, second or third degree heart block, hypersensitivity to the drug
- (2) Patients less than 18 years of age

e) Precautions

Use cautiously in patients with renal failure or congestive heart failure.

f) Side effects

- (1) Headache
- (2) Nausea
- (3) Vomiting
- (4) Bradycardia
- (5) Hypotension

g) Significant interactions

Congestive heart failure may result if used along with beta blockers.

h)  Dosage

(1) Adult

- (a) 0.25 mg/kg (maximum dose 20 mg) by IV bolus administered SLOW IV over 2 minutes; if response is not adequate, repeat in 15 minutes with a dosage of 0.35 mg/kg (maximum dose 25 mg) over 2 minutes.
- (b) For patients older than 50 years of age or borderline blood pressure, consider initial bolus 5–10 mg administered IV over 2 minutes.

(2) Pediatric:


Contraindicated for patients less than 18 years of age. If needed, consult Pediatric Base Station.



i) Overdose or Toxicity Presentation

Generally consists of exaggeration of side effects, including severe hypotension and symptomatic bradycardia

j) Treatment of Overdose or Other Adverse Reactions

- (1) Give general supportive measures, monitor vitals, administer oxygen.
- (2)  Hypotension: Consider calcium chloride 500 mg SLOW IVP with medical consultation and IV fluid bolus with LR; evaluate legs.
- (3) Bradycardia: Consider atropine (0.5 to 1 mg); if necessary, consider pacing.



- (4) Headache
- (5) Nervousness
- (6) Decreased level of consciousness
- (7) Rebound edema may occur 20–30 minutes after administration to croup patients.

f) Precautions

- (1) Do not mix with sodium bicarbonate as this deactivates epinephrine.
- (2) Epinephrine causes a dramatic increase in myocardial oxygen consumption.
- (3) Its use in the setting of an acute MI should be restricted to cardiac arrest.
- (4) IVP epinephrine (1:1,000) should not be administered to any patient with a pulse.

g) Dosage


- (1) Cardiac Arrest
 - (a) Adult:
 - (i) Administer 1 mg (1:10,000) IVP every 3–5 minutes
 - (b) Pediatric:
 - (i) Administer 0.01 mg/kg (0.1 mL/kg) of 1:10,000 IVP/IO; repeat every 3–5 minutes
 - (ii) ET: 0.1 mg/kg of 1:1,000, diluted with 5 mL of LR; repeat every 3–5 minutes
 - (c) Neonate:
 - (i) Administer 0.01 mg/kg (0.1 mL/kg) of 1:10,000 IVP/IO; repeat every 5 minutes
 - (ii) ET: 0.03 mg/kg of 1:10,000, diluted with 1 mL of LR
- (2) Bradycardia
 - (a) Adult: not indicated
 - (b) Pediatric:
 - (i) Administer 0.01 mg/kg (0.1 mL/kg) of the 1:10,000 IVP/IO; repeat every 3–5 minutes
 - (ii) ET: 0.1 mg/kg of 1:1,000, diluted with 5 mL of LR; repeat every 3–5 minutes
 - (c) Neonate:
 - (i) Administer 0.01 mg/kg (0.1 mL/kg) of 1:10,000 IVP/IO; repeat every 3–5 minutes
 - (ii) ET: 0.03 mg/kg of 1:10,000, diluted with 1 mL of LR



- (3) Allergic Reaction/Anaphylaxis/Asthma
 - (a) FOR ANAPHYLAXIS (ADULT ONLY)

For patients who are in extremis with severe hypotension or impending respiratory failure, consider initiating an epinephrine drip after having administered 3 doses of IM epinephrine.

 - (i) Mix 1 mg of epinephrine (either 1:1,000 or 1:10,000) in a 1 liter bag of LR IV/IO. Initiate an infusion with a wide open macro drip titrating to a systolic pressure of greater than 90 mmHg. When drip administered, this will be reported as an exceptional call.
 - (b) Epinephrine: 1:1,000 (**NEW '17**)
 - (i) Less than 5 years of age: administer 0.15 mg in 0.15 mL IM
 - (ii) 5 years and greater: administer 0.5 mg in 0.5 mL IM

- (4) Croup
 - (a) Adult: not indicated
 - (b) Pediatric
 - (i) Administer 2.5 mL of epinephrine 1:1,000 via nebulizer.
 - (ii)  If patient does not improve, administer a second dose of 2.5 mL of epinephrine 1:1,000 via nebulizer.



ALL PATIENTS WHO RECEIVE NEBULIZED EPINEPHRINE MUST BE TRANSPORTED BY AN ALS UNIT TO AN APPROPRIATE FACILITY.



17. FENTANYL

(Optional Supplemental Protocol, which allows for jurisdictional selection of both morphine and fentanyl OR replacement of morphine by fentanyl as the opioid of choice)

a) Pharmacology

- (1) Synthetic opioid binds with opiate receptors in the CNS, altering both perception and emotional response to pain.
- (2) Fentanyl is significantly more potent than morphine. 100 mcg of fentanyl is equivalent to 10 mg of morphine.

b) Pharmacokinetics

Onset of action is 2–3 minutes after IV dose and effects last 30 minutes to 1 hour.

c) Indications

- (1) The patient reports moderate to severe pain.
- (2) In the provider's judgment the patient will benefit from treatment with an opioid analgesic, including patients who are MOLST and/or EMS/DNR patients or being pre-medicated for a procedure. **(NEW '17)**

d) Contraindications

- (1) Hypersensitivity or known allergy to fentanyl
- (2) Uncorrected respiratory distress or hypoxemia refractory to supplemental oxygen
- (3) Uncorrected hypotension, defined as a persistent systolic pressure less than 90 mmHg.

e) Adverse Effects

- (1) Respiratory depression/arrest
- (2) Altered mental status
- (3) Increased vagal tone due to suppression of sympathetic pathways (slowed heart rate)
- (4) Constricted pupils (pinpoint)
- (5) Increased cerebral blood flow

f) Precautions



- (1) Naloxone reverses all effects.
- (2) To reduce the risk of chest wall rigidity (especially in children), fentanyl should be administered slowly and titrated to effect.
- (3) Vital signs should be monitored frequently.
- (4) Hypotension is a greater possibility in volume-depleted patients.
- (5) Elderly patients and those with impaired renal function may be more sensitive to the medication's effects.

g) Dosage

- (1) Adult: IV/IN/IM. IN administration max 1 mL per nare
 - (a) Administer 1 **mcg**/kg to a maximum initial dose of 200 **mcg**.
 - (b) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of fentanyl 1 **mcg**/kg to a maximum dose of 200 **mcg**. (Divide IN administration of the dose equally between the nares to a maximum of 1 mL per nare.)

OPTIONAL SUPPLEMENTAL PROTOCOL



- (c)  Obtain on-line medical direction for additional doses, if required.
- (2) Pediatric: IV/IN/IM. IN administration max 1 mL per nare.
 - (a) Administer 1 **mcg**/kg to a maximum initial dose of 200 mcg. Administer at a rate of 0.5 **mcg**/kg/min. (Divide IN administration of the dose equally between the nares to a maximum of 1 mL per nare.)
 - (b) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of fentanyl 1 **mcg**/kg to a maximum dose of 200 **mcg**.
 - (c)  Obtain on-line medical direction for additional doses, if required.



18. GLUCAGON

a) Pharmacology

- (1) Hormone synthesized by the pancreas
- (2) Increases blood glucose concentration
- (3) Inhibits gastric and pancreatic secretions
- (4) May increase heart rate and cardiac output
- (5) May decrease blood pressure
- (6) Increases metabolic rate

b) Pharmacokinetics

- (1) Destroyed by the GI tract and is not effective orally
- (2) Maximum hyperglycemic activity occurs within 30 minutes and disappears after 1–2 hours.
- (3) Relaxation of smooth muscle occurs within 8–10 minutes and persists for 12–27 minutes.
- (4) The half-life is 3–10 minutes.
- (5) Degraded in liver and kidneys

c) Indications

- (1) Patients with altered mental status who are suspected of being hypoglycemic where IV access is not obtainable
- (2) Beta blocker overdose

d) Contraindications

Known hypersensitivity




e) Adverse Effects

Nausea and vomiting

f) Precautions

Glucagon only works if liver has significant glycogen stores.

g) Dosage

- (1) For suspected hypoglycemia without IV access:
 - (a) Adult: Administer 1 mg IM/IN (Medical consult for additional dosing to a maximum of 3 mg IM)
 - (b) Pediatric:
 - (i) 1 mg IM/IN (5 years of age up to patient's 18th birthday)
 (Medical consult for additional dosing to a maximum of 3 mg IM/IN)
 - (ii) 0.5 mg IM/IN (28 days–4 years of age)
 (Medical consult for additional dosing to a maximum of 3 mg IM/IN)
- (2)  For suspected beta blocker overdose:
 - (a) Adult: Administer 1 mg IVP every 5 minutes
 - (b) Pediatric: Administer every 5 minutes
 - (i) 1 mg IVP (5 years of age up to patient's 18th birthday) every 5 minutes
 - (ii) 0.5 mg IVP (28 days–4 years of age) every 5 minutes



19. HALOPERIDOL (HALDOL)

a) Pharmacology

- (1) An effective anxiolytic agent. Very effective in the management of aggressive and violent patients.
- (2) Also has anti-emetic properties. Useful in the management of severe nausea and vomiting.
- (3) Weak anticholinergic (atropine-like) and alpha-blocking agent (vasodilation).

b) Pharmacokinetics

Onset of action is within 10 minutes of the IM administration.


c) Indications

Chemical restraint for violent, agitated, and aggressive patients who present a danger to themselves or to others and who cannot be safely managed otherwise. Most violent/agitated patients can be handled with verbal or physical restraint alone.

d) Contraindications

- (1) Children under 5 years of age
- (2) Parkinson's disease
- (3) CNS depression
- (4) Acute CNS injury

e) Adverse Effects

- (1)  Extrapyrimal symptoms (dystonic reaction) are the most common side effects. These are generally not encountered with short-term use. In the event that they should develop, a single dose of diphenhydramine 25–50 mg (1 mg/kg for pediatrics to a max of 25 mg) will generally relieve symptoms.
- (2) Hypotension and tachycardia are common (20–25%) but usually self-limiting side effects. Fluid bolus is indicated with a significant drop blood pressure or hypotension.
- (3) Haloperidol has been known to cause torsades de pointes ventricular tachycardia. Once the patient has been medicated, place the patient on a cardiac monitor and monitor for dysrhythmias.



f) Precautions

- (1) Violent patients should be physically restrained while the medication is administered.
- (2) May mask subsequent evaluation.

g) Dosage (May combine with midazolam in same syringe)

- (1) Adult
 - (a) **Patient 18–69 years of age:**
5 mg IM or IV
 - (b) **Patient greater than 69 years of age:**
2.5 mg IM or IV
- (2) Pediatric
 - (a) **Child less than 5 years of age:**
Contraindicated
 - (b) **Child 5–12 years of age:**
0.05 mg/kg IM or IV, max of 2.5 mg
 - (c) **Patient 13 up to 18th birthday:**
2.5–5 mg IM or IV



20. LACTATED RINGER'S

a) Pharmacology

- (1) Isotonic crystalloid solution
- (2) Lactated Ringer's (LR) contains:
 - (a) Sodium (Na⁺) 130 mEq/liter
 - (b) Potassium (K⁺) 4 mEq/liter
 - (c) Calcium (Ca⁺⁺) 3 mEq/liter
 - (d) Chloride (Cl⁻) 109 mEq/liter
 - (e) Lactate 28 mEq/liter

b) Pharmacokinetics

Lactated Ringer's is a water and electrolyte replacement.

c) Indications

- (1) Hypovolemia
- (2) Keep vein open
- (3) Fluid boluses

d) Contraindications

Fluid overload states



e) Adverse Effects

Rare in therapeutic doses

f) Precautions

- (1) Patients receiving Lactated Ringer's should be monitored to prevent circulatory overload.
- (2) Lactated Ringer's should be used with caution in patients with congestive heart failure or renal failure.

g) Dosage

- (1)  Maximum dose 2,000 mL without medical consultation
- (2) Adult:
 - (a) KVO
 - (b) Initiate IV LR fluid therapy (20 mL/kg bolus).
 - (c) Titrate to a systolic pressure of 100 mmHg.
- (3) Pediatric:
 - (a) KVO
 - (b) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid bolus of 20 mL/kg LR IV/IO. Fluid boluses for neonates and volume-sensitive children are 10 mL/kg.
 - (c) If patient's condition does not improve, administer the second fluid bolus of 20 mL/kg LR IV/IO.
 - (d)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO



21. LIDOCAINE (XYLOCAINE)

a) Pharmacology

- (1) Anesthesia for IO infusions
- (2) Nasal anesthesia

b) Pharmacokinetics

- (1) Extremely rapid (within minutes) onset following IV administration and lasts approximately 10–20 minutes
- (2) Mucosal anesthesia with onset in 1–5 minutes

c) Indications

- (1) Anesthesia for IO infusions
- (2) Nasal tracheal intubation
- (3) Decrease intracranial pressure with Rapid Sequence Intubation

d) Contraindications

- (1) AV blocks
- (2) Sensitivity to lidocaine
- (3) Idioventricular escape rhythms
- (4) Accelerated idioventricular rhythm
- (5) Sinus bradycardia or arrest or block
- (6) Hypotension
- (7) Shock
- (8) Ventricular conduction defects

e) Adverse Effects


- (1) Lidocaine may cause clinical evidence of toxicity usually related to the central nervous system.
- (2) Toxicity:
 - (a) Early: muscle twitching, slurred speech, altered mental status, decreased hearing, paresthesia (pins and needles), anxiety, apprehension, visual disturbances, nausea, numbness, difficulty breathing or swallowing, decreased heart rate
 - (b) Late: convulsions, hypotension, coma, widening of QRS complex, prolongation of the P-R interval, hearing loss, hallucinations

f) Precautions

- (1) Reduce the dosage in patients with decreased cardiac output, liver dysfunction, and the elderly (age over 70)



g) Dosage

- (1) Adult/Adolescent with an IO infusion: To prevent or treat pain during an IO infusion in patients greater than or equal to 13 years of age, administer 20–40 mg (1–2 mL) of 2% (preservative free) lidocaine IO.
- (2)  IO infusion in patients less than 13 years of age: To prevent or treat pain during an IO infusion for patients under 13 years of age, consult a Pediatric Base Station.
- (3) Nasal Pharyngeal Anesthesia (age 13 years and greater) **(NEW '17)**
Draw up 4 mL of lidocaine 4% (40 mg/mL) and using mucosal atomization device, administer 2 mL per nare. The patient IV, gel, and intranasal dosing should not exceed 3 mg/kg.

h) Interfacility Transport Only

- (1) IV Infusion
- (2) Maintain the IV infusion of lidocaine at the rate established by the sending physician and record vital signs every 15 minutes.
(See Lidocaine Infusion for Interfacility Transport.)



22. MAGNESIUM SULFATE

a) Pharmacology

Physiologic calcium channel blocker and also blocks neuromuscular transmission. Hypomagnesemia can cause cardiac dysrhythmias. It is also a CNS depressant effective in the management of seizures during pregnancy. It does this by decreasing the amount of acetylcholine liberated from motor nerve terminals. Magnesium is necessary for many biochemical processes and plays a role in the transmission of electrical impulses.

b) Pharmacokinetics

With intravenous administration the onset of anticonvulsant action is immediate and lasts about 30 minutes. Magnesium is excreted solely by the kidney at a rate proportional to the plasma concentration and glomerular filtration rate.

c) Indications

- (1) Torsades de pointes
- (2) Seizures with pregnancy
- (3) Refractory VF and VT after amiodarone administration
- (4) Moderate to severe asthma/bronchospasm exacerbation


d) Contraindications

- (1) Heart blocks
- (2) Renal impairment
- (3) Hypermagnesemia

e) Adverse Effects

- (1) Respiratory depression
- (2) Flushing
- (3) Sweating
- (4) Hypotension
- (5) Depressed reflexes

f) Precautions

- (1) May exaggerate effects of CNS depressants and neuromuscular blocking agents
- (2) Due to concern of hypotension, IV fluid bolus should be initiated if hypovolemia is suspected.
- (3)  Magnesium toxicity is a concern with higher doses and would present with respiratory depression, decreased reflexes, flaccid paralysis, and apnea. Calcium chloride 500 mg SLOW IVP for above indications of toxicity.




g) Dosage

(1) Adult:

(a) Seizure activity associated with pregnancy: 4 grams IV/IO over 10 minutes (mixed in 50–100 mL of approved diluent)


(b) Refractory VT/VF: 1–2 grams IV/IO over 2 minutes

(c)  Moderate to severe asthma/bronchospasm exacerbation: 1–2 grams IV/IO over 10–20 minutes (mixed in 50–100 mL of approved diluent)

(d) Torsades de pointes: 1–2 grams IV/IO over 2 minutes

(2) Pediatric (under 18 years old):

(a) Seizure activity associated with pregnancy: 4 grams IV/IO over 10 minutes (mixed in 50–100 mL of approved diluent)

(b)  Moderate to severe asthma/bronchospasm exacerbation: consider magnesium sulfate 50 mg/kg IV/IO (mixed in 50 - 100 mL of approved diluent) to max of 2 grams given over 10–20 minutes



MAGNESIUM ADMINISTRATION OFTEN CAUSES HYPOTENSION IN CHILDREN. CONSIDER ADMINISTERING BOLUS 20 ML/KG OF LACTATED RINGER'S WITH THE ADMINISTRATION OF MAGNESIUM.

(c) Torsades de pointes: 25 mg/kg to a max of 2 grams IV/IO over 2 minutes

h) Interfacility Transport

(1) A paramedic may administer continuous infusion established by a sending facility, not to exceed the ordered total dose, and monitoring the patient for signs and symptoms of magnesium toxicity.

(2) Magnesium sulfate used for tocolytic control is a RN level indication.



23. MIDAZOLAM (VERSED)

a) Pharmacology

- (1) Sedative
- (2) Hypnotic
- (3) Anticonvulsant

b) Pharmacokinetics

- (1) A short-acting benzodiazepine with strong hypnotic, anticonvulsant activity, and amnesic properties
- (2) Onset of action is extremely rapid following IV administration; approximately 1.5 minutes, and for IM approximately 15 minutes.
- (3) Duration of effect is 1–4 hours with half-life of 1.5 to 3 hours in healthy adult.

c) Indications (NEW '17)

- (1) Sustained and/or recurrent seizures
- (2) Precardioversion to reduce anxiety
- (3) Awake patient requiring transcutaneous pacing (TCP)
- (4) Nasal Tracheal Intubation
- (5) Implanted Cardioverter Defibrillator (ICD) Malfunction
- (6) Nerve/organophosphate exposure
- (7) Bucking Endotracheal Intubated patient
- (8) Chemical Restraint
- (9) Moderate to severe stimulant toxicity
- (10) Excited Delirium Syndrome

d) Contraindications

- (1) Hypotension (See below for ET bucking)
- (2) Known hypersensitivity to midazolam


e) Adverse Effects

- (1) Respiratory depression or apnea
- (2) Hypotension

f) Precautions

- (1) The effects of midazolam can be accentuated and significantly potentiated by CNS depressants, such as opioids or alcohol.
- (2) Midazolam is five times as potent per milligram as diazepam and there is an increased risk of respiratory depression.





- g)**  **Dosage** (paramedic and CRT-I) may perform without consult for patients with active seizures.)

All indications in c) above, except for Bucking Endotracheal Intubated patient, Chemical Restraint, and Excited Delirium Syndrome
(NEW '17)

(1) Adult:



REDUCE THE BELOW IV/IO/IN/IM BY 50% FOR PATIENTS 69 YEARS OR OLDER.

- (a) 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg.
 - (b) If IV unavailable, 5 mg IN/IM may be administered.
IN administration max 1 mL per nare
 - (c) Additional doses up to a maximum total dose 10 mg require medical consultation for all providers.
For seizures lasting greater than 10 minutes (status), consider IO administration of midazolam.
 - (d) If suspected severe nerve agent exposure, providers may administer midazolam 5 mg IM without medical consultation.
- (2) Pediatric:
- (a) 0.1 mg/kg in 2 mg increments. SLOW IVP over 1–2 minutes per increment to a maximum single dose of 5 mg.
 - (b) If IV unavailable, 0.2 mg/kg IN/IM
IN administration max 1 mL per nare
Maximum total dose 5 mg
 - (c)  Additional doses up to a maximum total dose 5 mg require medical consultation for all providers.
For life-threatening conditions, consider IO administration of midazolam.
 - (d) If suspected severe nerve agent exposure, providers may administer midazolam as above without medical consultation.
- (3) Chemical Restraint
- (a) Patient 15–69 years: midazolam 5 mg IM/IV
Patient greater than 69 years: midazolam 2.5 mg IM/IV
 Repeat doses may be given with medical direction
 - (b) Pediatric: Not indicated



(4) Bucking Endotracheal Intubated patient (**NEW '17**)

- (a) Adult: Administer 0.05 mg/kg SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 90 mmHg. STOP ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED. Maximum single dose is 5 mg.



Additional doses require medical consultation.


- (b) Pediatric: Administer 0.05 mg/kg SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 60 in neonates, 70 in infants, $[70 + (2 \times \text{years}) = \text{systolic BP}]$ for patients greater than 1 year of age. Maximum total dose 5 mg.



ADMINISTER UP TO 0.05 MG/KG IV WHEN TREATING ENDOTRACHEAL TUBE BUCKING, STOPPING ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED.

(5) Excited Delirium Syndrome (ExDS)


- (a) Administer midazolam.

- (i) Administer midazolam in 2 mg increments (SLOW IV/IO push over 1–2 minutes).
- (ii) May be repeated twice to a maximum total IV dose of 6 mg prior to consult.
- (iii) Reduce by 50% for patients 69 years or older.
- (iv) If IV/IO unavailable or unsafe to obtain, administer 2 mg increments IN (1 mL per nare)
- (v) If IV/IO/IN administration routes are not possible, administer 5 mg IM.
- (vi)  Multiple doses may be required to achieve therapeutic effect.

Additional doses require medical consultation.



- (b) Administer midazolam.

- (i) 0.1 mg/kg in 2 mg increments (SLOW IV/IO push over 1–2 minutes) with a maximal single dose of 2 mg.
- (ii) If IV/IO unavailable or unsafe to obtain, administer 2 mg increments IN (1 ml per nare)
- (iii) If IV/IO/IN administration routes are not possible, administer 2 mg IM.
- (iv)  Multiple doses may be required to achieve therapeutic effect with a maximum total dose of 5 mg. Additional doses require medical consultation via a medical consult center.



24. MORPHINE SULFATE

(Required unless Fentanyl OSP approved)

a) Pharmacology

- (1) Decreases pain perception and anxiety
- (2) Relaxes respiratory effort
- (3) Causes peripheral dilation, which decreases preload
- (4) Decreases left ventricular afterload

b) Pharmacokinetics

- (1) Binds with opiate receptors in the CNS, altering both perception and emotional response to pain
- (2) Onset of action is in less than 5 minutes after IV dose and effects last 4–5 hours.
- (3) Causes peripheral arterial and venous vasodilation

c) Indications

- (1) The patient reports moderate to severe pain.
- (2) In the provider's judgment the patient will benefit from treatment with an opioid analgesic, including patients who are MOLST and/or EMS/DNR patients or being pre-medicated for a procedure. **(NEW '17)**

d) Contraindications

- (1) Hypersensitivity or known allergy to morphine
- (2) Uncorrected respiratory distress or hypoxemia refractory to supplemental oxygen
- (3) Uncorrected hypotension, defined as a persistent systolic pressure less than 90 mmHg

e) Adverse Effects

- (1) Respiratory depression/arrest
- (2) Altered mental status (decreased level of consciousness)
- (3) Increased vagal tone due to suppression of sympathetic pathways (slowed heart rate)
- (4) Nausea and vomiting
- (5) Constricted pupils (pinpoint)
- (6) Increased cerebral blood flow



26. NITROGLYCERIN

a) Pharmacology

- (1) Vasodilator-effect on veins more than arteries
- (2) Decreases right heart return (preload) by venous pooling, thereby decreasing myocardial workload and oxygen consumption

b) Pharmacokinetics

- (1) Absorbed through oral mucosa
- (2) Antianginal and vasodilation effects within 1–2 minutes after administration. Half-life is 1–4 minutes.
- (3) Duration of action is less than 5 minutes.

c) Indications

- (1) For treatment of angina
- (2) Congestive heart failure, acute pulmonary edema

d) Contraindications

- (1) Known hypersensitivity
- (2) Pediatric patient under the age of 13
- (3) Any patient having taken medication for Pulmonary Artery Hypertension (e.g., Adcirca™ or Revatio™) or erectile dysfunction (e.g., Viagra™, Levitra™, or Cialis™) within the past 48 hours. Medical consultation is required to override this contraindication.
- (4) Asymptomatic hypertension
- (5) Blood pressure below 90 mmHg systolic
- (6) Heart rate less than 60


e) Adverse Effects

Headache, hypotension, nausea, vomiting, dizziness, and decreased level of consciousness


f) Precautions

May cause hypotension

g) Dosage

- (1) Adult: Chest pain
 - (a) If patient has a prescription or previous history of nitroglycerin use, administer nitroglycerin: 0.4 mg SL (may repeat dose 2 times at 3–5 minute intervals)
May be repeated if symptoms persist, BP is greater than 90 mmHg, and pulse is greater than 60 bpm, to a maximum dose of 1.2 mg
 - (b) If patient does **not** have a prescription or previous history of nitroglycerin use, establish IV prior to the administration of nitroglycerin, then administer nitroglycerin as above.
 - (c)  Additional doses may be administered with medical consultation.



- (2) Adult: Pulmonary Edema/Congestive Heart Failure
 - (a) Low dose - Administer 0.4 mg SL at 3–5 minute intervals to a maximum dose of 1.2 mg.
 - (b) High dose - (until CPAP is applied or if CPAP is not tolerated)
 - (i) Administer 1 dose of 0.4 mg SL and apply 1 inch of NTG paste.
 - (ii) Administer 1 dose of 0.8 mg SL.
 - (iii) Continue 0.8 mg NTG dosing to achieve a 20% reduction in systolic blood pressure.
- (3)  Pediatric: Requires medical consultation from Pediatric Base Station.



27. NITROGLYCERIN PASTE

a) Pharmacology

Nitroglycerin paste contains a 2% solution of nitroglycerin in a special absorbent paste. When placed on the skin, nitroglycerin is absorbed into the systemic circulation. In many cases, it may be preferred over nitroglycerin tablets because of its longer duration of action.

b) Pharmacokinetics

Nitroglycerin is a rapid smooth-muscle relaxant that reduces cardiac work and, to a lesser degree, dilates the coronary arteries. This results in increased coronary blood flow and improved perfusion of the ischemic myocardium. Relief of ischemia causes reduction and alleviation of chest pain. Pain relief following transcutaneous nitroglycerin administration usually occurs within 5 to 10 minutes, and therapeutic effects can be observed up to 30 minutes later. Nitroglycerin also causes vasodilation, which decreases preload. Decreased preload leads to decreased cardiac work. This feature, in conjunction with coronary vasodilation, reverses the effects of angina pectoris.

c) Indications

Patients in respiratory distress with moderate or severe symptoms and elevated systolic blood pressure.

d) Contraindications

- (1) Known hypersensitivity
- (2) Pediatric patient under the age of 13
- (3) Any patient having taken medication for Pulmonary Artery Hypertension (e.g., Adcirca™ or Revatio™) or erectile dysfunction (e.g., Viagra™, Levitra™, or Cialis™) within the past 48 hours. Medical consultation is required to override this contraindication.
- (4) Asymptomatic hypertension
- (5) Blood pressure below 90 mmHg systolic
- (6) Heart rate less than 60

e) Adverse Effects


Headache, dizziness, weakness, tachycardia, hypotension, orthostasis, skin rash, dry mouth, nausea, and vomiting.

f) Precautions

Patients taking the drug routinely may develop a tolerance and require an increased dose. Headache is a common side effect of nitroglycerin administration and occurs as a result of vasodilation of the cerebral vessels.

Postural syncope sometimes occurs following the administration of nitroglycerin. This should be anticipated and the patient kept supine when possible. It is important to monitor the blood pressure continuously.

g) Dosage

- (1) Adult: 1 inch of the NTG paste is applied. Measuring applicators are supplied.
- (2)  Pediatric: Requires medical consultation from Pediatric Base Station.



28. **ONDANSETRON (ZOFRAN)**

a) Pharmacology

A selective blocking agent of the serotonin 5-HT₃ receptor type

b) Pharmacokinetics

Anti-nausea and anti-emetic with onset of action within 5–15 minutes IV and 30 minutes IM

c) Indications

- (1) Prevention and control of nausea and/or vomiting
- (2) Ondansetron can be administered in an effort to reduce the nausea or vomiting complications associated with certain existing injuries, medical illness, or medication side effects (e.g., penetrating eye injury, high risk for aspiration, or following opioid administration).

d) Contraindications

Known hypersensitivity to ondansetron
Patients less than 28 days

e) Adverse Effects

- (1) Hypotension
- (2) Tachycardia
- (3) Extrapyramidal reactions
- (4) Seizures
- (5) QT interval prolongation

f) Precautions

- (1) Monitor EKG, pulse oximetry, and blood pressure.
- (2) Have emesis basin and suction ready.

g) Dosage

- (1) Adult: 8 mg SLOW IV over 2–5 minutes OR 4–8 mg IM OR 8 mg orally disintegrating tablet (ODT)

May repeat once without medical consultation.



For third repeat dose to a patient with maximum total dose of 24 mg.

- (2) Pediatric:

Patients 28 days to 12 years old: 0.1 mg/kg SLOW IV over 2–5 minutes

Patients who are 13 to 18 years old: 8 mg ODT OR 8 mg SLOW IV over 2–5 minutes

OR

If no IV: 0.1 mg/kg IM (with max single dose of 8 mg);

May repeat once without medical consultation.



For third repeat dose to a patient with maximum total dose of 0.3 mg/kg or 24 mg, whichever is lower.



29. OXYGEN

a) Pharmacology

- (1) Increases oxygen content of the blood
- (2) Improves tissue oxygenation
- (3) Decreases energy expended for respirations

b) Pharmacokinetics

Changing the percentage of inspired oxygen results in an increased blood and tissue level equilibration within 5–20 minutes.

c) Indications (NEW '17)

- (1) If evidence of hypoxia (Less than 94% SpO₂)
- (2) Respiratory distress
- (3) Cardiopulmonary arrest
- (4) Trauma
- (5) Suspected CO exposure
- (6) Dyspnea

d) Contraindications

Not clinically significant

e) Adverse Effects


High concentrations of oxygen will reduce the respiratory drive in some COPD patients; these patients should be carefully monitored.

f) Precautions

- (1) Never withhold oxygen from those who need it.
- (2) Oxygen should be given with caution to patients with COPD.
- (3) Simple or partial rebreather face masks must be supplied with a minimum 6 lpm.
- (4) Non-breather (NRB) face masks must be supplied with a minimum 12 lpm.

g) Dosage (NEW '17)

- (1) Adult: Administer 12–15 lpm via NRB mask or 2–6 lpm via nasal cannula, as needed.
CO exposure: Administer 100% oxygen via NRB mask. Maintain SpO₂ at 100%
- (2) Pediatric: Administer 12–15 lpm via NRB mask or 2–6 lpm via nasal cannula, as needed.
CO exposure: Administer 100% oxygen via NRB mask. Maintain SpO₂ at 100%

Percent O ₂ Saturation	Ranges	General Patient Care
94–100%	Normal	Give oxygen as necessary
91–93%	Mild Hypoxia	Give oxygen as necessary
86–90%	Moderate Hypoxia	Give 100% oxygen Assisting Ventilations if necessary
less than or equal to 85%	Severe Hypoxia	Give 100% oxygen Assist Ventilations If indicated, Intubate
 INACCURATE OR MISLEADING SpO ₂ READINGS MAY OCCUR IN THE FOLLOWING PATIENTS: HYPOTHERMIC, HYPOPERFUSION (SHOCK), CO POISONING, HEMOGLOBIN ABNORMALITY, ANEMIA, AND VASOCONSTRICTION.		



30. SODIUM BICARBONATE

a) Pharmacology

Sodium bicarbonate corrects acidosis.

b) Pharmacokinetics

- (1) Rapid onset of action in the blood
- (2) Delayed onset of action in the tissues

c) Indications

- (1) Used in cardiac arrest only after more definitive treatments
- (2) Hyperkalemia
- (3) Tricyclic and phenobarbital overdose
- (4) Pretreatment for patients with decreased renal function who will be receiving IV contrast dye

d) Contraindications

Preexisting alkalosis

e) Adverse Effects

- (1) Worsened intracellular acidosis due to carbon dioxide formation
- (2) Hyperosmolality
- (3) May precipitate congestive heart failure
- (4) Metabolic alkalosis
- (5) Acute hypokalemia
- (6) Exacerbation of central venous acidosis
- (7) Shifting the oxyhemoglobin dissociation curve, inhibiting the release of oxygen to the tissues

f) Precautions

- (1) Inactivates simultaneously-administered catecholamines
- (2) Priorities before use:
 - (a) Intubation
 - (b) Hyperventilation
 - (c) Defibrillation
 - (d) Epinephrine
 - (e) Antiarrhythmics

g)  Dosage

- (1) Should only be given after airway has been secured and ventilations achieved
- (2) Adult: Administer 1 mEq/kg IVP bolus initially with 0.5 mEq/kg at 10-minute intervals.
- (3) Pediatric: Administer 1 mEq/kg IVP/IO; for patients less than 1 year of age, must be diluted (1:1) with LR.



(4) Hyperkalemia

(Reserve for patients with suspected CRUSH SYNDROME or patients with functional kidneys by history.)



FLUSH IV WITH 5 ML OF LR BETWEEN CALCIUM AND BICARBONATE ADMINISTRATION.

(a) Adult:



Consider sodium bicarbonate 50 mEq SLOW over 5 minutes and then initiate drip of sodium bicarbonate 100 mEq in 1,000 mL LR to run over 30–60 minutes.

(b) Pediatric:



Consider sodium bicarbonate 1 mEq/kg IV over 5 minutes. For patients less than 1 year of age, must be diluted 1:1 with LR.

(5) IV drip for diuresis prior to receiving IV contrast dye:

Continue the sodium bicarbonate drip at the rate ordered by the sending physician. Document the base solution and the amount of sodium bicarbonate that was added to the solution and the total volume infused.

Do not administer IVP medications through the same IV line as the bicarbonate drip unless compatibility has been established. Flush the line well before and after giving any IVP medication.

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E. PROCEDURES

1. ACCESSING CENTRAL VENOUS CATHETERS AND DEVICES

a) PURPOSE

Accessing a preexisting central venous catheter or device may be required for fluid volume resuscitation and/or medication administration for critically ill/injured patients when peripheral IV access cannot be established.

b) INDICATIONS

Life-Threatening Emergency

A preexisting central venous access catheter or device may be accessed by a paramedic for resuscitation medication administration or fluid volume administration.



A CRT-I may access these devices **WITH MEDICAL CONSULTATION**.



Non-Life-Threatening Emergency

Medical consultation is required for all ALS (CRT-I and paramedic) providers.

c) CONTRAINDICATIONS

None


d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Infection (local site and in the central bloodstream)
- (2) Air in the catheter line (air embolism)
- (3) Damage to catheter line
- (4) Obstruction in the line
- (5) Dislodge the catheter

e) PROCEDURE: PORTS (e.g., Port-a-Cath®, Mediport®, Bard®, Infuse-a-Port®)

A port (reservoir) is a disc about an inch in diameter that is just under the skin, usually on the upper chest. Under the skin, it is connected to a catheter line that lies in a large vein just above the heart.

- (1) Explain the procedure to the patient whenever possible.
- (2) Obtain assistance as needed.
- (3) Position the patient supine.
- (4) Using a 10 mL syringe or larger, draw up TWO 5 mL flushes with NS/RL.
NOTE: 10 mL syringes are used because they have lower pressure when flushing fluids than smaller volume syringes (1 mL, 3 mL, or 5 mL). The smaller volume syringes may deliver enough pressure to break the catheter.
- (5) Open the right-angle, non-coring (Huber® or Gripper®) needle package and flush with NS/RL. Be sure there are **no air bubbles in the tubing**.
- (6) Clean the skin site at the port with cleaning material from patient/family, or use alcohol or other *approved antibacterial agent* (e.g., *ChloroPrep®*), using a circular motion.

- (7) Use sterile latex-safe gloves. Using the non-dominant hand, palpate the area over the port to stabilize the port and locate the center.
- (8) With other hand, insert the non-coring needle into the center of the port with firm, steady pressure until you feel the needle reach the back of the port. Do not rock the non-coring needle back and forth in the port.
- (9) Aspirate 5 mL of blood and/or heparinized solution and discard. If unable to aspirate blood, verify needle position by gently pushing the needle farther against the backstop of the port.
 -  If you are still unable to aspirate blood or fluid, contact MEDICAL CONSULTATION prior to use.
- (10) Flush with 5 mL NS/RL while assessing for swelling at the site. **Be sure there are no air bubbles in the syringe or tubing.** Do not force flush if resistance is met. Verify the non-coring needle position by gently pushing the needle further against the backstop of the port, and attempt to flush again.
- (11) After assessing patency, clamp the tubing, and remove the syringe.
- (12) Apply needleless injection cap, if available, and cleanse with alcohol.
- (13) IV fluids, tubing, and connectors must be assembled and primed in the cleanest area possible with **all air eliminated** prior to connecting to the patient.
- (14) Attach the completely flushed IV line, unclamp the needle tubing, and begin infusion of fluid/medication. NOTE: IV fluids may not infuse by gravity.
- (15) Secure the non-coring needle with sterile 2x2 or 4x4 and tape or occlusive dressing, being careful not to tape over the insertion site.
- (16) Tape or loop extension tubing to outside of dressing.

f) PROCEDURE: TUNNELED AND NON-TUNNELED LINES

TUNNELED LINES (e.g., Hickman[®], Groshong[®], Broviac[®], Cook[®])

A tunneled central line is a catheter that is inserted under the skin of the chest, and the tip of the catheter is in a large vein just above the heart. A tunneled catheter has a cuff below the skin that the soft tissue grows into, reducing the risk of dislodgement and infection. These can be single or multiple-lumen catheters.

NON-TUNNELED LINES: PICC and MLC (e.g., Cook[®], Neo-PICC[®])

A PICC (Peripherally Inserted Central Catheter) line is a thin catheter that is inserted into one of the large veins, usually in the arm near the bend of the elbow, but may be in the neck or a lower extremity, and is threaded in a large vein just above the heart. A MLC (Mid-Line Catheter) is a thin peripheral catheter that is inserted into a large vein in the elbow and ends in the vein before the shoulder. Both of these catheters have a very small lumen and are considered “low volume lines” and not appropriate for volume resuscitation.

e) PRECAUTIONS

- (1) Have suction available since vomiting may occur.
- (2) Use an appropriate size airway adjunct with BVM.
- (3) Use an appropriate size mask to avoid pressure over the eyes (pediatric patient), which may cause vagal stimulation.
- (4) For single provider BVM use the “E-C clamp” technique to achieve an adequate seal and avoid pressure on the soft tissues of the face or neck: Place the third, fourth, and fifth fingers along the jaw to provide a chin lift (forming an E); use the thumb and index finger to hold the mask on the child’s face (forming a C).
- (5) If the patient does not have adequate chest rise and breath sounds with BVM, consider the following interventions:
 - (a) Use 2-hand jaw lift and oral airway to relieve tongue obstruction.
 - (b) Use a larger bag to increase the volume of air delivered into the patient.
 - (c) Evaluate and treat the patient for gastric distension.
Providers may manually decompress the stomach and/or open an existing gastric tube or button.

f) SUGGESTED SIZES FOR RESUSCITATION MASKS

Age	Mask Size
Premature infants	Neonatal
Newborn to 1 year	Infant
1–4 years	Toddler
5–12 years	Pediatric
Greater than 13 years of age	Small adult
Adult	Adult

g) SUGGESTED SIZES FOR RESUSCITATION BAGS

Age	Bag Size
Infant to less than 1 year of age	Infant (450–500 mL)
Child 1-12 years	Pediatric (750 mL)
Adolescent/Adult	Adult (1,000–1,200 mL)

3. AIRWAY MANAGEMENT: CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)



CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

a) INDICATIONS (NEW '17)

- (1) Respiratory distress or failure, due to cardiogenic pulmonary edema or COPD/asthma, in which the patient demonstrates spontaneous respirations and a patent, self-maintained airway
- (2) Patients who are 13 years of age or older
- (3) Exception: EMT may transport a patient who is chronically on CPAP who is going for routine medical care and has in attendance a patient provided attendant who can manage the patient's own CPAP.



PROVIDER MUST ASSURE THAT THE CPAP MASK FITS THE PATIENT APPROPRIATELY.
(NEW '17)

b) CONTRAINDICATIONS

- (1) Circumstances in which endotracheal intubation or a surgical airway is preferred or necessary to secure a patent airway
- (2) Circumstances in which the patient does not improve or continues to deteriorate despite CPAP administration

c) PROCEDURE

- (1) Assure patent airway.
- (2) Administer 100% O₂ via appropriate delivery system.
- (3) Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO₂) reading, and cardiac rhythm.
- (4) Apply CPAP device per manufacturer's instructions.
- (5) Continuously reassess the patient.
- (6) Monitor continuous pulse oximetry.
- (7) Monitor continuous EtCO₂ with nasal prongs (if available).
- (8) Follow the appropriate set of standing orders for continued treatment.
- (9) Contact the medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel.



FOR CIRCUMSTANCES IN WHICH THE PATIENT DOES NOT IMPROVE OR CONTINUES TO DETERIORATE DESPITE CPAP AND/OR MEDICATIVE THERAPY, TERMINATE CPAP ADMINISTRATION AND PERFORM BVM VENTILATION AND ENDOTRACHEAL INTUBATION IF NECESSARY.

CPAP MAY BE CONSIDERED FOR NON-CARDIOGENIC PULMONARY EDEMA.



Paramedic ONLY

6. AIRWAY MANAGEMENT: NASOTRACHEAL INTUBATION

a) PURPOSE

Nasal intubation is the technique of passing an endotracheal tube through the nose and pharynx into the trachea. This is done without using a laryngoscope to visualize the vocal cords (blind technique). The procedure is limited to breathing patients in whom oral intubation is difficult.

b) INDICATIONS

- (1) Use is primarily for hypoxemic CHF and COPD patients and is allowed for closed head injury patients with clenched teeth
- (2) An oxygen saturation of less than or equal to 90% in a patient on 100% oxygen by face mask and respiratory distress
- (3) A respiratory rate of 8 or less per minute or 35 or greater per minute
- (4) A Glasgow Coma Score of 8 or less, **or**
- (5) Loss of gag reflex

c) CONTRAINDICATIONS

- (1) Patient receiving anticoagulants, such as Coumadin (warfarin)
- (2) Patient with upper airway hemorrhage, significant mid-facial trauma, or laryngeal trauma
- (3) Patient with cerebral spinal fluid leakage or evidence of basilar skull fracture
- (4) Patient less than 13 years of age (**NEW '17**)


d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Epistaxis
- (2) Intubation of the esophagus
- (3) Trauma to the oral pharynx, vocal cords, esophagus, or trachea
- (4) Right mainstem bronchus intubation
- (5) Vomiting
- (6) Increased intracranial pressure, as result of increased vagal stimulation



- (7) Pneumothorax/tension pneumothorax from high pressure ventilation or underlying preexisting trauma
- (8) Intracranial tube placement through basal skull fracture

e) PRECAUTIONS

- (1) Topical anesthesia (lidocaine 4% spray or gel) should be applied to both nares to minimize discomfort.
- (2) Confirmation of ET placement
 - (a) Utilization of the Beck Airway Airflow Monitor (BAAM) device when available
 - (b) Auscultation of all lung fields to confirm air exchange
 - (c) Auscultation of the epigastrium to deny disturbance of gastric fluids upon ventilation
 - (d) Observation of bilateral expansion of the thorax
 - (e) EtCO₂ detection device required. At a minimum, use colorimetric devices.
 - (f) The esophageal detection device
 - (g) Documentation of tube depth at the nares
 - (h) Other clinical signs of improved perfusion and ventilation (e.g., pupillary response, skin color, etc.)
- (3)  Nasal intubation may require facilitation with sedation. When hypovolemia is unlikely, morphine or midazolam, or a combination of both, may be given by direct medical consultation to achieve mild sedation.

14. ELECTRICAL THERAPY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)



a) INDICATIONS (NEW '17)

Sudden cardiac arrest (patients with no pulse and not breathing).

Neonate (1 hour to 28 days of life) to less than 1 year of age	Manual defibrillator preferred. (If unavailable, an AED with pediatric capability is preferred over an adult AED.)
1 year of age to 8 years of age	AED with pediatric capability, using the pediatric capability, is preferred over an adult AED.
Child 8 years of age or greater	Adult AED

b) CONTRAINDICATIONS (NEW '17)

Patient exhibiting signs of life

Newly born patients (up to one hour after birth)



USE OF THE AED IN THE MANUAL MODE IS RESERVED FOR ALS.

c) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Burns to skin
- (2) Deactivation of patient's implanted pacemaker
- (3) Injury to patient, self, and/or bystanders

d) PRECAUTIONS

- (1) Make sure the patient and the environment are dry.
- (2) Avoid placing pads over cardiac pacemakers/defibrillators or nitroglycerin patches.
- (3) DO NOT touch the patient while the AED is analyzing the patient or discharging energy.
- (4) ENSURE that no one is touching the patient when the shock button is pushed.
- (5) Never defibrillate while moving the patient or when in a moving ambulance.

e) PROCEDURE

- (1) Initiate analysis of rhythm.
- (2) If shock is indicated:
 - (a) Ensure all individuals are clear of the patient.
 - (b) Initiate shock to the patient.
 - (c) Immediately perform 5 cycles of CPR between shocks, then initiate analysis of rhythm.
 - (d) If patient remains pulseless, continue this cycle of CPR and shocks until the patient regains a pulse, the AED prompt states "no shock advised," or ALS arrives.

- (3) No more than 3 stacked shocks (9) or 4 single new device shocks via AED without medical consultation.
- (4) If shock is not indicated and the patient remains in cardiac arrest:
 - (a) Perform 5 cycles of CPR.
 - (b) Initiate analysis of rhythm.
 - (c) If shock is indicated, see “If shock is indicated” section above.
 - (d) If shock is not indicated, continue CPR and transport.
- (5) If shock is not indicated and patient regains pulse, treat per Altered Mental Status Protocol.

f) SPECIFIC DOCUMENTATION

- (1) Document the number of analyses and shocks delivered, times of assessments and treatments, and the patient’s response to shocks/CPR. Specify the type of AED, location of AED, bystander and provider contact, and the triggering event.
- (2) If using an AED with EKG strip recorder, generate 2 recordings.
- (3) Give one to the ALS provider or hospital and attach the other to your patient care report.
- (4) Record the name of the contact for accessing AED data download summary.
- (5) Consider bringing the AED to the hospital for downloading.



15. ELECTRICAL THERAPY: CARDIOVERSION

a) PURPOSE

Emergency cardioversion involves the delivery of a synchronized electric current to the myocardium of a patient who is exhibiting supraventricular or ventricular tachydysrhythmias that results in hemodynamic compromise (i.e., a systolic BP less than 80 mmHg with shock-like signs and symptoms). Emergency cardioversion is appropriate in the field only in those patients where there is hemodynamic compromise or where it is evident that the patient's condition may further deteriorate.

b) INDICATIONS

Symptomatic rate-related tachycardia (age-specific) with serious signs and symptoms related to tachycardia. Signs and symptoms may include chest pain, shortness of breath, decreased level of consciousness, low blood pressure, shock, pulmonary edema, congestive heart failure, and/or acute myocardial infarction.

c) DOSAGE

(1) Adult

- (a) For symptomatic PSVT or atrial flutter:
 - (i) Initial 50 J
 - (ii) Subsequent 100 J, 200 J, 300 J, 360 J
- (b) For symptomatic atrial fibrillation:
 - (i) Initial 200 J
 - (ii) Subsequent 200 J, 300 J, 360 J
- (c) For other symptomatic tachydysrhythmias
 - (i) Initial 100 J
 - (ii) Subsequent 200 J, 300 J, 360 J

(2) Pediatric (**NEW '17**)

Symptomatic tachydysrhythmias

- (a) Initial 0.5 J/kg; if the calculated joules setting is lower than the defibrillation device is able to deliver, use the lowest joules setting possible or obtain medical consultation.
 - (b) Subsequent 1 J/kg; repeat at 2 J/kg
- (3) If the patient exhibits ventricular fibrillation following emergency cardioversion, immediately turn off the synchronizer and defibrillate with appropriate delivered energy (200 to 360 J for adults and 2 to 4 J/kg for pediatric patients) and refer to defibrillation and/or other appropriate protocol.

d) CONTRAINDICATIONS

Tachydysrhythmias due to digitalis toxicity

e) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

An unsynchronized shock can result in ventricular fibrillation.

f) PRECAUTIONS

(1) If the calculated joules setting is lower than the cardioversion device is able to deliver, use the lowest joules setting possible or obtain medical consultation.

(2) Pre-procedural sedation or analgesia **(NEW '17)**


(a) Patient may experience moderate to severe discomfort during cardioversion. Consider pre-medication by administering opioid per Pain Management Protocol.

OR


(b) Administer midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment, with maximum single dose 5 mg. (Reduce by 50% for patients 69 years or older.)



(3) Pre-procedural sedation or analgesia **(NEW '17)**

(a)  Patient may experience moderate to severe discomfort during cardioversion. Consider pre-medication by administering opioid per Pain Management Protocol.

OR

(b)  Administer midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment, with maximum single dose 5 mg.

c) DOSAGE

Start pacemaker at age appropriate heart rate:

Infant (less than 1 year): 120 beats per minute

Child (1 through 12 years): 100 beats per minute

Adult/Adolescent (13 years and greater): 80 beats per minute

Start milliamperes (m.a.) as low as possible and gradually increase m.a. until palpable pulse to confirm capture or 200 m.a.



CONTINUE CHEST COMPRESSIONS FOR PEDIATRIC PATIENTS WHO REMAIN POORLY PERFUSED DESPITE PACEMAKER CAPTURE.

d) CONTRAINDICATIONS

- (1) Non-witnessed cardiopulmonary arrest with asystole
- (2) Patient not meeting blood pressure criteria


e) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Patient may experience moderate to severe discomfort during pacing. Consider pre-medication by administering opioid per Pain Management Protocol. **(NEW '17)**
 - (a) Administer opioid per Pain Management Protocol.


OR

- (b) Administer midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment, with maximum single dose 5 mg. (Reduce by 50% for patients 69 years or older.)



-
- (2) Patient may experience moderate to severe discomfort during pacing. Consider pre-medication by administering opioid per Pain Management Protocol. **(NEW '17)**
 - (a)  Administer opioid per Pain Management Protocol.

OR

 - (b)  Administer midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment, with maximum single dose 5 mg.

f) PRECAUTIONS

When properly applied, chest compressions can be performed directly over the insulated electrodes while the pacer is operating.



18. GO-TEAM ACTIVATION

a) PURPOSE

The University of Maryland Medical System, R Adams Cowley Shock Trauma Center (STC) maintains a deployable advanced surgical team (Go-Team) that includes an attending physician with surgical skills and an anesthetist capable of assisting EMS providers with the care of seriously injured patients when extrication times are anticipated to be more than 1 hour. On-scene incident commanders may request the Go-Team by contacting SYSCOM.

b) INDICATIONS

The on-scene incident commander may contact SYSCOM and request the Go-Team for seriously injured patients with potentially life or limb threatening injuries when extrication times are anticipated to be more than 1 hour and who may require advanced resuscitative or surgical services that are beyond the scope of prehospital emergency services.

Examples include:

- (1) During a prolonged extrication, assist rescue personnel with planning the type and pace of the rescue by assessing the extent of injury and determine potential consequences that delays in time to definitive care might have on patient outcome.
- (2) A patient trapped in heavy machinery requiring anesthesia/pain management to perform extrication
- (3) A patient surviving a building collapse requiring an amputation to enable extrication
- (4) A patient with a prolonged extrication requiring advanced fluid resuscitation including the administration of blood products
- (5) Insertion of chest tubes or gastric and urinary catheters during the course of prolonged extrication

c) PROCEDURE

- (1) On-scene incident commander will request the Go-Team by contacting SYSCOM. SYSCOM will coordinate the Go-Team's transport to and from the scene with Maryland Express Care.
- (2) If the Go-Team is dispatched by air, then SYSCOM will notify the Go-Team when the aircraft is landing on the STC helipad. If the Go-Team is dispatched by land, then Maryland Express Care will coordinate the Team's response.
- (3) Prior to the Go-Team's departure to the scene, SYSCOM will notify the on-scene incident commander for the Go-Team's ETA and reconfirm the need for the Go-Team.



20. GLUCOMETER PROTOCOL

a) PURPOSE

The glucometer should be utilized by ALS providers to determine the blood glucose level in an attempt to determine the etiology of the patient's condition and provide treatment tailored to the needs of the patient.

b) INDICATIONS

The glucometer should be utilized for any patient presenting with an altered mental status, seizure activity, or unresponsiveness, stroke, combative, suspected cyanide poisoning, reported history of high or low blood sugar, and pediatric bradycardia or cardiac arrest.



IN ADDITION FOR PEDIATRIC PATIENTS: DIZZINESS, SYNCOPAL EPISODES, VOMITING IN KNOWN DIABETIC, OR ALCOHOL INGESTION

c) TREATMENT

(1) ADULT

- (a) If blood glucose is less than 70 mg/dL administer 10% dextrose in 50 mL (5 gram) boluses, one minute apart, to a maximum of 250 mL OR 25 grams of 50% dextrose IVP, until:
 - (i) the patient has a return to normal mental status, and;
 - (ii) the patient's blood glucose is at least 90 mg/dl or
 - (iii) if, following 250 mL of 10% dextrose or 25 grams of 50% dextrose, patient has persistently altered mental status and blood glucose less than 90 mg/dl, repeat dosing regimen in (a).
- (b) If unable to initiate an IV and blood glucose is less than 70 mg/dL, administer glucagon 1 mL IM/IN.



IF, 20 MINUTES AFTER IM/IN GLUCAGON ADMINISTRATION, THE PATIENT HAS PERSISTENTLY ALTERED MENTAL STATUS **AND** BLOOD GLUCOSE LESS THAN 90 MG/DL, CONSIDER IO ADMINISTRATION OF 10% **OR D25W** DEXTROSE CONSISTENT WITH THE DOSING REGIMEN OUTLINED IN (a).

- (c) If blood glucose is greater than 300 mg/dl, administer 10 mL/kg LR bolus unless rales, wheezing, pedal edema, or history of renal failure or CHF is present.



(2) PEDIATRIC

Patient less than 28 days - if blood glucose is less than 40 mg/dL administer 2 mL/kg of 10% dextrose IV/IO.

D10W is prepared by mixing one part of D50W with four parts LR.

Recheck glucose after first dose.



If blood glucose is less than 40 mg/dL, obtain medical consultation to administer second dose of D10W.

Patient 28 days or greater until the 18th birthday - if blood glucose is less than 70 mg/dL, administer 2–4 mL/kg of 25% dextrose IV/IO to a maximum of 25 grams.

D25W is prepared by mixing one part of D50W with an equal volume of LR.

Recheck glucose after first dose.



If blood glucose is less than 70 mg/dL, obtain medical consultation to administer second dose of D25W.

(i) If unable to start IV and blood glucose is less than 70 mg/dL, administer glucagon IM/IN:

5 years of age up to patient's 18th birthday: 1 mg

28 days–4 years of age: 0.5 mg



22. INTRAOSSEOUS INFUSION (IO)

a) PURPOSE

The administration of fluids and medications via intraosseous infusion has long been known to be a relatively safe and effective procedure in the treatment of critically ill patients.

b) INDICATIONS

Patients in which the following conditions are present:

- (1) Cardiac arrest, **OR**
- (2) Profound hypovolemia, **OR**
- (3) No available vascular access, or following two unsuccessful peripheral IV attempts for patients with any other life-threatening illness or injury requiring immediate pharmacological or volume intervention **OR**



-
- (4) In pediatric patients in cardiac arrest, go directly to IO if no peripheral sites are obvious and without having to attempt peripheral access.

c) PROCEDURES

Allowable sites for IO:

- (1) Sites for manual placement of IO needle
 - (a) IO needle with 18 gauge should be used in patients less than 3 kg.
 - (b) Patients 6 years of age or less, use the proximal tibial site: locate the preferred site of 1–3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia.
 - (c) Patients greater than 6 years of age, use the distal tibial site: locate the medial surface of the distal tibia just proximal to the medial malleolus.
- (2) Sites for mechanical placement of IO needle
 - (a) Select appropriate site (**NEW '17**):
 - (i) Patients 3–39 kg or who have not yet reached their 13th birthday: use the proximal tibial site. Extend the leg. Insertion site is approximately 1 cm **medial** to the tibial tuberosity, or just below the patella (approximately 1 cm or one finger width) and slightly **medial** (approximately 1 cm or one finger width), along the flat aspect of the tibia. Pinch the tibia between your fingers to identify the center of the medial and lateral borders. Aim the needle set at a 90-degree angle to center of the bone.
 - (ii) Patients 40 kg and greater and who have reached their 13th birthday:
 - a. Preferred site: use the proximal humerus site: Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated). Secure the arm in place across the abdomen.
 - i. Place your palm on the patient's shoulder anteriorly. The area that feels like a "ball" under your palm is the general target area. You should be able to feel this ball, even on obese patients, by pushing deeply.

- ii. Place the ulnar aspect of your hand vertically over the axilla.
 - iii. Place the ulnar aspect of your other hand along the midline of the upper arm laterally.
 - iv. Place your thumbs together over the arm. This identifies the vertical line of insertion on the proximal humerus.
 - v. Palpate deeply up the humerus to the surgical neck. This may feel like a golf ball on a tee. The spot where the “ball” meets the “tee” is the surgical neck.
 - vi. The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle. Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial.
- b. If proximal humerus site is not available, use the proximal tibial site. Extend the leg. Insertion site is approximately 2 cm medial to the tibial tuberosity, or approximately 3 cm (two finger widths) below the patella, and approximately 2 cm medial, along the flat aspect of the tibia. Aim the needle set at a 90-degree angle to the center of the bone.
 - c. If proximal site is not available, use the lower extremity distal tibia site. Insertion site is located approximately 3 cm (2 finger widths) proximal to the most prominent aspect of the medial malleolus. Palpate the anterior and posterior borders of the tibia to assure that your insertion site is on the flat center aspect of the bone. Aim the needle set at a 90-degree angle to the center of the bone.
- (b) Select the appropriate needle (**NEW '17**):
- (i) There are three lengths of 15 gauge mechanical IO needles.
 - (ii) Estimate tissue depth at selected site and select appropriate needle (15 mm, 25 mm, or 45 mm). Always use the 45 mm needle for the proximal humerus site. Point the needle set tip at a 45-degree angle to the anterior plane and posteromedial.
 - (iii) Insert so needle is touching bone.
 - (iv) Check the IO needle hub to assure that the 5 mm mark on the needle is visible when the tip of the needle touches the bone. The black line closest to the hub should be visible.
 - (v) Gently drill into the humerus 2 cm or until the hub is close to the skin. Gently drill, into the tibia approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin. Hold the hub in place and pull the driver straight off. Continue to hold the hub while twisting the stylet off the hub with counter-clockwise rotations. The catheter should feel firmly seated in the bone (1st confirmation of placement).
 - a. Place the stylet in a sharps container.
 - b. Place the dressing over the hub.
 - c. Attach an extension set to the hub if available; firmly secure by twisting clockwise.
 - d. Aspirate for blood/bone marrow (2nd confirmation of placement). For patients unresponsive to pain:
 - e. Flush the IO catheter with 5-10 mL IV fluid.



TWO ATTEMPTS WITHIN FIVE MINUTES ARE PERMITTED. MEDICAL CONSULTATION SHOULD BE OBTAINED FOR FURTHER ATTEMPTS.



(3) Pain due to infusion via IO

(a) To prevent or treat pain during an IO infusion for adults, administer 20–40 mg of 2% (only 1–2 mL preservative free/cardiac) lidocaine IO.

(b) To prevent or treat pain during an IO infusion for an adolescent patient (13–18 years of age), administer 20–40 mg of 2% (only 1–2 mL preservative free/cardiac) lidocaine IO.

(c) Medical consultation is required for patients under 13 years of age.

(d) Slowly infuse lidocaine IO. Allow lidocaine to dwell in IO space 60 seconds. Flush with IV fluid.

d) CONTRAINDICATIONS

- (1) Conscious patient with stable vital signs
- (2) Peripheral vascular access readily available
- (3) Suspected or known fractures in the extremity targeted for IO infusion
- (4) Previous attempt in the same bone within 48 hours
- (5) Cellulitis at the intended site of the procedure
- (6) Patient with known bone disorder
- (7) Prior knee or shoulder joint replacement
- (8) Inability to identify landmarks

e) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Extravasation of fluid
- (2) Infection
- (3) Compartment syndrome

f) PRECAUTIONS

Humeral site: Stabilize the needle prior to any attempt at removing the driver. The humeral cortex can be considerably less dense, and failure to stabilize the needle may cause inadvertent dislodgement. Also, as patients advance in age, bone density continues to decrease and the proximal humeral needle's stability must be routinely assessed.

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23. INTRAVENOUS MAINTENANCE THERAPY FOR EMT

a) Provider-controlled IV solutions

(1) The EMT is authorized to be the primary caregiver for patients with established intravenous (IV) therapy **ONLY** when the reason for transport is not related to complications associated with the IV line, and:

(a) The IV Solution **DOES NOT** contain:

(i) **MEDICATIONS,**

(ii) **WHOLE BLOOD,** or

(iii) **BLOOD PRODUCTS** (such as plasma, platelets, or packed red blood cells)

(b) The IV catheter is placed in a **PERIPHERAL LIMB VEIN,** or

(c) The IV catheter is a capped (e.g., heparin-locked) peripheral or central line, and

(d) No other ALS interventions are required.

(2) IV fluids

The EMT is authorized to perform IV maintenance of **NON-MEDICATED** IV solutions that contain only:

(a) LR solution

(b) 2.5%–10.0% dextrose in water

(c) 0.25%–0.9% saline solution

(d) Potassium chloride (KCL) added to the solution. The amount of KCL in solution shall not exceed 20 milli-equivalents (mEq)/liter **OR**

(e) Peripheral Parenteral Nutrition (PPN) or Total Parental Nutrition (TPN)



IF IV FLUIDS OR PPN ARE BEING ADMINISTERED VIA INFUSION PUMP AND NOT PATIENT-CONTROLLED, THE PATIENT MUST BE ACCOMPANIED BY A NURSE OR APPROPRIATELY TRAINED ALS PROVIDER.

b) Patient-controlled medications or IV solutions

The EMT is authorized to be the primary caregiver for patients with established intravenous (IV) therapy **ONLY** when the reason for transport is not related to complications associated with the IV line or the medications being infused and the patient has been caring for the line, IV fluids, and/or IV medications at home without the assistance of a health care provider.



UNDER NO CIRCUMSTANCES SHALL THE EMT PROVIDER ATTEMPT TO MAKE ANY ADJUSTMENTS TO IV INFUSION PUMPS, NOR SHOULD THE EMT PROVIDER ADMINISTER ANY ADDITIONAL MEDICATIONS OR IV FLUIDS.

- c) Provide patient care according to appropriate protocol.
- d) Routine IV maintenance procedures
 - (1) Ensure IV solution and catheter placement meets criteria above.
 - (a) Request assistance of appropriate level health care provider if IV solution and/or IV catheter placement do not meet criteria above, or
 - (b) Request authorized personnel at health care facility to:
 - (i) Replace IV solution with an appropriate IV solution, or
 - (ii) Discontinue the IV prior to departing the scene.

- (2) Confirm appropriate IV solution drip rate prior to transport.
- (3) Ensure IV bag contains adequate volume of solution for duration of patient transport.

If IV solution is not adequate, request authorized personnel at health care facility to:


- (a) Replace IV solution with an adequate volume, or
 - (b) Discontinue the IV prior to departing the scene.
- (4) Ensure IV solution is flowing at appropriate rate.
 - (5) Ensure patient has no signs or symptoms specifically related to complications of IV therapy prior to transport.

If patient has signs or symptoms related to complications of IV therapy:
Request authorized personnel at health care facility to correct the complication.

- e) Complications of IV Therapy
 - (1) During patient transport, many possible complications of IV therapy may occur that the EMT must be prepared to manage.
 - (a) Local complications may include: pain, hematoma, infiltration, infection, dislodged catheter, and tissue sloughing.



DO NOT ATTEMPT TO REINSERT DISLODGED IV CATHETER.

- (b) Central complications may include: syncope, sepsis (infection), air embolism, pulmonary edema, pulmonary thromboembolism, congestive heart failure, overhydration, and catheter embolism.
- (c) General complications may include: restricted flow (e.g., bent tubing, fluid-filled air chamber, inappropriate bag placement), and empty IV solution bag.
- (2)  Obtain medical direction and prepare to discontinue the IV if any of the complications described above are assessed and/or observed.
- (3) If medical direction is genuinely not obtainable, the EMT shall discontinue the IV as soon as possible.



THE EMT IS AUTHORIZED TO DISCONTINUE PERIPHERAL LIMB VEIN IVs ONLY.

- (4) Specific documentation includes:
 - (a) Type of provider-controlled IV solution
 - (b) Type of patient-controlled IV solution
 - (c) Type of patient-controlled IV medication
 - (d) Volume administered
 - (e) Complications encountered

24. MEDEVAC UTILIZATION

a) PURPOSE

Summarize Medevac Utilization Protocol indications, contraindications, principles for consideration of medevac request, medevac request process, standardized medevac request dataset, optimal landing zone setup, and safety recommendations when interacting with helicopters

b) INDICATIONS FOR “MEDEVAC REQUEST”

The following indications must meet the specific criteria of the indicated protocol(s)

- (1) Trauma Category Alpha, Bravo, Charlie*, Delta*
- (2) Specialty Category
 - (a) Burn
 - (b) Hand*
 - (c) Eye
 - (d) Head
 - (e) Spinal
- (3) Medical Category
 - (a) Stroke
 - (b) STEMI
 - (c) Hyperbaric (CO, Toxic Inhalation, or SCUBA)
- (4) Consult-Approved Critical/Unstable (Time-critical illness or disease requiring specialized care)*

All of the above requests containing an asterisk (*) (adult or pediatric) require acceptance at the Trauma/Medical/Specialty Center for medevac authorization before SYSCOM can dispatch the helicopter.

c) PRINCIPLES FOR CONSIDERATION OF MEDEVAC TRANSPORT MEETING ABOVE INDICATIONS:

- (1) Priority 1 Patients (critically ill or injured person requiring immediate attention: unstable patients with life-threatening injury or illness)
 - (a) Consider air transportation if the patient will **ARRIVE** at the appropriate receiving facility more quickly than could be accomplished by ground transportation.
 - (b) The provider should consider all of the following:
 - (i) Time for helicopter response
 - (ii) Patient turnover (loading time)
 - (iii) Flight time to appropriate facility
 - (iv) Weather conditions
- (2) Priority 2 Patients (less serious condition yet potentially life-threatening injury or illness, requiring emergency medical attention but not immediately endangering the patient’s life)

Consider medevac transport if drive time is greater than 30 minutes.

Patient refusals are one of the highest risk encounters in clinical EMS. Careful assessment, patient counseling, and appropriate base hospital physician consultation can decrease non-transport of high-risk refusals. Patients who meet any of the following criteria require Base Station hospital physician consultation:

- (1) The provider is unsure if the patient is medically capable of refusing transport.
- (2) The provider disagrees with the patient's decision to refuse transport due to unstable vital signs, clinical factors uncovered by the assessment, or the provider's judgment that the patient may have a poor outcome if not transported.
- (3) The patient was involved in any mechanism included in the Trauma Decision Tree of the Maryland Medical Protocols that would recommend transportation to a Trauma Center.
- (4) Minor patients: No parent, guardian, or authorized decision maker is available or the provider disagrees with decision made by the parent, guardian, or authorized decision maker.

For patients with significant past medical history, consider consultation with the specialty center that follows the patient if possible.

Patients who do not meet the criteria above but have one or more positive answers to questions 6 through 10 on the Patient-Initiated Refusal of EMS form may have a higher risk of illness. In these situations, providers shall consult with the Base Station hospital physician.

f) Documentation

- (1) Complete Section One of the Patient-Initiated Refusal of EMS form, documenting the patient's medical decision-making capability and any "At-Risk" criteria.
- (2) Complete Section Two, which documents provider assessment and actions.
- (3) Following patient counseling and Base Station hospital consultation, when indicated, complete Section Three: Initial Disposition, Interventions, and Final Disposition.
- (4) Have the patient and witness sign the refusal statement as determined by your jurisdiction.
- (5) Document your assessment, the care provided, elements of the refusal, medical decision-making capability, and "At-Risk" criteria on the jurisdiction's documentation (Medical Incident Report, MAIS form, or jurisdictional equivalent.)
- (6) Submit copies of the Patient-Initiated Refusal of EMS form and the documentation form to the EMS Supervisor.
- (7) If the patient/authorized decision maker refuses to sign the refusal statement:
 - (a) Contact a supervisor.
 - (b) Explain the need for a signature and again attempt to have the patient sign the refusal statement.
 - (c) If not already done, have a witness sign the refusal statement.
 - (d) Transmit the patient's unwillingness to sign the refusal statement on a recorded channel and document all steps taken to convince patient to sign.

Section One:

When encountering a patient who is attempting to refuse EMS treatment or transport, assess his/her condition and record whether the patient screening reveals any lack of medical decision-making capability (1, 2, 3a, 3b, and 4) or high risk criteria (5–8):

Medical Capacity	1. Disoriented to:	Person?	<input type="checkbox"/> yes	<input type="checkbox"/> no
		Place?	<input type="checkbox"/> yes	<input type="checkbox"/> no
		Time?	<input type="checkbox"/> yes	<input type="checkbox"/> no
		Situation?	<input type="checkbox"/> yes	<input type="checkbox"/> no
	2. Altered level of consciousness?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	3. Alcohol or drug ingestion by history or exam with:			
	a. Slurred speech?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	b. Unsteady gait?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	4. Patient does not understand the nature of illness and potential for bad outcome?		<input type="checkbox"/> yes	<input type="checkbox"/> no
At Risk Criteria	5. Abnormal vital signs		If yes, transport	
	For Adults			
	Pulse greater than 120 or less than 60?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	Systolic BP less than 90?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	Respirations greater than 30 or less than 10?		<input type="checkbox"/> yes	<input type="checkbox"/> no
	For minor/pediatric patients			
	Age inappropriate HR or		<input type="checkbox"/> yes	<input type="checkbox"/> no
	Age inappropriate RR or		<input type="checkbox"/> yes	<input type="checkbox"/> no
	Age inappropriate BP		<input type="checkbox"/> yes	<input type="checkbox"/> no
	6. Serious chief complaint (chest pain, SOB, syncope)		<input type="checkbox"/> yes	<input type="checkbox"/> no
7. Head Injury with history of loss of consciousness?		<input type="checkbox"/> yes	<input type="checkbox"/> no	
8. Significant MOI or high suspicion of injury		<input type="checkbox"/> yes	<input type="checkbox"/> no	
9. For minor/pediatric patients: ALTE, significant past medical history, or suspected intentional injury		<input type="checkbox"/> yes	<input type="checkbox"/> no	
10. Provider impression is that the patient requires hospital evaluation		If yes, consult		
		<input type="checkbox"/> yes	<input type="checkbox"/> no	

Section Two:

For providers: Following your evaluation, document information and care below:

1. Did you perform an assessment (including exam) on this patient? yes no
If yes to #1, skip to #3
2. If unable to examine, did you attempt vital signs? yes no
3. Did you attempt to convince the patient or guardian to accept transport? yes no
4. Did you contact medical direction for patient still refusing service? yes no

Patient Refusal of EMS

I, _____, have been offered the following by _____ (EMS Operational Program) but refuse (check all that apply):

- Examination Treatment Transport

Patient Name: _____ Phone: _____

Patient Address: _____

Signature: _____ Witness: _____

- Patient Parent Guardian Authorized Decision Maker (ADM)

If you experience new symptoms or return of symptoms after this encounter, we recommend that you seek medical attention promptly.

Section Three: (CHECK ALL THAT APPLY)

Initial Disposition:

- Patient refused exam Patient refused treatment Patient refused transport
 Patient accepted exam Patient accepted treatment Patient accepted transport
 ADM refused exam ADM refused treatment ADM refused transport

Interventions:

- Attempt to convince patient Attempt to convince family member/ADM
 Contact Medical Direction (Facility: _____)
 Contact Law Enforcement None of the above available

Final Disposition:

- Patient refused exam Patient refused treatment Patient refused transport
 Patient accepted exam Patient accepted treatment Patient accepted transport
 ADM refused exam ADM refused treatment ADM refused transport

Section Four: (MUST COMPLETE)

Provide in the patient's own words why he/she refused the above care/service:

Jurisdiction _____ Incident: _____ Date: _____



Unit #: _____ Provider Name/EID: _____ Time: _____

26. PERIPHERAL IV ACCESS FOR CRT-(I) & PARAMEDIC, AND IV ACCESS OPTION FOR EMT APPROVED BY THE EMS OPERATIONAL PROGRAM

a) PURPOSE

IV access is an invasive skill reserved for ALS providers and “Program Approved Option” EMTs with IV Technician training. The purpose of establishing an IV line, or a saline-lock, is to provide direct venous access for the possible administration of fluids and ALS medications (ALS only), if necessary and appropriate.

b) INDICATIONS

- (1) See treatment protocols for initiation of IV.
- (2) If the protocol indicates to start an IV, the “Program Approved Option” EMT may initiate an IV or saline-lock, if appropriate.
- (3) **Saline locks** may be substituted for IV KVO anywhere in the protocol with the understanding that if the patient needs a fluid bolus or medication, the saline lock is converted to an IV of LR.
- (4) All ALS providers, in the event of a life-threatening emergency (with medical consult) or cardiac arrest, may access indwelling or implanted, central or peripheral venous catheters for medication administration.
- (5) When a patient is a **Hemophiliac A or B** (Factor VIII or IX) and the family or patient states that the patient must have factor concentrate administered, the ALS provider may assist the patient in the IV administration of the patient’s own factor concentrate (VIII or IX). Notify the receiving hospital of the administration of blood factor concentrate.
- (6) All ALS providers may access lower extremity IV sites. The CRT-(I) and paramedic should consider lower extremity IV sites prior to IO attempts (EMT-IV technicians may not access lower extremity IV sites).
- (7) The ALS provider may establish a peripheral IV in a patient whose vasoactive medication has been interrupted due to a malfunctioning long-term access device that cannot be repaired by the home health caregiver. The ALS provider can assist in reestablishment of an existing vasoactive infusion at the same dose or setting. Patient shall be transported to the nearest appropriate facility to access patient’s long-term device. When in doubt, obtain medical consultation.
- (8)  Maximum 2,000 mL LR without medical consultation.
- (9)  Second IV requires medical consultation except when initiating the Sepsis Protocol and for ALS providers who have Priority 1 patient. Initiation of the second IV shall not delay transport. **(NEW '16)**

- (v) Secure the patient onto the stretcher for transport, using additional straps if necessary. Be prepared at all times to logroll, suction, and maintain airway.
- (d) Monitor airway status continuously, utilize pulse oximetry when available, vital signs, and neurocirculatory status distal to restraints. Document findings every 15 minutes, along with reason for restraint.
- (e) For interfacility transfers, obtain a written physician's order for use of restraints.



(2) Chemical Restraint Procedure




BE SURE TO ASSESS FOR EVIDENCE OF TRAUMATIC OR MEDICAL CAUSES FOR PATIENT'S AGITATION. IF EXCITED DELIRIUM SYNDROME IS SUSPECTED, WITHHOLD HADOL AND REFER TO EXCITED DELIRIUM PROTOCOL.

- (a) Prepare airway equipment, including suction, BVM, and intubation equipment.
- (b) Adults
 - (i) Administer combined medications of haloperidol and midazolam, which can be mixed in the same syringe. (If patient has head injury consider administration of only midazolam.)
 - a. **Patient 18–69 years of age:**
 - (i) Haloperidol 5 mg IM/IV **and**
 - (ii) Midazolam 5 mg IM/IV (Paramedic may perform without consult)
 - b. **Patient greater than 69 years of age:**
 - (i) Haloperidol 2.5 mg IM/IV **and**
 - (ii) Midazolam 2.5 mg IM/IV (paramedic may perform without consult)
 - (iii) Repeat doses may be given with medical direction.



- (c) Pediatric
 - (i) Administer haloperidol only.
 - a. **Less than 5 years of age is contraindicated.**
 - b. **5–12 years of age**
 - (i) Haloperidol 0.05 mg/kg IM/IV
 - (ii) Max dose 2.5 mg
 - c. **13 up to 18th birthday**
 - Haloperidol 2.5–5 mg IM/IV
 - (ii) Repeat doses may be given with medical direction.

- (d) Establish IV access with LR, if appropriate.
- (e) Use glucometer and treat accordingly.
- (f) Monitor vital signs, EKG, and pulse oximetry.
- (g) Be prepared to treat hypotension with fluid bolus.
- (h)  Treat acute dystonic or extrapyramidal reactions with Diphenhydramine
Adult: 25–50 mg IV/IM; pediatrics 1 mg/kg SLOW IV/IO/IM; Maximum single dose 25 mg. Additional doses of diphenhydramine require medical consultation.
- (i) Monitor airway status continuously, utilize pulse oximetry when available, vital signs, and neurocirculatory status distal to restraints. Document findings every 15 minutes, along with reason for restraint.

d) ADDITIONAL INFORMATION

- (1) Physical-restraint guidelines:
 - (a) Use the minimum restraint necessary to accomplish necessary patient care and ensure safe transportation (soft restraints may be sufficient in some cases). If law enforcement or additional personnel are needed, call for assistance prior to attempting restraint procedures. Do not endanger yourself or your crew.
 - (b) Avoid placing restraints in such a way as to preclude evaluation of the patient's medical status (airway, breathing, and circulation). Consider whether placement of restraints will interfere with necessary patient-care activities or will cause further harm.
 - (c) Once restraints are placed, do not remove them until you arrive at the hospital unless there is a complication from their use. If at all possible, take extra personnel during transport to hospital to deal with potential complications.
- (2) Chemical-restraint guidelines:

Sedative agents may be used to provide a safe method of restraining violently combative patients who present a danger to themselves or others, and to prevent violently combative patients from further injury while secured with physical restraints.

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
PARAMEDIC ONLY**

c) Preparation

- (1) Pre-oxygenate with 90–100% oxygen.
- (2) Monitor oxygen saturation with pulse oximetry and EKG.
- (3) Ensure functioning IV and fluid therapy as per protocol.
- (4) Evaluate for difficult airway.
- (5) Perform focused RSI neurologic exam.
- (6) Prepare equipment
 - (a) Intubation kit: Recommended to carry both cuffed and uncuffed ET tubes for patients less than 8 years of age or 25 kg.
 - (b) Bag-Valve-Mask (BVM) with manometer. (Manometer may be part of the BVM or separate.)
 - (c) Suction
 - (d) RSI kit
 - (i) Prepare medications
 - (ii) Alternative airway device, Cricothyroidotomy equipment
 - (e) Capnograph

d) RSI Procedure

- (1) Adequate sedation must be provided to prevent awareness during paralysis from neuromuscular blockade.

Etomidate, if available, will be the preferred agent for patients who are aware of their surroundings and do not have hypotension or possible hypovolemia.

Dose: Administer 0.3 mg/kg IVP over 30–60 seconds. May repeat 0.15 mg/kg IVP in 2–3 minutes if inadequate sedation.

Ketamine may be used if etomidate is unavailable, and may be preferred for patients who have hypotension or possible hypovolemia.

Dose: Administer 2 mg/kg IVP over 60 seconds.

Midazolam should be considered for patients with isolated head injury and elevated blood pressure, especially with possible seizure activity. Midazolam should not be used for patients with hypotension, and should be avoided with possible hypovolemia.

Dose: Administer 0.05 mg/kg IVP over 1–2 minutes. Maximum single dose is 5 mg.

- (a) **Hold for** BP less than 60 in neonates (patients less than 28 days old), less than 70 in infants (patients less than 1 year of age), less than [70 + (2 x years) = systolic BP] for patients greater than 1 year of age.
- (2) For patients with head injury or suspected increased intracranial pressure, administer lidocaine 1 mg/kg IVP over 1–2 minutes.
- (3) If patient is less than 8 years of (or if age unknown and using ET tube smaller than 6.0), pretreat patient with atropine 0.02 mg/kg IVP.
- (4) In-line cervical spine stabilization by second caregiver (in trauma setting)

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
PARAMEDIC ONLY**

- (5) Apply cricoid pressure (by third caregiver).
- (6) Succinylcholine: Administer 1.5 mg/kg rapid IVP.
- (7) Intubate trachea and verify ET placement.
- (8) If inadequate relaxation after 2–3 minutes, repeat succinylcholine 1.0 mg/kg IVP. **(NEW '17)**

e) Successful Endotracheal Tube Placement

- (1) Release cricoid pressure and secure ET.
- (2) Ventilate to EtCO₂ of 30–32 mmHg.
- (3) If significant resistance to ventilation occurs as succinylcholine wears off (4–5 minutes), refer to Ventilatory Difficulty Secondary to Bucking Protocol.

f) Unsuccessful Endotracheal Tube Placement

- (1) Maintain cricoid pressure and resume BVM ventilation for 30 seconds.
- (2) If unable to ventilate, see “If Unable to Ventilate” below.
- (3) Reattempt oral ET intubation.
- (4) If unsuccessful, resume BVM ventilation.

g) If Unable to Ventilate

If unable to ventilate, verify appropriate oropharyngeal airway placement and reposition BVM for optimal mask seal. If still unable to ventilate, refer to Needle Cricothyroidotomy Protocol.

2. Ventilatory Difficulty Secondary to Bucking or Combativeness in Intubated Patients

a) Indication

Patients successfully intubated with an endotracheal tube, or needle cricothyroidotomy, for whom the ability to provide manual or mechanical ventilation is impaired secondary to bucking or combativeness

b) Contraindication

Unsecured airway

c) Procedure

- (1) Etomidate, if available, will be the preferred agent for patients who are aware of their surroundings and do not have hypotension or possible hypovolemia.
Dose: Administer 0.3 mg/kg IVP over 30–60 seconds. May repeat 0.15 mg/kg IVP every 15 minutes to a total of three doses.

OR

Ketamine may be used if etomidate is unavailable, and may be preferred for patients who have hypotension or possible hypovolemia, or if ventilatory difficulty is thought to be the result of pain response.

Dose: Ketamine: 2 mg/kg IVP over 60 seconds. May repeat 1 mg/kg for IVP every 10–15 minutes to a total of three doses as necessary.



Additional doses require medical consultation.

OR

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
PARAMEDIC ONLY**

2. KETAMINE (KENTANEST, KETASET, KETALAR)

a) Pharmacology

Hypnotic Analgesic

b) Pharmacokinetics

A rapid-acting nonbarbiturate hypnotic analgesic agent characterized by normal pharyngeal-laryngeal reflexes, normal or enhanced skeletal muscle tone, and possible cardiovascular and respiratory stimulation.

c) Indications

- (1) Pre-sedation of responsive patients prior to administration of neuromuscular blocking agents
- (2) Sedation of intubated patients with ventilatory difficulty secondary to bucking or combativeness

d) Contraindications

Known hypersensitivity to ketamine

e) Adverse Effects

- (1) Although respiration is frequently stimulated, respiratory depression may occur with rapid IV administration. Laryngospasm has been known to occur.
- (2) Although hypotension may occur, blood pressure and heart rate are frequently stimulated.
- (3) Involuntary myoclonus that may mimic seizure activity
- (4) Possible enhanced secretions
- (5) Possible unpleasant dreams and delirium upon emergence from sedation

f) Precautions

- (1) The likelihood of respiratory depression and undesired pressor effects is increased by too rapid IV administration.
- (2) Myoclonic movements are possible and should not be confused for fasciculations due to a depolarizing neuromuscular blocking agent, seizure activity, or emergence from sedation.

g) Dosage

- (1) Adult:

Administer 2 mg/kg IVP over 60 seconds.

May repeat 2 mg/kg IVP after succinylcholine effects resolve if patient is bucking or combative.

May repeat 1 mg/kg for IVP every 10–15 minutes to a total of three doses as necessary.



Additional doses require medical consultation.

- (2) Pediatric:

Administer 2 mg/kg IVP over 60 seconds.

May repeat 2 mg/kg IVP after succinylcholine effects resolve if patient is bucking or combative.

May repeat 1 mg/kg for IVP every 10–15 minutes to a total of three doses as necessary.



Additional doses require medical consultation.

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
PARAMEDIC ONLY**

3. MIDAZOLAM (VERSED)

a) Pharmacology

- (1) Sedative
- (2) Hypnotic

b) Pharmacokinetics

A short-acting benzodiazepine with strong hypnotic and amnestic properties

c) Indications

- (1) Pre-sedation of responsive patients prior to administration of neuro-muscular blocking agents
- (2) Sedation of intubated patients with ventilatory difficulty secondary to bucking or combativeness

d) Contraindications

- (1) Hypotension
- (2) Acute narrow-angle glaucoma
- (3) Known hypersensitivity to midazolam

e) Adverse Effects

- (1) Respiratory depression or apnea
- (2) Hypotension
- (3) Amnesia

f) Precautions

The effects of midazolam can be accentuated by CNS depressants such as opioids and alcohol

g) Dosage

- (1) Adult:
Administer 0.05 mg/kg, SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 90 mmHg. Maximum single dose is 5 mg.
- (2) Pediatric:
Administer 0.05 mg/kg SLOW IVP over 1–2 minutes, while maintaining systolic BP greater than 60 in neonates, 70 in infants,
[70 + (2 x years) = systolic BP] for patients greater than 1 year of age. Maximum single dose is 5 mg.



ADMINISTER UP TO 0.05 MG/KG IV WHEN TREATING ENDOTRACHEAL TUBE BUCKING, STOPPING ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED.

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
PARAMEDIC ONLY**

4. SUCCINYLCHOLINE (ANECTINE)

a) Pharmacology

Neuromuscular blocking agent (depolarizing)

b) Pharmacokinetics

Paralyzes skeletal muscles, including respiratory muscles, and removes gag reflex

c) Indications

To achieve paralysis to facilitate endotracheal intubation in patients as per Rapid Sequence Intubation Protocol

d) Contraindications

- (1) Conditions that may cause hyperkalemia:
 - (a) Burns greater than 24 hours old
 - (b) Spinal cord injury greater than 24 hours old
 - (c) Known neuromuscular disease (Guillain-Barré Syndrome, myasthenia gravis, amyotrophic lateral sclerosis, muscular dystrophy)
 - (d) Chronic renal failure on hemodialysis or presence of hemodialysis access
- (2) History of malignant hyperthermia
- (3) Patients with known hypersensitivity to the drug

e) Adverse Effects

- (1) Bradycardia
- (2) Prolonged paralysis

f) Precautions

Paralysis occurs in 1–2 minutes and generally lasts 4–6 minutes.

g) Dosage/Route

- (1) Adult:

Administer 1.5 mg/kg rapid IVP to a maximum single dose of 200 mg.
If relaxation is inadequate after 2–3 minutes, a repeat dose of 1 mg/kg rapid IVP may be given to a maximum single dose of 200 mg.
- (2) Pediatric:

Administer 1.5 mg/kg rapid IVP to a maximum dose of 200 mg. **(NEW '17)**
If relaxation is inadequate after 2–3 minutes, a repeat dose of 1 mg/kg rapid IVP may be given to a maximum dose of 200 mg.

5. VECURONIUM (NORCURON)

a) Pharmacology

Neuromuscular blocking agent (non-depolarizing)

b) Pharmacokinetics

- (1) Skeletal muscle relaxant
- (2) Paralyzes skeletal muscles, including respiratory muscles

c) Indications

For treatment of ventilatory difficulty secondary to bucking or combativeness in intubated patients

d) Contraindications

- (1) Non-intubated patients
- (2) Patients with known hypersensitivity to the drug

e) Adverse Effects

- (1) Bradycardia
- (2) Prolonged paralysis

f) Precautions

- (1) Pre-sedation must be provided when vecuronium is administered to a patient who is either responsive to stimulus or who may become responsive to stimulus during neuromuscular blockade.
- (2) Paralysis occurs within 2–4 minutes and generally lasts 25–40 minutes.

g) Dosage/Route

- (1) Adult:
Administer 0.05 mg/kg IVP. Maximum single dose is 10 mg.
- (2) Pediatric:
Administer 0.05 mg/kg IVP.
- (3) If bucking or combativeness persists 4–6 minutes after initial vecuronium administration, a second dose of 0.05 mg/kg IV may be administered for an adult or pediatric patient. Maximum single dose is 10 mg.

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**PILOT PROGRAM
PELVIC STABILIZATION BINDER DEVICE FOR
SUSPECTED PELVIC FRACTURE PROCEDURE**

L. PELVIC STABILIZATION BINDER DEVICE

All levels of EMS providers, if appropriately trained in the device

1. INDICATIONS

All of the following blunt trauma patients with physical findings indicative of pelvic fracture should have a Pelvic Stabilization Binder Device applied.

- a) Evidence of pelvic instability on examination of the pelvis
- b) Patients complaining of pelvic pain on examination of the pelvis
- c) Pain on iliac compression
- d) Pain on compression of the pubic symphysis
- e) Blood at the urethral meatus
- f) Vaginal bleeding
- g) Perineal or scrotal hematoma
- h) All blunt trauma patients with an unreliable physical exam and significant mechanism of injury may be considered for application of a Pelvic Stabilization Binder Device.



PREGNANCY IS NOT A CONTRAINDICATION TO THE APPLICATION OF THE PELVIC STABILIZATION BINDER DEVICE WHEN INDICATED.

2. CONTRAINDICATIONS

Patient for whom the smallest available pelvic stabilization binder is too wide and places pressure on abdomen or chest **(NEW '17)**

3. PROCEDURE

- a) Assess for pelvic instability.
In order to not increase bleeding, only one exam should be performed to evaluate for pelvic fracture. Multiple exams will disrupt clot formation.
- b) Identify the greater trochanter of each femur.
The greater trochanter is the bony prominence of the lateral upper thigh.
- c) Identify the anterior superior iliac spine. **(NEW '17)**
- d) Check size with estimating stabilization device and center at the greater trochanter. Ensure the top of the binder does not go above the anterior superior iliac spine. **(NEW '17)**
- e) The patient should be placed in a supine position prior to application of the pelvic stabilization binder device.
- f) Place pelvic binder around the patient, centered at the level of the greater trochanter.
- g) It may be advisable to place the binder on the backboard prior to placing the patient onto the backboard, so that it is already prepared for placement.
- h) Ensure patient has been undressed and adequate exposure is provided.
- i) Tighten the binder as directed by the manufacturer's instructions for the specific stabilization binder.
- j) Once pelvic stabilization binder device is applied, do not remove until directed to do so by a physician.

**PILOT PROGRAM
TRANSPORT TO FREESTANDING EMERGENCY MEDICAL FACILITY
(BASE STATION OR NON-BASE STATION)**

**O. TRANSPORT TO FREESTANDING EMERGENCY MEDICAL FACILITY
(BASE STATION OR NON-BASE STATION) (NEW '17)**

1. PURPOSE

The purpose of this protocol is to define the type of patient an EMS service may transport to a MIEMSS-designated freestanding emergency medical facility.

2. INDICATIONS

A jurisdiction may allow transport of a patient, who meets one or more of the following indications, to a freestanding emergency medical facility.

- a) A stable Priority 2, 3, or 4 patient as outlined in *The Maryland Medical Protocols for EMS Providers* who does not need a time-critical intervention
- b) Priority 1 patient with an unsecured airway or in extremis, who requires stabilization beyond the capability of the EMS crew (e.g., cardiac or respiratory arrest)

3. CONTRAINDICATIONS

Except as provided in INDICATIONS, above, the following patients shall not be transported to a freestanding emergency medical facility.

- a) Any patient meeting the criteria for transport to a Trauma Center or Specialty Referral Center as defined in *The Maryland Medical Protocols for EMS Providers*
- b) A pregnant patient complaining of abdominal pain or a patient who is in active labor
- c) Any patient in need of time-critical intervention that can be provided only at a hospital-based emergency department

4. PROCEDURE

The EMS provider shall consult with a designated Base Station at the freestanding emergency medical facility, or the nearest Base Station if the freestanding emergency medical facility is not a designated Base Station, prior to arrival on all Priority 1 and 2 transports as provided in INDICATIONS and when otherwise unclear of the appropriate destination. The designated Base Station shall direct the provider to the appropriate destination.

5. SPECIAL CONSIDERATIONS

None

**PILOT PROGRAM
SURGICAL CRICOTHYROIDOTOMY
PARAMEDIC ONLY**

P. ADULT SURGICAL CRICOTHYROIDOTOMY

1. Initiate General Patient Care.
2. Presentation
Patients must have reached their 15th birthday and may present with any of the following conditions:
 - a) Inability to oxygenate despite having tried BVM with oropharyngeal/nasopharyngeal airway, ET placement, and supraglottic airway (if not contraindicated)
 - b) Inability to place ET in the setting of life-threatening upper airway hemorrhage
 - c) Completely obstructing upper airway foreign body that cannot be removed via BLS maneuvers or Magill forceps with direct visualization
3. Equipment:



PROVIDERS MAY USE PRE-ASSEMBLED EQUIPMENT OR AN FDA-APPROVED KIT, AS PRESCRIBED BY THE PROGRAM MEDICAL DIRECTOR.



-
4. Procedure:
 - a) Providers must use a designated technique and procedure for establishing the airway through the cricothyroid membrane that has been approved by the program medical director as part of this pilot.
 - b) Upon completion of the skill (or at an appropriate time during the sequence of patient care) the provider will obtain medical direction and also notify the receiving physician/emergency department with the following information:
 - (1) Patient condition
 - (2) Reason for surgical cricothyroidotomy
 - (3) Complications arising from procedure (if any)
 - (4) Patient response to treatment
 5. Surgical Cricothyroidotomy Quality Assurance Process
 - a) Individual Paramedic Approval
 - (1) Persons participating in this jurisdictional optional protocol will have completed all of the following:
 - (a) Classroom lecture **AND**
 - (b) Successful placement of device using pig trachea **OR**
Substitute instruction and demonstration of skill proficiency maybe approved by the program medical director on an individual basis.

**PILOT PROGRAM
SURGICAL CRICOTHYROIDOTOMY
PARAMEDIC ONLY**

- b) Ongoing Demonstration of Proficiency
 - (1) During bi-annual recertification classes, each paramedic will repeat the classroom lecture and placement of the device using the pig's trachea. **OR** Substitute instruction and demonstration of skill proficiency may be approved by the program medical director on an individual basis.
 - (2) Surgical Cricothyroidotomy Pilot Program providers who participate in the continuing education program for the RSI pilot will satisfy this requirement.)
- c) Review of Each Call
 - (1) Documentation:
 - (a) The provider will thoroughly document the following on their Patient Care Report (PCR):
 - (i) Indications that led to performing cricothyroidotomy
 - (ii) Complications that arose from procedure
 - (iii) Patient response to treatment
 - (2) Notifications:
 - (a) Immediate notification of EMS Supervisor following transfer of care to the receiving facility
 - (b) Notification of the EMSOP Quality Assurance Section within 24 hours of the event
 - (c) Notification of the Program Medical Director within 24 hours of the event
 - (3) Individual Event Review
 - (a) Each use of this Jurisdictional PILOT Protocol will be reviewed by the EMSOP for correct application and technique.
 - (4) The EMSOP will maintain a detailed surgical cricothyroidotomy procedure database and will provide an annual report to the State EMS Medical Director.

**PILOT PROGRAM
MOBILE INTEGRATED COMMUNITY HEALTH PROGRAM**

Q. MOBILE INTEGRATED COMMUNITY HEALTH PILOT PROGRAM (NEW '17)

1. PURPOSE

The purpose of this pilot protocol is to establish guidelines for the Mobile Integrated Community Health Pilot Program (MICHPP). The MICHPP is part of a jurisdictional/commercial or regional oversight committee. The oversight committee has, at a minimum, representatives from a Jurisdictional/Commercial EMS Operational Program (EMS Medical Director and EMS Operations), local health department, and local/regional hospital system(s). The EMSOP oversight committee must conduct a community gap/needs assessment to identify frequent utilizers of 9-1-1 services.

This program is established to identify individuals who frequently utilize 9-1-1 for non-life-threatening or medical reasons, and to assist in linking them with community resources and unexplored medical/social programs that will most appropriately meet their needs. The MICHPP team consists of a nurse practitioner/registered nurse and experienced Paramedic. The uniformed MICHPP Paramedic may perform an abuse/neglect evaluation, conduct a home safety check, perform vital sign acquisition (i.e., temperature, pulse, RR, BP, pulse oximetry) for the nurse practitioner/registered nurse (NP/RN), and document findings jointly with the NP/RN. The NP/RN will perform the individual assessment, medication reconciliation/compliance, make referrals, interface with the primary health care professional/physician, and make recommendations to the patient.

2. INDICATIONS

Individuals who may qualify for a home visit by the MICHPP team include:

- a) Patients who have called 9-1-1 for any medically-related reason five times in any six-month interval (individual's consent required) or
- b) Patients who are referred to the MICHPP by other allied health professionals or EMS providers (individual's consent required)

3. PRECAUTIONS

Upon initiation of the home visit, if any individual were to exhibit any signs or symptoms that would require transport to an emergency department, the MICHPP team will contact the county dispatch center who will be directed to generate an emergent response for that individual.

The MICHPP Paramedic will perform all assessments and care based on current Maryland Medical Protocols for EMS Providers until the appropriate EMS resource's arrival; care may then be transferred to that EMS unit. The NP/RN cannot direct the Paramedic to perform any skill or medical intervention that is not within his or her scope of practice nor provide "Medical Consultation" as referenced in the Maryland Medical Protocols for EMS Providers.

4. CONTRAINDICATIONS

Individuals who will not qualify for this program include:

- a) Individuals already receiving care from a patient-centered medical home (PCMH) or who have already established individual home health care or use a visiting nurse agency

**PILOT PROGRAM
MOBILE INTEGRATED COMMUNITY HEALTH PROGRAM**

- b) Individuals who refuse participation by revoking written consent, verbal refusal of care at time of visit, or integration into programs as in 4. a) above
- c) Patients who have not reached their 18th birthday

5. PROCEDURE

After an individual has consented to be included in this program, a scheduled home visit will be performed as follows:

- a) Uniformed Paramedic will:
 - (1) Provide a recognized uniformed presence for individual reassurance and familiarity.
 - (2) Assess the individual's home.
 - (a) Assess for signs of neglect or abuse.
 - (b) Assess for safety issues (e.g., slip/fall risk, smoke detector, fire, exposed electrical).
 - (3) Obtain basic vital signs.
 - (a) Heart rate
 - (b) Blood pressure
 - (c) Pulse oximetry
 - (d) Respiratory quality and rate
 - (e) Temperature
 - (f) Weight



PARAMEDIC WILL NOT BE PERFORMING BLOOD DRAWS (WITH THE EXCEPTION OF BLOOD GLUCOSE), MEDICATION ADMINISTRATION, OR ALS INTERVENTIONS UNLESS AN IMMEDIATE LIFE-THREATENING CONDITION HAS BEEN IDENTIFIED AND THE 9-1-1 CENTER HAS BEEN NOTIFIED AND AN EMS RESPONSE INITIATED.

- b) NP/RN will
 - (1) Evaluate for any immediate life-threatening condition.
 - (2) Assess for signs of neglect or abuse.
 - (3) Review vital signs.
 - (4) Obtain and review the individual's past medical history.
 - (5) Determine the individual's family and social history.
 - (6) Review medication.
 - (7) Review behavioral health.
 - (8) Conduct a basic physical assessment including a focused review of systems.
 - (9) Make appropriate health professional contacts, medication modifications education, and referrals

6. MEDICAL CONSULTATION as defined in *The Maryland Medical Protocols for EMS Providers*

- a) Obtained through Jurisdictional/Commercial EMS Medical Director or designated Base Station
- b) Paramedics cannot accept orders from primary care physicians on the phone or on-scene unless individual has an immediate life-threatening condition and the physician is going to the hospital with individual on EMS unit.

**PILOT PROGRAM
MOBILE INTEGRATED COMMUNITY HEALTH PROGRAM**

7. DOCUMENTATION AND DATA COLLECTION

- a) All data (by Paramedic/NP/RN) will be collected in a patient care record that will have a data set that will meet the required QA/QI performance measure of section 8 of this protocol.
- b) The MICH program will establish policies and procedures for sharing of protected health information across allied health, social services, and community organizations, with resources available for patients.
- c) In the event that an immediate life-threatening condition is identified and the MICHPP Paramedic initiated EMS care:
 - (1) The MICHPP Paramedic shall complete an entire eMEDS® report (or Commercial EMSOP equivalent) documenting care provided.
 - (2) The NP/RN will complete the MICH patient care report documenting the activation of an EMS response due to immediate life-threatening condition and NP/RN individual care provided.

8. QUALITY ASSURANCE/QUALITY IMPROVEMENT

- a) All calls will be reviewed by an EMSOP QA Committee consisting of Nursing, EMS, Administrative, and EMS Medical Director.
- b) Data reports will be generated monthly (for the first year, and then quarterly) to the Office of the State EMS Medical Director and to the Oversight Committee.
- c) The MICH metrics for reporting are as follows:
 - (1) The number of patients that qualified, and the number that have consented and enrolled in the MICHPP and the number that refused (ideally with the reason for refusal)
 - (2) The number and frequency of EMS transports and encounters for the recruited MICH patients (trending the access of health care services) for both pre- and post- enrollment of the patient into the MICHPP
 - (3) Aggregate summary of patient satisfaction survey (completed upon conclusion of each visit)
 - (4) Patient Quality of Life survey scores for both pre- and post- enrollment of the patient into the MICHPP (CDC HRQOL- 4, below)
 - (5) Any problems identified in complying with or applying the pilot program by the NP, RN, or Paramedic
 - (6) Any untoward events or formal patient complaints with detailed explanation
 - (7) Any increase of the number and percent of patients utilizing a primary care provider (PCP) (if none upon enrollment)
 - (8) Number of referrals to additional allied health, social services, or programs that the MICHPP determines as beneficial per patient and recruited patient compliance
 - (9) Number and percent of medication inventories conducted with issues identified and communicated to PCP
 - (10) Monthly run chart reporting and/or pre-post emergency department intervention comparison
 - (11) Where possible, cost expenditures and cost savings (part of quarterly and annual reporting)
 - (12) Number and percent of safety-related interventions (physical environment assessment tool and Hendrich fall risk assessment tool)

**PILOT PROGRAM
MOBILE INTEGRATED COMMUNITY HEALTH PROGRAM**

**Healthy Days Core Module (CDC HRQOL- 4)
(The numbers behind answers are for coding purposes.)**

1. Would you say that in general your health is:

Please Read

- | | |
|--------------|---|
| a. Excellent | 1 |
| b. Very good | 2 |
| c. Good | 3 |
| d. Fair | |
| or | 4 |
| e. Poor | 5 |

Do not read these responses

- | | |
|---------------------|---|
| Don't know/Not sure | 7 |
| Refused | 9 |

2. Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

- | | |
|---------------------|----|
| a. Number of Days | -- |
| b. None | 88 |
| Don't know/Not sure | 77 |
| Refused | 99 |

3. Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?

- | | |
|---------------------|---|
| a. Number of Days | -- |
| b. None | 88 (If both Q2 and Q3 = "None," skip next question) |
| Don't know/Not sure | 77 |
| Refused | 99 |

4. During the past 30 days, for about how many days did poor physical or mental health keep you from doing your usual activities, such as self-care, work, or recreation?

- | | |
|---------------------|----|
| a. Number of Days | -- |
| b. None | 88 |
| Don't know/Not sure | 77 |
| Refused | 99 |

**PILOT PROGRAM
MOBILE INTEGRATED COMMUNITY HEALTH PROGRAM**

Hendrich II Fall Risk Model™			
Confusion Disorientation Impulsivity		4	
Symptomatic Depression		2	
Altered Elimination		1	
Dizziness Vertigo		1	
Male Gender		1	
Any Administered Antiepileptics		2	
Any Administered Benzodiazepines		1	
Get Up & Go Test			
Able to rise in a single movement – No loss of balance with steps		0	
Pushes up, successful in one attempt		1	
Multiple attempts, but successful		3	
Unable to rise without assistance during test (OR if a medical order states the same and/or complete bed rest is ordered) *If unable to assess, document this on the patient chart with the date and time		4	
A Score of 5 or Greater = High Risk		Total Score	
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**PILOT RESEARCH PROTOCOLS
STROKE PATIENT PROCESS, SINAI HOSPITAL
BALTIMORE CITY FIRE DEPARTMENT**

U. STROKE PATIENT PROCESS, SINAI HOSPITAL, BALTIMORE CITY FIRE DEPARTMENT

1. PURPOSE

Reduce the amount time from medical recognition of stroke symptoms to advanced treatment at a Stroke Center, thus reducing the “first medical/EMS contact to needle time,” which has shown been shown to improve the outcome for stroke patients. In an effort to improve on the current Maryland EMS/Stroke system of care, the on-call 24/7 Stroke Neurologist for the receiving hospital (Sinai Hospital) will be patched into the EMS to Sinai Hospital consult thus allowing the Stroke Neurologist to hear the EMS report and receive a family member’s cell phone from the EMS provider. Upon the conclusion of the EMS consult and while the EMS unit is transporting, the Stroke Neurologist will call the family member to gather important information that would normally take valuable minutes at the hospital.

2. INDICATIONS

- a) Adult patient who presents with stroke symptoms and meets the requirements for a STROKE Alert.
 - (1) Positive Cincinnati Stroke Scale
 - (2) Last know well time of less than 3.5 hours and
- b) Based on geography, the EMS intended destination is Sinai Hospital Primary Stroke Center

3. CONTRAINDICATIONS

- a) Patients who have not yet reached their 18th birthday
- b) Patients outside of Sinai Hospital’s Primary Stroke Center catchment area

4. PROCEDURE

- a) No change in current EMS dispatch process with ALS
- b) No change to current EMS initial assessment (vital signs, physical assessment, and application of Stroke: Neurological Emergency Protocol to include “last known well time”) and treated following the Maryland Medical Protocols for EMS Providers.
- c) The EMS provider will ask the family present for a cell phone number, which will be relayed to the Stroke Neurologist during the EMS consult.
- d) For patients meeting “STROKE Alert” criteria and the EMS intended destination of Sinai hospital, EMS will call EMRC and state “Unit number with STROKE ALERT FOR SINAI HOSPITAL.” EMRC will patch that call to Sinai’s Base Station and simultaneously link the 24/7 cell phone maintained by the on-call Stroke Neurologist. The Stroke Neurologist will then listen to the EMS to Sinai consult.
- e) The patient will be transported to Sinai and the usual Sinai Stroke/Brain Attack Process will be followed.
- f) During the transport, the Stroke Neurologist will call a member of the patient’s family on the cell phone to gather important information, in an effort to reduce “first medical/EMS contact to needle time.”

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

V. MONTGOMERY COUNTY FIRE RESCUE SERVICES ALTERNATIVE DESTINATION PROGRAM (NEW '17)

1. PURPOSE

Emergency departments across the country spend a disproportionate share of staff and financial resources providing non-urgent care to patients who often would have been better served in a primary care setting. According to a 2010 study by the RAND Corporation, between 14 and 27 percent of all ED visits are for non-urgent care and could take place in a different setting, such as a doctor's office, after-hours clinic, or retail clinic with a potential cost savings of \$4.4 billion annually. A 2010 study published in the Annals of Emergency Medicine found that frequent users comprise 4.5% to 8.0% of all ED patients, yet account for 21% to 28% of all visits.

In 2014, Montgomery County Fire and Rescue received 80,000 EMS calls and performed 65,000 transports. Of the 65,000 transports, 60% were BLS (low acuity) and 40% were ALS. The EMS growth rate is unsustainable. At current rates, MCFRS would need to add an ambulance each year to service the needs of residents in the county. In an effort to encourage appropriate utilization of 911 services and disposition to an Emergency Department, and to better serve the State under the new Medicare All Payer System (waiver), Holy Cross Health (HC), Montgomery County Fire and Rescue Services (MCFRS), and Kaiser Permanente (KP) are piloting the alternative care destination protocol to optimize EMS resource utilization and assure appropriate patient care.

The anticipated benefits of the quality improvement pilot project are to provide the patient with quality care in a timelier fashion and potentially at a cost savings to the patient with a potential for rapid return to service of EMS units. This program would also have the potential to allow for patients to stay within their HMO services where the patient's medical records and physicians are available.

All entities involved will provide a general notice to the population through joint release being serviced under this pilot for PHASE TWO.

Montgomery County has identified a highly qualified "Pilot Triage Expert" to consistently apply the Provider Quick Form, consent the patient and make the destination determination. This "Pilot Triage Expert" is currently a MIEMSS certified EMT for Montgomery County who also is a registered nurse and previously was an Advanced Life Support provider. The use of this highly qualified "Pilot Triage Expert" is to reduce the risk to the patient but also does not make this pilot generalizable to all EMTs across Maryland.

The objective of this quality improvement pilot is to assess the accuracy and safety of triaging dispatch identified "IAED Alpha determinate code" basic life support patients to either Holy Cross Hospital Express Care (Co-located with Holy Cross's emergency department) or Kaiser Permanente's Clinical Diagnostic Unit (CDU) by applying the **Provider Quick Form**.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

a) Start Point

Due to the changing federal and state health care delivery systems, Montgomery County is seeking to develop a process for improving the management of the EMS and health care delivery system for stable low priority patients.

b) Quality Improvement Design

When reviewing the literature there are multiple strategies to match the right patient with the right clinical resources. This is an iterative modification of current practices with the addition in phase two of the Kaiser CDU which is the patient's own insurance, personal medical records, and improved continuity of care.

c) Benefits:

As Emergency department off load times have increased, the alternative destination process may improve the EMS resource utilization
It is designed to provide patient cost savings and time savings while matching patients to the appropriate resource and continuity of care
It is designed to improve patient satisfaction

d) Risks:

As the EMS Operational Program will be dispatching the normal resources to the patient with the addition of the "Pilot Triage Expert" and the patient will be voluntarily participating in the ADP pilot and destination determination, there is no increased risk.

There are multiple safety checks placed in this ADP protocol so no patient is placed at increased risk. These include:

- All patient will have an EMS unit response as would occur today
- The use of the Internal Association of Emergency Dispatchers (IAED) Medical Priority Dispatch (MPD) standard public service access point screening and dispatch algorithm which is highly accurate at determining low acuity patients.
- The use of the "Pilot Triage Expert" who has both EMS and nursing training and experience.
- The medical director oversight group access and review of all ADP medical records through Holy Cross and Kaiser Permanente with objective State EMS Medical Director review
- If at any time a patient at an alternative destination is identified to need a higher level of care, Holy Cross Express Care will immediately transfer the patient to the Emergency Department (same building) and Kaiser Permanente CDU will call MCFRS who will dispatch the appropriate EMS resource to transport the patient to the appropriate Emergency Department.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

e) End Point

The following are the identified end points.

- The ADP Pilot metrics are designed to assess the benefit to the system of the use of the Provider Quick Form and the ADP pilot protocol.
- Anytime a patient has been identified as being placed at risk
 - o Under triage to an alternative destination with the Provider Quick form being used properly and the review demonstrates that the patient required admission to the hospital or observation unit or a truly untoward outcome were to occur
- No demonstrated benefit to the delivery of EMS services such as extended EMS unit cycle time or availability
- Costs of delivering this program exceed benefit gained in EMS service to the community determined by MCFRS

f) Analysis:

The ADP Pilot metrics will be compared before and after the implementation of the ADP pilot protocol to determine if there was system improvement. The Provider Quick Form will be reviewed and compared for accuracy and safety.

g) Adoption of Results:

As the proposed is using a "Pilot Triage Expert" with both EMS provider and nursing experience and training, the results of the ADP pilot cannot be generalized to all EMTs or EMS providers. The Provider Quick Form screening tool and the ADP pilot protocol if demonstrated to be accurate, safe, and reliable could be considered for EMS provider trials with the hope that this ADP protocol and tool set could be used to improve the delivery of EMS care.

The patient satisfaction survey may demonstrate positive customer service.

h) The ADP protocol will be implemented in two PHASES.

All of the indications, contraindications, procedures, quality assurance, the Provider Quick Form, eMEDS®, and Consent form will be consistent in both PHASE ONE and PHASE TWO. The phase two documents will have the additional destination option of the Kaiser CDU.

The PHASE ONE will use one alternative destination: Holy Cross Hospital Express Care in Silver Spring, MD. This will provide for tight evaluation of the Provider Quick Form and the assurance that all patients will have access to the full array of diagnostic services and a full service emergency department in case of under triage. This will also allow for comprehensive follow up on all patients seen. In an effort to implement an additional safety net for these patients in the pilot, Montgomery County will be using a very small group of EMS Providers that are specially authorized by the MCFRS Medical Director as the "pilot triage experts" for MCFRS services. These providers have decades of EMS experience and also many years of experience as Registered Nurses.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

PHASE ONE will be conducted for sixty days from the start date. Upon the conclusion of this phase, or earlier if untoward events have arisen or MCFRS terminates the pilot protocol, there will be a summary report generated to MIEMSS using the metrics outline in the quality assurance section of this protocol. MIEMSS will review the summary report / metrics and, with Montgomery County, will evaluate the feasibility of moving the pilot into Phase Two. During this evaluative period, PHASE ONE will continue unless the pilot is ceased due to an untoward reason.

After review of the results of Phase One, the participants in this pilot, including MIEMSS, will determine the feasibility of implementing Phase Two of the project. PHASE TWO will allow for the addition of one alternative destinations assuming the conditions listed below are met. The alternative destinations are: Kaiser Permanente Gaithersburg Medical Center Clinical Decision Unit.

The inclusion of these alternative destinations allows for the pilot to showcase additional settings that operate under a different cost structure. The destination added in Phase Two of the pilot will have the following minimum patient care capabilities:

- a. 12 lead EKG
- b. UA
- c. Urine Pregnancy
- d. Minor Suturing

PHASE TWO will be conducted for Sixty days. Upon the conclusion of PHASE TWO or earlier if untoward events have arisen or MCFRS terminates the pilot protocol, there will be a summary report generated to MIEMSS meeting the metrics outline in the quality assurance section of this protocol.

All of the indications, contraindications, procedures, quality assurance, and the Provider Quick Form, eMEDS[®] and Consent will be consistent in both PHASE ONE and PHASE TWO. The phase two documents will have the additional destination option of the Kaiser CDU. This Alternative Destination pilot protocol cannot be extended or modified including time line without the approval of the MIEMSS and the EMS Board.

2. INDICATIONS

Certain low acuity priority 3 patients who match the Alternative Destination pilot protocol criteria, within the geographic bounds and available hours of the pilot, will be offered transportation to an appropriate receiving facility. The receiving facility will be offered based on the medical needs of the patient, the corresponding capabilities of the receiving facility, and Kaiser Permanente patients based on receiving facility coverage. The Pilot (PHASE ONE and TWO) will be run during the pilot hours on week days.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

Receiving facilities PHASE ONE:

1. Holy Cross Hospital Express Care in 1500 Forest Glenn Rd, Silver Spring, MD will be the receiving facility for all included patients

Receiving facilities PHASE TWO:

1. Kaiser Permanente Gaithersburg Medical Center CDU, located at 655 Watkins Mill Road in Gaithersburg MD, will be a receiving facility for Kaiser Permanente patients
2. Holy Cross Hospital Express Care in Silver Spring, MD will be a receiving facility for other insured or uninsured patients that select this alternative destination who need to be seen after clinic hours or require diagnostic imaging services

3. CONTRAINDICATIONS

- a) Patients who have not yet reached their 18th birthday
- b) Patients who 60 years of age or greater
- c) Patients who do not meet the criteria for the MIEMSS approved inclusion/ exclusion checklist
- d) Patients that are not able communicate with pilot triage expert provider, including non-English speaking patients
- e) Patient who are not able to understand the consent process
- f) Patients who refuse to participate in pilot

4. PROCEDURE

- a) This protocol may only be used by MCFRS EMS providers that are identified a “pilot triage experts” and specifically authorized to do so by the MCFRS Medical Director
- b) General Patient Care Protocol
- c) Under the Pilot, all patients will be offered an appropriate definitive care destination
- d) For inclusion in the Alternative Destination Pilot, the patient must agree and must have:
 - (1) No chief complaint consistent with a comprehensive evaluation that would traditionally need the capabilities of a full service ED
 - (a) High risk Chief Complaints are currently defined as dyspnea, AMS, syncope, chest pain, focal neurological deficits, unexplained back or abdominal pain, seizures, and sometimes fever.
 - (2) No physical findings consistent with time dependent needs for assessment or stabilization
 - (a) Signs on exam that indicate a threat to airway, breathing, circulation, circulation to an extremity, disability (deficit) or deformity, as well as severe tenderness (ABCDE, etc.).
 - (3) No reasonably foreseeable signs or suspicion of any deterioration of condition (e.g. airway or hemodynamic compromise)
 - (4) No requirement for any ALS monitoring nor ALS interventions
 - (5) All affirmative answers on the ADP Consent form.
- e) In order to include the patient in the ADP pilot, the authorized MCFRS EMS “Pilot Triage Expert” must obtain a complete set of vital signs, a complete history, complete the Provider Quick Form, and a signed pilot consent.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

- f) If the patient does not agree to be included in the pilot, the Consent form will have the “declination” box checked and the patient will be transported to the ED per normal MCFRS practice
- g) If patient is stable, met the inclusion criteria of the ADP protocol and Provider Quick form and has a disease/injury process which can be safely treated by a primary care or urgent care practitioner:
 - (1) PHASE ONE:
 - (a) The Consented patient will be transported to Holy Cross Express Care
 - (b) If patient refuses to participate, patient condition deteriorates or during transport changes their mind and declines to participate , the patient will be taken to nearest full service emergency department
 - (2) PHASE TWO
 - (a) Determine if the patient has Kaiser Permanente health insurance:
If Kaiser patient – patient may be transported to the Kaiser CDU in Gaithersburg
 - (b) If other health insurance or uninsured:
 - (i) Holy Cross Hospital Express Care in Silver Spring, MD will be a receiving facility for other insured or uninsured patients that select this alternative destination
 - (c) Contact proposed receiving facility and discuss patient with receiving licensed health care professional (MD/DO, NP, or RN) and ensure that the facility is willing to accept patient. This contact may be made by cell phone and upon arrival have receiving health care professional sign off on the MCFRS Pilot Consent form.
- h) The MCFRS Ambulance crew will transport the patient to the Alternative Destination and provide both a written and verbal report to the receiving health care professional.
- i) If patient refuses to participate, patient condition deteriorates, during transport changes their mind and declines to participate or the receiving facility refuses the patient, the patient will be transported to nearest appropriate full service emergency department without argument or delay.
- j) The transporting unit and the MCFRS specially authorized EMS provider will complete an eMEDS® report which will include a sign off from the receiving licensed health care professional.

5. QUALITY ASSURANCE

The overall pilot is under the shared medical direction of MCFRS EMS Medical Director, who will collaborate with Physician designee from Holy Cross Health Center Silver Spring, Medical Director for Holy Cross Hospital Emergency Department, and physician assigned by Kaiser Permanente, to ensure that triage protocols are safe and effective for each receiving facility. Upon beginning the pilot, the local site medical directors will be accountable for ensuring adherence to pilot protocols, communication and training. This group along with the MIEMSS State EMS Medical Director will meet or hold teleconference weekly during the pilot to review all cases evaluated by the “Pilot Triage Expert” and evaluate emergent trends, ensure the pilot protocols are not leading to suboptimal triage and, as needed, for any sentinel events.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

In addition the Medical Directors and MCFRS Operational Leadership will meet weekly to review and a report to the State EMS Medical Director at MIEMSS within 3 days of the conclusion of these meetings. The report will include:

- Report on PILOT METRICS (below)
- Patient Satisfaction Survey results
- Unscheduled reentry of patient into health care system within 72 hours of transport
- Any untoward events or formal patient complaints with detailed explanation
- Any deviation or challenges of the “pilot triage experts” implementation of the ADP protocol or Provider Quick Form.

a) Pilot Metrics:

- (1) Each patient transported to and treated at any of the alternative destinations must have discharge diagnosis and capture any patients that are secondarily transported to another facility
 - (a) Number and type of upgrades from alternative destination (Specific signs/ symptoms on presentation, where slipped though Inclusion/ Exclusion criteria, and final diagnosis)
- (2) Number of patients that qualified, and the number that accepted transport to an alternative destination, the number that refused (Ideally with reason for refusal)
- (3) Collect and report the number of patients that were screened but failed one or more items on the provider quick form check list
- (4) Any failures of patients to be accepted at one of the alternative facilities and reason for refusal
- (5) Any identified problems by the “Pilot Triage Expert” to comply with or apply the pilot protocol
- (6) EMS average “arrival destination to back in service” time (turnaround time) for Holy Cross and the alternative facilities
- (7) EMS first unit notification time until transport unit is back in service” time (Total call duration time) measure for these calls
- (8) Patient standardized satisfaction survey results
 - (a) Did patient have additional un-schedule re-entry into urgent care, PMD or ED within 72 hours of alternative destination
 - (b) Was patient satisfied with choice
 - (c) Rate EMS care 1-5
 - (d) Rate Destination Care 1-5
 - (e) Any complications or complaints associated with your care decision?
- (9) What are their pre-implementation performance measures (above) for the units in the pilot area

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

**Montgomery County Alternative Destination Program Protocol
Provider Quick Form**

- | | Yes | No |
|--|--------------------------|--------------------------|
| 1. Patient is an Alpha MPD dispatch and meets MIEMSS triage and treatment category Priority 3. | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. Patient is between the age of 18 and 59 years of age | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. Criterion 1: Vital Signs are within these limits | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Respirations 12–18 | | |
| b. Blood Pressure:
100–140 systolic
60–100 diastolic | | |
| c. Pulse: 60–100 | | |
| d. Temperature: less than 101 F and greater than 96 F | | |
| 4. Criterion 2: High-risk indications are <u>Absent</u> | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Severe Pain | | |
| b. Chest or Abdominal Pain | | |
| c. Shortness of breath or respiratory distress | | |
| d. Altered Mental Status or new neurologic deficit | | |
| e. Unable to walk (if able to walk before illness) | | |
| f. Patient high-risk condition | | |
| 1. Active malignancy | | |
| 2. HIV | | |
| 3. Immunosuppressive therapy | | |
| 4. Transplant | | |
| 5. Criterion 3: Physical exam performed to assure patient does not have exclusion criteria. | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. Criterion 4: Criterion 4: Patient has one or more of the non-emergency chief complaints (refer to back). | <input type="checkbox"/> | <input type="checkbox"/> |
| 7. EMS provider is able clearly communicate with patient and the patient is able to communicate with EMS. | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. Patient is able to understand the consent process. | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Patient has read and signed the MCFRS Alternative Destination Pilot Consent. | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Paperwork is completed for Alternative Destination Case Review | <input type="checkbox"/> | <input type="checkbox"/> |
| a. eMEDS® | | |
| b. Original MCFRS Alternative Destination Pilot Consent Transport Form | | |
| c. Provider Quick Form | | |

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

Criterion 4: Nonemergency Chief Complaints

1. Allergy or hay fever
2. Back pain, mild; able to walk without assistance
3. Contusions or abrasions, minor
4. Cough, mild; without hemoptysis or respiratory impairment
5. Non-traumatic dental problems
6. Diarrhea, without dizziness or other signs of dehydration
7. Dizziness, chronic (recurrent or known history)
8. Dysuria, mild; female
9. Ear pain
10. Ingrown toenails
11. Itching without systemic rash
12. Eye irritation without signs of active infection, minor
13. Fracture, distal extremity (forearm, lower leg), isolated injury, not open,
 With neuro/vascular intact
14. Headache, minor without neurological impairment
15. Injury follow-up (minor injury, treated previously)
16. Joint pain
17. Mouth blisters
18. Muscle aches
19. Nausea, vomiting
20. Neck pain (no history of acute trauma)
21. Nosebleed (resolved)
22. Painless urethral discharge
23. Physical exam requests(except patients with diabetes, CHF, kidney failure, cancer)
24. Plantar warts
25. Rectal pain/itching, minor
26. Sexual disease exposure
27. Simple localized rash
28. Sinusitis, chronic
29. Skin infection or sores, minor
30. Sore throat without stridor
31. Sunburn (localized without blisters)
32. Vaginal discharge
33. Vaginal bleeding (Hx non-pregnant, not postpartum, and requires less than
 one pad in 5 hours)
34. Upper respiratory infection
35. Work release or disability
36. Wound checks

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

Draft MCFRS Alternative Destination Pilot Consent Form

(Method for copy to each: One patient, One MCFRS and ONE receiving)

I have called 9-1-1 to seek medical treatment. After assessment by and discussion with the Montgomery County Fire and Rescue Services (MCFRS) EMS provider, I have been offered transportation by the MCFRS to one of the following destinations:

PHASE 1:

- o Holy Cross Hospital Express Care in Silver Spring
- o I DECLINE TO PARTICIPATE in the pilot and want to go to Holy Cross Emergency Department or nearest appropriate emergency department

PHASE 2:

- o Kaiser Permanente Clinical Decision Unit in Gaithersburg
- o Holy Cross Hospital Express Care in Silver Spring
- o I DECLINE TO PARTICIPATE in the pilot and want to go to Holy Cross Emergency Department or nearest appropriate emergency department

I understand that the choice of where to receive medical care is my decision and that I can decide to be transported to a hospital emergency department or one of the destinations listed above.

I understand that if I have an emergency medical condition, a hospital emergency department is required under federal law to provide me a screening exam and stabilization regardless of my health insurance, and I further understand if I am a member of an HMO, under Maryland law an out-of-network hospital emergency department cannot balance bill me for treatment for an emergency medical condition.

I understand that I may revoke this decision and request transportation to a hospital emergency department at any time.

I understand that I may need to be transferred to the nearest appropriate emergency department if my illness or injury is found to be too serious to be managed at the alternative destination.

I understand that because of my participation in this pilot and transport to an alternative destination, MCFRS will not bill me for ambulance transport to the initial alternate destination.

At this time I wish to be transported to the destination checked above.

I also understand that this transportation and care choice arises out of a time-limited pilot project that has been authorized by MCFRS and by the State EMS Board. I understand that if I call 9-1-1 in the future, this pilot may be over and my transportation and care choice may be limited to only emergency departments. I also understand that other MCFRS patients may not be offered the same choices due to factors that may exclude them from the pilot program.

**PILOT RESEARCH PROTOCOLS
MONTGOMERY COUNTY FIRE RESCUE SERVICES
ALTERNATIVE DESTINATION PROGRAM (NEW '17)**

Name: _____

Signature: _____ Date: _____

Patient Phone Number for Survey: _____

Witness Name and Relationship: _____

Signature: _____ Date: _____

MCFRS Pilot Triage Expert Provider: _____

Signature: _____

Upon delivery to alternative destination and after the patient has been screened and accepted:

Name of receiving staff (MD/DO/NP/RN): _____

Signature of receiving staff: _____

V. JURISDICTIONAL OPTIONAL PROTOCOLS



A. OVERDOSE/POISONING: CYANIDE POISONING

1. Initiate General Patient Care.

2. Presentation

Depending on its form, cyanide can enter the body through inhalation, ingestion, or absorption through the skin. Cyanide should be suspected in occupational or smoke exposures (e.g., firefighting), industrial accidents, natural catastrophes, suicide and murder attempts, chemical warfare, and terrorism (whenever there are multiple casualties of an unclear etiology).

Non-specific and early signs of cyanide exposure (inhalation, ingestion, or absorption) include the following signs and symptoms: anxiety, vertigo, weakness, headache, tachypnea, nausea, dyspnea, vomiting, and tachycardia.

“High Concentrations of cyanide” will produce:

- Markedly altered level of consciousness
- Seizure
- Respiratory depression or respiratory arrest or
- Cardiac dysrhythmia (other than sinus tachycardia)

The rapidity of onset is related to the severity of exposure (inhalation or ingestion) and may have dramatic, immediate effects causing early hypertension with subsequent hypotension, sudden cardiovascular collapse, or seizure/coma.



PATIENTS WHO HAVE SUSTAINED A BURN AND/OR TRAUMATIC INJURY SHOULD BE GIVEN TREATMENT SPECIFIC TO THOSE INJURIES, INCLUDING APPLYING SPINAL PROTECTION, IF INDICATED. THE SMELL OF (BITTER) ALMONDS IS NOT A RELIABLE SIGN AND THE PROVIDER SHOULD NOT ATTEMPT TO INHALE LOCAL AIR NOR PATIENT BREATH TO DETERMINE IF THE ALMOND SMELL IS PRESENT.

BE SURE TO ASSESS FOR EVIDENCE OF TRAUMATIC OR MEDICAL CAUSES FOR PATIENT'S ALTERED MENTAL STATUS.



3. Treatment:



- a) Remove the patient from the source of exposure. (In the smoke inhalation victim, maintain appropriate provider respiratory protection, SCBA.)
- b) Restore or maintain airway patency.
- c) Administer 100% oxygen via non-rebreather mask or bag-valve-mask.
- d) Provide aggressive advanced airway management.

OVERDOSE/POISONING: CYANIDE POISONING (CONTINUED)



- e) Establish IV access with LR.
- f) Use glucometer and treat patient accordingly.
- g) There is no widely available, rapid, confirmatory cyanide blood test. Treatment decisions must be made on the basis of clinical history and signs and symptoms of cyanide intoxication. For the patient with an appropriate history and manifesting one or more of “high concentrations of cyanide” signs or symptoms:
 - (1) Collect a pre-treatment blood sample in the appropriate tube for Lactate and Cyanide levels.
 - (2) ADULT: Administer hydroxocobalamin. Initial dose is 5 grams administered over 15 minutes SLOW IV. Each 2.5 gram vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10–15 mL/minute.
 -  An additional 5 gram dose may be administered with medical consultation.
 - (3) PEDIATRIC: Administer hydroxocobalamin 70 mg/kg (reconstitute concentration is 25 mg/mL). Each 2.5 gram vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10–15 mL/minute. Maximum single dose is 5 grams.
 - (4)  If patient (adult or pediatric) has a reported oral cyanide ingestion and does not manifest signs and symptoms meeting administration criteria, medical consultation is required for administration of hydroxocobalamin (consider simultaneous consultation with poison control and medical consultation).
 - (5) If patient history is suggestive of CO inhalation, follow Overdose/Poisoning: Carbon Monoxide/Smoke Inhalation Protocol **(NEW '17)**



HYDROXOCOBALAMIN MAY CAUSE TEMPORARY RED DISCOLORATION OF THE SKIN, URINE, AND MUCOUS MEMBRANES (WHICH IS NOT TO BE CONFUSED WITH THE RARE SIGN OF CARBON MONOXIDE POISONING). THE DEVICES THAT RELY ON COLORIMETRY (E.G., PULSE OXIMETER AND CO LEVEL) WILL BE INTERFERED WITH BY THE COLOR CHANGE AND ARE NOT RELIABLE FOR PATIENT ASSESSMENT.

NOTIFY HOSPITAL OF ADMINISTRATION OF HYDROXOCOBALAMIN AND DO NOT ADMINISTER SODIUM THIOSULFATE THROUGH THE SAME IV, AS THIS MAY CAUSE CRYSTALLINE PRECIPITATION.

4. Continue General Patient Care.

**OPTIONAL SUPPLEMENTAL PROGRAM
CYANIDE POISONING PROTOCOL**

HYDROXOCOBALAMIN

1. Pharmacology

Hydroxocobalamin is a form of Vitamin B-12.

2. Pharmacokinetics

Hydroxocobalamin binds to the cyanide ion, forming cyanocobalamin, which is excreted in the urine.

3. Indication

Signs and symptoms of high concentrations of cyanide exposure with an appropriate clinical history are indications for treatment as there is no widely available, rapid, confirmatory cyanide blood test.

“High concentrations of cyanide” will produce:

- Markedly altered level of consciousness
- Seizure
- Respiratory depression or respiratory arrest or
- Cardiac dysrhythmia (other than sinus tachycardia)

Mechanism of action of **cyanide** in the body

Cyanide inhibits mitochondrial cytochrome oxidase and hence blocks electron transport, resulting in decreased oxidative metabolism and oxygen utilization. Lactic acidosis occurs as a consequence of anaerobic metabolism. The oxygen metabolism at the cell level is grossly hampered.

Cyanide is rapidly absorbed from the stomach, lungs, mucosal surfaces, and unbroken skin.

The lethal dose of potassium or sodium **cyanide** is 200 to 300 mg, and of hydrocyanic acid is 50 mg. Effects begin within seconds of inhalation and within 30 minutes of ingestion. The rapidity of onset is related to the severity of exposure (inhalation or ingestion) and may have dramatic, immediate effects causing sudden cardiovascular collapse or seizure/coma.

Initial effects of poisoning include headache, faintness, vertigo, excitement, anxiety, a burning sensation in the mouth and throat, breathing difficulty, increased heart rate, and hypertension. Nausea, vomiting, and sweating are common.

Smell of almonds is not a reliable sign and the provider should not attempt to inhale local air nor patient breath to determine if the almond smell is present.

OPTIONAL SUPPLEMENTAL PROGRAM
CYANIDE POISONING PROTOCOL

HYDROXOCOBALAMIN (CONTINUED)

4. Contraindications

Patients with known anaphylactic reactions to hydroxocobalamin or cyanocobalamin

5. Adverse Effects

- a) Reddish discoloration of the skin and urine (which is not to be confused with the rare sign of carbon monoxide poisoning). The devices that rely on colorimetry (e.g., pulse oximeter and CO level) will be interfered with by the color change and are not reliable for patient assessment.
- b) Rash
- c) Increased blood pressure
- d) Nausea
- e) Headache
- f) Decreased white cell count
- g) Injection site reactions
- h) Allergic reactions have been observed.



6. Precautions

- a) Notify hospital of administration of hydroxocobalamin and do not administer sodium thiosulfate through the same IV, as this may cause crystalline precipitation.
- b) Administer slowly over 15 minutes.
- c) Watch for administration sight reactions.
- d) Monitor for hypertensive response to administration.



BE SURE TO ASSESS FOR EVIDENCE OF TRAUMATIC OR MEDICAL CAUSES FOR PATIENT'S ALTERED MENTAL STATUS.

7. Dosage

- a) Collect a pre-treatment blood sample in the appropriate tube to assess cyanide level.
- b) ADULT: Administer hydroxocobalamin. Initial dose is 5 grams administered over 15 minutes SLOW IV. (Each 2.5 gram vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10–15 mL/minute.)
 An additional 5 gram dose may be administered with medical consultation.
- c) PEDIATRIC: Administer hydroxocobalamin 70 mg/kg (reconstitute concentration is 25 mg/mL). Each 2.5 gram vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10–15 mL/minute. Maximum single dose 5 grams.
- d)  If patient (adult or pediatric) has a reported oral cyanide ingestion and does not manifest signs and symptoms meeting administration criteria, consider medical consultation for administration of hydroxocobalamin.

**OPTIONAL SUPPLEMENTAL PROGRAM
HEPARIN INFUSION FOR INTERFACILITY TRANSPORT
PARAMEDIC ONLY**



**D. HEPARIN INFUSION FOR INTERFACILITY TRANSPORT
(Paramedic only)**

1. PURPOSE

During interfacility transports, a paramedic may monitor a patient on a continuous IV heparin infusion as long as the following criteria have been met.

2. INDICATIONS

The heparin infusion must have been started by the hospital staff prior to an interfacility transfer. IV heparin infusions may NOT be started by the prehospital provider in the prehospital setting.

3. CONTRAINDICATIONS

- a) Patients who have had trauma or surgery to the brain, eye, spinal cord, urinary tract, joints, or retroperitoneum within the last 7 days
- b) Patients with active bleeding
- c) Third trimester pregnancy



4. PROCEDURE

- a) Follow the appropriate ALS algorithm and maintain the infusion as directed by the sending physician.
- b) The sending physician must document the infusion to be administered on the patient's record or transport note, including the concentration of the units per hour.
- c) The infusion must be maintained on an infusion pump designed for transport, and the provider must be trained in the appropriate use of that specific make and model infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
- d) The total volume of heparin infused must be recorded on the patient care report.
- e) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report every 15 minutes.
- f) When in doubt, contact the sending physician for medical direction.

5. SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document the training of ALS providers on the operation of the infusion pump(s) being used. They must also have a quality improvement (QI) program monitoring the appropriateness and quality of care provided. The QI program should be directed or coordinated by, at minimum, an ALS provider.

**OPTIONAL SUPPLEMENTAL PROGRAM
HEPARIN INFUSION FOR INTERFACILITY TRANSPORT
PARAMEDIC ONLY**



**HEPARIN
(Paramedic only)**

1. Pharmacology

Heparin is an anticoagulant that works by neutralizing several of the clotting factors (XIII, XII, XI, X, IX, and II).

2. Pharmacokinetics

- a) Heparin inhibits the coagulation mechanism in 3 sites:
 - (1) activation of factor X
 - (2) formation of thrombin from prothrombin
 - (3) conversion of fibrinogen to fibrin
- b) Heparin's effect, which is to retard or prevent blood clotting, is immediate. The half-life of intravenous heparin is 1–1.5 hours.

3. Indications

- a) Thromboembolic disease, such as pulmonary embolism deep vein thrombophlebitis, and arterial embolization
- b) Acute myocardial infarction. (Heparin may be given alone or in conjunction with thrombolytic therapy.)

4. Contraindications

- a) Patients who have had trauma or surgery to the brain, eye, spinal cord, urinary tract, joints, or retroperitoneum within the last 7 days
- b) Patients with active bleeding
- c) Third trimester pregnancy

5. Adverse Effects

Increased potential for bleeding

6. Precautions

- a) Inadvertent infusion of too much heparin can result in over-anticoagulation and the potential for bleeding complications.
- b) If it is necessary to draw blood or start an IV while a patient is receiving heparin, extra time to hold pressure over the puncture site will be necessary to stop the bleeding.
- c) Use with caution for patients with extreme hypertension.



7. Dosage

- a) Adult: Administer a maximum of 18 units/kg per hour. **(NEW '17)**
- b) Pediatric: Not indicated.

**OPTIONAL SUPPLEMENTAL PROGRAM
AIRWAY MANAGEMENT
PARAMEDIC ONLY**



F. AIRWAY MANAGEMENT: BI-LEVEL POSITIVE AIRWAY PRESSURE (BiPAP)

1. INDICATIONS

- a) Interfacility transfer of a patient with established/chronic respiratory distress or failure due to cardiogenic pulmonary edema or COPD/asthma in which the patient demonstrates spontaneous respirations and a patent, self-maintained airway
- b) No increase in pressure settings or oxygen requirement of the current BiPAP device within 48 hours of the transfer. Otherwise, the patient shall be transferred by an SCT team.
- c) Patients who are 13 years of age or older **(NEW '17)**
- d) Exception: A CRT-I or EMT may transport a patient who is chronically on BiPAP who is going for routine medical care, and has in attendance a patient-provided attendant who can manage the patient's own BiPAP. **(NEW '17)**

2. CONTRAINDICATIONS

- a) Circumstances in which endotracheal intubation or a surgical airway is preferred or necessary to secure a patent airway
- b) Circumstances in which the patient is being transferred for treatment of acute respiratory distress

3. PROCEDURE

- a) Assure patent airway.
- b) Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO₂) reading, and cardiac rhythm.
- c) Apply BiPAP device per manufacturer's instructions.
- d) Program the device to match the settings of the BiPAP machine that the patient is currently using.
- e) Assess the patient after placing the BiPAP device selected for transfer. If respiratory distress occurs, support the patient with a BVM until facility personnel reestablish therapy with original BiPAP device.
- f) Continuously reassess the patient.
- g) Monitor continuous pulse oximetry.
- h) Monitor continuous EtCO₂ with nasal prongs.
- i) Follow the appropriate set of standing orders for continued treatment.
- j) Confirm the availability of a BiPAP device at the destination facility.



FOR CIRCUMSTANCES IN WHICH THE PATIENT DOES NOT IMPROVE OR CONTINUES TO DETERIORATE DESPITE BIPAP AND/OR MEDICATIVE THERAPY, TERMINATE BIPAP ADMINISTRATION AND PERFORM BVM VENTILATION AND ENDOTRACHEAL INTUBATION IF NECESSARY.

BIPAP MAY BE CONSIDERED FOR NON-CARDIOGENIC PULMONARY EDEMA.

**OPTIONAL SUPPLEMENTAL PROGRAM
BLS GLUCOMETER PROTOCOL
EMT ONLY**

**G. BLS GLUCOMETER PROTOCOL
(EMT ONLY)**

a) PURPOSE

The glucometer should be utilized by BLS providers to determine the blood glucose level in an attempt to determine the etiology of the patient's condition and provide treatment tailored to the needs of the patient before ALS intervention can be made.

b) INDICATIONS

The glucometer should be utilized for any patient presenting with an altered mental status, seizure activity, unresponsiveness, stroke, combative, suspected cyanide poisoning, reported history of high or low blood sugar, and pediatric bradycardia or cardiac arrest.

c) TREATMENT

Utilize the glucometer to determine the patient's blood glucose level. If the glucose level is less than 70 mg/dl:

- (1) ADULT: Administer glucose paste (10–15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.
- (2) PEDIATRIC: Administer glucose paste (10–15 grams) between the gum and cheek; this may be accomplished through several small administrations. Consider single additional dose of glucose paste if not improved after 10 minutes.



IF THE GLUCOSE LEVEL IS GREATER THAN 100 MG/DL, DO NOT ADMINISTER GLUCOSE PASTE.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I / DUODOTE KITS**

I. MARK I / DuoDote Kits (Atropine and 2-PAM Auto-Injectors) (NEW '17)

1. Initiate General Patient Care.

2. Presentation

- a) Nerve agents are a group of highly toxic chemicals that may be released in a WMD event. These agents act to inhibit cholinesterase, and therefore prolong the effects of acetylcholine. These agents are potent, long acting, and all bind to acetylcholine irreversibly unless an oxime is given.
- b) Nerve agents include Tabun (GA), Sarin (GB), Soman (GD) and GF. There are also V agents such as VX.
- c) The G-type agents evaporate (become vapor) or may be dispersed in the air by weapons. When a person inhales this vapor, effects begin within seconds to minutes.
- d) The V-type agents are oily and evaporate very slowly. They persist on the ground, foliage, etc., for long periods. Exposure to this liquid on the skin causes effects to start as soon as 10 minutes or as long as 18 hours after contact. The vapor hazard from these is not as great as from the G-type agents.
- e) Many insecticides currently in use are organophosphates and are chemically related to nerve agents. The organophosphate insecticides may have a slower onset and a longer lasting effect compared with nerve agents.
- f) Characteristic signs and symptoms may identify nerve agent poisoning. After vapor exposure, early manifestations of poisoning occur in the eyes, nose, and airway. With liquid/dermal contact exposure, early manifestations occur in the skin and the GI tract. Thus, when looking at the chart below, consider the mechanism of release and the associated signs and symptoms (refer to the chart below with the mnemonic P-SLUDGE-MC). (NOTE: This mnemonic is used for all organophosphate toxicity. Pupillary response occurs only with vapor exposure and will not be seen unless there is direct liquid contact with the eye. Urinary incontinence is also very rare.)

Nerve Agents			
Signs and Symptoms of Chemical Agents			
		Vapor Exposure	Liquid Exposure
	P - Pinpointing pupils	✓	Not Seen
	S - Salivation	✓	Not Seen
Mild	L - Lacrimation (tearing)	✓	Not Seen
Severe	U - Urination	✓	✓
	D - Defecation	✓	✓
	G - Gastrointestinal; pain/gas	✓	✓
	E - Emesis (vomiting)	✓	✓
	M - Muscle twitching	✓	✓
	C - Convulsions	✓	✓
	B - Bradycardia	✓	✓
	B - Bronchospasm	✓	✓
	B - Bronchorrhea	✓	✓

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I / DUODOTE KITS**

- g) EMS providers must know the following MILD, MODERATE, and SEVERE signs and symptoms of nerve agent poisoning. When providers recognize most or all of the symptoms listed below, they must IMMEDIATELY receive treatment (first aid or buddy aid).
- (1) MILD poisoning (self-aid). Casualties with mild symptoms may experience most or all of the following:
 - (a) Unexplained runny nose
 - (b) Unexplained sudden headache
 - (c) Sudden drooling
 - (d) Difficulty in seeing (dimness of vision, constricted pupil)
 - (e) Tightness in the chest or difficulty in breathing
 - (f) Wheezing and coughing
 - (g) Localized sweating and muscular twitching in the area of the contaminated skin
 - (h) Stomach cramps
 - (i) Nausea without vomiting
 - (2) MODERATE effects would be the above, but also include more severe effects such as diarrhea, moderate to severe difficulty breathing, and some skeletal-muscular twitching/fasciculations. The progression of symptoms from mild to moderate indicates either inadequate treatment or continuing exposure to the nerve agent.
 - (3) SEVERE symptoms. Providers with severe symptoms will not be able to treat themselves and must receive prompt buddy aid and medical treatment. Casualties with severe symptoms may experience most or all of the MILD symptoms plus most or all of the following:
 - (a) Impaired thinking
 - (b) Increasing wheezing and increased difficulty breathing
 - (c) Severe pinpoint pupils
 - (d) Red eyes with tearing
 - (e) Vomiting
 - (f) Severe muscular twitching and general weakness
 - (g) Involuntary defecation
 - (h) Convulsions
 - (i) Unconsciousness
 - (j) Respiratory Failure
 - (k) Bradycardia
- h) Prevention of Poisoning
- (1) In the setting of an exposure to a nerve agent, the most rapid absorption occurs through the respiratory tract. When it is suddenly determined that providers are in the “hot zone,” do not look for the invisible vapor cloud. Providers should hold their breath until they don and clear their breathing apparatus or protective masks. Once masked, a provider will then give the alarm to other providers. This may be done with hand signals or through the mask. If a fellow provider is severely poisoned with altered consciousness in the hot zone, the initial, less-poisoned masked provider should mask the casualty.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I / DUODOTE KITS**

- (2) When the masked casualty is severely poisoned after exposure to vapor and liquid, they should be decontaminated by removing clothing, blotting the agent (if a liquid exposure), and diluting the agent by using a flush with large amounts of water. Decontamination should be done as soon as possible, but it will usually occur in the warm zone or a safe area.
- (3) When treating a severely poisoned casualty, the treating provider should take care to avoid exposure to the liquid agent (which could occur when kneeling next to the casualty). Squatting next to the casualty while masking or treating him/her will help the caregiver to avoid exposure to liquid nerve agent.
- (4) Do not administer nerve agent antidotes before actual exposure to nerve agents or development of clinical symptoms occurs. Nerve agent antidotes may degrade performance in the hot zone (creating a heat-stressed provider) and should be administered only when symptoms and signs of nerve agent poisoning are present.

3. Treatment

- a) The ABC priorities of prehospital treatment require modification to AABCs (Antidote then ABCs). The antidote (Atropine and 2-PAM) should be given as soon as possible, because toxic exposure to the nerve agent will make ventilation difficult. If the antidote is not immediately available, prevent further exposure to the nerve agent, provide ABC support, and evacuate the patient to an area where the antidote is available.
- b) Based on signs and symptoms in a mass casualty incident (MCI) or on-site chemical testing that confirms nerve or organophosphate agent presence in a mass casualty incident, a certified EMR or EMT may administer MARK I/DuoDote kits (up to total of three kits) as buddy care to public safety personnel or when directed to do so by an ALS provider. The midazolam 5 mg or diazepam 10 mg auto-injector (CANA) can only be administered by an ALS provider when three MARK I/DuoDote kits are administered in a severe exposure. Medical consultation is not required in these situations.

Adult Doses

MILD EXPOSURE: miosis, rhinorrhea, increased salivation, nausea

1 dose IM DuoDote® or Mark I kit (atropine 2 mg and pralidoxime chloride 600 mg)

MODERATE EXPOSURE: miosis, rhinorrhea, short of breath and/or vomiting and diarrhea

2 doses IM (one after another) DuoDote® or Mark I kit

SEVERE EXPOSURE: respiratory distress, respiratory arrest, cyanosis, extreme SLUDGE (salivation, lacrimation, urination, defecation, gastrointestinal distress, and emesis), seizures, unconsciousness, bronchorrhea, bronchospasm, bradycardia

3 doses IM (one after another) DuoDote® or Mark I kit and 1 dose Diazepam 10 mg IM or 5-10 mg IV

If MILD or MODERATE symptoms progress in the face of treatment, administer additional DuoDotes® or Mark I kits for a total of 3 kits.

MILD EXPOSURE

Pediatric Doses for Nerve Agent Exposure



Mild Exposure (AtroPen® only)

Wt. (kg)	Initial AtroPen® Dose ¹	Repeat AtroPen® Dose ¹
4-6	0.5 mg	0.5 mg
7-13	0.5 mg	1 mg
14-22	1 mg	2 mg
23-26	1 mg	2.5 mg
27-33	1.5 mg	3 mg
Over 33	0.05 mg/kg	0.1 mg/kg

May repeat every 5 minutes until secretions begin to dry or maximum 6 mg IM.

Color coding and unit amount for Pediatric AtroPens®

	0.5 mg auto-injector (blue)
	1 mg auto-injector (red)

¹Atropine auto-injectors (AtroPen®) from CHEMPACK caches come in 0.5 mg and 1 mg devices. Initial dosage based off of 0.05 mg/kg; repeat dosage based off of 0.1 mg/kg.

MODERATE EXPOSURE

Pediatric Doses for Nerve Agent Exposure



Moderate Exposure

Wt. (kg)	Atropine ²	Repeat Dosing		2PAM Chloride ³ 600 mg in 20 mL Multi-dose vial (50 mg/kg)
		Multi-dose vial (0.1 mg/kg) (IM or IV)	Repeat AtroPen [®] Dose	
4	0.5 mg	0.4 mg	1 mg	200 mg
7	0.5 mg	0.7 mg	1 mg	350 mg
9	0.5 mg	0.9 mg	1 mg	450 mg
10	0.5 mg	1 mg	1 mg	500 mg
13	1 mg	1.3 mg	1 mg	650 mg
17	1 mg	1.7 mg	2 mg	850 mg
21	1 mg	2.1 mg	2 mg	1,050 mg (1,000 mg IV)
26	1.5 mg	2.6 mg	2.5 mg	1,300 mg (1,000 mg IV)
33	1.5 mg	3.3 mg	3 mg	1,650 mg (1,000 mg IV)
Over 33	0.05 mg/kg	0.1 mg/kg	0.1 mg/kg	50 mg/kg

May repeat every 5 minutes until secretions begin to dry or maximum 6 mg IM.

² Atropine auto-injectors (AtroPen[®]) from CHEMPACK caches come in 0.5 mg and 1 mg devices. Initial dosage based off of 0.05 mg/kg; repeat dosage based off of 0.1 mg/kg.

³ 2PAM Chloride is supplied in 1 gram in 20 mL. This must be reconstituted in sterile water. See the back page for additional information.

SEVERE EXPOSURE – PREFERRED TREATMENT

Pediatric Doses for Nerve Agent Exposure



Use only one of these modalities.

There are two treatment modalities for severe exposure:

1. Treatment with DuoDote[®]/Mark I auto-injectors
2. Treatment with atropine and 2PAM supplied in vials.

1. Severe Exposure Treated with DuoDote[®]/Mark I

SEVERE EXPOSURE: respiratory distress, respiratory arrest, cyanosis, extreme SLUDGE (salivation, lacrimation, urination, defecation, gastrointestinal distress, and emesis) seizures, unconsciousness, bronchorrhea, bronchospasm, bradycardia

In severe exposures, DuoDote[®] or Mark I kit can be given to any child, regardless of age or weight, as the initial antidote therapy when no other atropine or pralidoxime source is available.

Treatment for severe exposure with DuoDote[®]/Mark I

- Children up to 21 kg, administer 1 DuoDote[®] or 1 Mark I kit.
- Children 22 to 33 kg, administer 2 DuoDote[®] or 2 Mark I kits.
- Over 33 kg, see adult dosage (page 1).

Diazepam if Seizing

- 0.2 mg/kg, IV preferred route, but can also administer IM.

SEVERE EXPOSURE

Pediatric Doses for Nerve Agent Exposure



Use only one of these modalities.

There are two treatment modalities for severe exposure:

1. Treatment with DuoDote®/Mark I auto-injectors
2. Treatment with atropine and 2PAM supplied in vials.

2. Severe Exposure Treated with Atropine and 2PAM (Diazepam if seizing)

Wt. (kg)	Atropine		Repeat Atropen® Dose ⁴	2PAM Chloride ⁵ 600mg	Diazepam ⁶ Multi-dose vial IV or IM
	AtroPen® dose ⁴ (IM Only)	Multi-dose vial (IM or IV)			
4	0.5 mg	0.4 mg	0.5 mg	200 mg	0.8 mg
7	1 mg	0.7 mg	1 mg	350 mg	1.4 mg
9	1 mg	0.9 mg	1 mg	450 mg	1.8 mg
10	1 mg	1.0 mg	1 mg	500 mg	2.0 mg
13	1.5 mg	1.3 mg	1.5 mg	650 mg	2.6 mg
17	1.5 mg	1.7 mg	1.5 mg	850 mg	3.4 mg
21	2 mg	2.1 mg	2 mg	1,050 mg (1000 mg IV)	4.2 mg
26	3 mg	2.6 mg	3 mg	1,300 mg (1000 mg IV)	5.2 mg
33	3 mg	3.3 mg	3 mg	1,650 mg (1000 mg IV)	6.6 mg
Over 33	0.1 mg/kg	0.1 mg/kg	0.1 mg/kg	50 mg/kg	0.2 mg/kg

⁴ Atropine auto-injectors (AtroPen®) in CHEMPACK caches come in 0.5 mg and 1 mg devices. Multi-dose vials can provide closer to ideal dosages, if available.

⁵ Initial dose if only atropine has been given or repeat dose (60 minutes after initial DuoDote®/Mark I).

⁶ IV preferred route but can administer IM, if no IV available. May repeat one time in 5 minutes; maximum total pediatric dose 5 mg all routes.

Use of Vial Medications - Instructions

Atropine 0.4 mg/mL in 20 mL

Adult dose: draw up medication in 5 mL syringe (2 mgs) for initial dose of 2 mgs.

Pediatric dose: determine dose based on chart above and draw up medication in 3, 5, or 10 mL syringe as indicated.

2PAM Chloride (Pralidoxime) 1 gm in 20 mL

For IV administration: Pralidoxime vials contain medication in a powder form. Draw up 20 mL of sterile water for injection and add to the 1 gm container of Pralidoxime; this results in a 50 mg/mL concentration.

For INTRAMUSCULAR injection: Reconstitute a single 1 gm vial adding 3.3 mL of sterile water for injection; this results in a concentration of 300 mg/mL. Do not exceed 2 mL per IM injection.

Adult dose: Draw up medication in 20 mL syringe for initial dose of 1 gm IVP (600 mg in 2 mL if IM).

Pediatric dose: Determine dose based on chart above and draw up medication (from 20 mL syringe containing reconstituted medication) in a 3, 5, 10, or 20 mL syringe as indicated. Dose is based on 50 mg/kg. Maximum 2 mL per injection.

Diazepam 5 mg/mL in 10 mL

Adult dose: draw up 1 mL in 1 or 3 mL syringe for IM administration for initial dose of 10 mg IM for patient who has active seizures. If IV is available, administer 2.5-10 mg IVP.

Pediatric dose: determine dose based on chart above and draw up medication in 1 or 3 mL syringe as indicated. Dose is based on 0.2 mg/kg IV or IM.

**OPTIONAL SUPPLEMENTAL PROGRAM
SPECIALTY CARE PARAMEDIC
PARAMEDIC ONLY**

Medication - Procedure (Continued)		
A. Medications (Continued)	Specialty Care Paramedic (SP)	Team with Nurse (RN)
9. Fibrinolytics/Thrombolytics		
a. All types		RN
10. Anti-Coagulants/Anti-Platelets		
a. All Types	SP (adults only)	
11. Anti-Emetic		
a. All types anti-emetic	SP	
12. Miscellaneous		
a. Flumazenil AD (romazicon)		RN
b. Insulin – IV		RN
c. Insulin in TPN	SP	
d. Mannitol (osmitrol)		RN
e. Magnesium Sulfate (added to mixed drip – e.g., with vitamins)	SP	
f. Potassium Chloride (only maintenance infusions; not bolusing)	SP	
g. Sodium Bicarbonate Drip	SP	
h. Steroids – IV (not initiated)	SP	
i. Tocolytics (including Magnesium Sulfate)		RN
j. Uterine stimulants (e.g., oxytocin)		RN
13. Anti-Arrhythmic		
a. Bretylium (bretylol)		RN
b. Digoxin (lanoxin)		RN
c. Diltiazem Drip	SP	
d. Esmolol (brevibloc)		RN
e. Metoprolol (lopressor)		RN
f. Procainamide (pronestyl)		RN
g. Quinidine Sulfate & Gluconate		RN
14. Anti-Convulsants (also see sedatives)		
a. Barbiturates		RN
b. Phenytoin (dilantin)/Fosphenytoin	SP	
c. Other non-benzodiazepine anti-convulsants		RN
15. Diuretics	SP	

**OPTIONAL SUPPLEMENTAL PROGRAM
SPECIALTY CARE PARAMEDIC
PARAMEDIC ONLY**

Medication - Procedure (Continued)		
	Specialty Care Paramedic (SP)	Team with Nurse (RN)
B. Invasive Procedures		
1. Chest Escharotomies		RN
2. Chest Tubes Insertion		RN
3. Chest Tube or Surgical Drain with or without vacuum system	SP	
4. Laryngeal Mask Airway (LMA)	SP (adult only)	
5. Needle Cricothyroidotomy	SP	
6. Rapid Sequence Intubation		RN
7. Surgical Cricothyroidotomy	SP	
8. Urinary catheter insertion	SP	
C. Non-Invasive Procedures		
1. IV Pumps	SP	
2. Ostomy care	SP	
D. System Monitoring		
1. Arterial Line/Cardiac Sheath		RN
2. CVP line (monitor but not performing measures)	SP	
3. Intracranial Pressure Monitor/Line		RN
4. Swan-Ganz		RN
E. Specialized Equipment		
1. Acute Ventilated Interfacility Patient – Transport Service’s Ventilator (except as in E6)	SP	
2. Internal Pacer with external control		RN
3. Intra-Aortic Balloon Pump		RN
4. Peritoneal Dialysis Systems	SP	
5. Specialty Ventilator (e.g., pediatric or when hospital ventilator must accompany patient)		RN
6. Transport Isolette/Incubator		RN
7. Ventricular Assist Devices	SP	

**OPTIONAL SUPPLEMENTAL PROGRAM (NEW '17)
EMT ACQUISITION OF 12-LEAD
ELECTROCARDIOGRAPHY**

N. EMT ACQUISITION OF 12-LEAD ELECTROCARDIOGRAPHY

1. PURPOSE

Coronary heart disease is the single largest cause of death in U.S. men and women. Early identification and treatment of patients with acute myocardial infarction (AMI) has proven to reduce myocardial damage and decrease morbidity and mortality. The goal of this program is to allow an EMT to acquire and transmit a 12-lead (15-lead if trained to perform) electrocardiogram (EKG) to the receiving facility and possibly reduce the door to reperfusion time for the AMI patient.

2. PRESENTATION

Chest discomfort that may radiate to the arm, shoulders, jaw, or back. Generally described as a crushing pain or toothache. May be accompanied by shortness of breath, sweating, nausea, or vomiting.

OR

- a) Chest discomfort. Some heart attacks involve discomfort in the center of the chest that lasts for more than a few minutes or that goes away and comes back. This discomfort can feel like uncomfortable pressure, squeezing, or fullness.
- b) Discomfort in other areas of the upper body. Symptoms can include discomfort in one or both arms or in the back, neck, jaw, or stomach.
- c) Shortness of breath. This symptom often accompanies chest discomfort. However, it can also occur prior to the chest discomfort.
- d) Other signs. These may include breaking out in a cold sweat, nausea, light-headedness, or a sense of impending doom.
- e) Post-cardiac arrest with ROSC.
- f) Medical history and contributing factors.
 - (1) A previous heart attack or procedure to open up coronary arteries
 - (2) Family history of heart disease
 - (3) Diabetes mellitus
 - (4) High blood pressure
 - (5) High blood cholesterol
 - (6) Overweight
 - (7) Physical inactivity
 - (8) Cigarette smoking

**OPTIONAL SUPPLEMENTAL PROGRAM (NEW '17)
EMT ACQUISITION OF 12-LEAD
ELECTROCARDIOGRAPHY**

3. INDICATIONS

Any patient complaining of chest discomfort or exhibiting signs, symptoms, or medical history as outlined in Section 2 (Presentation).

4. CONTRAINDICATIONS

Acquisition of a 12-lead EKG should not take precedence over required life-saving measures (e.g., CPR, assisting respirations, clearing or maintaining a patient's airway, checking blood glucose, extrication, or removing a patient from a dangerous scene).

5. PROCEDURE

- a) Initiate General Patient Care.
 - b) Initiate Cardiac Emergencies: Chest Pain Protocol.
 - c) Position patient (1) (2).
 - d) Place chest and limb leads (3) (4).
 - e) Turn on monitor.
 - f) Set patient age and a patient identifier.
 - g) Acquire 12-lead (5).
 - h) Consult with receiving facility.
 - i) Transmit 12-lead (6).
 - j) Continue patient care.
- (1) Unrestricted access to the skin in the chest area, arms, and lower legs is required to allow for correct placement of electrodes. Do your best to protect the patient's privacy. Once the electrodes are positioned and connecting leads are appropriately attached, the patient should be covered with a sheet to preserve their dignity during the procedure.
- (2) If unable to place patient in the recumbent position, include this information in your hospital consult and note it in the written narrative of your patient care report.

**OPTIONAL SUPPLEMENTAL PROGRAM (NEW '17)
EMT ACQUISITION OF 12-LEAD
ELECTROCARDIOGRAPHY**

- (3) Remove electrodes from a sealed package immediately before use. Using previously unpacked electrodes or electrodes with expired date codes may impair EKG signal quality.
- (4) When placing electrodes on female patients, always place the leads V3-V6 under the breast rather than on the breast.
- (5) Acquisition of a 12-lead EKG should take no more than 5 minutes.
- (6) Transmission of the 12-lead EKG to the receiving facility should be done en route to the receiving facility. There is no need to delay transport to transmit a 12-lead EKG.

6. INDIVIDUAL EMT APPROVAL FOR PARTICIPATION

- a) The EMT 12-Lead EKG Program is open to all Maryland EMTs that have been providing direct patient care for a minimum of one year.
- b) Providers must be members of an ALS company that currently owns a local system compatible 12-lead device.

7. ONGOING DEMONSTRATION OF PROFICIENCY

After the initial training program is completed, the EMT will participate in an annual refresher training program.

8. REVIEW OF EACH CALL

- a) The provider will submit copies of each 12-lead EKG and patient care report to their jurisdictional Quality Review Committee.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

O. WILDERNESS EMS

A. INTRODUCTION

These protocols are complementary to the MIEMSS protocols. They are to be utilized only under the following conditions:

1. The protocols are being utilized in a defined wilderness environment.
2. The EMS jurisdiction has been authorized to utilize wilderness EMS protocols.
3. The EMS provider has been credentialed as a wilderness EMS provider (see B.1.b).
4. The EMS provider is functioning under appropriate wilderness EMS medical direction.

B. DEFINITIONS

1. Wilderness Environment
 - a) A wilderness environment is defined as “any geographic area where the typical urban resources are not adequate for the management of an injured or sick patient.” Some examples include woodland areas, mountainous terrain, uneven terrain where traditional urban EMS equipment and stretchers are not able to safely function, rivers, and ski hills.
 - b) In order to be considered a Wilderness EMS (WEMS) provider, the provider needs to have completed additional training beyond that required to function in the urban environment. This training can be completed by any of the following methods:
 - (1) Completion of the State of Maryland Wilderness EMS Course
 - (2) Alternatively, the provider may demonstrate proficiency in the skills of wilderness EMS after providing proof of completion of a nationally recognized wilderness EMS program. Four programs that are nationally recognized are:
 - (a) National Outdoor Leadership School’s Wilderness Medical Institute
 - (b) National Ski Patrol’s Outdoor Emergency Care program
 - (c) Stonehearth Open Learning Opportunities
 - (d) Wilderness Medical Associates
2. Wilderness EMS Physician
 - a) In order to be considered a wilderness EMS physician, the physician needs to have fulfilled the requirements in order to function as a medical director under COMAR 30.03.03 and be recognized by the State EMS Medical Director as being qualified to provide medical direction in the wilderness environment. Expertise in wilderness EMS may be demonstrated by:
 - (1) Completion of a recognized program in wilderness medicine
 - (2) At least 2 years of experience functioning in the wilderness environment under the defined capacity of a wilderness medical practitioner
3. Wilderness EMS Jurisdiction
 - a) In order to be recognized as a wilderness EMS jurisdiction the following parameters must be met:
 - (1) A written request with a demonstrated need
 - (2) EMS providers credentialed as Wilderness Providers
 - (3) The providers are functioning under a state recognized wilderness EMS medical director

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

C. Asthma

1. Initiate general patient care as per the MIEMSS protocols.
2. Administer albuterol MDI – 2 puffs every hour as needed; may administer up to 4 puffs per hour.
3. Consider administration of epinephrine auto-injector for severe asthma.
4. Pediatrics less than 30 kg estimated weight administer 0.15 mg IM
5. Pediatrics greater than 30 kg estimated weight and adults administer 0.3 mg IM

ALS SKILL

6. Consider administration of dexamethasone
 - (a) Pediatrics – 0.5 mg/kg to max of 10 mg every 24 hours
 - (b) Adults – 10 mg every 24 hours

All Providers

7. Continue treatment and monitoring of patient.
8. Transport to definitive care.

D. Acute coronary syndrome

1. Initiate general patient care as per the MIEMSS protocols.
2. Acute coronary syndrome may be difficult to diagnose in the wilderness environment without the use of a 12-lead EKG. WEMS providers should have a high index of suspicion in a patient complaining of chest pain, shortness of breath, or extreme fatigue without an alternate explanation for these symptoms.
3. Closely monitor vital signs during patient contact.
4. Provide oxygen if available at 2 liters per nasal cannula or as needed to treat symptoms or keep oxygen saturation above 90% if a pulse oximetry is available.
5. Administer aspirin 324 mg (81 mg low-dose aspirin X 4) or 325 mg aspirin chewed
6. Expedite transport out of the wilderness.

E. Shock

1. Patients presenting with shock will exhibit signs of poor perfusion to critical organs.
2. The patient may or may not be hypotensive.
3. The most common reason for shock in trauma is hemorrhage.
4. Treat the underlying cause. Control external bleeding.
5. Control for environmental conditions.

ALS SKILL

6. If carrying IV fluids, establish IV access and administer IV fluids with Lactated Ringer's (LR).
7. Pediatrics 20 mL/kg bolus to maintain a radial pulse and to maintain normal mentation
8. Adults 500–1,000 mL bolus to maintain a radial pulse and to maintain normal mentation
9. Continue fluids to maintain peripheral perfusion.

ALL PROVIDERS

10. Expedite transport.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

F. External Bleeding

1. Initiate general patient care as per the MIEMSS protocols.
2. Control external bleeding with direct pressure.
3. If unable to control extremity bleeding with direct pressure, apply tourniquet proximally to the site of bleeding. Note the time and date of the tourniquet application. If time of delivery of patient to definitive care is expected to exceed 12 hours, then it is appropriate to release the tourniquet every 2 hours. However if tourniquet is released, closely observe area for bleeding and immediately reapply if bleeding resumes.

ALS SKILL

4. If unable to control bleeding in site other than extremity, or if unable to get control of bleeding with a tourniquet, then apply hemostatic agent (HemCon or similar product) per manufacturer instructions.

G. Wound Care

1. Initiate general patient care as per the MIEMSS protocols.
2. Once bleeding has been controlled, assess the size and depth of the wound. Assess for extent of contamination. In addition, assess for any suspicion of underlying broken bones or dislocated joints in association with the wound.
3. Irrigate the wound. Ideally the wound should be irrigated with high pressure. High pressure irrigation devices can be created with a syringe or a plastic bag with a small hole. Irrigate with water that is clean enough to drink. Irrigate until all visible foreign bodies have been removed.

ALS SKILL

4. Assess need for primary closure of wound.
 - a) In the wilderness setting, large wounds may warrant primary closure if time to definitive treatment is greater than four hours.
 - b) Primary closure can be achieved with:
 - (1) Tissue adhesive (Dermabond or similar product)
 - (2) Steri-strips or other tape (duct tape works well)
 - (3) Staples (Physician only skill)
 - (4) Sutures (Physician only skill)
 - c) Wounds that persist with foreign bodies despite adequate irrigation should not be primarily closed.
 - d) Unless there will be a significant delay of transport of patient to definitive care (i.e., greater than 12 hours) do not primarily close facial wounds in the wilderness environment.
5. Assess need for administration of antibiotics
 - a) Wounds that warrant antibiotic prophylaxis include:
 - (1) Grossly contaminated wounds
 - (2) Wounds with obvious involvement of broken bones or joint spaces
 - (3) Wounds with involvement of tendons or ligaments
 - (4) Mammalian bites
 - b) Antibiotic that may be used include:
 - (1) Amoxicillin-clavulanate (Augmentin) – 10 mg/kg or 500 mg of the amoxicillin component every 8 hours

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

Y. Tick Bites

1. Tick bites in the State of Maryland are at high risk for transmission of Lyme Disease and/or Rocky Mountain Spotted Fever.
2. In order for a tick to transmit Lyme, the tick has to be attached to the patient for at least 36 hours. Ticks found on a patient that are engorged with blood pose a much higher risk than ticks that are not engorged with blood.
3. Lyme disease presents with a circular red rash with the center clear of redness. Patients will have fevers and non-specific flu-like symptoms. The patient may also have neurological finding such as a facial droop.
4. To remove a tick, directly pull the tick up from the skin using a pair of tweezers in a single firm steady pull.

ALS SKILL

5. If there is high suspicion for Lyme, start the patient on antibiotic treatment with doxycycline 100 mg twice a day; 2.2 mg/kg 8 years or greater. If less than 8 years old use Augmentin 10 mg/kg every 12 hours.
6. If there is suspicion for Rocky Mountain Spotted Fever (the patient has fever and petechiae), then doxycycline is the antibiotic of choice for all age groups. If less than 45 kg estimated weight, administer 2.2 mg/kg every 12 hours to max dose of 100 mg. If greater than 45 kg then administer 100 mg every 12 hours.

Z. Large Animal Attacks (e.g., bear, wild cat, fox)

1. Ensure that the area is safe and that the animal is not still a threat to the patient or rescuers.
2. Patients typically die from large animal attacks secondary to injury to airway structures or hemorrhagic shock from large, gaping wounds.
3. Ensure the patient has an intact airway.
4. Control for any external bleeding.
5. Clean and dress wounds.
6. Transport out of the wilderness.
7. Do NOT attempt to capture the animal for identification purposes.

AA. Plants

1. Patients may develop localized skin reactions after contact with a plant.
 - a) Remove the patient from the plant.
 - b) Wash the area clean.

ALS SKILL

- c) For mild reactions, use a topical steroid. Cover the area with Betamethasone valerate 0.1% ointment twice a day.
 - d) For severe reactions administer dexamethaxone 10 mg po; 0.5 mg/kg for pediatrics.
 - e) Transport
2. Ingestion of plants and mushrooms can be life-threatening.
 - a) Patients will present with nausea and vomiting.
 - b) Provide supportive care.
 - c) Transport

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

BB. Oral Rehydration

1. Oral rehydration with a glucose-sodium solution may be indicated in one of three conditions.
 - a) Excessive sweat loss from intense exercise
 - b) Mild to moderate heat illness, or severe heat illness as long as the airway is intact and the patient is able to tolerate oral fluids
 - c) Dehydration from diarrhea
2. The patient will likely feel dehydrated. Mucus membranes will be dry. Skin may tent.
3. Replacement of fluids with only water and no electrolytes may lead to a dilution of intravascular sodium levels. This risks the development of cerebral edema. Therefore, fluids should be replaced with a solution of glucose and salts.
4. The ideal solution will contain 2–6% glucose and 30 mEq/Liter of sodium. Commercial sports drinks generally contain about 6% glucose and 25 mEq/Liter of sodium. While commercial sports drinks contain more than the ideal amount of glucose and less than the ideal amount of sodium, these solutions are better than just water.
5. If a glucose/sodium solution is not available, hydrate with water judiciously.
6. Replace fluids at a rate of 50–100 mL/kg over the first 4–6 hours.

CC. Nutrition

1. In rescues that are expected to be prolonged (i.e., greater than 4 hours) it may be necessary to provide nutritional support to the patient.
 - a) Ensure that the patient has an intact airway and that the patient is not experiencing nausea or vomiting.
 - b) Only feed the patient if you are reasonably sure that the patient will not be going to surgery in the next 12 hours.
 - c) Provide nutrition with a combination of protein and carbohydrate.
 - (1) Energy bars are a good choice.
 - (2) A mixture of dried fruits and nuts is also a good choice.

DD. Nausea

1. Patients with traumatic injuries and/or medical illness may experience nausea.

ALS SKILL

2. If carrying ALS medications and IVs, follow Nausea and Vomiting Protocol in MIEMSS treatment protocols.
3. Alternatively, may administer
 - a) Pomethazine pediatric greater than 2 years old 0.5 mg/kg every 12 hours; adults 25 mg po every eight hours
 - b) Zofran pediatric 0.1 mg/kg; adults 4 mg IM

EE. Diarrhea

1. Diarrhea in the wilderness can result in significant dehydration to the patient.
2. Orally rehydrate the patient.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

amoxicillin-clavulanate (Augmentin)

- Availability 500 mg–125 mg tablet; 125 mg–31.5 mg/5 mL
- Action antibiotic
- Indication suspected respiratory infection
- Contraindication hypersensitivity to penicillin
- Precautions
- Side effects diarrhea
- Dose Pediatrics – 10 mg/kg every 12 hours
Adult - 1 tablet every 8 hours

Aspirin

- Availability 325 mg; 81 mg
- Action anti-platelet
- Indication suspected acute coronary syndrome or stroke
- Contraindication hypersensitivity to salicylates
- Precautions
- Side effects
- Dose No pediatric dosing
Adults - one 325 mg tab po qd or four 81 mg tabs po qd

bacitracin

- Availability 1 ounce (28 gram) ointment tube
- Action topical antibiotic
- Indication soft tissue wounds
- Contraindication
- Precaution
- Side effects
- Dose (Peds & Adult) cover the affected area 2–3 times a day

betamethasone valerate

- Availability 0.1% topical ointment
- Action topical steroid anti-inflammatory
- Indication contact dermatitis
- Contraindication
- Precautions
- Side effects
- Dose (Peds & Adult) apply to affected area twice a day

calcium carbonate (Tums)

- Availability 500 mg; 750 mg chewable
- Action neutralizes stomach acid
- Indication upset stomach; gastroesophageal reflux
- Contraindication
- Precautions
- Side effects
- Dose Pediatric – 1 every four hours as needed
Adult – 1–2 every hour as needed up to max dose of 8 tabs

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

cephalexin (Keflex)	
•Availability	500 mg tablets; 125 mg/5mL
•Action	antibiotic
•Indication	suspected skin infection or prophylaxis for skin wound
•Contraindication	hypersensitivity to penicillin
•Precautions	
•Side effects	diarrhea
•Dose	Pediatric – 10 mg/kg every 6 hours Adult – 500 mg every 6 hours
chitosan (Hemcon)	
•Availability	2”X2”; 2”X4”; 4”X4” bandages
•Action	hemostatic
•Indication	severe bleeding
•Contraindication	
•Precautions	
•Side effects	
•Dose (Peds & Adult)	apply to severe bleeding as needed
ciprofloxacin (Cipro)	
•Availability	500 mg tablets
•Action	antibacterial
•Indication	suspected urinary tract infection; skin infection if patient is hypersensitive to penicillin
•Contraindication	hypersensitivity to floroquinolone
•Precautions	
•Side effects	
•Dose	no pediatric dosing Adult – 500 mg every 12 hours
clindamycin (Cleocin)	
•Availability	150 or 300 mg/tablet, reconstituted liquid 75 mg/ 5 mL
•Action	antibiotic
•Indication	suspected pharyngitis or respiratory infection; Cellulitis
•Contraindication	hypersensitivity to clindamycin
•Precautions	
•Side effects	diarrhea
•Dose	Pediatrics– 10mg/kg every 8 hours Adult -300mg every 8 hours
cryanoacrylate tissue adhesive (Dermabond)	
•Availability	single use ampoules
•Action	tissue adhesive
•Indication	minor wound repair
•Contraindication	known hypersensitivity
•Precaution	avoid near eyes
•Side effects	transient local discomfort
•Dose	as required for wound closure; may need 2–4 layers

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

dexamethasone (Decadron)

- Availability 1 mg/1 mL solution
- Action Steroidal anti-inflammatory
- Indication asthma, allergic reactions
- Contraindication
- Precautions
- Side effects
- Dose Adults 10 mg po every 24 hours as needed
Pediatrics 0.5 mg/kg po every 24 hours as needed

diphenhydramine (Benadryl)

- Availability 25 mg tablets; 12.5 mg/5 mL
- Action antihistamine
- Indication allergic reactions
- Contraindication
- Precautions
- Side effects sedating
- Dose Pediatric – 1 mg/kg to max dose 50 mg every 8 hours
Adult – 25–50 mg every 8 hours as needed

doxycycline (Doxy)

- Availability 100 mg tablets; 25 mg/5 mL
- Action antibacterial
- Indication suspected respiratory infection with contraindication to Augmentin
- Contraindication
- Precautions
- Side effects
- Dose 8–14 years old - 2.2 mg/kg every 12 hours
Adults – 100 mg every 12 hours

epinephrine auto-injector

- Availability 0.3 mg; 0.15 mg auto-injector
- Action antihistamine; anti-inflammatory; vasoconstrictor
- Indication moderate to severe allergic reaction
- Contraindication
- Precautions
- Side effects tachycardia; hypertension
- Dose Pediatric less than 30 kg estimated weight – 0.15 mg IM
greater than 30 kg estimated weight and adults – 0.3 mg IM

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

fentanyl	
•Availability	prefilled syringe, multidose vial
•Action	opioid analgesic
•Indication	severe pain
•Contraindication	
•Precautions	
•Side effects	depressed level of consciousness; hypoxia; hypotension
•Dose	1 mcg /kg IN/IV/IM to a max dose of 200 mcg with a repeat dose of 1 mcg /kg to a max dose of 200 mcg every 1 hour as needed
glucagon	
•Availability	1 mg injector
•Action	facilitates release of glucose from glycogen stores in the liver
•Indication	suspected hypoglycemia in patient that is not able to take oral glucose
•Contraindication	
•Precautions	
•Side effects	
•Dose	Pediatric less than 25 kg – 0.5 mg IM greater than 25 mg and adults – 1 mg IM
glucose gel (Glucose 15)	
•Availability	15 grams oral gel
•Action	raises blood glucose levels
•Indication	suspected hypoglycemia
•Contraindication	
•Precautions	use caution in patient with depressed level of consciousness
•Side effects	
•Dose (Peds & Adult)	give to patient by mouth in patient with depressed level of consciousness, rub the gel on the patient's gums, but use caution
ibuprofen (Advil; Motrin)	
•Availability	200 mg; 400 mg; 600 mg; 40 mg/mL
•Action	anti-inflammatory; analgesic
•Indication	mild to moderate pain
•Contraindication	hypersensitivity; known renal disease; history of GI bleeding
•Precautions	
•Side effects	
•Dose	Pediatric – 10 mg/kg to max dose 600 mg every 6 hours as needed Adult – 200 mg–600 mg every 6 hours as needed

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

loperamide (Imodium)

- Availability 2 mg tablets
- Action anti-diarrheal
- Indication diarrhea
- Contraindication
- Precautions
- Side effects constipation
- Dose Pediatric – 2 mg after first watery stool, then 1 mg after each subsequent watery stool; max dose 8 mg per day
Adult – 4 mg after first watery stool; then administer 2 mg after each subsequent watery stool; max dose 16 mg per day

metaclopramide (Reglan)

- Availability 10 mg tablets; 5 mg/mL
- Action anti-emetic
- Indication nausea and vomiting
- Contraindication
- Precautions
- Side effects
- Dose Pediatric – 0.1 mg/kg every 8 hours as needed
Adult – 10 mg every 8 hours as needed

morphine

- Availability 4 mg carpujet
- Action opiate analgesic
- Indication severe pain
- Contraindication
- Precautions
- Side effects depressed level of consciousness; hypoxia; hypotension
- Dose Pediatric – 0.1 mg/kg IM every hour as needed
Adult – 4 mg IM every hour as needed

ondansetron (Zofran)

- Availability 4 mg injectable solution
- Action anti-emetic
- Indication severe nausea and vomiting
- Contraindication
- Precautions
- Side effects
- Dose Pediatric – 0.1 mg/kg IM every 1 hour as needed up to max dose 16 mg per day
Adult – 4 mg IM every 1 hour as needed up to max dose of 32 mg per day

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMS**

oxycodone	
•Availability	5 mg tablet
•Action	opiate analgesic
•Indication	moderate to severe pain
•Contraindication	
•Precautions	
•Side effects	depressed level of consciousness
•Dose	Pediatric – 0.05–0.15 mg/kg every 6 hours Adult – 1–2 tablets by mouth every 4 hours as needed
promethazine (Phenergan)	
•Availability	25 mg tablets; 6.25/5 mL
•Action	anti-emetic
•Indication	mild to moderate nausea
•Contraindication	
•Precautions	
•Side effects	
•Dose	Pediatric – 0.5 mg/kg every 8 hours as needed Adult – 25 mg every 8 hours by mouth as needed
tetracaine	
•Availability	0.5% ophthalmic solution
•Action	topical anesthetic
•Indication	severe eye pain; foreign body removal from the eye
•Contraindication	hypersensitivity
•Precautions	
•Side effects	
•Dose (Peds & Adult)	2 drops to the affected eye
trimethoprim/sulfamethoxazole (Bactrim)	
•Availability	160 mg TMP/800 mg SMX (DS tab); 40 mg/200 mg/5 mL
•Action	antibiotic
•Indication	sinus infection, upper respiratory infection, urinary tract infection
•Contraindication	hypersensitivity to sulfa
•Precautions	
•Side effects	
•Dose	Pediatric – 5 mg/kg TMP every 12 hours Adult – 1 DS tab po bid

**OPTIONAL SUPPLEMENTAL PROGRAM
MARYLAND VACCINATION & TESTING
PROGRAM FOR PARAMEDIC PROVIDERS**

D. MARYLAND VACCINATION & TESTING PROGRAM

Scope of practice for paramedic personnel has been expanded to allow select immunization and Purified Protein Derivative (PPD) testing by paramedic personnel. The immunizations that are allowed to be performed include Hepatitis B, Influenza, and PPD. This program is a jurisdictional option requiring the jurisdictional medical director and the jurisdiction to authorize select trained paramedic personnel to perform these functions. There are program requirements below. Please note that you must have a written memorandum of understanding between your EMS service and the local health department before this program can be instituted.

In order to become recognized and authorized to implement the immunization and testing program for paramedics, you must complete the application and submit a copy of the health department memorandum of understanding to the Office of the State EMS Medical Director. At that time you will receive a copy of the CD-ROM that has all of the pertinent documents and instructional material, along with a CDC videotape on PPD placement and interpretation. Your jurisdiction will then be recognized as an authorized optional immunization and testing jurisdiction.

When you are implementing this program, we strongly encourage you to advise EMS personnel at risk to seek vaccination where possible.

REQUIREMENTS:

1. Medical Director: Must have a jurisdictional Medical Director who is willing to take responsibility for the program.
2. Must be under the Infection Control Program for the Jurisdiction.
3. Immunization record form with documentation of all pertinent information about vaccination or test, including the patient's primary care practitioner.
4. Direct linkage with occupational medicine/employee health and a memorandum of understanding (MOU) with local public health service/department.
5. Statewide protocol approved by the EMS Board.
6. ALS resuscitation equipment (refer to *The Maryland Medical Protocols for EMS Providers*) must be available on-site during vaccinations.
7. Must use the comprehensive training curriculum developed by MIEMSS Infection Control Committee.
8. Physician does not have to be physically present for the administration of vaccinations or tests by the trained paramedic (Vaccination and Testing Officer (VTO)).
9. Program instruction must be directed by and have participation by the jurisdictional Medical Director to select paramedics who will become the VTOs.
10. This is not for post-exposure prophylaxis (patient must be seen by occupational medicine/physician for consent and treatment).
11. Only Public Safety Personnel (any career or volunteer member of a fire, rescue, or EMS department, company, squad, or auxiliary; any law enforcement officer; or the State Fire Marshal or sworn member of the State Fire Marshal's office) are eligible to receive immunizations or testing from VTOs.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARYLAND VACCINATION & TESTING
PROGRAM FOR PARAMEDIC PROVIDERS**

12. Mechanism for meeting FDA storage and refrigeration standards for vaccines and testing with the use of the Maryland Inventory Control Sheet.
13. Mechanism for follow-up
 - a) For additional vaccinations for completion of series
 - b) For potential complications of vaccinations or symptoms noted on adverse event form (meeting federal reporting requirements)
 - c) Patient contact phone number for complications (e.g., bad vaccine “lot”)
14. Must have a standardized informed consent form and standardized vaccine pre-screening questionnaire form.
15. Vaccinations allowable are:
 - a) Influenza
 - b) Hepatitis B
16. Testing
 - a) PPD Screening (Intradermal)
17. Recommend 30-minute observation period (to be determined by the jurisdictional medical director) post-immunization administration with ALS personnel and equipment available.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT
TREATMENT PROTOCOL**

Nerve Agents (GA, GB, GD, GF, VX) (continued)

3. Treatment:

a. Initial Management:

(For pediatric dosing, see Mark I/DuoDote Kits Protocol.) **(NEW '17)**

(1) EMT may administer MARK I kits (up to total of three kits) as buddy care to public safety personnel or when directed to do so by an ALS provider based on signs and symptoms in a mass casualty incident (MCI) or on-site chemical testing, confirming nerve or organophosphate agent presence in a mass casualty incident. The Diazepam 10 mg auto-injector (CANA) can only be administered when three MARK I kits are administered in a severe exposure by an ALS provider. Medical Consultation is not required in these situations.

(2) Mild to moderate: Dyspnea should be treated with one or two doses of atropine (MARK I) IM or IV (2-4 mg) and 1-2 doses of pralidoxime (MARK I) or IV drip 600–1200 mg initially, depending on severity of the dyspnea. (See paragraph b below for size of dose.) This should be supplemented with oxygen, particularly in infants, young children, and the elderly; healthy older children and adults will usually do well without it unless they have pulmonary or cardiac disease. Atropine dose should be repeated at 7- to 10-minute intervals until improvement is noted. Failure to respond (i.e., no dry mouth, no decrease in secretions) confirms the need to administer additional doses of atropine. Gastrointestinal effects after liquid exposure is treated in the same manner. Do not treat for miosis (unless eye pain is severe) or rhinorrhea (unless severe).

(3) Severe: Administer 3 doses of atropine IM (three MARK I) or 6 mg IV with caution if hypoxic patient (and start 3 doses of pralidoxime (MARK I) or 2 grams by slow (20 minutes) IV drip. [More rapid administration will cause hypertension.] (See paragraph b below for size of dose.) Intubate and ventilate with oxygen (initial ventilation will be difficult because of airway resistance; atropine will relieve this). Administer diazepam if the patient is convulsing. Suction for secretions. Repeat 1 dose of atropine every 5 minutes until (a) secretions diminish or (b) airway resistance is less or is normal. Failure to respond (i.e. no dry mouth, no decrease in secretions) confirms the need to administer additional doses of atropine. Monitor via pulse oximeter; cardiac monitoring should also be done (cardiac arrhythmias are uncommon after atropine is given). Acidosis may develop after seizures or after period of hypoxia and will require therapy. This patient should be transported to a hospital after stabilization (adequate drug therapy and initiation of ventilation).

(4) Eyes: Do not treat miosis unless eye/head pain is severe. Use topical, not systemic, anticholinergic to relieve pain.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT
TREATMENT PROTOCOL**

Nerve Agents (GA, GB, GD, GF, VX) (continued)

b. Recommended Doses:

Atropine:

Older child and adult: 2 mg q 5 minutes until secretions dry

Infant and young child: 0.02 mg/kg

Elderly: Use adult dose unless cardiac or pulmonary disease is present or patient is small or frail; in latter instances, use 1 mg as standard, but be prepared to administer additional amounts more frequently.

Pralidoxime:

Older child and adult: 1 gram (If IM 600 mg to 1.2 grams)

Infant and young child: 25-50 mg/kg

Elderly: Adult dose unless cardiac or renal disease is present, patient has hypertension, or patient is small and frail; decrease dose by half in these patients, but administer the other half 1 hour later if patient has not improved.

Pralidoxime can cause hypertension when given rapidly by IV. Slow administration over 20 minutes will minimize the hypertensive effect. After rapid administration, hypertension can be rapidly but transiently reversed by phentolamine (adult: 5 mg IV, child: 1 mg IV).

c. Further Care:

(1) Mild to moderate: After vapor exposure, a patient who is breathing normally does not need to be hospitalized. However, miosis should be followed until the patient's eyes are normal (4 to 6 weeks). After liquid exposure, a patient should be observed in a hospital for 18 hours until all the nerve agent is absorbed from the skin.

(2) Severe: Continue to ventilate the patient and to administer atropine following guidelines above. Treat acidosis if present. If patient has not had prolonged hypoxia, recovery of an unconscious patient will be gradual over 1 to 3 hours.