



The Maryland  
**Medical Protocols**  
for Emergency Medical Services Providers

Effective July 1, 2018

**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](http://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.

**April 10, 2018**

**To All Health Care Providers in the State of Maryland:**

Re: 2018 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](http://www.miemss.org) and will be receiving a single copy of the 2018 pocket protocols.

The EMS Board has approved these protocols for implementation on July 1, 2018. Prior to July 1, all EMS providers must complete the Maryland EMS Update: 2018 (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:**

- The use of D10 has been expanded to include all pediatric patients, thus removing the need to make D25.
- Ketamine has been added to the Advanced Life Support formulary, with the primary indication for use being patients experiencing Excited Delirium Syndrome (ExDS). A secondary indication for pain management has also been approved.
- The Spinal Protection Protocol has been enhanced to include an algorithm and refined definitions for indications of when to implement the protocol.
- The consult requirement for calcium chloride has been removed for all indications.
- The EasyTube® has been removed from the airway procedure section and replaced by the King LTS-D™ airway. The King LTS-D has been moved from an Optional Supplemental Protocol to general procedures.
- The management of cardiac arrest patients has been significantly revised for both medical and trauma etiologies. Multiple changes have been made including an increase of time from 15 minutes to 30 minutes before consideration of implementing the Termination of Resuscitation protocol for medical patients.
- The use of naloxone/Narcan as a standing order has been expanded to include the Emergency Medical Responder level of certification. This was approved for emergency implementation on October 1, 2017, to meet the opioid overdose crisis.
- The Pelvic Stabilization Binder Device Pilot Protocol has been changed to an Optional Supplemental Protocol, which removes the reporting requirement for local jurisdictions.
- Freestanding Emergency Medical Facility Acute Stroke Ready Harford pilot protocol for future implementation.

**In addition to the above changes, the following changes were approved by the EMS Board on April 10, 2018, and are included in this version of *The Maryland Medical Protocols for EMS Providers*.**

- **Epinephrine drip has been approved for use by ALS providers as a replacement for dopamine when it is in short supply, per indications for dopamine (pgs. 220 to 222).**
- **Verapamil (Isoptin) has been approved for use by ALS providers as a replacement for diltiazem when it is in short supply (pgs. 246 to 246-1).**
- **The Stabilization Center Pilot Program has been updated to specifically include suspected opioid patients who have improved with naloxone (pg. 364).**
- **A naloxone “leave behind” protocol has been added as a pilot protocol (pg. 366-10).**
- **The Pediatric Destination Decision Tree (PDTree) program has been added as a research protocol (pgs. 450-4 to 450-5).**

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

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# TABLE OF CONTENTS

<b>I. GENERAL INFORMATION</b> .....	1
A. General Provisions .....	1
B. Important Numbers .....	3
C. Health Care Facility Codes .....	5
D. Maryland Trauma and Specialty Referral Centers.....	13
E. Protocol Key .....	16
F. Protocol Usage Flow Diagram .....	17
G. Protocol Variation Procedure.....	18
H. Inability to Carry Out Physician Order .....	19
I. Physician Orders for Extraordinary Care .....	20
J. Quality Review Procedure for Pilot Programs .....	22
K. Proposed Protocol Submission Request Policy.....	23
L. Proposed Protocol Submission Template .....	25
M. Protocol Concept/Sponsor Request .....	26
<b>II. GENERAL PATIENT CARE</b> .....	27
Age-Related Normal Vital Signs .....	31-1
<b>III. TREATMENT PROTOCOLS</b> .....	41
<b><i>Abuse/Neglect</i></b>	
A. Abuse/Neglect .....	41
<b><i>Altered Mental Status</i></b>	
B. Altered Mental Status: Seizures .....	43
C. Altered Mental Status: Unresponsive Person .....	46
<b><i>Apparent Life-Threatening Event (ALTE)</i></b>	
D. Apparent Life-Threatening Event (ALTE) .....	48
<b><i>Behavioral Emergencies</i></b>	
E. Behavioral Emergencies.....	49
<b><i>Cardiac Emergencies</i></b>	
F. Non-Arrest Cardiac Guidelines ( <b>NEW '18</b> ) .....	51
Universal Algorithm for Adult Emergency Cardiac Care for BLS .....	52
Universal Algorithm for Adult Emergency Cardiac Care for ALS ( <b>NEW '18</b> ) .....	53
Universal Algorithm for Pediatric Emergency Cardiac Care for BLS .....	54
Universal Algorithm for Pediatric Emergency Cardiac Care for ALS .....	55
G. Bradycardia.....	56
Adult Bradycardia Algorithm .....	57
Pediatric Bradycardia Algorithm.....	58
H. Tachycardia .....	59
Adult Tachycardia Algorithm .....	61
Pediatric Tachycardia Algorithm .....	62

## TABLE OF CONTENTS

I. Cardiac Arrest ( <b>NEW '18</b> ) .....	63
Adult Asystole Algorithm ( <b>NEW '18</b> ) .....	64
Pediatric Cardiac Arrest Algorithm ( <b>NEW '18</b> ) .....	65
Pulseless Electrical Activity (PEA) Algorithm ( <b>NEW '18</b> ) .....	66
VF Pulseless VT Algorithm ( <b>NEW '18</b> ) .....	67
J. Return of Spontaneous Circulation (ROSC) ( <b>NEW '18</b> ) .....	68
K. Termination of Resuscitation ( <b>NEW '18</b> ) .....	70
Termination of Resuscitation Algorithm ( <b>NEW '18</b> ) .....	72
L. Pronouncement of Death in the Field .....	73
M. EMS DNR/MOLST ( <b>NEW '18</b> ) .....	74
N. EMS DNR Flowchart.....	84
O. Chest Pain/Acute Coronary Syndrome.....	85
P. Hyperkalemia: Renal Dialysis/Failure or Crush Syndrome.....	87
Q. Implantable Cardioverter Defibrillator (ICD) Malfunction .....	89
R. ST Elevation Myocardial Infarction (STEMI).....	91
S. Sudden Infant Death Syndrome (SIDS).....	94
<b>Environmental Emergencies</b>	
T. Cold Emergencies (Frostbite) .....	95
U. Cold Emergencies (Hypothermia).....	97
V. Depressurization.....	99
W. Hazardous Materials Exposure.....	100
X. Heat-Related Emergencies.....	102
Y. Near-Drowning.....	103
Z. Overpressurization.....	104
<b>Nausea and Vomiting</b>	
AA. Nausea and Vomiting .....	107
<b>Non-Traumatic Shock</b>	
BB. Non-Traumatic Shock: Hypoperfusion .....	108
<b>Obstetrical/Gynecological Emergencies</b>	
CC. Childbirth Algorithm .....	110
DD. Newly Born .....	112
Universal Algorithm for Newly Born for BLS .....	112
Universal Algorithm for Newly Born for ALS .....	113
APGAR Chart.....	114
EE. Vaginal Bleeding .....	115
<b>Overdose/Poisoning</b>	
FF. Carbon Monoxide/Smoke Inhalation .....	115-1
GG. Absorption .....	116
HH. Ingestion .....	118
II. Inhalation.....	121
JJ. Injection.....	123
KK. Stimulant Toxicity .....	125
LL. Excited Delirium Syndrome (ExDS) .....	127
<b>Pain Management</b>	
MM. Pain Management.....	130

## TABLE OF CONTENTS

<b>Respiratory Distress</b>	
NN.	Allergic Reaction..... 134
OO.	Anaphylaxis..... 137
PP.	Asthma/COPD ..... 139
QQ.	Croup ..... 141
RR.	Pulmonary Edema/Congestive Heart Failure..... 142
	Universal Algorithm for Pediatric Respiratory Distress for BLS ..... 145
	Universal Algorithm for Pediatric Respiratory Distress for ALS ..... 146
<b>Sepsis</b>	
SS.	Sepsis Adult..... 147
TT.	Sepsis Pediatric ..... 149
<b>Stroke</b>	
UU.	Stroke: Neurological Emergencies..... 152
	EMS Stroke Algorithm..... 155
<b>Syncope</b>	
UU2.	Syncope ..... 155-1
<b>Trauma</b>	
VV.	Burns..... 156
	Rule of Nines ..... 158
WW.	Eye Trauma ..... 159
XX.	Hand/Upper/Lower Extremity Trauma ..... 161
YY.	Multiple/Severe Trauma..... 163
	Glasgow Coma Scale ..... 165
ZZ.	Sexual Assault ..... 166
AAA.	Spinal Protection..... 167
	Spinal Protection Algorithm ( <b>NEW '18</b> )..... 171-1
BBB.	Trauma Arrest ( <b>NEW '18</b> ) ..... 172
CCC.	Trauma Decision Tree ..... 174
<b>IV. APPENDICES</b>	..... 175
A.	Glossary..... 175
B.	Procedures, Medical Devices, and Medications for EMS and Commercial Services..... 182
C.	BLS Pharmacology
	1. Acetaminophen ..... 187
	2. Activated Charcoal (Without Sorbitol) ..... 188
	3. Albuterol ..... 189
	4. Aspirin ..... 190
	5. Epinephrine (1:1,000)..... 191
	6. Epinephrine Auto-Injector..... 192
	7. Naloxone Public Safety and EMR ( <b>NEW '18</b> ) ..... 193
	8. Nitroglycerin ..... 195
	9. Oral Glucose ..... 196
	10. Oxygen ..... 197

## TABLE OF CONTENTS

D.	ALS Pharmacology	
	1. Acetaminophen .....	199
	2. Activated Charcoal (Without Sorbitol) .....	200
	3. Adenosine .....	201
	4. Albuterol .....	202
	5. Amiodarone .....	204
	6. Aspirin .....	206
	7. Atropine Sulfate .....	207
	8. Atrovent .....	209
	9. Calcium Chloride .....	211
	10. Dexamethasone .....	212
	11. Dextrose .....	213
	12. Diazepam .....	214
	13. Diltiazem .....	215
	14. Diphenhydramine Hydrochloride .....	217
	15. Dopamine Hydrochloride .....	218
	16. Epinephrine .....	220
	17. Fentanyl .....	223
	18. Glucagon .....	225
	19. Haloperidol (Haldol) .....	226
	20. Ketamine ( <b>NEW '18</b> ) .....	227-1
	21. Lactated Ringer's .....	228
	22. Lidocaine .....	229
	23. Magnesium Sulfate .....	231
	24. Midazolam .....	233
	25. Morphine Sulfate .....	236
	26. Naloxone .....	238
	27. Nitroglycerin .....	239
	28. Nitroglycerin Paste .....	241
	29. Ondansetron .....	242
	30. Oxygen .....	243
	31. Sodium Bicarbonate .....	244
	32. Verapamil ( <b>NEW '18</b> ) .....	246

## TABLE OF CONTENTS

E. Procedures	
1. Accessing Central Venous Catheters and Devices.....	247
<b>Airway Management Procedures (2–13)</b>	
2. Bag-Valve-Mask Ventilation .....	250
3. Continuous Positive Airway Pressure (CPAP) .....	252
4. Laryngeal Tube Airway Device (KING LTS-D™) ( <b>NEW '18</b> ) .....	253
5. Gastric Tube.....	254
6. Nasotracheal Intubation .....	255
7. Needle Decompression Thoracostomy (NDT) .....	257
8. Obstructed Airway Foreign Body Removal: Direct Laryngoscopy .....	258
9. Orotracheal Intubation.....	259
10. Tracheostomy Change.....	262
11. Tracheostomy Suctioning.....	264
12. Ventilatory Difficulty Secondary to Bucking or Combativeness.....	265
13. Ventilatory Management.....	266
<b>Electrical Therapy Procedures (14–17)</b>	
14. Automated External Defibrillation .....	269
15. Cardioversion.....	271
16. Defibrillation .....	273
17. External Transcutaneous Cardiac Pacing.....	274
<b>Other Procedures</b>	
18. Go-Team Activation.....	276
19. External Jugular Intravenous Access .....	278
20. Glucometer Protocol.....	279
21. High Performance CPR ( <b>NEW '18</b> ) .....	281
22. Intraosseous Infusion .....	285
23. Intravenous Maintenance Therapy for EMT.....	287
24. Medevac Utilization .....	290
25. Patient-Initiated Refusal of EMS .....	296
26. Peripheral Intravenous Access for CRT-(I) and Paramedic, and IV Access Option for EMT Approved by EMS Operational Program.....	302
27. Physical and Chemical Restraints.....	304
28. Neuroprotective Induced Hypothermia .....	307
29. 12-Lead Electrocardiogram.....	309
30. Acupressure for Nausea.....	310
31. Multiple Casualty Incident/Unusual Event.....	311
32. Potentially Volatile Environment with Life-Sustaining Interventions.....	314
33. Emerging Infectious Disease (EID) .....	320



## TABLE OF CONTENTS

### ***Interfacility***

F. Lidocaine Infusion for Interfacility Transport .....	325
G. Morphine Sulfate Infusion for Interfacility Transport .....	326

### ***Pilot Programs***

H. Adult Rapid Sequence Intubation .....	327
1. RSI Pilot Program .....	327
2. Ventilatory Difficulty Secondary to Bucking or Combativeness in Intubated Patients .....	329
3. Protocol for Cricothyroidotomy (Surgical and Needle) .....	331
4. RSI Quality Assurance Process .....	333
I. Pediatric Rapid Sequence Intubation .....	334
1. RSI Pilot Program .....	334
2. Ventilatory Difficulty Secondary to Bucking or Combativeness in Intubated Patients .....	336
3. Protocol for Cricothyroidotomy (Surgical and Needle) .....	338
4. RSI Quality Assurance Process .....	339
J. Rapid Sequence Intubation Pharmacology .....	340
1. Etomidate .....	340
2. Ketamine .....	341
3. Midazolam .....	342
4. Succinylcholine .....	343
5. Vecuronium .....	344
K. Tactical EMS ( <b>NEW '18</b> ) .....	345
L. Transport to Freestanding Emergency Medical Facility at Bulle Rock ( <b>NEW '18</b> ) .....	348
M. On-Scene Protocol and Alternative Dispatch Protocol .....	350
N. Video Laryngoscopy for Orotracheal Intubation .....	353
O. Transport to Freestanding Emergency Medical Facility (Base Station or Non-Base Station) .....	355
P. Adult Surgical Cricothyroidotomy .....	356
Q. Mobile Integrated Community Health Program .....	358
R. Vascular Doppler Device .....	361
S. Prehospital Ultrasound .....	362
T. Stabilization Center ( <b>NEW '18</b> ) .....	364
U. Stroke Patient Process, Sinai Hospital, Baltimore City Fire Department .....	365
V. Alternative Destination Program ( <b>NEW '18</b> ) .....	366
W. Naloxone "Leave Behind" Protocol ( <b>NEW '18</b> ) .....	366-10

## TABLE OF CONTENTS

<b>V. JURISDICTIONAL OPTIONAL SUPPLEMENTAL PROGRAMS/PROTOCOLS</b> .....	367
A. Cyanide Poisoning .....	367
B. Glycoprotein IIb/IIIa Antagonist Infusions .....	371
Glycoprotein IIb/IIIa Antagonist.....	372
C. Intranasal Naloxone for Commercial Service BLS Providers ( <b>NEW '18</b> ).....	373
D. Heparin Infusion for Interfacility Transport.....	379
Heparin .....	380
E. Laryngeal Mask Airway with Design to Facilitate Hospital Endotracheal Intubation ( <b>NEW '18</b> ) .....	381
F. Bi-Level Positive Airway Pressure (BiPAP) .....	383
G. BLS Glucometer.....	384
H. Antimicrobial Infusion for Interfacility Transport .....	385
I. MARK I / DuoDote Kits (Atropine and 2-PAM Auto-injectors).....	387
J. Specialty Care Paramedic .....	391
K. Mechanical CPR ( <b>NEW '18</b> ) .....	395
L. Pelvic Stabilization Binder Device ( <b>NEW '18</b> ).....	397
M. Transport of Acute Ventilated Interfacility Patients .....	412
N. Transport of Chronic and Scene Ventilated Patients .....	414
O. EMT Acquisition of 12-Lead Electrocardiography.....	417
P. Wilderness Emergency Medical Services Protocols ( <b>NEW '18</b> ).....	418
Q. Maryland Vaccination and Testing Program.....	443
<b>VI. RESEARCH PROTOCOLS</b> .....	447
A. Prehospital Point of Care Testing for Shock.....	447
B. LAMS Stroke Research Protocol for Baltimore City Fire Department ( <b>NEW '18</b> ).....	450-1
C. Pediatric Destination Decision Tree (PDTree) ( <b>NEW '18</b> ) .....	450-4
<b>VII. WEAPONS OF MASS DESTRUCTION SUPPLEMENT</b> .....	451

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## I. GENERAL INFORMATION

### A. GENERAL PROVISIONS

The goal of prehospital emergency medical services is to deliver a viable patient to appropriate definitive care as soon as possible. Optimal prehospital care results from a combination of careful patient assessment, essential prehospital emergency medical services, and appropriate medical consultation.

The Maryland Medical Protocols were developed to standardize the emergency patient care that EMS providers, through medical consultation, deliver at the scene of illness or injury and while transporting the patient to the closest appropriate hospital. These protocols will help EMS providers anticipate and be better prepared to give the emergency patient care ordered during the medical consultation.

Maryland has highly trained and dedicated basic and advanced life support personnel who may need on-line medical consultation only for complicated or extended resuscitative patient care. These protocols are a form of “standing orders” for emergency patient care intervention in a patient who has a life-threatening illness or injury. It remains the responsibility of the EMT, CRT-(I), or paramedic to obtain on-line medical consultation when appropriate. If it is genuinely impossible or inappropriate (i.e., when rendering emergency care to a patient who has a life-threatening injury or medical condition) to obtain on-line medical consultation, the EMT/CRT-(I)/paramedic may render emergency patient care in accordance with these protocols in an effort to save a patient’s life or limb. Whenever such emergency life-saving patient care is rendered, the EMT/CRT-(I)/paramedic must document the treatment rendered and the reason on-line medical consultation could not be obtained on the Patient Care Report (PCR) and on an additional narrative. In addition, the “exceptional call” area on the PCR must be marked, and the provider must immediately notify the EMS Jurisdiction. The EMS Jurisdiction must notify the State EMS Medical Director within 5 days of the incident. This general provision applies throughout these protocols.

Requests for additions, deletions, or exceptions must be submitted through the State EMS Medical Director’s Office of the Maryland Institute for Emergency Medical Services Systems.

Unless otherwise specified, a mandate with a stated year but no date shall be interpreted as taking effect on the protocol implementation date for that year.



THE GENERAL PATIENT CARE SECTION AND THE ALGORITHMS MUST BE FOLLOWED IN THE SPECIFIC SEQUENCE NOTED.

FOR ALL OTHER TREATMENT PROTOCOLS, THE LETTER AND NUMERICAL OUTLINE FORMAT IS STRICTLY FOR RAPID AND UNIFORM REFERENCE AND DOES NOT IMPLY OR DIRECT A MANDATORY SEQUENCE FOR PATIENT CARE.



IF AN EMERGENCY MEDICAL RESPONDER IS DISPATCHED AS AN EMS UNIT, OR FOR PURPOSES RELATED TO MEDICAL ASSISTANCE, OXYGEN AND AED TREATMENT MAY BE UTILIZED, WHEN APPROPRIATE AND APPLICABLE, PROVIDED THE EMERGENCY MEDICAL RESPONDER IS JURISDICTIONALLY AUTHORIZED TO USE AN AED AND/OR THE EMERGENCY MEDICAL RESPONDER HAS BEEN EDUCATED AND TRAINED TO PROVIDE OXYGEN AND/OR AED THERAPY.

THE EMERGENCY MEDICAL RESPONDER SHALL DOCUMENT ALL PATIENT CARE.



## **B. IMPORTANT NUMBERS**

- |  |        |                       |
|--|--------|-----------------------|
| 1. Commercial Ambulance Licensing and Regulation   | Office | <b>(410) 706-8511</b> |
|  | Fax    | <b>(410) 706-8552</b> |
| 2. Critical Incident Stress Management   |        | <b>(800) 648-3001</b> |
| 3. Office of Licensure and Certification   | Office | <b>(800) 762-7157</b> |
|  | Fax    | <b>(410) 706-2367</b> |
| 4. Regional Programs   |        |                       |
| a) Region I (Allegany and Garrett Counties)  | Office | <b>(301) 895-5934</b> |
|  | Fax    | <b>(301) 687-0129</b> |
| b) Region II (Washington and Frederick Counties)   | Office | <b>(301) 791-2366</b> |
|  | Fax    | <b>(301) 791-9231</b> |
| c) Region III (Baltimore City, Anne Arundel,<br>Baltimore, Carroll, Harford, and Howard Counties)                        | Office | <b>(410) 706-3996</b> |
|  | Fax    | <b>(410) 706-8530</b> |
| d) Region IV (Caroline, Cecil, Dorchester, Kent,<br>Queen Anne's, Somerset, Talbot, Wicomico,<br>and Worcester Counties) | Office | <b>(410) 822-1799</b> |
|  | Fax    | <b>(410) 822-0861</b> |
| e) Region V (Calvert, Charles, Montgomery,<br>Prince George's, and St. Mary's Counties)                                  | Office | <b>(301) 474-1485</b> |
|  | Fax    | <b>(301) 513-5941</b> |
| 5. State EMS Medical Director  | Office | <b>(410) 706-0880</b> |
|  | Fax    | <b>(410) 706-0853</b> |
| 6. SYSCOM (Administrative)   |        | <b>(800) 648-3001</b> |
| 7. EMRC  |        |                       |
| a) Consult Line (Region I)   |        | <b>(301) 722-0494</b> |
| b) Consult Line (Region III)   |        | <b>(800) 492-3805</b> |
| c) Consult Line (Region IV)  |        | <b>(877) 963-6963</b> |
| d) Consult Line (Region V)   |        | <b>(877) 840-4245</b> |

## IMPORTANT NUMBERS (Continued)



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

8. Poison Control Centers
  - a) Maryland Poison Center/University of Maryland School of Pharmacy, Baltimore **(800) 222-1222**
  - b) National Capital Poison Center, Washington, DC **(800) 222-1222**
9. In-Patient Hospice Facilities
  - a) Gilchrist Center–Towson **(443) 849-8200**
  - b) Gilchrist Center Baltimore–Joseph Richey House **(410) 523-2150**
  - c) Stella Maris Hospice **(410) 560-9695**

## 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	CalvertHealth Medical Center (Base Station, Primary Stroke) <b>(NEW '18)</b>
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

<b>Code</b>	<b>Health Care Facility Name</b>
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, Cardiac Interventional) <b>(NEW '18)</b>
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, Primary Stroke) <b>(NEW '18)</b>
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)

<b>Code</b>	<b>Health Care Facility Name</b>
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
360	Jennersville Regional Hospital <b>(NEW '18)</b>
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 (Base Station) <b>(NEW '18)</b>
773	Laurel Regional Hospital-Rehabilitation
565	Leesburg Hospital, VA



<b>Code</b>	<b>Health Care Facility Name</b>
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)

<b>Code</b>	<b>Health Care Facility Name</b>
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 (UM) (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

<b>Code</b>	<b>Health Care Facility Name</b>
210	Sinai Hospital of Baltimore (Adult Trauma, Base Station, Cardiac Interventional, Neonatal, Perinatal, Primary Stroke)
770	Sinai Rehabilitation Hospital
772	Solomon's Nursing Center
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

<b>Code</b>	<b>Health Care Facility Name</b>
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
<b>888</b>	<b>Other Facility</b>

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## D. MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS

### Trauma Centers (Adult)

#### **Primary Adult Resource Center**

- R Adams Cowley Shock Trauma Center (UM), Baltimore

#### **Level I Trauma Center**

- The Johns Hopkins Hospital Adult Trauma Center, Baltimore

#### **Level II Trauma Centers**

- Johns Hopkins Bayview Medical Center, Baltimore
- Prince George's Hospital Center (UM), Cheverly
- Sinai Hospital
- Suburban Hospital (JHM), Bethesda

#### **Level III Trauma Centers**

- Meritus Medical Center, Hagerstown
- Peninsula Regional Medical Center, Salisbury
- Western Maryland Regional Medical Center, Cumberland

#### **Out-of-State Centers**

- Christiana Care Health System, Wilmington, DE
- MedStar Washington Hospital Center, Washington, DC

### Specialty Referral Centers

#### **Eye Trauma**

- Wilmer Eye Institute/The Johns Hopkins Hospital, Baltimore

#### **Hand/Upper Extremity Trauma**

- The Curtis National Hand Center for Treatment of the Hand and Upper Extremity/  
Union Memorial Hospital (MedStar), Baltimore

#### **Hyperbaric Medicine**

- Center for Hyperbaric Medicine/R Adams Cowley Shock Trauma Center (UM),  
Baltimore

#### **Neurotrauma (Head and Spinal Cord Injuries)**

- Neurotrauma Center/R Adams Cowley Shock Trauma Center (UM), Baltimore

#### **Pediatric Trauma**

- Johns Hopkins Children's Center, Baltimore
- Children's National Medical Center, Washington, DC

#### **Burns**

- Adult Burn Center/Johns Hopkins Bayview Medical Center, Baltimore
- Adult Burn Center/MedStar Washington Hospital Center, Washington, DC
- Pediatric Burn Center/Johns Hopkins Children's Center, Baltimore
- Pediatric Burn Center/Children's National Medical Center, Washington, DC

## MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS (Continued)

### Specialty Referral Centers

#### ***Perinatal Referral Centers***

- Anne Arundel Medical Center, Annapolis
- Franklin Square Medical Center (MedStar), Baltimore
- Frederick Memorial Hospital, Frederick
- Greater Baltimore Medical Center, Towson
- Holy Cross Hospital, Silver Spring
- Howard County General Hospital (JHM), Columbia
- Johns Hopkins Bayview Medical Center, Baltimore
- Mercy Medical Center, Baltimore
- Prince George's Hospital Center (UM), Cheverly
- Saint Agnes Hospital, Baltimore
- Saint Joseph Medical Center (UM), Baltimore
- Shady Grove Adventist Hospital, Gaithersburg
- Sinai Hospital of Baltimore
- The Johns Hopkins Hospital, Baltimore
- University of Maryland Medical Center, Baltimore

#### ***Primary Stroke***

- Anne Arundel Medical Center, Annapolis
- Atlantic General Hospital, Berlin
- Baltimore Washington Medical Center (UM), Glen Burnie
- CalvertHealth Medical Center, Prince Frederick **(NEW '18)**
- Carroll Hospital Center, Westminster
- Charles Regional Medical Center (UM), La Plata
- Doctor's Community Hospital, Lanham
- Franklin Square Medical Center (MedStar), Baltimore
- Frederick Memorial Hospital, Frederick
- Good Samaritan Hospital (MedStar), Baltimore
- Greater Baltimore Medical Center, Baltimore
- Harbor Hospital (MedStar), Baltimore
- Harford Memorial Hospital (UMUCH), Havre De Grace
- Holy Cross Hospital, Silver Spring
- Howard County General Hospital (JHM), Columbia
- Mercy Medical Center, Baltimore
- Meritus Medical Center, Hagerstown
- Midtown Campus (UM), Baltimore
- Montgomery Medical Center (MedStar), Olney
- Northwest Hospital, Baltimore
- Peninsula Regional Medical Center, Salisbury
- Prince George's Hospital Center (UM), Cheverly
- Saint Agnes Hospital, Baltimore
- Saint Joseph Medical Center (UM), Baltimore
- Saint Mary's Hospital (MedStar), Leonardtown
- Shady Grove Adventist Hospital, Rockville
- Shore Medical Center at Easton (UMSRH)

## 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 (UM), Cheverly
- Saint Agnes Hospital, Baltimore
- Saint Joseph Medical Center (UM), Baltimore
- Shady Grove Adventist Hospital, Rockville
- Shore Medical Center at Easton (UM) (**NEW '18**)
- 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 (UM) (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

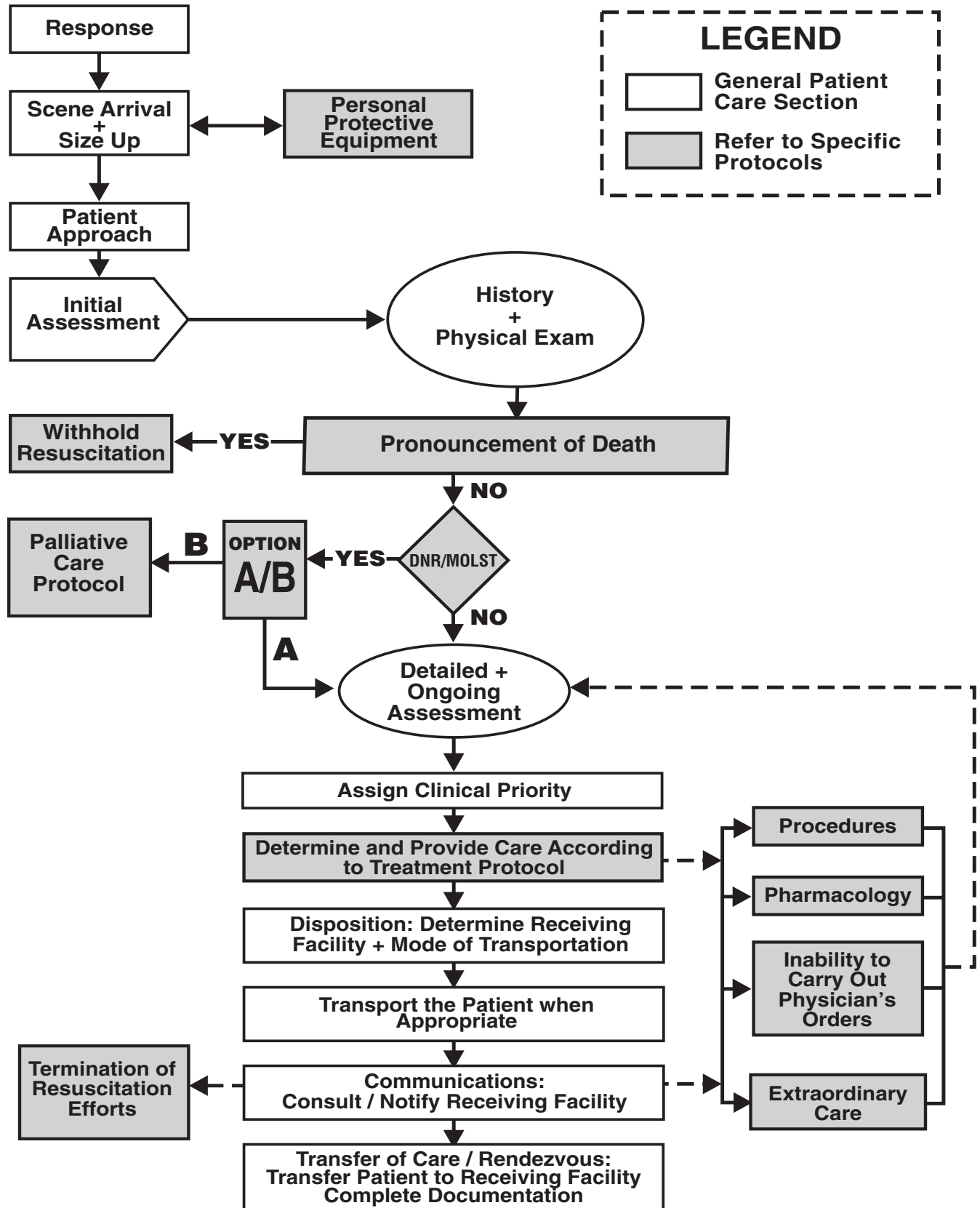
NOTE: ALL PROVIDERS (BLS and ALS) SHOULD CHECK ALL PEDIATRIC SECTIONS FOR NECESSARY CARE.

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

## F. PROTOCOL USAGE FLOW DIAGRAM



## G. PROTOCOL VARIATION PROCEDURE

If an error or variance occurs (i.e., any act or failure to act, in practice or judgment, involving patient care that is not consistent with established protocol, whether or not it results in any change in the patient's status or condition):

1. The EMS provider must:
  - a) Notify the consulting physician via radio as soon as the error or variance is discovered, if prior to arrival at the receiving hospital,
  - b) Monitor the patient's condition very closely for any changes,
  - c) Notify the receiving physician upon arrival, and
  - d) Notify the local EMS jurisdiction or licensed commercial ambulance service and Program Medical Director within 24 hours of the incident.
  
2. The EMS Operational Program **Quality Assurance Officer**, in accordance with COMAR 30.03.04.02 B(6), must:
  - a) Within **5 days** of being made aware of the incident, submit written notification of the incident to the:
    - (1) Local EMS jurisdiction,
    - (2) Program Medical Director,
    - (3) MIEMSS Compliance Office, and
    - (4) State EMS Medical Director.
  - b) Within **14 days** of the written notification of the incident, initiate a Medical Review Committee QA investigation.
  - c) Within **30 days** of the written notification of the incident, forward to MIEMSS' Compliance Office and State EMS Medical Director the written results of the Medical Review Committee QA investigation and recommendations.



## H. INABILITY TO CARRY OUT PHYSICIAN ORDER

Occasionally a situation may arise in which a physician's order cannot be carried out; e.g., the provider feels the administration of an ordered medication would endanger the patient, a medication is not available, or a physician's order is outside the protocol. If this occurs:

1. The EMS provider must:
  - a) Immediately notify the consulting physician as to the reason the order cannot be carried out.
  - b) Document on the patient care report what was ordered, the time it was ordered, and the reason the order could not be carried out.
  - c) As soon as practical following the call, notify the local EMS jurisdiction of the incident.
  
2. Public Service EMS Operational Programs must:
  - a) Within **5 days** of being made aware of the incident, submit written notification of the incident through the local EMS jurisdiction and Program Medical Director to the Regional Medical Director with a copy to the State EMS Medical Director. The MIEMSS Regional EMS Administrator shall be notified at the discretion of the Regional Medical Director.
  - b) Within **14 days** of the written notification of the incident, initiate a QA investigation under the authority of the Medical Review Committee.
  - c) Within **30 days** of the written notification of the incident, forward to MIEMSS' Compliance Office and State EMS Medical Director written results of the Medical Review Committee QA investigation and recommendations.
  
3. Licensed Commercial Programs must:
  - a) Within **5 days** of being made aware of the incident, submit written notification of the incident through the commercial Program Medical Director to the Director of the State Office of Commercial Ambulance Licensing and Regulation with a copy to the State EMS Medical Director.
  - b) Within **14 days** of the written notification of the incident, initiate a QA investigation under the authority of the Medical Review Committee.
  - c) Within **30 days** of the written notification of the incident, forward to the Program Medical Director and to the Director of the State Office of Commercial Ambulance Licensing and Regulation and State EMS Medical Director written results of the Medical Review Committee QA investigation and recommendations.

## I. PHYSICIAN ORDERS FOR EXTRAORDINARY CARE NOT COVERED BY MARYLAND PROTOCOL

Rarely, a physician providing on-line medical consultation may direct a prehospital provider to render care that is truly life-saving and is not explicitly listed within the protocols.

1. **ALL** of the following criteria **MUST** be present for prehospital providers to proceed with an order under this section:
  - a) During the consultation, both the consulting physician and the provider must acknowledge and agree that the patient's condition and extraordinary care are not addressed elsewhere within these medical protocols and that the order is absolutely necessary to maintain the life of the patient.
  - b) The provider must feel capable of correctly performing the care directed by the consulting physician, based on the instructions given by the consulting physician.
  - c) When such an order is carried out, the consulting physician and the provider must immediately notify the State EMS Medical Director (via SYSCOM, 800-648-3001) of the extraordinary care situation. In addition, the provider must fax documentation of the rationale for extraordinary care within **24 hours** to the State EMS Medical Director at 410-706-0853. Attendance at a subsequent review meeting shall be required.
  - d) The prehospital provider must inform the consulting physician of the effect of the treatment and notify the receiving physician of the treatment upon arrival at the hospital (if the receiving physician is different than the consulting physician). The prehospital provider must also notify their BLS/ALS Program Medical Director within **24 hours**.
  - e) The public service local EMS jurisdiction and the Program Medical Director must then submit written notification of the incident to the Regional Medical Director with a copy to the State EMS Medical Director within **5 days** of the incident.
  - f) The commercial ambulance company and the Program Medical Director must submit written notification of the incident to the Director of the State Office of Commercial Ambulance Licensing and Regulation and the State EMS Medical Director within **5 days** of the incident.

- g) The State EMS Medical Director shall conduct a review conference to include when appropriate: the prehospital provider, the on-line physician who provided the medical consultation, the appropriate local jurisdictional official(s), the Program Medical Director, and the Regional Medical Director.
- h) Reports of incidents shall be submitted by the State EMS Medical Director to the Incident Review Committee and, when appropriate, to the Board of Physician Quality Assurance.
2. If a prehospital provider receives an order for care that is not covered by Maryland protocols, but does not feel comfortable with it or does not agree that it is absolutely necessary to maintain the life of the patient, they shall proceed with the “Inability to Carry Out Physician Order” section.
3. Protocols provide a safe basis for prehospital intervention and transport and provide both prehospital providers and on-line physicians with parameters for this care. Extraordinary care situations not within the protocols may occur a handful of times over a span of years. This extraordinary care protocol is intended to address the potential moral/ethical dilemma that may arise in unanticipated or unforeseen situations not specifically addressed within protocols. This extraordinary care protocol is neither a *carte blanche* for any and all actions nor a device to avoid or circumvent protocols. In all situations, emergency health care providers, both prehospital providers and on-line physicians providing medical direction, are accountable for their actions in discharging their patient care responsibilities.

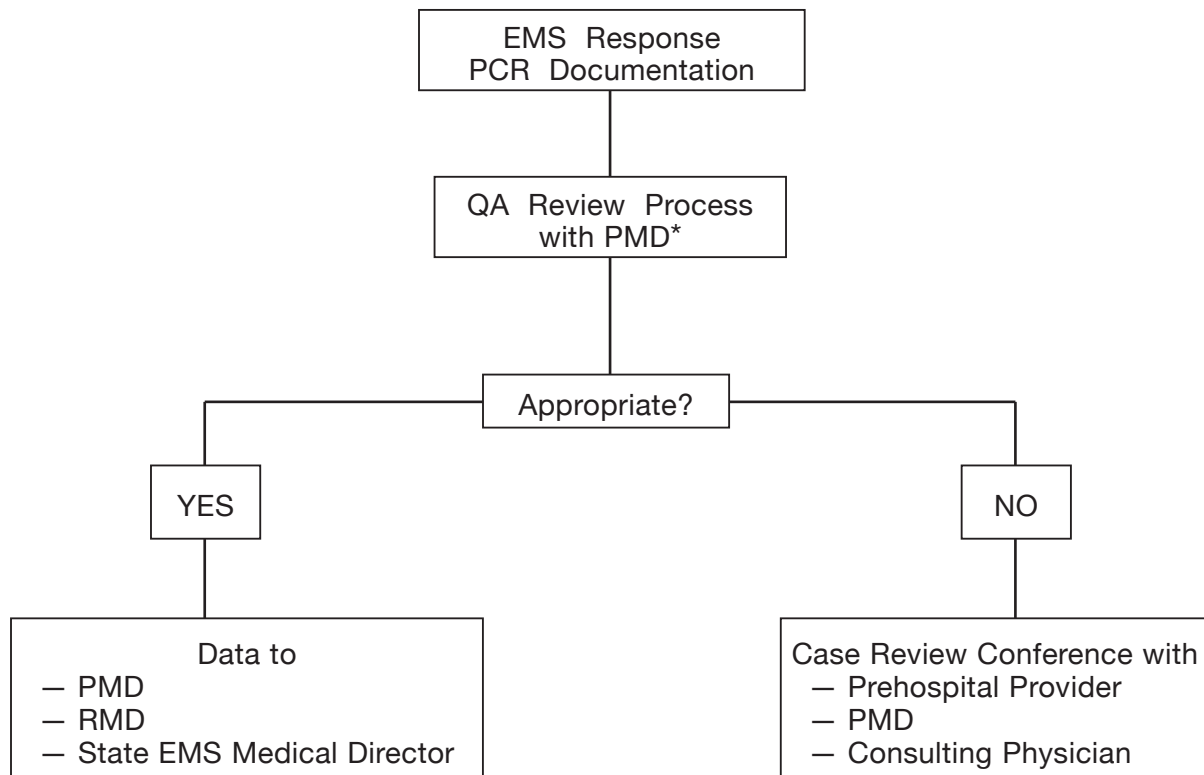
#### **EXTRAORDINARY CARE CHECKLIST**

- Identify the need for extraordinary care with physician consult and EMS provider acceptance.
  - Care is not covered elsewhere in the protocols.
  - Care is absolutely necessary to maintain the life of the patient.
- Immediately upon delivery of patient, EMS provider must notify the receiving physician and the State EMS Medical Director via SYSCOM.
- Fax (410-706-0853) the rationale to the State EMS Medical Director within 24 hours.
- Notify the Program Medical Director within 24 hours.
- Submit written notification of event to Regional Medical Director or SOCALR and the State EMS Medical Director within 5 days.

## J. QUALITY REVIEW PROCEDURE FOR PILOT PROGRAMS (Old Class B)

1. Through a quality assurance review process directly involving the Program Medical Director (PMD), developed by the local program and approved by the PMD, the respective Regional Medical Director (RMD) and the State EMS Medical Director, the local program will review the runsheet and patient outcome records to determine the appropriateness of each individual use of the skill or administration of the medication. If the pilot procedure or medication is judged to be an appropriate intervention, the occurrence is added to the jurisdictional database and forwarded to the RMD and the State EMS Medical Director on an annual basis unless otherwise specified.
2. If a variance or question arises from the review of the case, a case review conference will be held with the provider, the PMD, and, if indicated, the on-line medical consultant with the summary of the findings to be reported to the RMD and the State EMS Medical Director.

### Quality Assurance Mechanism for PILOT Programs and Procedures



\* Approved by PMD, RMD, MIEMSS State EMS Medical Director

## **K. PROPOSED PROTOCOL SUBMISSION REQUEST POLICY**

MIEMSS is open to Protocol Concept/Sponsor Request and Proposed Protocol Submissions from any health care provider or interested party.

### **1. PROTOCOL APPLICATION PROCESS**

- a) Complete the attached “Proposed Protocol Submission Template.”
- b) Each application will need a sponsoring “System Medical Director” (someone from the following groups: 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, or Assistant EMS Operational Program Medical Directors).
- c) Proposed Protocol Submission Template will be delivered to the State EMS Medical Director.
- d) If you do not have a sponsoring System Medical Director, a “Protocol Concept/Sponsor Request” submission may be submitted to the Protocol Review Committee for a straw vote on the concept and to acquire a sponsoring “System Medical Director” before the formal Proposed Protocol Submission Template submission.

### **2. ESSENTIAL CRITERIA FOR PROPOSED PROTOCOL SUBMISSION**

- a) Clearly defined indication(s) for the proposed protocol
- b) An explanation providing the advantages and disadvantages that the proposed protocol will have on patients encountered by EMS and how it will impact the delivery of EMS within Maryland
- c) Strong evidence supporting the implementation of the proposed protocol (as noted on the template)
- d) Fiscal impact statement
- e) A System Medical Director sponsor

### **3. PROTOCOL EVALUATION BEFORE SUBMISSION TO THE PROTOCOL REVIEW COMMITTEE**

- a) The Proposed Protocol Submission Template will be evaluated by the State EMS Medical Director with input from subject matter experts and appropriate standing committees within MIEMSS when indicated.
- b) Once the proposed protocol submission has been appropriately formatted and reviewed, it will be forwarded to the Protocol Review Committee.
- c) With the approval of the proposed protocol submission by the Protocol Review Committee, the proposed protocol will then be forwarded for comment to the State EMS Advisory Council followed by approval of the EMS Board for implementation, based on the current protocol printing and implementation cycle.
- d) Following EMS Board approval of Optional Supplemental, Pilot, and Research Proposed Protocols, the EMS Operational Programs may apply for and implement these types of proposed protocols with the approval of the State EMS Medical Director through a separate application and approval process.

Date submitted to State EMS Medical Director: \_\_\_\_\_

Submitted by Name (print): \_\_\_\_\_

Signature: \_\_\_\_\_

Jurisdiction: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Sponsoring System Medical Director (print): \_\_\_\_\_

Signature: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Forward Proposed Protocol Submission to:

MIEMSS

State EMS Medical Director

653 West Pratt St., Room 405

Baltimore, MD 21201

Or email:

Ralcorta@miemss.org

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Official Use Only

Date received by OMD: \_\_\_\_\_

Review Date: \_\_\_\_\_ Approved / Denied

Protocol Review Committee hearing date: \_\_\_\_\_ Approved / Denied

**L. PROPOSED PROTOCOL SUBMISSION TEMPLATE**

**I. EXPLANATION**

**II. INDICATION**

**III. SUPPORTING EVIDENCE AND LITERATURE**

**IV. SUPPORTING MARYLAND AND/OR NATIONAL DATA**

**V. FORMATTED PROTOCOL TO MEET *The Maryland Medical Protocols for EMS Providers***

**Patient Care**

Presentation

Treatment

Basic Life Support

Advanced Life Support

Adult

Pediatric

Where indicated, Geriatric

Where indicated, Online Medical Consultation

Where indicated, Algorithm

Where indicated, Alerts

**Procedure/Skill**

Purpose

Indication

Contraindications

Potential Adverse Effects/Complications

Precautions

Procedure

**Medication**

Indication

Pharmacokinetics

Adverse Effects

Precautions

Contraindications

Preparations

Dosage

Adult

Pediatric

Where indicated, Geriatric

Where indicated, Online Medical Consultation

**VI. FISCAL IMPACT STATEMENT COVERING THE START-UP AND MAINTENANCE COST OF THE MEDICATION, DEVICE, REPLACEMENT PARTS, AND ANY UNIQUE REQUIREMENTS TO IMPLEMENT THE PROTOCOL**

**VII. IMPACT ON THE EXISTING *Maryland Medical Protocols for EMS Providers***

**M. PROTOCOL CONCEPT/SPONSOR REQUEST**

The Protocol Concept/Sponsor Request is to allow for the submission of an idea, medication, or skill to the Protocol Review Committee as a sounding board before completing the “Proposed Protocol Submission Template.” The Protocol Concept/Sponsor Request also provides an opportunity for the author of the concept to recruit a System Medical Director to champion and sponsor the formal Proposed Protocol Submission Template.

**Requirements for submission**

Provide a paragraph describing the concept in as much detail as possible covering the idea, medication, or skill and the following demographics.

Date submitted to State EMS Medical Director: \_\_\_\_\_

Submitted by Name (print): \_\_\_\_\_

Signature: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

Email: \_\_\_\_\_

Forward Protocol Concept/Sponsor Request Submission to:

MIEMSS

State EMS Medical Director

653 West Pratt St., Room 405

Baltimore, MD 21201

Or email:

Ralcorta@miemss.org

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Official Use Only

Date received by OMD: \_\_\_\_\_

Review Date: \_\_\_\_\_ Approved / Denied

Protocol Review Committee hearing date: \_\_\_\_\_ Approved / Denied

Acquired Sponsoring System Medical Director (print): \_\_\_\_\_

Signature: \_\_\_\_\_

Contact Phone: \_\_\_\_\_

Email: \_\_\_\_\_



## 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.

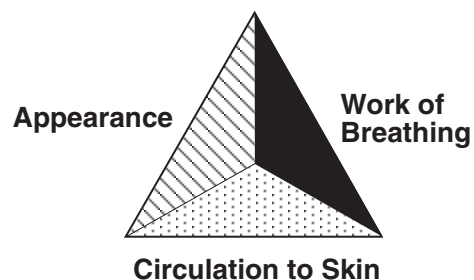
### C. PATIENT APPROACH

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.




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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 <sub>2</sub> 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<sub>2</sub> READINGS MAY OCCUR IN THE FOLLOWING PATIENTS: HYPOTHERMIC, HYPOPERFUSION (SHOCK), CO POISONING, HEMOGLOBIN ABNORMALITY, ANEMIA, AND VASOCONSTRICTION.

- (3) If available, utilize EtCO<sub>2</sub> 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 EtCO<sub>2</sub> 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.

PERFORM CPR WHILE PREPARING FOR RHYTHM ANALYSIS AND DEFIBRILLATION.



- a) Assess pulse.
- (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 13 years of age or greater, 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	<b>1 or 2 rescuers</b> 30:2	<b>1 rescuer</b> 30:2  <b>2 or more rescuers</b> 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)	<b>1 rescuer</b> 2 fingers in the center of the chest, just below the nipple line  <b>2 or more rescuers</b> 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: Any injury (e.g., fracture, chest, or abdominal trauma) associated with significant discomfort that could potentially distract from a patient's ability to accurately discern or define spinal column pain or tenderness.



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In addition to the above indicators for adults, the below apply to children who have not yet reached their 15<sup>th</sup> 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

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

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# HISTORY AND PHYSICAL EXAMINATION

## MEDICAL PATIENT

## TRAUMA PATIENT

Significant MOI	Non-Significant MOI	Unresponsive Patient	Responsive Patient
<p>Rapid Trauma Assessment</p> <p><b>D</b> Head</p> <p><b>C</b> Crepitation</p> <p><b>A</b> Chest</p> <p><b>P</b> Crepitation</p> <p><b>B</b> Respiration</p> <p><b>T</b> Paradoxical Motion</p> <p><b>L</b> Breath Sounds</p> <p><b>S</b> Abdomen</p> <p>Rigidity</p> <p>Distention</p> <p>Pelvis/GU</p> <p>Pain on Motion</p> <p>Blood, Urine, Feces</p> <p>Extremities</p> <p>Pulse/Motor/Sensory</p> <p>Posterior</p> <p>Baseline Vital Signs</p> <p>Obtain <b>SAMPLE</b> History</p> <p><b>S</b>igns &amp; Symptoms</p> <p><b>A</b>llergies</p> <p><b>M</b>edications</p> <p><b>P</b>ertinent History</p> <p><b>L</b>ast Oral Intake</p> <p><b>E</b>vents Prior</p>	<p>Determine Chief Complaint</p> <p><b>D</b> Perform</p> <p><b>C</b> Focused Examination</p> <p><b>A</b> of the</p> <p><b>P</b> Injured Site</p> <p><b>B</b> and</p> <p><b>T</b> Areas</p> <p><b>L</b> Compatible</p> <p><b>S</b> with</p> <p>Given</p> <p>MOI</p> <p>Baseline Vital Signs</p> <p>Obtain <b>SAMPLE</b> History</p> <p><b>S</b>igns &amp; Symptoms</p> <p><b>A</b>llergies</p> <p><b>M</b>edications</p> <p><b>P</b>ertinent History</p> <p><b>L</b>ast Oral Intake</p> <p><b>E</b>vents Prior</p>	<p>Rapid Physical Examination</p> <p><b>D</b> Head</p> <p><b>C</b> Neck</p> <p><b>A</b> JVD</p> <p><b>P</b> Medical Alert Device</p> <p><b>B</b> Chest</p> <p><b>T</b> Breath Sounds</p> <p><b>L</b> Abdomen</p> <p><b>S</b> Rigidity</p> <p>Distention</p> <p>Pelvis/GU</p> <p>Blood, Urine, Feces</p> <p>Extremities</p> <p>MSP</p> <p>Medical Alert Device</p> <p>Posterior</p> <p>Baseline Vital Signs</p> <p>Obtain History of Episode</p> <p><b>O</b>nset</p> <p><b>P</b>rovocation</p> <p><b>Q</b>uality</p> <p><b>R</b>adiation</p> <p><b>S</b>everity</p> <p><b>T</b>ime</p> <p>Obtain <b>SAMPLE</b> History</p>	<p>Obtain History of Episode</p> <p><b>O</b>nset</p> <p><b>P</b>rovocation</p> <p><b>Q</b>uality</p> <p><b>R</b>adiation</p> <p><b>S</b>everity</p> <p><b>T</b>ime</p> <p>Baseline Vital Signs</p> <p>Obtain <b>SAMPLE</b> History</p> <p><b>S</b>igns &amp; Symptoms</p> <p><b>A</b>llergies</p> <p><b>M</b>edications</p> <p><b>P</b>ertinent History</p> <p><b>L</b>ast Oral Intake</p> <p><b>E</b>vents Prior</p> <p>Focused Physical Exam</p> <p><b>DCAPBTL S</b></p> <p>Check areas suggested by <b>MOI</b> and <b>SAMPLE</b>.</p>
			Obtain <b>SAMPLE</b> History

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.



# DETAILED AND ONGOING ASSESSMENTS

## DETAILED EXAMINATION

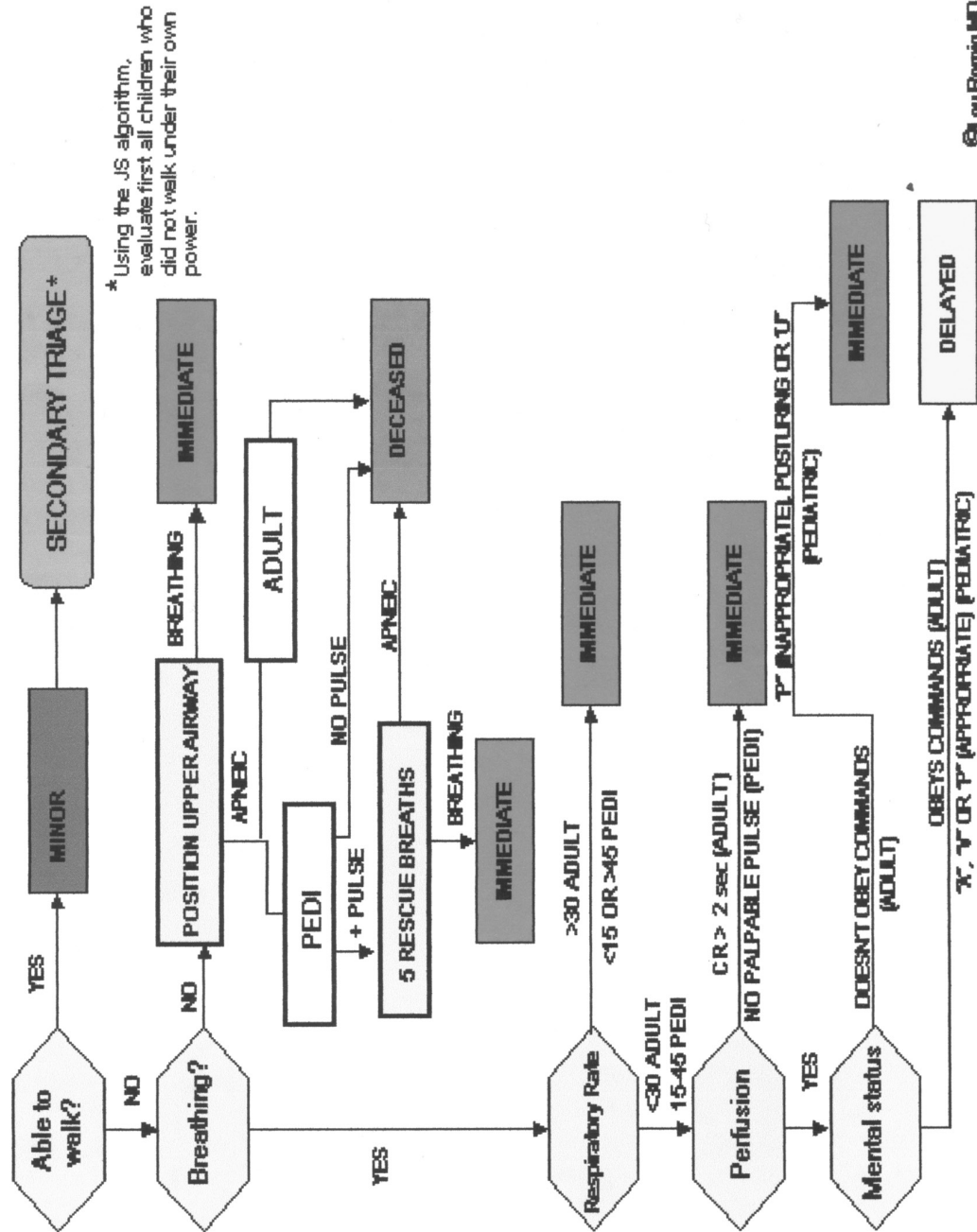
<p><b>D</b> HEAD</p> <ul style="list-style-type: none"> <li>Scalp &amp; Cranium</li> <li>Crepitation</li> </ul> <p><b>C</b> Eyes</p> <ul style="list-style-type: none"> <li>Discoloration</li> <li>Equality</li> <li>Foreign Bodies</li> <li>Blood in Anterior Chamber</li> </ul> <p><b>A</b> Ears &amp; Nose</p> <ul style="list-style-type: none"> <li>Fluid Drainage or Bleeding</li> <li>Discoloration</li> </ul> <p>Mouth</p> <ul style="list-style-type: none"> <li>Teeth &amp; Foreign Bodies</li> <li>Swelling or Lacerations</li> <li>Breath Odor</li> <li>Discoloration</li> </ul> <p><b>N</b> NECK</p> <ul style="list-style-type: none"> <li>Jugular Vein Distention</li> <li>Trachea Position</li> <li>Crepitation</li> </ul> <p><b>C</b> CHEST</p> <ul style="list-style-type: none"> <li>Paradoxical Motion</li> <li>Breath Sounds</li> <li>Crepitation</li> </ul> <p><b>A</b> ABDOMEN</p> <ul style="list-style-type: none"> <li>Rigidity</li> <li>Distention</li> </ul> <p><b>P</b> PELVIS/GU</p> <ul style="list-style-type: none"> <li>Pain on Motion</li> </ul> <p><b>E</b> EXTREMITIES</p> <ul style="list-style-type: none"> <li>Pulse, Motor, Sensory</li> <li>Capillary Refill</li> </ul> <p><b>P</b> POSTERIOR</p>
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## ONGOING ASSESSMENT


MEDICAL PATIENT	TRAUMA PATIENT
<p>REPEAT INITIAL ASSESSMENT</p> <ul style="list-style-type: none"> <li>Reassess <b>AVPU</b></li> <li>Reassess Airway</li> <li>Monitor Breathing</li> <li>Reassess Circulation</li> <li>Monitor Skin</li> <li>Confirm Clinical Priority</li> </ul> <p>REPEAT &amp; RECORD VITAL SIGNS</p> <p>REPEAT FOCUSED ASSESSMENT</p> <p>Especially Chief Complaint or Injuries</p> <p>CHECK ALL INTERVENTIONS</p> <ul style="list-style-type: none"> <li>Assure Oxygen Adequacy</li> <li>Check Bleeding</li> <li>Check Interventions</li> <li>Check for Trending</li> <li>Stable Pt.- Every 15 Min.</li> <li>Unstable Pt.- Recommend Every 5 Min.</li> </ul>	<p>REPEAT INITIAL ASSESSMENT</p> <ul style="list-style-type: none"> <li>Reassess <b>AVPU</b></li> <li>Reassess Airway</li> <li>Monitor Breathing</li> <li>Reassess Circulation</li> <li>Monitor Skin</li> <li>Confirm Clinical Priority</li> </ul> <p>REPEAT &amp; RECORD VITAL SIGNS</p> <p>REPEAT RAPID TRAUMA ASSESSMENT</p> <p>CHECK ALL INTERVENTIONS</p> <ul style="list-style-type: none"> <li>Assure Oxygen Adequacy</li> <li>Check Bleeding</li> <li>Check Neck Stabilization</li> <li>Check Interventions</li> <li>Check for Trending</li> <li>Stable Pt.- Every 15 Min.</li> <li>Unstable Pt.- Recommend Every 5 Min.</li> </ul>

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

# Combined START/JumpSTART Triage Algorithm



## 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. Providers should obtain and document a contact telephone number for one or more individuals who have details about the patient's medical history so that the physician may obtain and validate additional patient information. **(NEW '18)**
4.  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).

## 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 (Solucortef) 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 15<sup>th</sup> birthday (trauma) or their 18<sup>th</sup> 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) ETAIn 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.
  - 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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### III. TREATMENT PROTOCOLS



FOR ALL TREATMENT PROTOCOLS, THE LETTER AND NUMERICAL OUTLINE FORMAT IS STRICTLY FOR RAPID AND UNIFORM REFERENCE AND DOES NOT IMPLY OR DIRECT A MANDATORY SEQUENCE FOR PATIENT CARE.

HOWEVER, THE GENERAL PATIENT CARE SECTION AND THE ALGORITHMS DO HAVE A SPECIFIC SEQUENCE TO BE FOLLOWED.

#### A. ABUSE/NEGLECT

1. Initiate General Patient Care.



ALL HEALTH CARE PROVIDERS ARE OBLIGATED BY LAW TO REPORT CASES OF SUSPECTED CHILD OR VULNERABLE ADULT ABUSE OR NEGLECT TO EITHER THE LOCAL POLICE OR SOCIAL SERVICE AGENCIES. DO NOT INITIATE REPORT IN FRONT OF THE PATIENT, PARENT, OR CAREGIVER.

DO NOT CONFRONT OR BECOME HOSTILE TO THE PARENT OR CAREGIVER.

2. Presentation

The patient may present with patterned burns or injuries suggesting intentional infliction, such as injuries in varying stages of healing, injuries scattered over multiple areas of the body, fractures, or injuries inconsistent with stated cause of injury. The patient, parent, or caregiver may respond inappropriately to the situation. Malnutrition or extreme lack of cleanliness of the patient or environment may indicate neglect. Signs of increased intracranial pressure (bulging fontanel and altered mental status in an infant) may also be seen.



3. Treatment

- a) Stabilize injuries according to protocol.
- b) Discourage patient from washing if sexual abuse is suspected.
- c) Document the following information on the PCR:
  - (1) All verbatim statements made by the patient, the parent, or caregiver shall be placed in quotation marks, including statements made about the manner of the injuries.
  - (2) Any abnormal behavior of the patient, parent, and/or caregiver
  - (3) The condition of the environment and other residents present

**A. ABUSE/NEGLECT (Continued)**

- (4) The time the police/welfare agency was notified and the name of the person notified
  - (5) The name of the receiving health care provider (RN, PA, MD) and any statements made
- d) Treat injuries according to presentation.
4. Continue General Patient Care.

## 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 from further injury.
- (3) Consider underlying cause of seizure.

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.

- (1) If patient has no IV or IO in place or IV/IO is not available: Administer midazolam 5 mg IN or IM.
- (2) If IV/IO is already in place: 0.1 mg/kg in 2 mg increments SLOW IVP/IO over 1–2 minutes per increment with maximum single dose 5 mg.



REDUCE BY 50% FOR PATIENTS 69 YEARS OR OLDER.

- (3)  Additional doses up to a maximum total dose of 10 mg require medical consultation for all providers.
- (4) If patient seizures are refractory to treatment, consider IO administration of midazolam.
- (5) If midazolam is not available, consider diazepam in 2.5 mg increments SLOW IVP/IM. Maximum total dose 10 mg. If patient is in status, consider IO administration of diazepam.
  - (a)  IM administration requires all providers to obtain medical consultation. If suspected severe nerve agent exposure, providers may administer midazolam 5 mg IM or diazepam (CANA) without medical consultation.
- (6) Establish IV/IO access with LR.
- (7) If patient is pregnant, actively seizing, consider magnesium sulfate 4 grams IV/IO over 10 minutes (mixed in 50–100 mL of approved diluent).
  - (a)  If seizures persist, consult for second dose of magnesium sulfate.

## B. ALTERED MENTAL STATUS: SEIZURES (Continued)



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.




- 
- e) If the patient is still seizing:
    - (1) DO NOT RESTRAIN.
    - (2) Protect from further injury.
    - (3) Consider underlying cause of seizure.
  - f) 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.




- 
- g) Use glucometer and treat accordingly.
  - h) ALS providers may assist patients with the administration of their prescribed benzodiazepine. **(NEW '18)**
  - i) Consider midazolam for seizures lasting greater than 10 minutes.
    - (1) If patient has no IV or IO in place or IV/IO is not available: Administer midazolam 0.2 mg/kg IN or IM. Maximum total dose 5 mg.
    - (2) 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.



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

- (3)  Additional doses of midazolam up to a maximum total dose of 5 mg require medical consultation for all providers.
- (4) If patient's seizures are refractory to treatment, consider IO administration of midazolam.
- (5) If midazolam is not available, consider diazepam for seizures lasting greater than 10 minutes (paramedic may perform without consult for patients with active seizures).
  - (a) Up to 0.2 mg/kg diazepam rectal; maximum total dose 10 mg.**OR**
  - 0.1 mg/kg in 2.5 mg increments SLOW IVP/IO/IM; maximum total dose 5 mg.

## B. ALTERED MENTAL STATUS: SEIZURES (Continued)

(b)  IM requires all providers to obtain medical consultation. If suspected severe nerve agent exposure, providers may administer midazolam as above or diazepam (CANA) without medical consultation.

(6) Establish IV/IO access with LR.

(7) If patient is pregnant, actively seizing, consider magnesium sulfate 4 grams IV/IO over 10 minutes (mixed in 50–100 mL of approved diluent).

(8) Administer fluid bolus, if appropriate, 20 mL/kg of LR IV/IO.

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 IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**



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); **OR** administer 4 mg/0.1 mL IN in one nare. Repeat as necessary to maintain respiratory activity. **(NEW '18)**

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.




## C. ALTERED MENTAL STATUS: UNRESPONSIVE PERSON (Continued)

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- k) Obtain pulse oximetry if available.
- l) Administer glucose paste (10–15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.
- m) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**



- n) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
**Aged 28 days to adult:** Administer 0.1 mg/kg 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); **OR** administer 4 mg/0.1 mL IN in one nare. May be repeated as necessary to maintain respiratory activity. ET dose: 0.2–0.25 mg/kg. **(NEW '18)**
- o) Consider repeating naloxone.
- p) Establish IV/IO access with LR.
  - (1) 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.
  - (2) Consider obtaining blood sample using closed system.
- q) Use glucometer and treat accordingly.
- r)  Third and subsequent fluid boluses at 20 mL/kg IV/IO except in volume-sensitive children, then bolus at 10 mL/kg.

4. Continue General Patient Care.

## D. APPARENT LIFE-THREATENING EVENT (ALTE)



1. Initiate General Patient Care.

2. Presentation

An episode in an infant or child less than 2 years old that is frightening to the observer and is characterized by some combination of the following:

- a) Apnea (central or obstructive)
- b) Skin color change: cyanosis, erythema (redness), pallor, plethora (fluid overload)
- c) Marked change in muscle tone
- d) Choking or gagging not associated with feeding or a witnessed foreign body aspiration



MOST PATIENTS WILL APPEAR STABLE AND EXHIBIT A NORMAL PHYSICAL EXAM UPON ASSESSMENT BY RESPONDING FIELD PERSONNEL. HOWEVER, THIS EPISODE MAY BE THE SIGN OF UNDERLYING SERIOUS ILLNESS OR INJURY. FURTHER EVALUATION BY MEDICAL STAFF IS REQUIRED AND IT IS ESSENTIAL TO TRANSPORT ALL PATIENTS WHO EXPERIENCED ALTE.



3. Treatment

- a) Perform an initial assessment utilizing the Pediatric Assessment Triangle.
- b) Obtain a description of the event including nature, duration, and severity.
- c) Obtain a medical history with emphasis on the following conditions:
  - (1) Known chronic diseases
  - (2) Evidence of seizure activity
  - (3) Current or recent infections
  - (4) Gastroesophageal reflux
  - (5) Recent trauma
  - (6) Medications (current or recent)
- d) Apply oxygen.
- e) Be prepared to assist with ventilation if this type of episode occurs again during transport.
- f) Assess environment for possible causes.



- g) Place patient on cardiac monitor.
- h) Consider establishing IV/IO access with LR.



IF THE PARENT OR GUARDIAN REFUSES MEDICAL CARE OR TRANSPORT, PROVIDER SHALL CONTACT A **PEDIATRIC BASE STATION** PHYSICIAN.

4. Continue General Patient Care.

## E. BEHAVIORAL EMERGENCIES

1. Initiate General Patient Care.

2. Presentation

Behavior or actions that indicate the patient's mental function is disturbed and may pose a threat to oneself or to others (suicide, threat of violence, or psychosis).



THE PROVIDER SHOULD RECOGNIZE CRITICAL INCIDENT STRESS AS A STATE OF EMOTIONAL DISTRESS THAT DOES NOT NECESSARILY POSE A THREAT TO ONESELF OR OTHERS (E.G., DEATH IN THE FAMILY, BYSTANDERS AT A CRASH SCENE, OR REACTION TO VIOLENCE).

THE PREHOSPITAL CARE PROVIDER SHOULD NOT BE PLACED IN ANY PHYSICAL JEOPARDY OR ASSUME ANY LAW ENFORCEMENT FUNCTIONS, ESPECIALLY WHEN WEAPONS AND/OR ACTS OF VIOLENCE ARE INVOLVED!

LAW ENFORCEMENT SHOULD BE REQUESTED ON ALL CALLS INVOLVING POTENTIALLY VIOLENT PATIENTS.



3. Treatment

- a) When considering the prehospital use of restraints, a law enforcement officer should apply the device and accompany the provider and the patient in the ambulance.
- b) For interfacility transport, a physician order must be obtained for physical restraint.
- c) Implement **SAFER** model.
  - (1) **S**tabilize the situation by containing and lowering the stimuli.
  - (2) **A**ssess and acknowledge the crisis.
  - (3) **F**acilitate the identification and activation of resources (chaplain, family, friends, or police).
  - (4) **E**ncourage patient to use resources and take actions in their best interest.
  - (5) **R**ecovery or referral—leave patient in care of responsible person or professional or transport to appropriate facility.

## E. BEHAVIORAL EMERGENCIES (Continued)



- d) Establish IV access with LR, if appropriate.
  - e) Consider Chemical Restraint.
4. Continue General Patient Care.

## F. CARDIAC EMERGENCIES: NON-ARREST CARDIAC GUIDELINES (NEW '18)

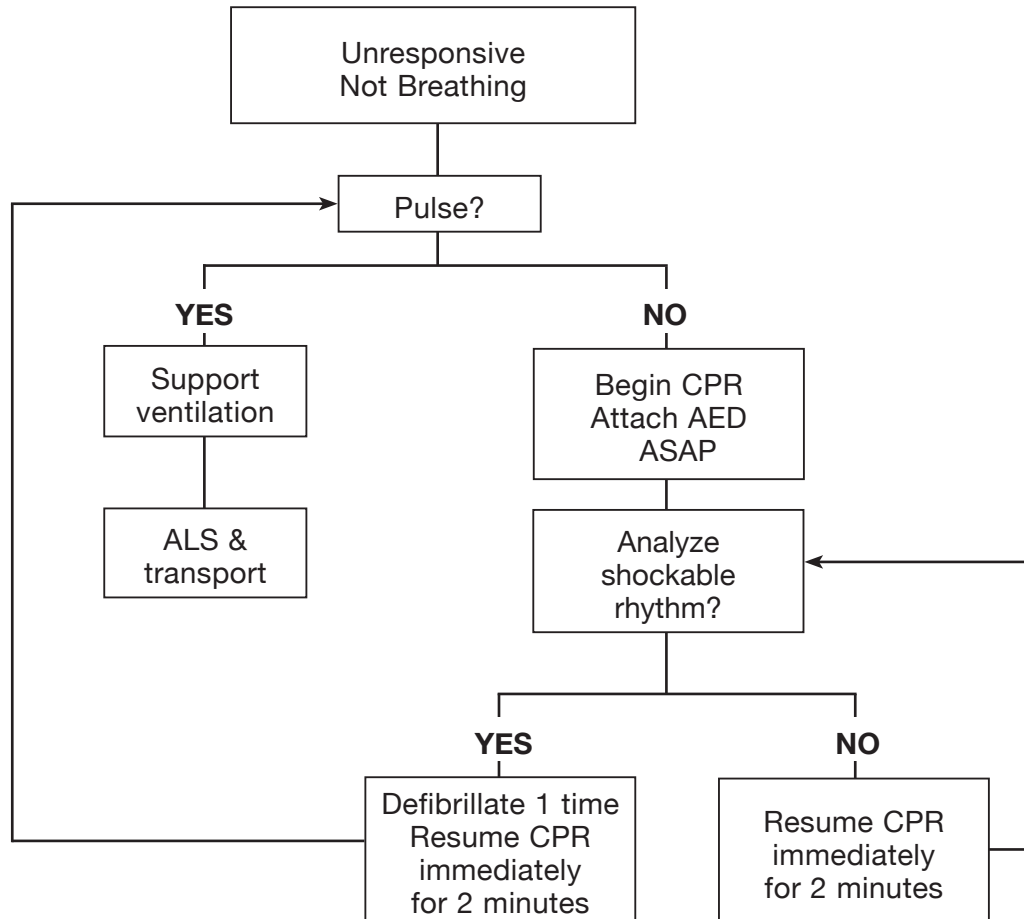


1. The following pertains to cardiac emergencies in patients who have a pulse. Several guidelines apply to all algorithms when assessing and treating cardiac patients. These guidelines are:
  - a) When the patient's condition changes, indicating the transition to a new treatment algorithm, the new treatment 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, electrical therapy is more important if the patient can be ventilated without intubation.



2.

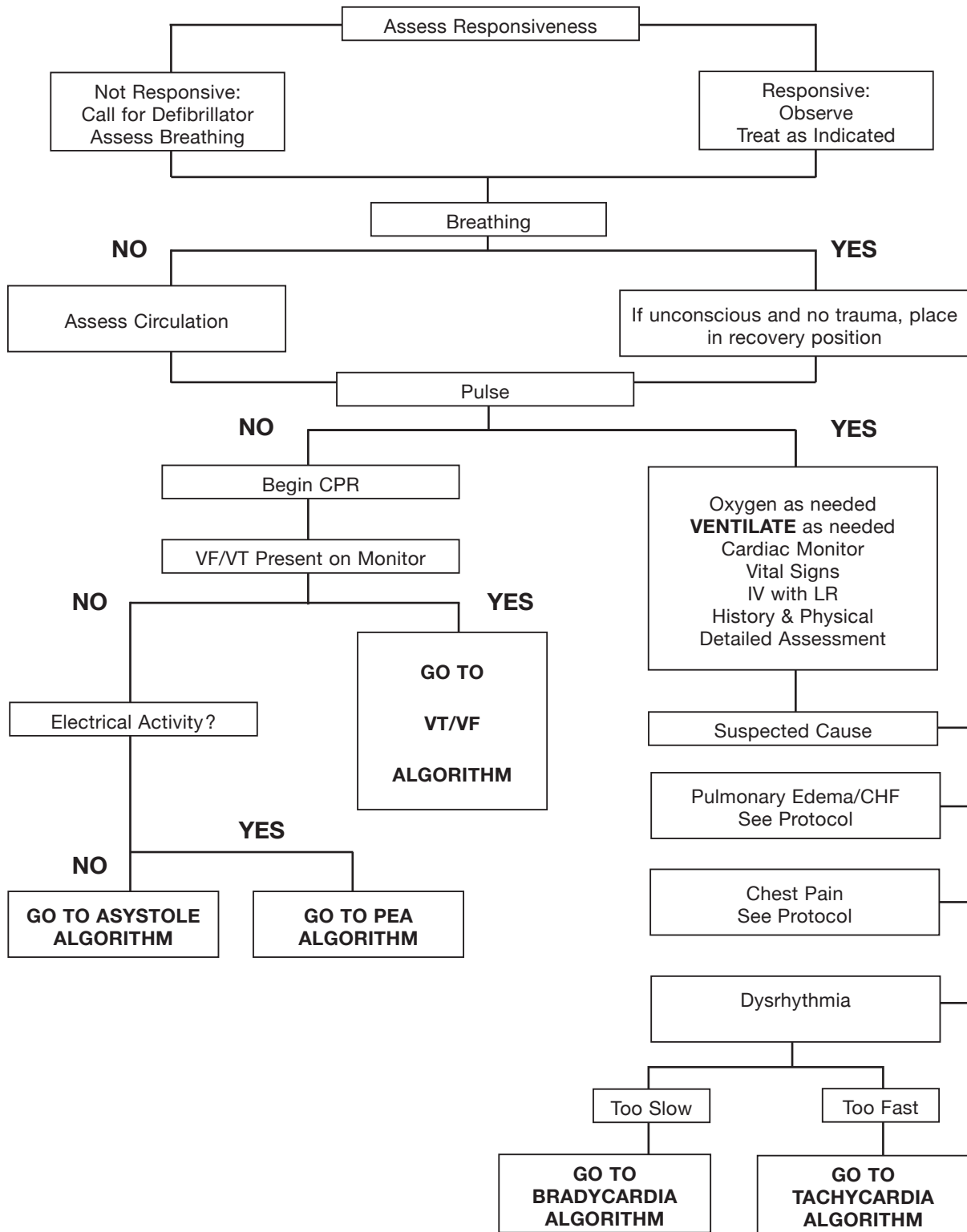
## UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR BLS





3.

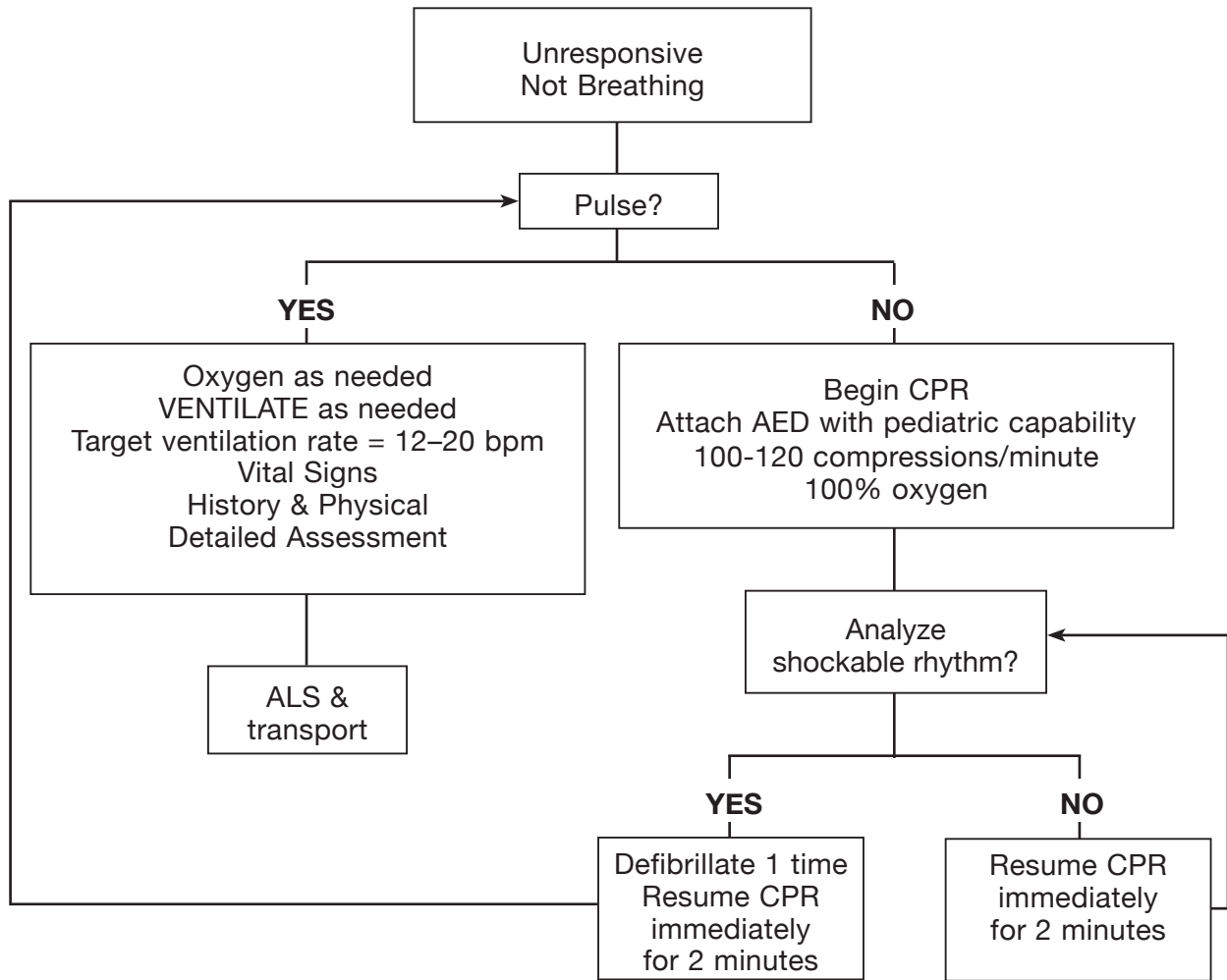
### UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR ALS (NEW '18)





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)**

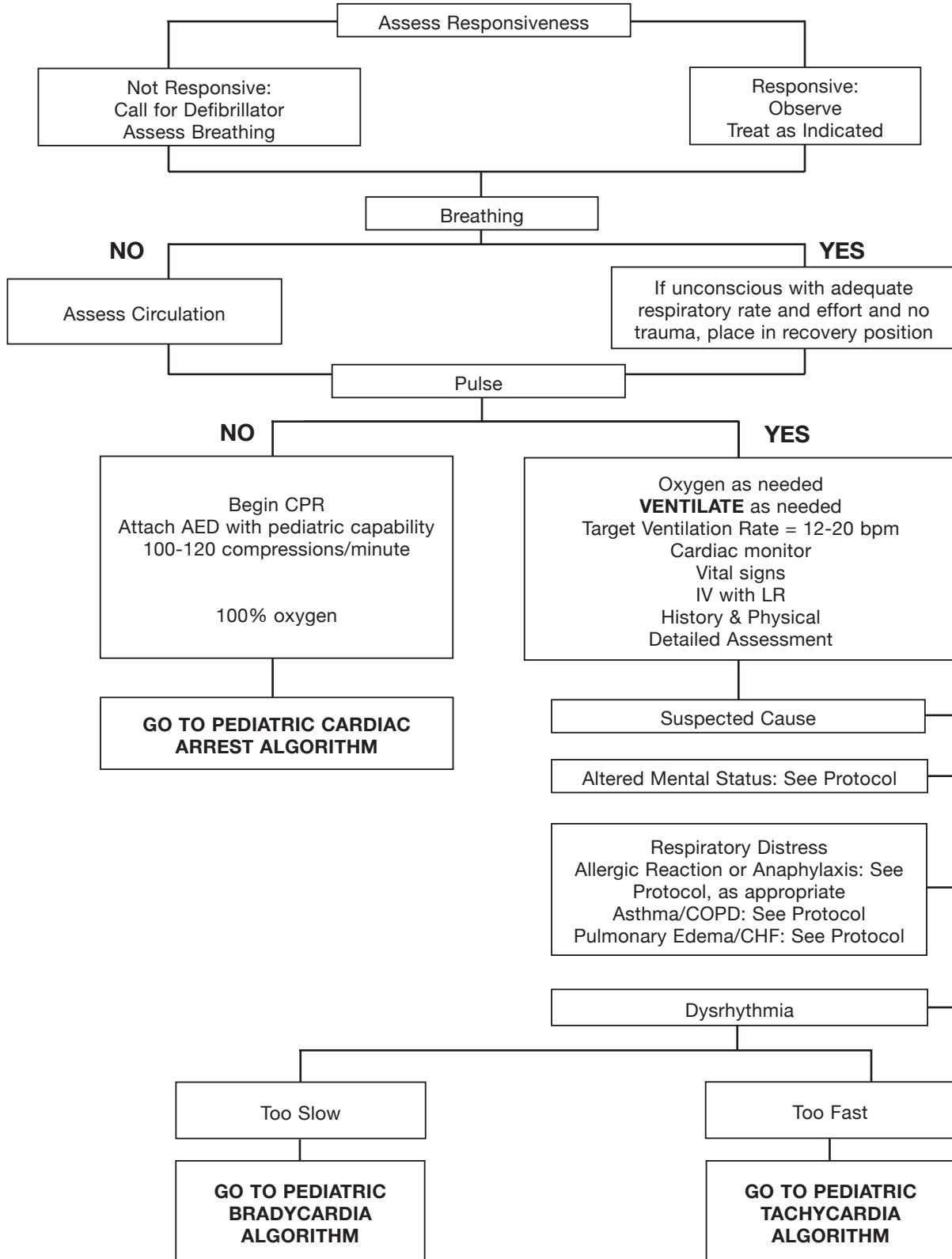






5.

**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)**



## 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.



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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**

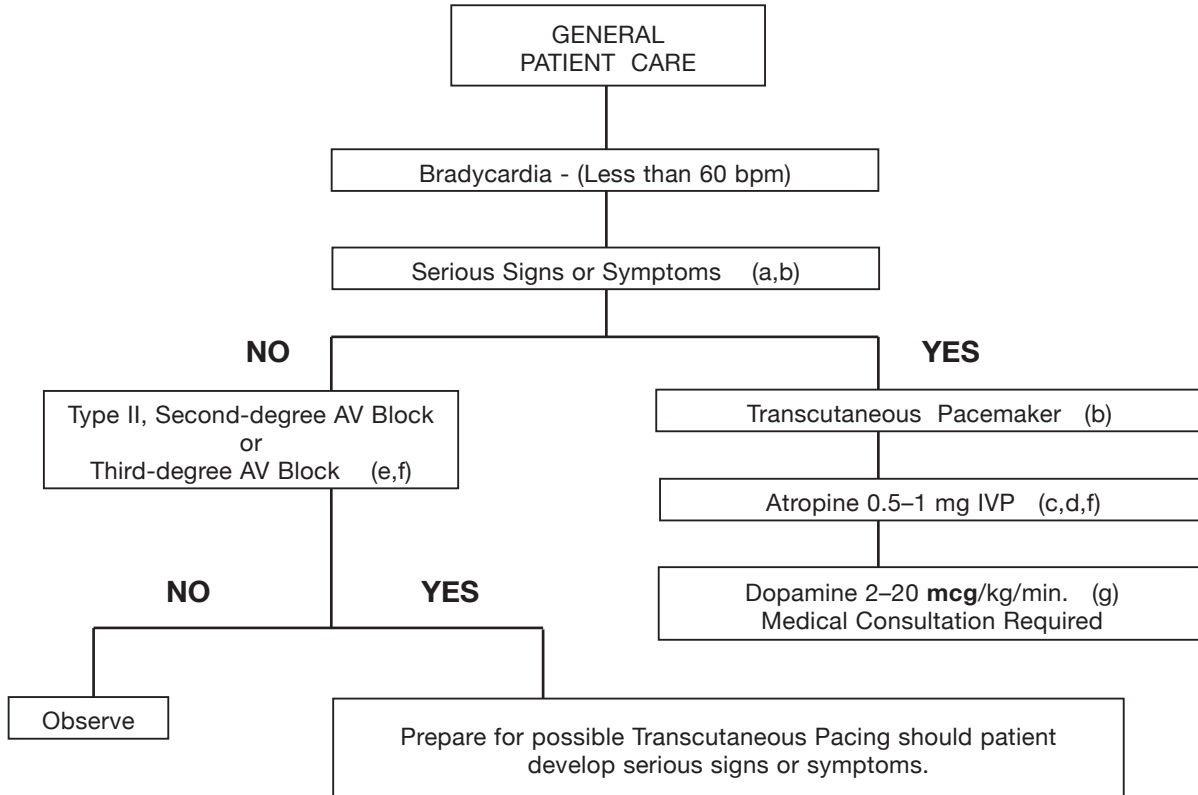
Consider midazolam 0.1 mg/kg in 2 mg increments SLOW IVP over 1–2 minutes per increment with maximum single dose 5 mg.  
(Reduce by 50% for patients 69 years or older.)

i) Refer to appropriate algorithm.

4. Continue Patient Care.



5.

**ADULT BRADYCARDIA ALGORITHM**

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

(b) - Do not delay TCP while awaiting IV or atropine to take effect if the patient is symptomatic.

(c) - Denervated transplanted hearts will not respond to atropine. Go at once to TCP.

(d) - Atropine shall be given in repeat doses in 3-5 minute intervals up to a total of 0.04 mg/kg. Consider shorter intervals in severe clinical conditions.



Medical consultation required to administer atropine in AV block at the His-Purkinje level (Type II AV block and new third-degree block with wide QRS complexes).

(e) - Never treat third-degree AV block or ventricular escape beats with amiodarone.



In the presence of Mobitz II and third-degree AV block, medical consultation is required for atropine administration.

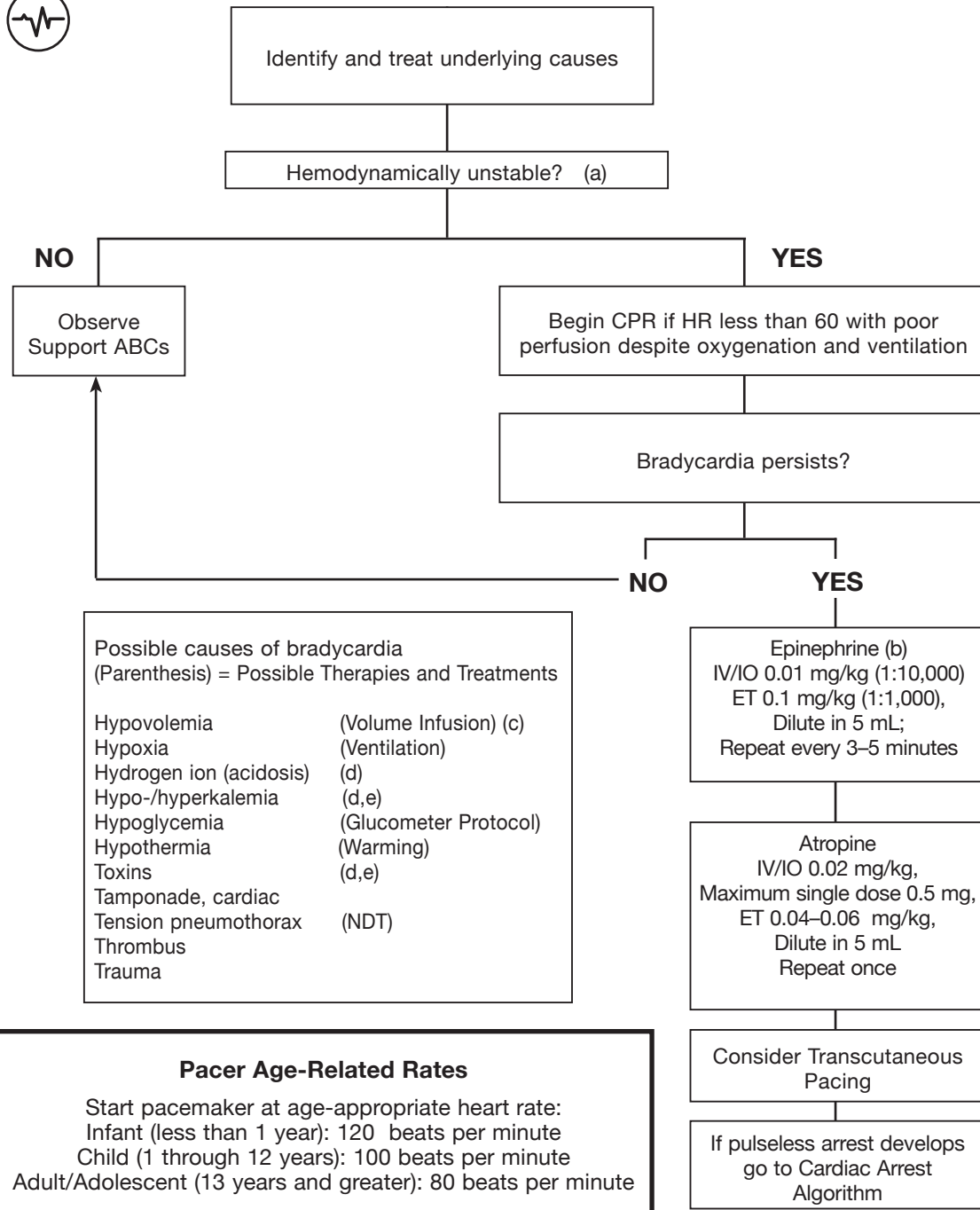



Requires medical consultation for administration of dopamine. Adults: titrate to systolic BP 100 mmHg or medical consultation directed BP. IV infusion pump is preferred.



6.


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



- (a) - Hemodynamically unstable is defined as a systolic blood pressure less than 60 in neonates (patients less than 28 days old), less than 70 in infants (patients less than 1 year of age), and less than  $[70 + (2 \times \text{years}) = \text{systolic BP}]$  for patients greater than 1 year of age.
- (b) - Neonates (birth to 28 days), epinephrine ET 0.03 mg/kg (1:10,000) dilute with 1 mL.
- (c) - Volume infusion for neonates and volume-sensitive children, 10 mL/kg; for infant and child 20 mL/kg.
- (d) -  Sodium Bicarbonate, 1 mEq/kg with medical consultation. See sodium bicarbonate.
- (e) - Calcium chloride, 20 mg/kg (0.2 mL/kg) SLOW IVP/IO (50 mg/min). Max dose 1 gram. **(NEW '18)**

## 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.



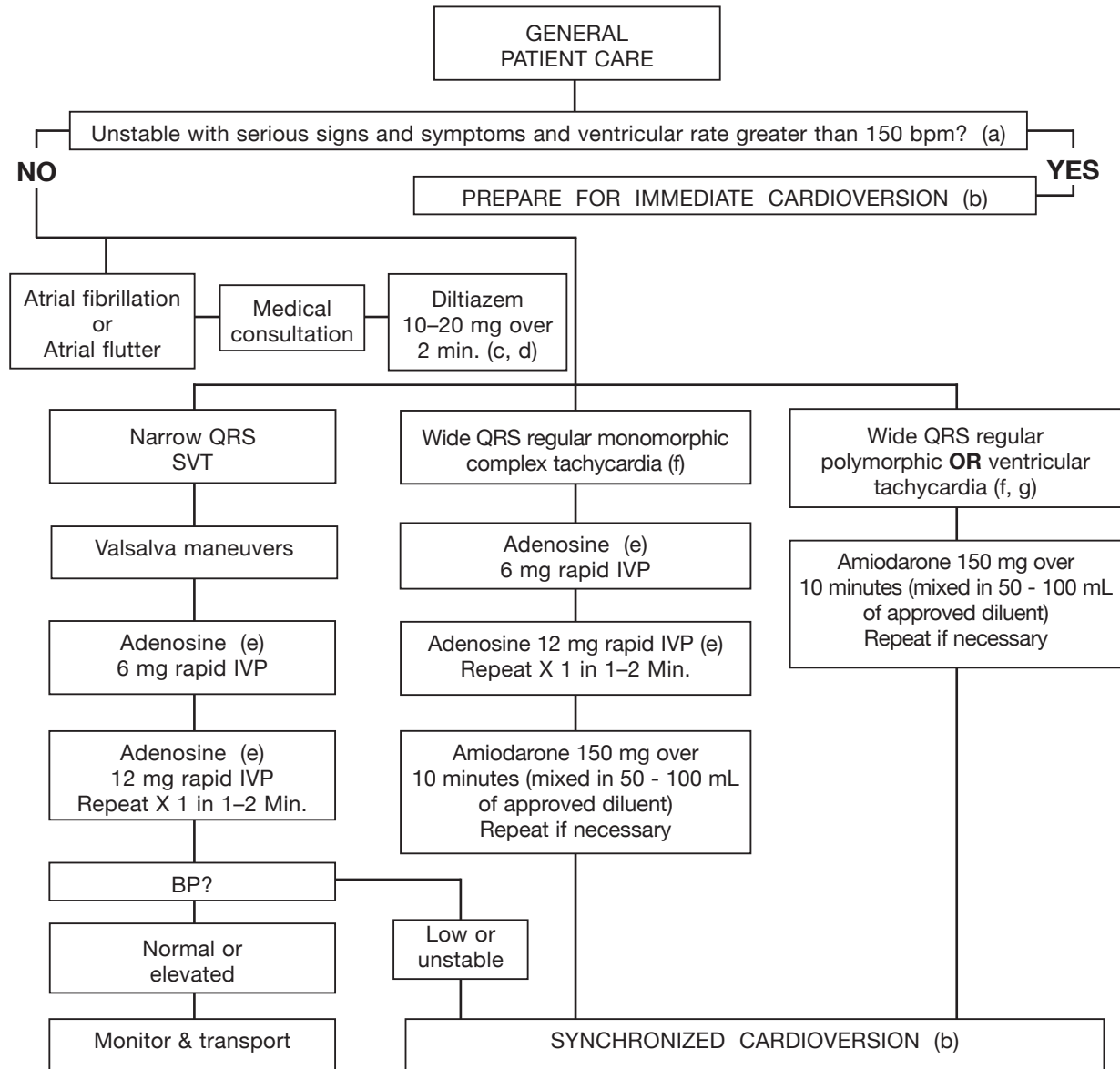
- 
- l) Establish IV access with LR.
  - m) Verify presence of pulse.
  - n) If no pulse present, treat as pulseless VF/VT.

## 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.
  - 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. **(NEW '18)**

(d) -  If rate does not slow in 15 minutes, administer a second dose of diltiazem (15-25 mg over 2 minutes). Medical consultation required.

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

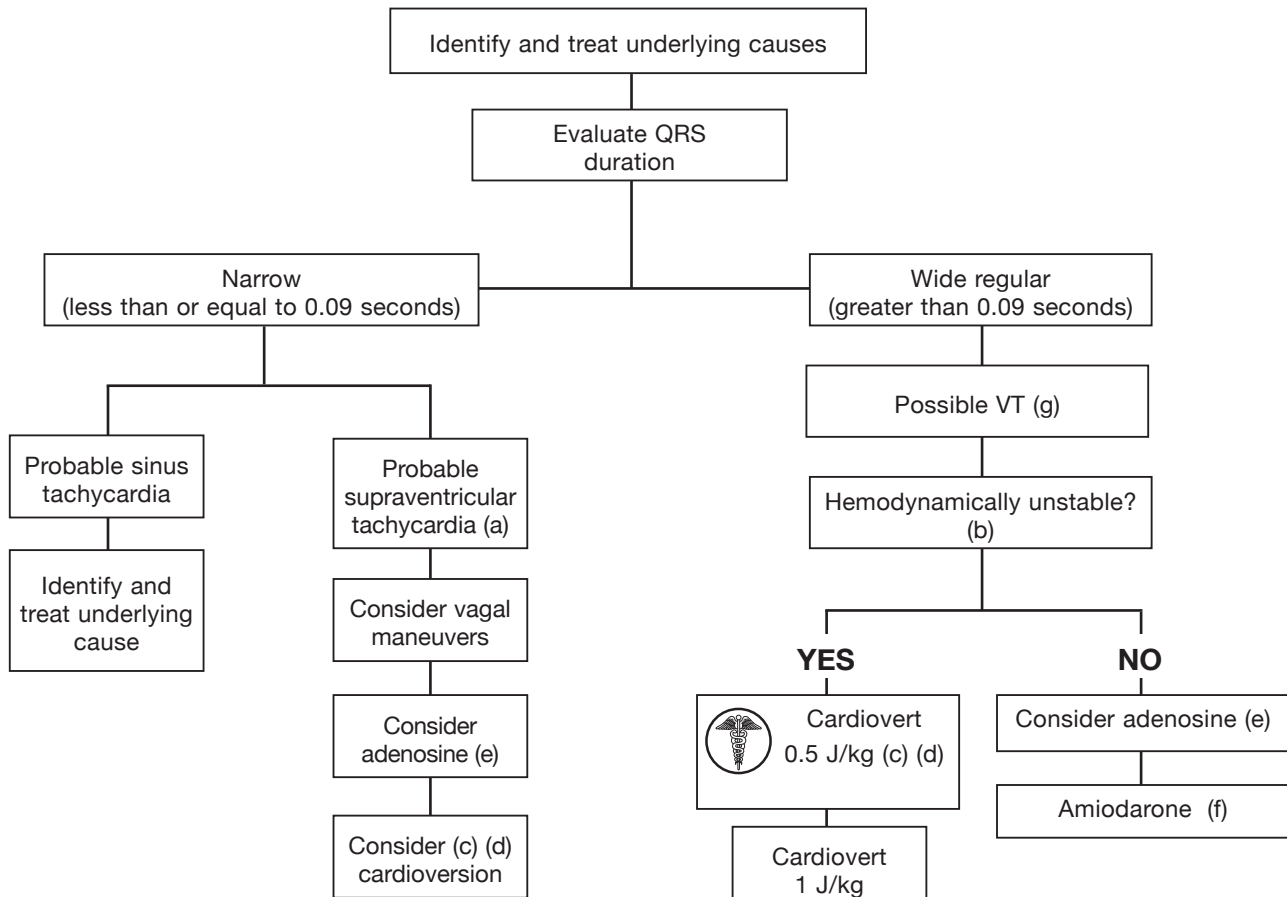
(f) - If **irregular, DO NOT** administer amiodarone or adenosine. Cardiovert if unstable.

(g) - 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 (NEW '18)

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

3.  Treatment
  - a) Perform high quality uninterrupted chest compressions as soon as possible and until defibrillator available.
  - b) Apply AED as soon as available.
  - c) Follow machine prompts regarding rhythm analyses and shocks.
  - d) Limit breaks in compressions to rhythm analysis periods and during shocks; perform compressions while defibrillator is charging.



ALS PROVIDERS WITH A COMBINATION AED/MANUAL DEFIBRILLATOR SHOULD USE IT IN THE MANUAL MODE TO MINIMIZE BREAKS IN COMPRESSIONS CAUSED BY AED ANALYSIS.

- e) **On-scene resuscitation:** patients who are found in arrest or who arrest prior to transport and are **attended to by BLS providers must only be resuscitated in place** (with minimal movement, no attempts at patient loading, and no attempts at transport) until the following have been accomplished:
  - (1) **Medical Etiologies**
    - (a) The patient has received a minimum of five two-minute cycles of rhythm interpretation and chest compressions.
  - (2) **Trauma Etiologies**
    - (a) Penetrating trauma patients should receive the indicated reversible causes treatments listed in section BBB–Trauma Protocol: Trauma Arrest, lines a) through h) of Treatment, while loading and preparing for immediate transport.
    - (b) Blunt trauma patients should receive all indicated reversible causes treatments listed in section BBB–Trauma Protocol: Trauma Arrest, lines a) through h) of Treatment, while on scene before termination of resuscitation or transport if ROSC is achieved.
  - (3) **Exemptions** from on-scene resuscitation:
    - (a) Where physical barriers prevent resuscitation
    - (b) Where providers are in danger
    - (c) Patients who have not yet reached their 18th birthday
    - (d) Pregnant patients
    - (e) Patients in cardiac arrest thought to be secondary to hypothermia or submersion
- f) **Following the initial on-scene resuscitation above,** providers may choose to continue the on-scene resuscitation until termination of resuscitation or to transport the patient at any time. Providers should ensure the following prior to transport:
  - (1) Mechanical CPR (mCPR) in place (if available)



HIGH-QUALITY CONTINUOUS CHEST COMPRESSIONS WITH FREQUENT PROVIDER ROTATION IS AN ESSENTIAL COMPONENT IN THE SUCCESSFUL RESUSCITATION OF THE CARDIAC ARREST PATIENT. THIS MAY BE ACCOMPLISHED ENTIRELY WITH MANUAL COMPRESSIONS, OR INITIALLY WITH MANUAL AND THEN MECHANICAL COMPRESSIONS, IN ACCORDANCE WITH THE OPTIONAL MECHANICAL CPR (MCPR) PROTOCOL. THE USE OF MCPR IS CONTRAINDICATED IN PATIENTS WHO HAVE NOT YET REACHED THEIR 13<sup>TH</sup> BIRTHDAY.



- g) Assess for shockable rhythm at next appropriate interval and treat appropriately.
- h) Minimize peri-shock pauses of compressions to less than 10 seconds.
- i) Any interruption of chest compressions, at any time for any reason, should last no more than 10 seconds
- j) 10-second interruptions should coincide with two-minute cycles of chest compressions
- k) **On-scene resuscitation:** patients who are found in arrest or who arrest prior to transport and are **attended to by ALS providers must remain in place** (with minimal movement, no attempts at patient loading, and no attempts at transport) until the following have been accomplished:
  - (1) **Medical Etiologies**
    - (a) The patient has received three doses of epinephrine, regardless of algorithm being followed
  - (2) **Trauma Etiologies**
    - (a) Penetrating trauma patients should receive the indicated reversible causes treatments listed in section BBB–Trauma Protocol: Trauma Arrest, lines a) through h) of Treatment, while loading and preparing for immediate transport
    - (b) Blunt trauma patients should receive all indicated reversible causes treatments listed in section BBB–Trauma Protocol: Trauma Arrest, lines a) through h) of Treatment, while on scene before termination of resuscitation or transport if ROSC is achieved.
  - (3) **Exemptions** from on-scene resuscitation:
    - (a) Where physical barriers prevent resuscitation
    - (b) Where providers are in danger
    - (c) Patients who have not yet reached their 18th birthday
    - (d) Pregnant patients
    - (e) Patients in cardiac arrest thought to be secondary to hypothermia or submersion
- l) **Following the initial on-scene resuscitation above,** providers may choose to continue the on-scene resuscitation until termination of resuscitation or to transport the patient at any time. Providers should ensure the following prior to transport:
  - (1) Mechanical CPR (mCPR) in place (if available)
  - (2) Placement of an airway that facilitates ventilation during transport by a restrained provider
- m) Identify rhythm and treat according to appropriate algorithm.
- n) 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).
- o) If ROSC, refer to ROSC Protocol.
- p) Consider Termination of Resuscitation when appropriate.



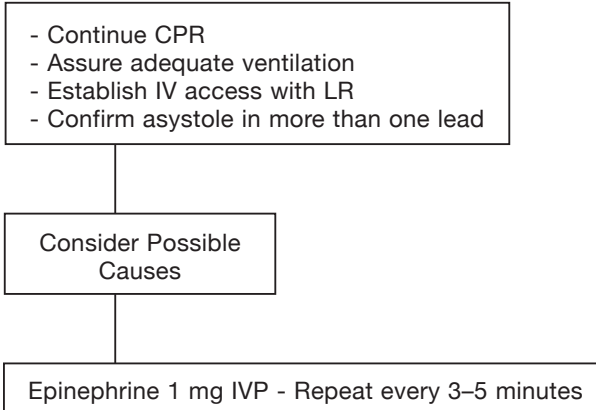
For patients who have not reached their 18<sup>th</sup> birthday:

- q) Identify rhythm and treat according to appropriate algorithm.
- r) 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.
- s) If no ROSC, transport to the closest appropriate facility.
- t) If ROSC, perform 12-lead EKG and transport the patient to Children’s National Medical Center 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 facility.




4.

### ADULT ASYSTOLE ALGORITHM (NEW '18)



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.

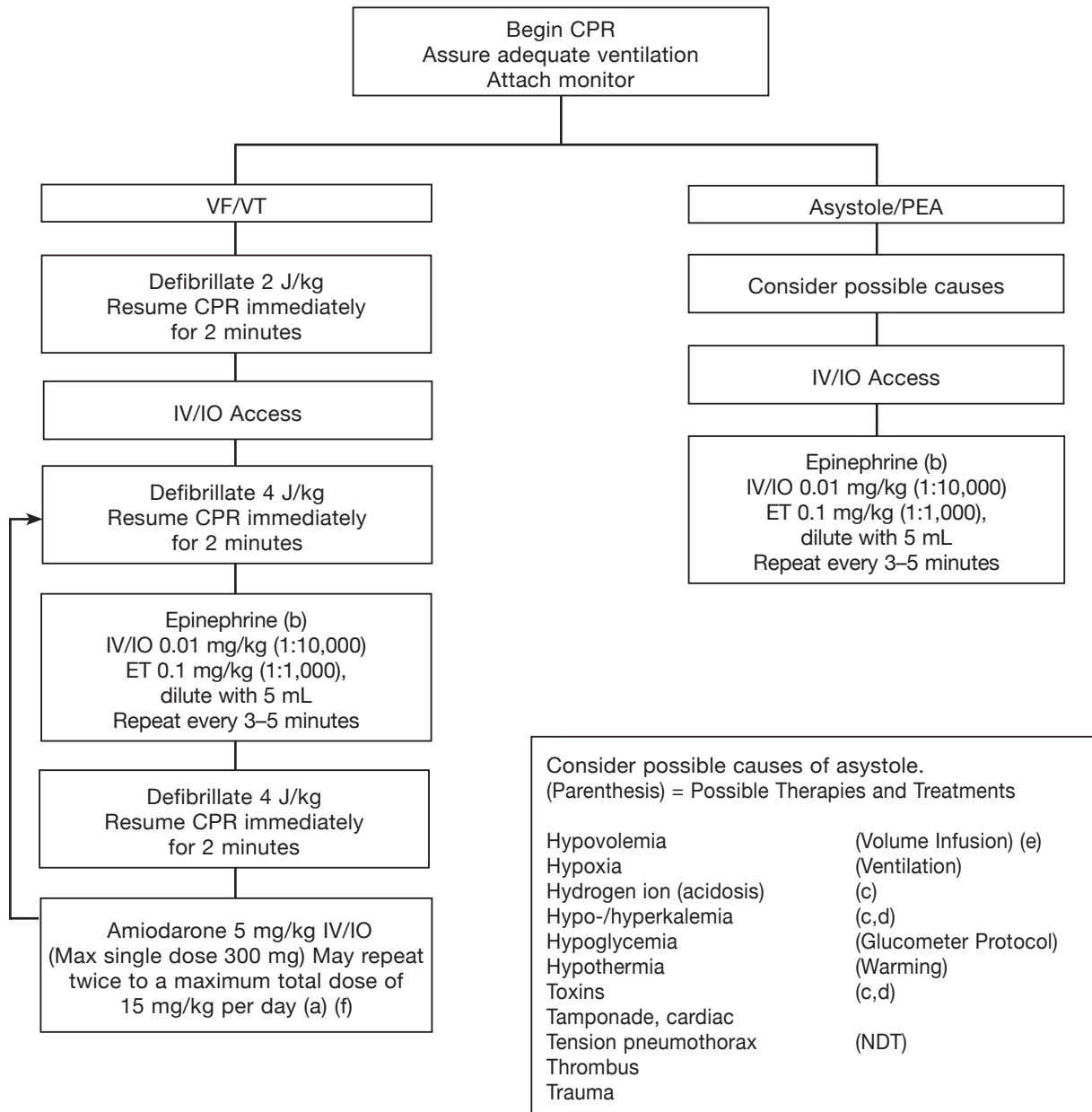
(b) - Calcium chloride, 0.5–1 gram IVP. See calcium chloride.

(c) - Volume infusion is 20 mL/kg.




5.

### PEDIATRIC CARDIAC ARREST ALGORITHM (NEW '18) (If less than 1 hour old, refer to the Newly Born Protocol)



(a) - Continue cycle of epinephrine, defibrillation (at 4 J/kg), then amiodarone. Defibrillate at increasing dosage: 6 J/kg, 8 J/kg, 10 J/kg.

(b) - Neonates (0–28 days), epinephrine ET 0.03 mg/kg (1:10,000) dilute with 1 mL.

(c) -  Sodium bicarbonate, 1 mEq/kg, with medical consultation. See sodium bicarbonate.

(d) - Calcium chloride, 20 mg/kg (0.2 mL/kg) SLOW IVP/IO (50 mg/min). Max dose 1 gram.

(e) - Volume infusion for neonates and volume-sensitive children, 10 mL/kg; for infant and child 20 mL/kg.

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

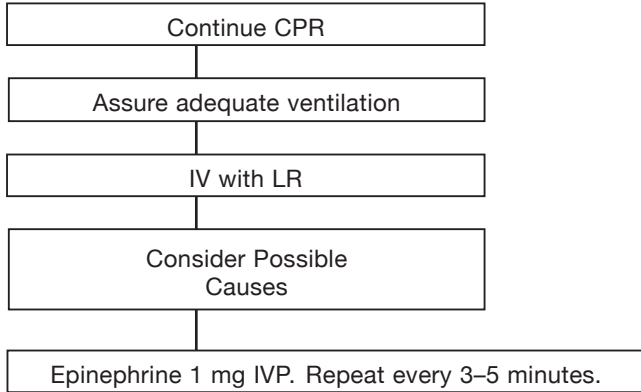


6.

### ADULT PULSELESS ELECTRICAL ACTIVITY (PEA) ALGORITHM (NEW '18)

Includes:

- EMD
- Pseudo EMD
- Brady-asystolic Rhythms
- Idioventricular Rhythms
- Ventricular Escape Rhythms
- Post-defibrillation Idioventricular Rhythms



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

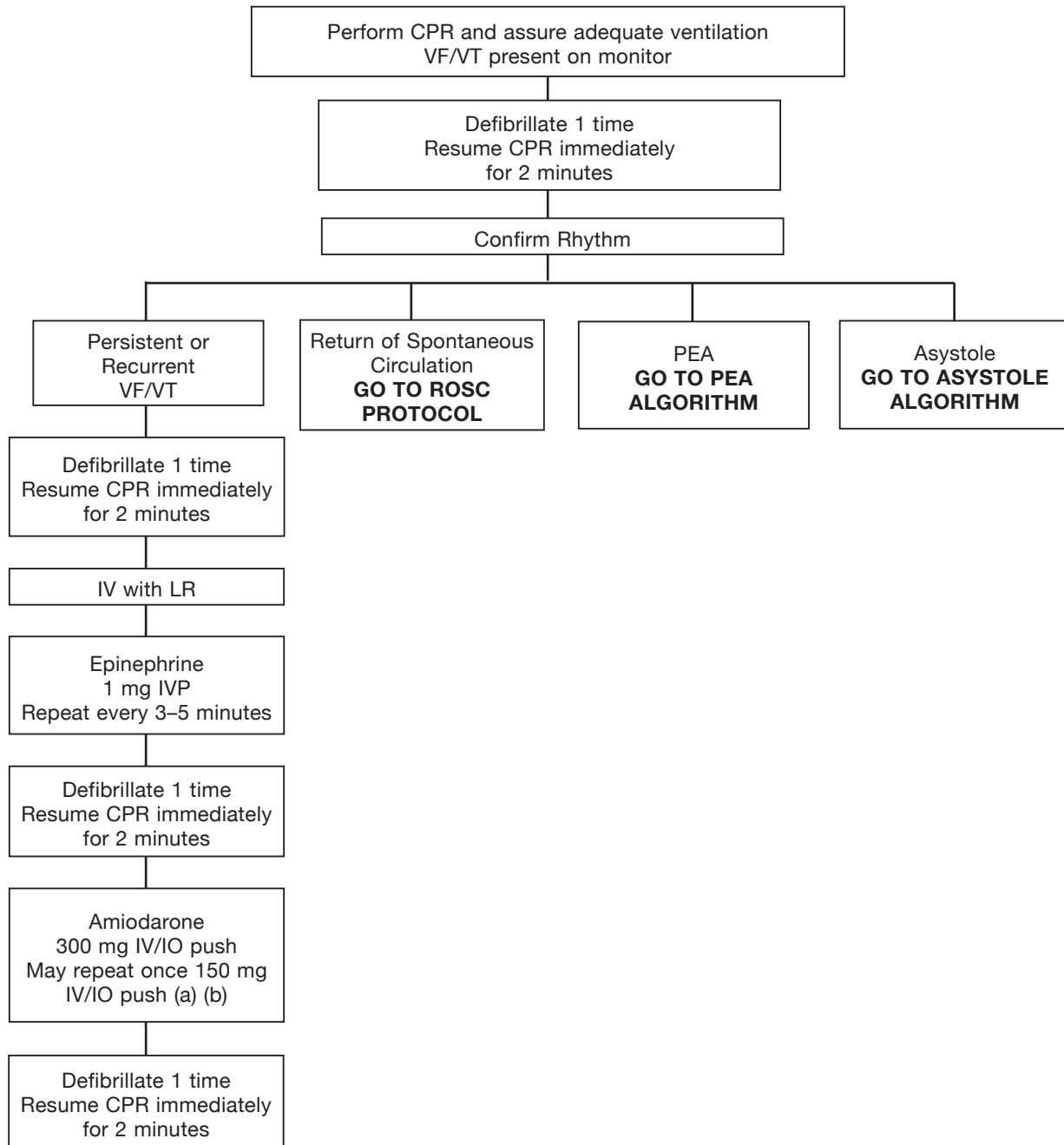
Hypovolemia	(Volume Infusion) (c)
Cardiac Tamponade	(Volume Infusion) (c)
Tension Pneumothorax	(Needle Decompression Thorocostomy–NDT)
Massive Pulmonary Embolism	
Massive AMI	
Drug Overdose	(a,b)
Hypoxia	(Ventilation)
Hypothermia	(Warming)
Acidosis	(a)
Hyperkalemia	(a,b)


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



7.

## VENTRICULAR FIBRILLATION PULSELESS VENTRICULAR TACHYCARDIA (NEW '18)



(a) -  Sodium bicarbonate 1 mEq/kg, with medical consultation. See sodium bicarbonate.

(b) - If torsades de pointes is present, give magnesium sulfate 1-2 grams IV/IO over 2 minutes before amiodarone.

## J. RETURN OF SPONTANEOUS CIRCULATION (ROSC)

1. Initiate General Patient Care.
2. Presentation  
Patients revived from non-traumatic cardiac arrest.




3. Treatment
  - a) Verify presence of carotid pulse. If absent, go to Cardiac Arrest Protocol.



FREQUENTLY REASSESS FOR PRESENCE OF PULSE. IF ANY DOUBT AS TO PRESENCE OF PULSE, REINITIATE CHEST COMPRESSIONS AND RETURN TO APPROPRIATE ALGORITHM FOR CARDIAC ARREST.

- b) If apneic or inadequate respirations, continue to support ventilations. Use supplemental oxygen in accordance with General Patient Care (Breathing in Initial Assessment, page 28).
- c) Reassess vital signs. Treat any abnormalities in accordance with relevant algorithms.
- d) If patient is 18 years of age or older and comatose (GCS less than 8), initiate Neuroprotective Induced Hypothermia Protocol (Medical etiology arrest only).
- e) Rendezvous with ALS or transport to nearest ED.



- 
- f) If available and not already in place, apply mechanical CPR (mCPR) device in standby mode.
  - g) Identify rhythm and treat according to appropriate algorithm.
  - h) Obtain 12-lead EKG; if STEMI, treat according to STEMI protocol.
  - i) Establish IV/IO access, if not yet obtained.
  - j) Treat hypotension
    - (1) If lungs are clear, consider fluid bolus. 20 mL/kg LR IV. Titrate to SBP of 100 mmHg.
    - (2)  Consider dopamine infusion (medical etiology arrest only).
      - (a) Adjust infusion rate in accordance with blood pressure and clinical response.
      - (b) Adult: Administer 2–20 **mcg**/kg/min IV/IO drip titrated to BP of 100 systolic or medical consultation selected BP; initial infusion rate 2–5 **mcg**/kg/min.
      - (c) Pediatric: Administer 2–20 **mcg**/kg/min IV/IO drip titrated to age specific BP or medical consultation selected BP; initial infusion rate is 2 **mcg**/kg/ min.
  - k) Reassess need for intubation if not yet performed.
  - l) Identify and treat contributing causes.



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

- m) If VF or VT was present during arrest and amiodarone not yet given, consider amiodarone 150 mg IV/IO over ten minutes. (Presence of a perfusing sinus rhythm is necessary for the administration of amiodarone for the ROSC patient post VF/VT conversion.)
- n) Initiate transport to appropriate facility.
- o) Arrests due to **medical** etiology:
  - (1) Most patients should go to a Cardiac Interventional Center. Consider helicopter transport.
  - (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.
- p) Arrests due to **trauma** etiology:
  - (1) Transport to closest appropriate trauma center.



- 
- q) Arrests due to **medical** etiology:
    - (1) Except as under (2) below, most pediatric patients should be transported to Children's National Medical Center or Johns Hopkins Children's Center. Consider helicopter transport.
    - (2) Transport to nearest ED.
      - (a) If transport time to Children's National Medical Center 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.
  - r) Arrests due to **trauma** etiology:
    - (1) Transport to closest appropriate pediatric trauma center.



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

- 4. Continue General Patient Care.

## K. TERMINATION OF RESUSCITATION (Medical and Traumatic) (NEW '18)

### 1. PURPOSE

This evidence-based protocol is designed to properly identify those patients who may benefit from prolonged resuscitation and transport to a hospital-based emergency department, as opposed to those patients whose resuscitations can be reliably and appropriately terminated in the prehospital environment.

### 2. CONTRAINDICATIONS TO PREHOSPITAL TERMINATION OF RESUSCITATION

- a) If arrest is believed to be secondary to hypothermia or submersion, treat according to appropriate protocol and transport to the nearest appropriate facility.
- b) If patient is pregnant, treat according to appropriate protocol and transport to the nearest appropriate facility.
- c) If patient has not reached their 18<sup>th</sup> 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 MEDICAL CENTER) FOR ONLINE MEDICAL DIRECTION PRIOR TO TERMINATION. IF ONLINE CONSULTATION WITH A PEDIATRIC BASE STATION IS NOT POSSIBLE, TREAT ACCORDING TO APPROPRIATE PROTOCOL.

### 3. PROCEDURE

- a) Resuscitations started by bystanders prior to EMS arrival (traumatic or non-traumatic etiology):
  - (1) EMS providers should terminate resuscitation if the patient meets the criteria listed in the Pronouncement of Death in the Field Protocol (section 2. Indications (a. – f.))
- b) BLS providers may terminate resuscitation if:
  - (1) ALS resources are genuinely unavailable, **and**
  - (2) The patient has received a minimum of 15 two-minute cycles of high quality CPR, **and**
  - (3) During the five AED analyses immediately prior to TOR there was “no shock advised”



- 
- c) Cardiac arrest (non-traumatic etiology)
    - (1) EMS providers may terminate resuscitation
      - (a) After the patient has received 15 two-minute cycles of CPR, the patients is:
        - (i) in asystole, OR
        - (ii) in VF, pulseless VT, or PEA with an EtCO<sub>2</sub> of less than 15 mmHg
      - (b) If patient does not meet TOR criteria, continue resuscitation and reevaluate at the next rhythm check

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

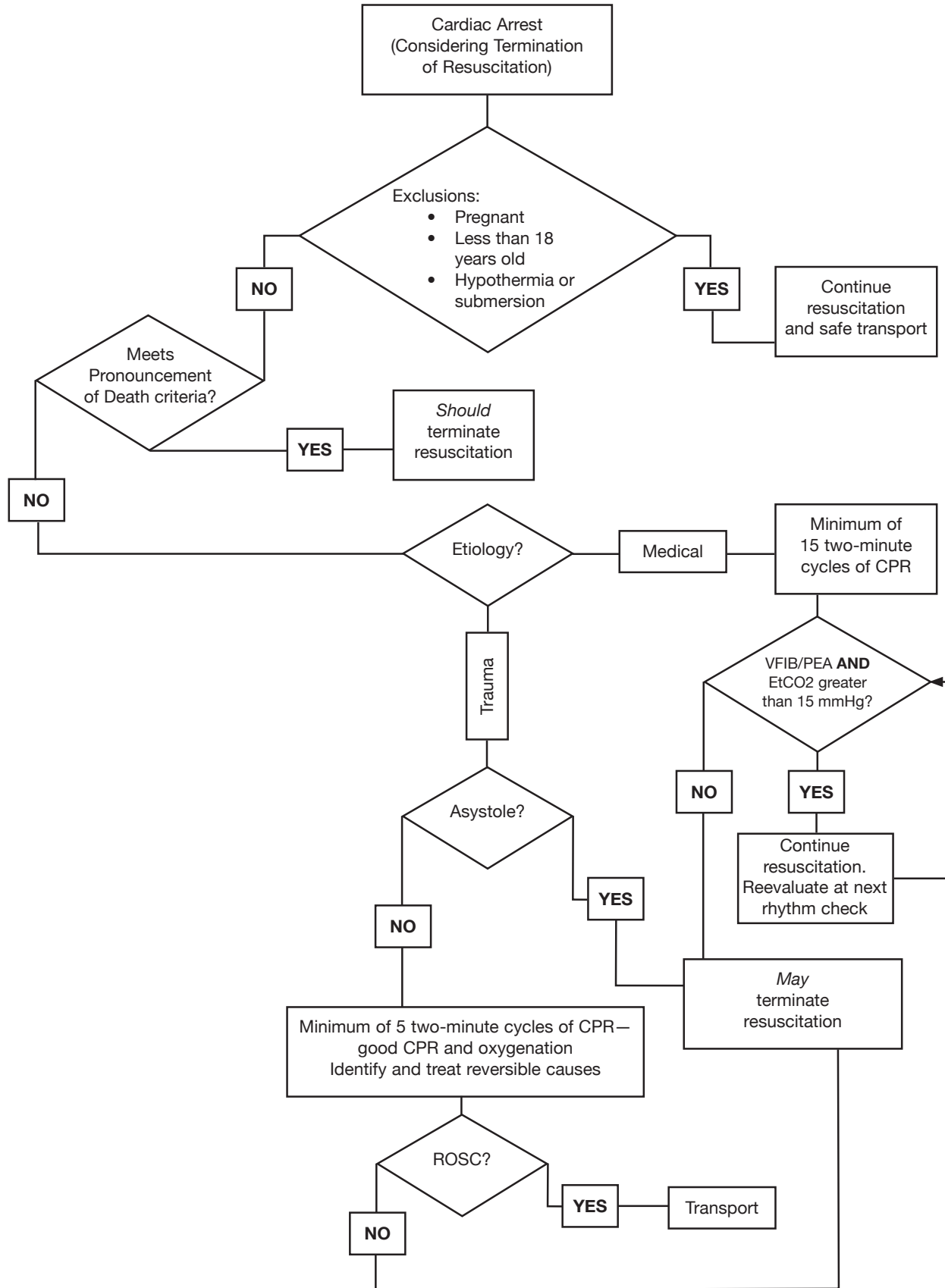
- d) Cardiac arrest (traumatic etiology)
  - (2) EMS providers may terminate resuscitation regardless of total resuscitation time if:
    - (a) The patient presents in asystole OR
    - (b) The patient's cardiac rhythm changes to asystole during the resuscitation
  - (3) EMS providers may terminate resuscitation following five two-minute cycles of CPR according to the Trauma Protocol: Trauma Arrest Protocol for a patient who remains in PEA or VF



ASYSTOLE AND RESUSCITATIONS LASTING LONGER THAN 10 MINUTES ARE INDEPENDENT PREDICTORS OF MORTALITY IN THE TRAUMA PATIENT. TREATMENT OF THE TRAUMA ARREST PATIENT SHOULD FOCUS ON IDENTIFYING AND TREATING REVERSIBLE CAUSES DURING THAT NARROW RESUSCITATIVE WINDOW. TOR AND TRANSPORT DECISIONS SHOULD ONLY BE MADE AFTER ADMINISTERING TIME-SENSITIVE AND APPROPRIATE THERAPIES.

- e) Pronouncement of Death in the Field Protocol.

## TERMINATION OF RESUSCITATION ALGORITHM (NEW '18)



## 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 (NEW '18)



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:
  - 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.
  - 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
  - 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.
4. ORAL EMS/DNR ORDERS
  - 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
  - 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)).
  - (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
- 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
- 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:  
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
- 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.
  - 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
- 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)

- b) In addition to other immunity that may be provided for in law, the Health Care Decisions Act provides the following specific immunity in cases involving the provision, withdrawal, or withholding of care that may be life-sustaining in nature:
- (1) EMS providers are not subject to criminal prosecution or civil liability or deemed to have engaged in unprofessional conduct as determined by the appropriate licensing, registering, or certifying authority as a result of **withholding or withdrawing** any health care **under authorization** obtained in accordance with the Health Care Decisions Act. See HG (5-609(a)(1)).
  - (2) EMS providers **providing, withholding, or withdrawing** treatment under authorization obtained under the Health Care Decisions Act do not incur liability arising out of any claim to the extent the claim is based on **lack of consent or authorization** for the action.  
See HG (5-609(a)(2)).
  - (3) EMS providers **providing** treatment because they reasonably believe that an EMS/DNR order, other than a bracelet, is not valid, do not incur liability arising out of any claim to the extent the claim is based on **lack of consent or authorization** for the action.  
See HG (5-608(d)).

### 11. EMS/DNR MEDICAL PROTOCOLS

- a) DISPATCH
- (1) Option B EMS/DNR patients (7/98 version) or patients with older version EMS/DNR orders only require a BLS response. Once the on-scene BLS provider has determined the need for additional pain control, an ALS Rendezvous may be requested. Medevac requests are not appropriate for these patients.
  - (2) Option A or A (DNI) EMS/DNR patients (7/98 version) who are not in arrest may require a range of responses from BLS through the highest echelon of response available. This will depend on the information available to dispatch and the service requested. The response complement in these cases will be dictated by local standard operating procedures (SOP).
  - (3) If a dispatch center is unclear whether the DNR order is an EMS/DNR order or is unclear about the pre-arrest patient care option selected (A, A (DNI), or B), the dispatch center shall dispatch the appropriate resources based on the information available.
  - (4) In the absence of knowledge to the contrary, information from medical professionals at a health care facility about the EMS/DNR status of a patient may be presumed to be reliable.

## M. EMS DNR/MOLST (Continued)

### b) PERFORM LIMITED PATIENT ASSESSMENT

Vital signs:

- (1) Check for absence of a palpable pulse.
- (2) Check for absence of spontaneous respirations in an unresponsive patient.
- (3) Check for a valid EMS/DNR Order or MOLST form; vinyl bracelet insert worn either on the wrist, as a necklace, or pinned to clothing; or for a metal emblem (bracelet or necklace).

### c) RESUSCITATE/DO NOT RESUSCITATE CRITERIA

- (1) If an EMS/DNR Order is not present, revoked, or otherwise void, the EMS provider shall treat and, if necessary, transport the patient.
- (2) If an EMS/DNR Order is not present, but the EMS provider believes that resuscitation or further resuscitation is futile, they may initiate the Termination of Resuscitation Protocol.
- (3) If a valid EMS/DNR order is found and the patient is in cardiac or respiratory arrest, no resuscitative measures shall be initiated.
- (4) If the patient is conscious and able to communicate that they revoke the EMS/DNR orally directly to EMS providers, EMS providers shall treat and, if necessary, transport the patient.
- (5) If the EMS/DNR patient (Option A, A (DNI), or B) arrests, withhold or withdraw further resuscitation and provide support to the family and caregivers. Consider notifying appropriate personnel.

### d) **OPTION A (MOLST A1) – MAXIMAL (RESTORATIVE) CARE PROTOCOL**

- (1) When Option A - “Maximal (Restorative) Care (with intubation) Before Arrest, then DNR” is selected on an EMS/DNR Order or MOLST form, the patient shall receive the full scope of restorative interventions permissible under the Maryland EMS Medical Protocols (including Continuous Positive Airway Pressure (CPAP), cardiac monitoring, synchronized cardioversion for pulse-**present** ventricular or supraventricular tachycardia, cardiac pacing for pulse-**present** symptomatic bradycardia, insertion of IVs, and drug therapy), in an attempt to forestall cardiac or respiratory arrest.
- (2) This option was requested primarily by long-term care facilities for their patients who are on DNR orders for potentially prolonged periods of time. Many of these patients are less concerned about palliation of pain and more concerned about the quality of life after a stroke or heart attack. The primary medical conditions seen in the field necessitating this option have been the desire to administer dextrose for diabetic emergencies and epinephrine for anaphylactic reactions in patients who, upon arrest, are not to be resuscitated.

## 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 O<sub>2</sub> 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
- 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).
- 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.

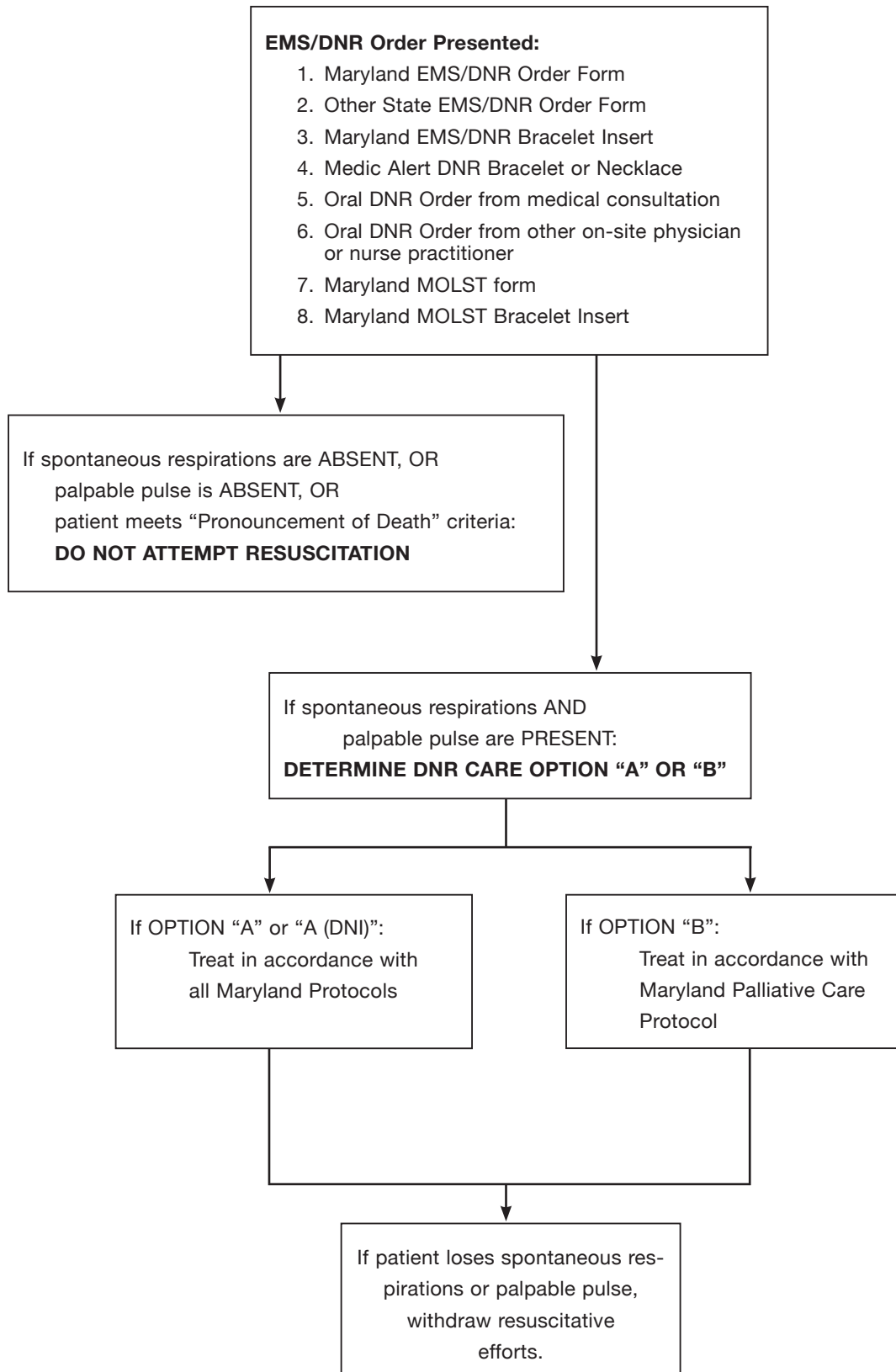
## M. EMS DNR/MOLST (Continued)

- (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.
  - (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.
- 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.
  - (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





## O. CARDIAC EMERGENCIES: CHEST PAIN/ACUTE CORONARY SYNDROME

1. Initiate General Patient Care.

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.



ACUTE CORONARY SYNDROME (ACS) IS DEFINED AS PATIENTS PRESENTING WITH ANGINA OR ANGINAL EQUIVALENTS SUCH AS SHORTNESS OF BREATH; CHEST, EPIGASTRIC, ARM, OR JAW PAIN OR DISCOMFORT; DIAPHORESIS; AND/OR NAUSEA.

3. Treatment



a) Place patient in position of comfort.

b) Assist patient with administration of patient's own prescribed nitroglycerin. May be repeated in 3–5 minutes if chest pain persists, blood pressure is greater than 90 mmHg, and pulse is greater than 60 bpm. Maximum three doses total (patient and EMT assisted).

c) Assess and treat for shock if indicated.

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

e) Consider aspirin 324 mg or 325 mg chewed, if acute myocardial infarction is suspected.



NITROGLYCERIN IS CONTRAINDICATED FOR 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.

IF THE PATIENT'S BLOOD PRESSURE DROPS MORE THAN 20 mmHg AFTER ADMINISTRATION OF NITROGLYCERIN, OBTAIN MEDICAL CONSULTATION BEFORE FURTHER ADMINISTRATION.





f)  Additional doses of nitroglycerin require medical consultation.

g) Establish IV access with LR.

h) Shall perform a 12-lead EKG for patients with ACS.  
(If trained, providers may perform a 15-lead EKG.)

i) If patient has a prescription or previous history of nitroglycerin use, administer nitroglycerin: 0.4 mg SL. May be repeated if symptoms persist, and BP is greater than 90 mmHg and pulse is greater than 60 bpm, to a maximum dose of 1.2 mg.

## O. CARDIAC EMERGENCIES: CHEST PAIN/ACUTE CORONARY SYNDROME (Continued)

- j) If patient does **not** have a prescription or previous history of nitroglycerin use, an IV must be established prior to administration; then administer nitroglycerin as above.
- k)  If IV cannot be established, nitroglycerin may be administered with medical consultation.
- l) Identify rhythm and treat according to appropriate algorithm.
- m)  Administer additional doses of nitroglycerin.
- n) Administer opioid per Pain Management Protocol.



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CONSULT A PEDIATRIC BASE STATION FOR CHILDREN (WHO HAVE NOT REACHED THEIR 18<sup>TH</sup> BIRTHDAY) WITH CHEST PAIN WITH ASSOCIATED DYSRHYTHMIAS, CARDIAC DISEASE, OR BLUNT CHEST TRAUMA.

- 4. Continue General Patient Care.

## 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. **(NEW '18)**


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. **(NEW '18)**
- 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.

## Q. CARDIAC EMERGENCIES: IMPLANTABLE CARDIOVERTER DEFIBRILLATOR (ICD) MALFUNCTION

1. Initiate General Patient Care.

2. Presentation

An implantable cardioverter defibrillator (ICD) is a device that delivers an internal defibrillation (shock) whenever the patient's heart rhythm/rate exceeds defined limits. EMS providers may encounter ICD devices that are appropriately or inappropriately delivering shock therapy. Internal shocks cause patient discomfort but **DO NOT** pose a danger to EMS personnel even when in direct contact with patient receiving an internal shock.

3. Treatment



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



IF PATIENT IS IN CARDIAC ARREST, PERFORM CPR AND USE AED AS APPROPRIATE DESPITE THE PATIENT'S ICD, WHICH MAY OR MAY NOT BE DELIVERING SHOCKS.



- 
- d) Establish IV access with LR.
  - e) Monitor cardiac rhythm and treat according to appropriate algorithm(s).
  - f) ICD deactivation: Patient must meet the following criteria:
    - (1) Three or more distinct shocks and
    - (2) Obvious device malfunction with an EMS provider-witnessed inappropriate shock (e.g., alert patient in atrial fibrillation with rapid ventricular rate or SVT)
  - g) Place an EMS donut magnet directly over device. Magnet placed directly over will deactivate device and shocks will not be delivered. After defibrillator is deactivated, tape magnet firmly in place and treat according to the appropriate algorithm(s).



IF THE PATIENT HAS A COMBINATION ICD AND PACEMAKER, DEACTIVATING THE ICD MAY OR MAY NOT DEACTIVATE THE PACEMAKER.

- h) Regardless of the decision to deactivate the ICD device, be prepared to manage the underlying rhythm (e.g., treat wide complex tachycardia with cardioversion or amiodarone per protocol as appropriate).

## Q. CARDIAC EMERGENCIES: IMPLANTABLE CARDIOVERTER DEFIBRILLATOR (ICD) MALFUNCTION (Continued)



IF PATIENT BECOMES UNSTABLE OR IN THE EVENT OF A RHYTHM CHANGE WHERE A SHOCK IS DESIRED, REMOVE THE MAGNET TO REACTIVATE THE ICD. IF REACTIVATION DOES NOT OCCUR, USE MANUAL DEFIBRILLATOR IN ACCORDANCE WITH TACHYCARDIA PROTOCOL.

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

- i) If ICD deactivation indications are questionable or deactivation is unsuccessful (or a donut magnet is not available) and undesired shocks continue, medications may be administered for patient comfort.

(1) Administer opioid per Pain Management Protocol.

**OR**



(2) Midazolam 0.1 mg/kg SLOW IVP/IN/IM/IO. Maximum single dose is 5 mg. (Paramedic may perform without consult.)

IN administration max 1 mL per nare

IM administration requires all providers to obtain consultation

- j) Transport to the closest appropriate facility.



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Consult a Pediatric Base Station for children (who have not reached their 18<sup>th</sup> birthday) with an ICD device delivering shock therapy or malfunctioning.

- k) If ICD deactivation indications are questionable or deactivation is unsuccessful (or a donut magnet is not available) and undesired shocks continue, medications may be administered for patient comfort.

(1) Administer opioid per Pain Management Protocol.

**OR**



(2) Midazolam 0.1 mg/kg SLOW IV/IO over 1–2 minutes. Maximum single IV/IN/IO dose 2 mg. Maximum total dose 5 mg. IN administration max 1 mL per nare. If IV cannot be established, administer 0.2 mg/kg IM. Max single IM dose is 5 mg. (IM requires all providers to obtain medical consultation.) Maximum total dose 5 mg.

- l) Transport to the closest appropriate facility.

4. Continue General Patient Care.

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

1. Initiate General Patient Care.
2. Presentation



ACUTE CORONARY SYNDROME (ACS) IS DEFINED AS PATIENTS PRESENTING WITH ANGINA OR ANGINAL EQUIVALENTS SUCH AS SHORTNESS OF BREATH; CHEST, EPIGASTRIC, ARM, OR JAW PAIN OR DISCOMFORT; DIAPHORESIS; AND/OR NAUSEA.

### Inclusion Criteria:

Patient presents with Acute Coronary Syndrome (ACS) symptoms and has one of the following in a diagnostic quality EKG:

- a) Greater than 1 mm of ST elevation in two or more contiguous limb leads
- b) Greater than 1.5 mm of ST elevation in two or more precordial leads (in women)
- c) Greater than 2 mm of ST elevation in two or more precordial leads (in men)
- d) Anterior, Inferior, or Lateral MI: ST elevation greater than 1 mm in two or more contiguous leads **and**

QRS complex is narrower than 0.12 seconds; (if wider than 0.12, you are unable to diagnose as STEMI)

### **OR**

- e) Posterior MI: ST depression greater than 1 mm in V1 and V2 with an R/S ratio of greater than or equal to one **and**  
QRS complex is narrower than 0.12 seconds; (if wider than 0.12, you are unable to diagnose as STEMI)



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

DETECTION OF RIGHT VENTRICULAR AND POSTERIOR WALL INFARCTION IS IMPORTANT, AS APPROXIMATELY 40% OF PATIENTS WITH INFERIOR WALL INFARCTIONS HAVE RIGHT VENTRICULAR AND/OR POSTERIOR WALL INVOLVEMENT, WHICH PREDISPOSES THEM TO MORE COMPLICATIONS AND INCREASED MORTALITY.

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





Consider the following presentations as indicative of increased cardiovascular risk and request guidance from the closest appropriate EMS Base Station or Cardiac Interventional Center.

- a) **Left bundle branch block (LBBB):** LBBB is rare in the setting of acute myocardial infarction and often indicates underlying cardiovascular disease. LBBB is more likely to signal a myocardial infarction if one of the following conditions are met:
  - 1) Patient presents in cardiogenic shock
  - 2) EKG shows excessive ST segment elevation greater than 5 mm
  - 3) EKG shows ST segment deviation (elevation or depression) in the same direction as the QRS complex. This concept is known as inappropriate concordance.
- b) **Wellens' Wave:** Biphasic T waves or deeply inverted T waves in precordial leads (V2-V3, +/-V4).
- c) **ST segment elevation in Lead aVR:** Multilead ST segment depression with coexisting ST segment elevation in lead aVR.
- d) **Hyperacute T waves:** Peaked, broad-based T waves

### 3. Treatment



- a) Follow Chest Pain Protocol for nitrate, aspirin, and pain management.
- b)  If patient meets above STEMI criteria, this patient is a Priority 1 patient and requires a medical consult.
- c) If a patient meets one of the above condition sets for STEMI inclusion criteria, the patient shall be transported to the closest Cardiac Interventional Center by air or ground as long as the delivery time is not more than 45 minutes greater than transport to the nearest ED.
  - (1) When indicated and based on the EMS provider's report, the Base Station physician at the receiving Cardiac Interventional Center will activate its Cardiac Interventional Team.
  - (2) The receiving ED physician will determine if the patient can bypass the ED and go directly to the cardiac catheterization lab to meet the cardiac interventional team.
  - (3) If the patient cannot be delivered to a Cardiac Interventional Center within the allotted time, complete the Fibrinolytic Therapy Checklist for STEMI.
    - (a) If the patient meets all of the criteria for fibrinolytic therapy, transport to the nearest ED.
    - (b)  If the patient does not meet all of the criteria for fibrinolytic therapy, consult with the nearest Cardiac Interventional Center and the nearest ED to determine the most appropriate receiving facility.



## 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.



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CONSULT A PEDIATRIC BASE STATION FOR CHILDREN WITH ST ELEVATIONS WHO HAVE **NOT** REACHED THEIR 18<sup>TH</sup> 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.

## T. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (FROSTBITE)

1. Initiate General Patient Care.

2. Presentation

Exposure to cold environment (not necessarily outdoors). Frostbite usually affects the feet first followed by the hands, face, and/or ears. The skin initially appears reddened, then turns mottled, bluish, white and/or gray with continued freezing of the flesh. Pain persists during initial stages followed by numbness.



3. Treatment

- a) Remove patient from cold environment.
- b) Handle potential frostbitten areas gently.
- c) Cover lightly with gauze.
- d) Protect from further heat loss.



DO NOT RUB THE AFFECTED AREAS, AS THIS WILL CAUSE MORE DAMAGE TO THE FROZEN TISSUE.



- 
- e) Establish IV access with LR.
  - f) Administer opioid per Pain Management Protocol.

**PEDIATRIC SECTION ON NEXT PAGE**

## T. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (FROSTBITE) (Continued)



- 
- g) Remove patient from cold environment.
  - h) Handle potential frostbitten areas gently.
  - i) Cover lightly with gauze.
  - j) Protect from further heat loss



- 
- k) Establish IV/IO access with LR, if appropriate.
  - l) Administer opioid per Pain Management Protocol.
4. Continue General Patient Care.

## U. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (HYPOTHERMIA)

1. Initiate General Patient Care.
2. Presentation
  - a) Mild to moderate hypothermia (90°–95° F)  
Core body temperature (if available) less than 95° F but greater than 90° F. Patient may present with a history of exposure to cold, altered level of consciousness, shivering, stiffness of muscles, stumbling or staggering gait, cool or cold skin, mottled or pale skin, absent or difficult to detect respiratory effort and/or peripheral pulses, respiratory and/or cardiac arrest.
  - b) Severe hypothermia (less than 90° F)
  - c) Core body temperature (if available) less than 90° F. Patient may present with any of the symptoms listed above except shivering.



HANDLE ALL HYPOTHERMIC PATIENTS CAREFULLY. ROUGH HANDLING MAY PRECIPITATE CARDIAC ARREST.

IF HYPOTHERMIA IS SUSPECTED AND THE PATIENT DOES NOT HAVE INJURIES INCOMPATIBLE WITH LIFE, THE PATIENT SHOULD BE RESUSCITATED.



3. Treatment
  - a) Remove the patient from the cold environment.
  - b) Avoid further heat loss by removing wet clothing, replacing with dry blankets and insulating material. Use a thermal type blanket and special attention to covering the patient's head.
  - c) PASSIVELY rewarm patient within a warm environment.
  - d) If available, administer warmed oxygen.



ADMINISTER SHOCK(S) WITH THE AED IF INDICATED.



- For further AED shocks, obtain medical consultation.

## U. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (HYPOTHERMIA) (Continued)



- 
- f) Monitor EKG closely.
  - g) Establish IV access with LR, if appropriate.
  - h) Identify rhythm and treat according to appropriate algorithm.



CONSIDER, WITH MEDICAL CONSULTATION, CONTINUED CARDIOPULMONARY ARREST PROTOCOLS WITH LONGER MEDICATION INTERVALS.

- 4. Continue General Patient Care.

## V. ENVIRONMENTAL EMERGENCIES: DEPRESSURIZATION

1. Initiate General Patient Care.

2. Presentation

History of SCUBA, breathing in a pressurized environment, or altitude chamber usage with sudden depressurization. Patients may present with any of the following symptoms: fatigue and itching, pain, vertigo, focal weakness, visual disturbances, speech difficulty, marbled rash, numbness, tingling, confusion, seizure, and/or cardiac arrest.



CONSIDER TRANSPORT TO HYPERBARIC MEDICINE SPECIALTY CENTER.

AEROMEDICAL TRANSPORT MAY BE APPROPRIATE FOR PATIENTS WITH BAROTRAUMA.

FOR ADDITIONAL INFORMATION CONCERNING SCUBA INJURIES, CONTACT THE DIVING ALERT NETWORK VIA EMRC 1-800-648-3001.



3. Treatment

a) Remove patient from water.

b) Protect patient from and/or treat for hypothermia.



---

c) Establish IV access with LR.

4. Continue General Patient Care.

## W. ENVIRONMENTAL EMERGENCIES: HAZARDOUS MATERIALS EXPOSURE

1. Initiate General Patient Care.

2. Presentation

Exposure to a known or unknown hazardous material. Patient may present with a wide array of signs and symptoms due to the variables of substance exposure. Any patient who is exposed to a hazardous material is considered contaminated until the patient is decontaminated thoroughly.

3. Treatment



DO NOT ENTER THE SCENE UNLESS PROPERLY TRAINED AND EQUIPPED TO DO SO.

PROPER LEVELS OF PERSONAL PROTECTIVE EQUIPMENT (PPE) ARE TO BE WORN BY ALL PERSONNEL, DEPENDING ON THE MATERIAL INVOLVED AND THE ZONE OCCUPIED.

IT IS ESSENTIAL TO HAVE THE EMS PROVIDER IN CHARGE NOTIFY EMRC AND POTENTIAL RECEIVING HOSPITALS OF A HAZARDOUS MATERIALS EVENT IN WHICH THEY MAY BE CONSULTED. NOTIFY EMRC/RECEIVING HOSPITALS ABOUT THE FIRST PATIENT'S ETA, THE NUMBER OF VICTIMS, AND THE TYPE OF HAZARDOUS MATERIAL AS SOON AS INFORMATION BECOMES AVAILABLE.

a) Transport of patients even after decontamination will be by ground units only.



THE USE OF AEROMEDICAL TRANSPORT IS CONTRAINDICATED FOR ANY POTENTIALLY CONTAMINATED PATIENT




b) Triage and decontaminate if indicated.


c) Protect the patient from the environment and ensure the patient is not/does not become hypothermic.



---

d) Establish IV access with LR in a clean area if medication administration is anticipated.

e)  Consider antidote to specific agent if available.

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



**W. ENVIRONMENTAL EMERGENCIES: HAZARDOUS MATERIALS EXPOSURE**  
**(Continued)**

g) Medical Follow-Up

All public safety personnel who come into close contact with hazardous materials should receive an appropriate medical examination, post-incident, based on information from the designated poison control center. This should be completed within 48 hours of the incident and compared with the findings of any recent pre-incident examination. Personnel who routinely respond to hazardous materials emergencies should have periodic pre-incident examinations. Personnel should be advised of possible latent symptoms at the time of their exams.

4. Continue General Patient Care.

## X. ENVIRONMENTAL EMERGENCIES: HEAT-RELATED EMERGENCIES

1. Initiate General Patient Care
2. Presentation
  - a) **Heat Cramps:** Moist, cool skin, cramps, normal to slightly elevated temperature
  - b) **Heat Exhaustion:** Moist, cool skin, cramps, weakness, dizziness, normal to elevated temperature, nausea
  - c) **Heat Stroke:** Hot, dry skin (25% of patients will still be moist), seizures, altered mental status, dilated pupils, rapid heart rate, or arrhythmia



3. Treatment
  - a) Remove patient from hot environment.
  - b) Cool patient as appropriate.



DO NOT GIVE ANYTHING BY MOUTH TO A PATIENT WITH AN ALTERED MENTAL STATUS.

- c) If patient is fully conscious and not nauseated, give electrolyte-rich fluid by mouth if available.
- d) If **heat stroke**, aggressively cool patient and place patient in semi-fowler's position.



- 
- e) Establish IV access with LR.
  - f) Administer fluid bolus, if appropriate.  
20 mL/kg of LR IV  
Titrate to a systolic pressure of 100 mmHg.
4. Continue General Patient Care.

## Y. ENVIRONMENTAL EMERGENCIES: NEAR-DROWNING

1. Initiate General Patient Care.
2. Presentation  
Confirmed or suspected near drowning, altered level of consciousness, dyspnea, cyanosis, vomiting, seizures, or cardiopulmonary arrest.



3. Treatment
  - a) Remove patient from water.



ABDOMINAL THRUSTS ARE CONTRAINDICATED, UNLESS THE PATIENT HAS A FOREIGN BODY AIRWAY OBSTRUCTION.

ALL NEAR-DROWNING VICTIMS SHOULD BE TRANSPORTED EVEN IF THEY APPEAR UNINJURED OR APPEAR TO HAVE RECOVERED.

ENTER WATER ONLY IF TRAINED AND AS A LAST RESORT.  
(REACH, THROW, ROW, GO WITH ASSISTANCE)

- b) Protect from and/or treat for hypothermia.



- 
- c) Establish IV access with LR.
    - d) Identify rhythm and treat according to appropriate algorithm.



- 
- e) Protect from and/or treat for hypothermia.



- 
- f) Establish IV/IO access with LR.
    - g) Identify rhythm and treat according to appropriate algorithm.



IF THE PARENT OR GUARDIAN REFUSES MEDICAL CARE OR TRANSPORT, PROVIDER SHALL CONTACT A **PEDIATRIC BASE STATION** PHYSICIAN.

4. Continue General Patient Care.

## Z. ENVIRONMENTAL EMERGENCIES: OVERPRESSURIZATION

1. Initiate General Patient Care.

2. Presentation

History of SCUBA, breathing in a pressurized environment and altitude chamber or exposure to blast concussion waves. Patients may present with any of the following symptoms: fatigue and itching, pain, vertigo, visual disturbances, dyspnea, bleeding from any body orifice, hearing difficulty, speech difficulty, numbness, tingling, confusion, seizure, and/or cardiac arrest.



ASSOCIATED INJURIES MAY MAKE ASSESSMENT AND COMMUNICATION DIFFICULT. SYMPTOMS MAY BE SLOW TO PRESENT.

AEROMEDICAL TRANSPORT MAY BE APPROPRIATE FOR PATIENTS WITH BAROTRAUMA.

FOR ADDITIONAL INFORMATION CONCERNING SCUBA INJURIES, CONTACT THE DIVING ALERT NETWORK VIA EMRC 1-800-648-3001.



3. Treatment

a) Treat associated trauma.



---

b) Establish IV access with LR.

c) Administer fluid bolus, if appropriate.  
20 mL/kg of LR IV  
Titrate to a systolic pressure of 100 mmHg.

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 acupuncture 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.

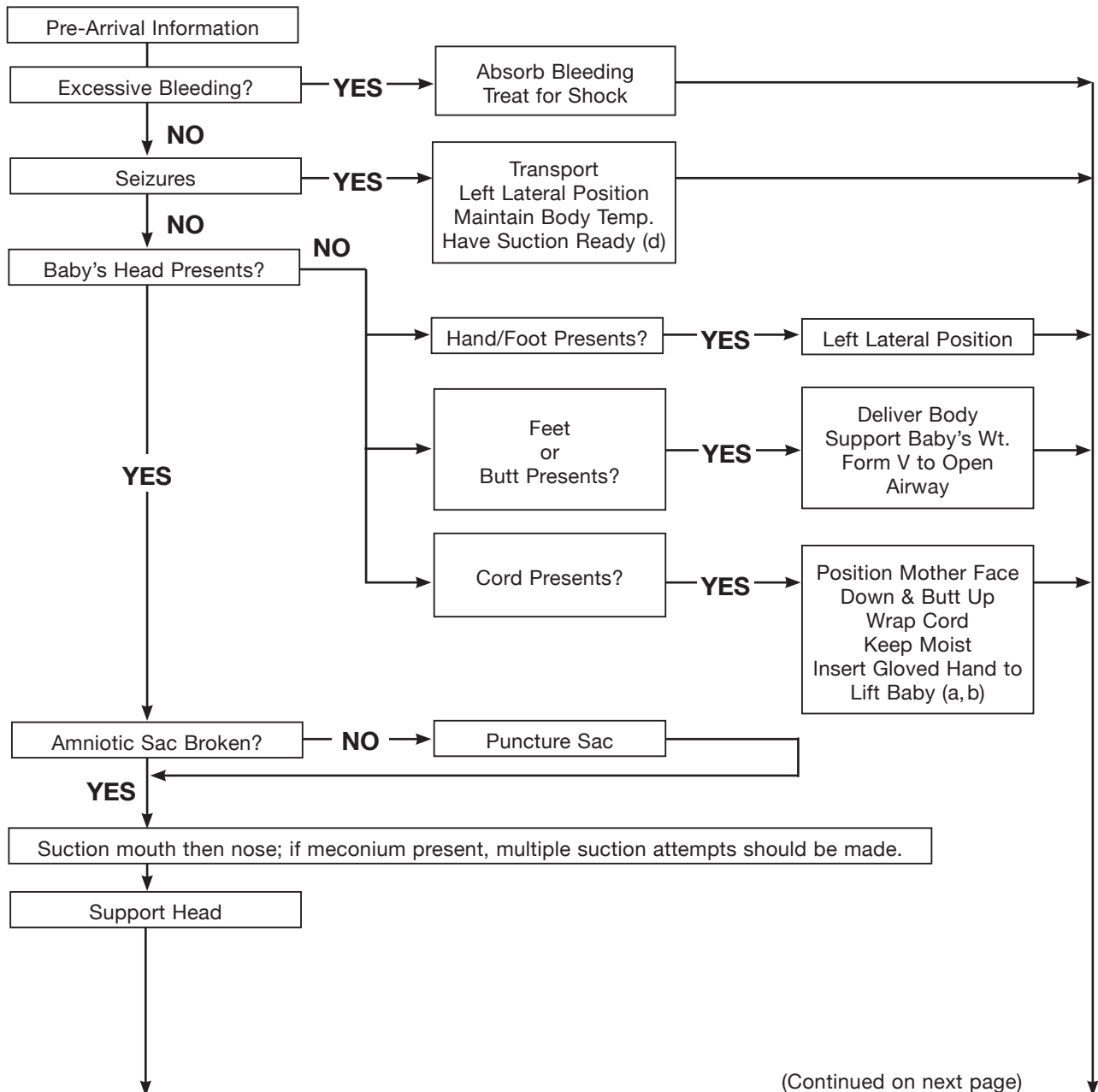
## CC. OBSTETRICAL/GYNECOLOGICAL EMERGENCIES: CHILDBIRTH ALGORITHM

1. Initiate General Patient Care.

2. Presentation

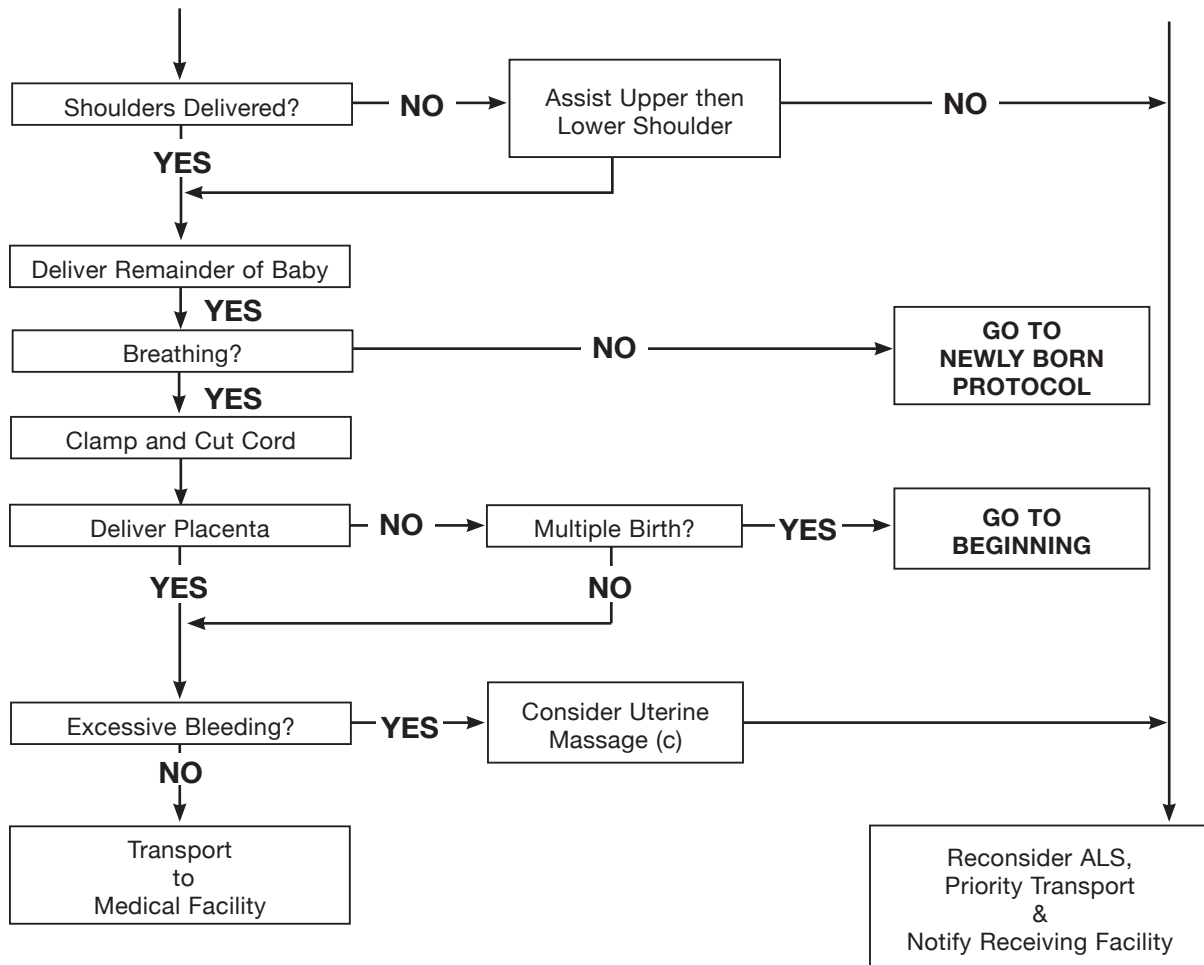
Patient presents pregnant, with contractions and/or pain, accompanied by bleeding or discharge, crowning during contraction, the feeling of an impending bowel movement, and/or a rock-hard abdomen.

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)

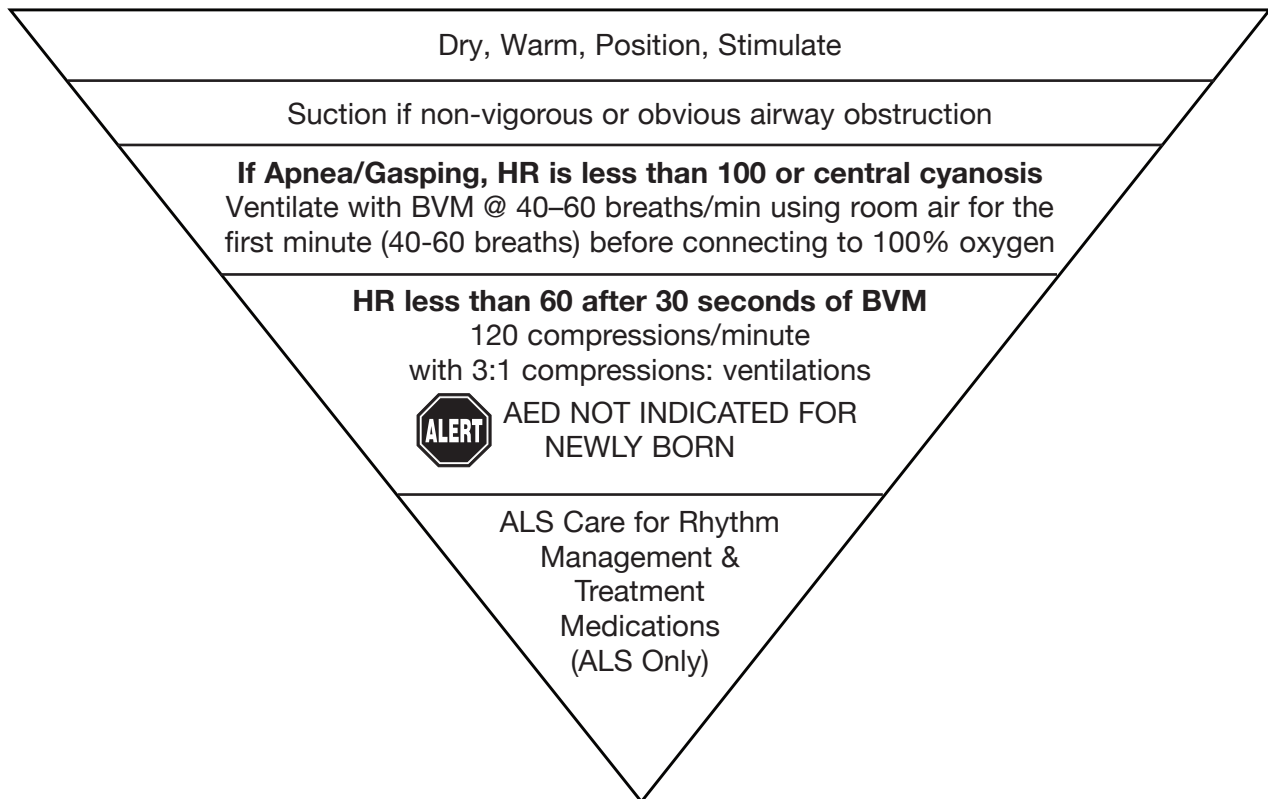


1. Initiate General Patient Care.

2. Presentation

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

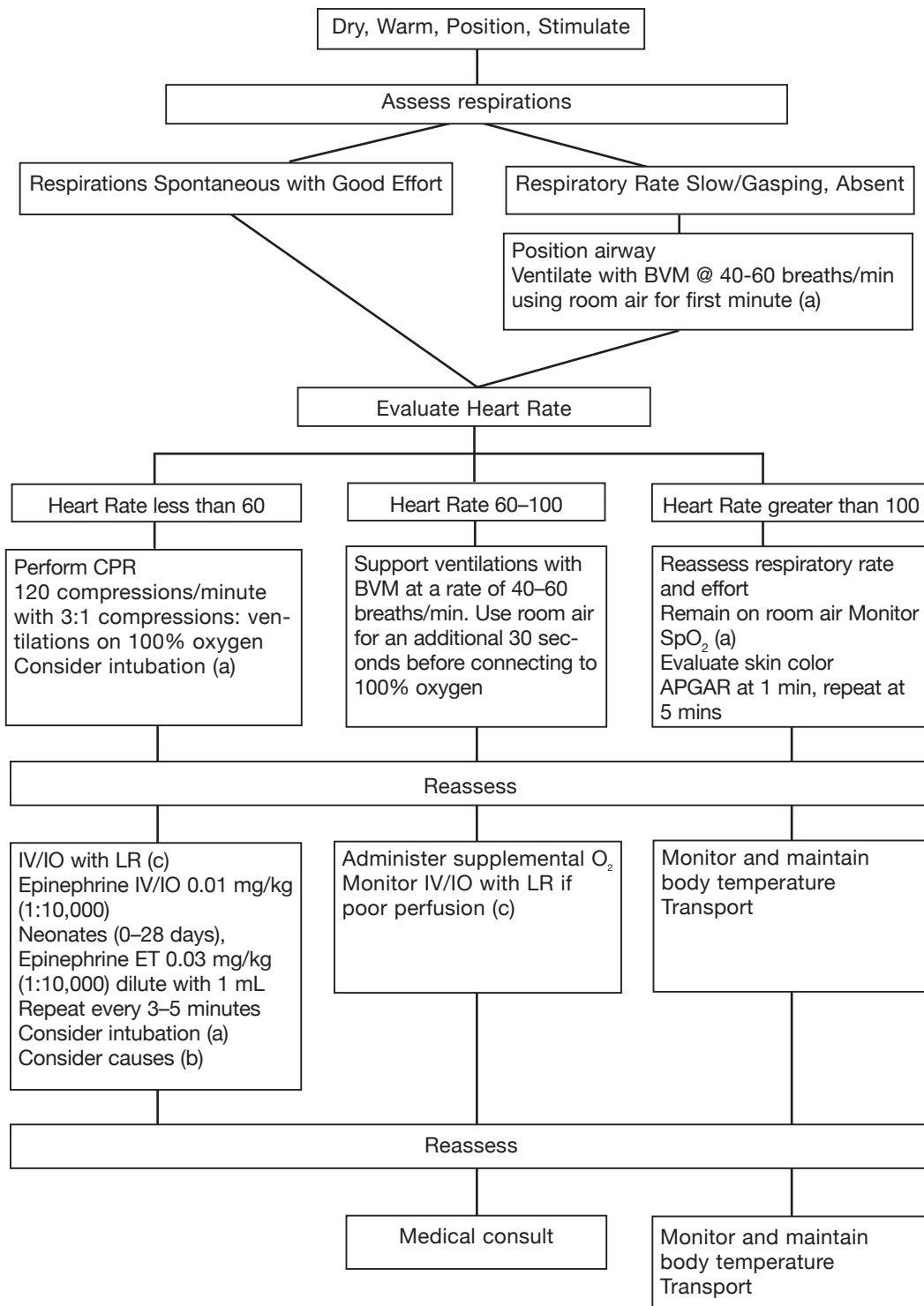
### UNIVERSAL ALGORITHM FOR THE NEWLY BORN FOR BLS





3.

### UNIVERSAL ALGORITHM FOR NEWLY BORN FOR ALS



## DD. NEWLY BORN PROTOCOL (Continued)

(a) - Acceptable Target SpO<sub>2</sub> 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
<b>MUSCLE TONE (ACTIVITY)</b>	LIMP	SOME FLEXION	ACTIVE, GOOD FLEXION
<b>PULSE</b>	ABSENT	LESS THAN 100/MIN	GREATER THAN 100/MIN
<b>REFLEX IRRITABILITY* (GRIMACE)</b>	NO RESPONSE	SOME GRIMACE OR AVOIDANCE	COUGH, CRY OR SNEEZE
<b>COLOR (APPEARANCE)</b>	BLUE, PALE	PINK BODY, BLUE HANDS/FEET	PINK
<b>RESPIRATIONS</b>	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

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 SpO<sub>2</sub> 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:
    - (a) **any** of the following diagnostic indicators:
      - (i) Patient (transcutaneous or blood) carboxyhemoglobin value of greater than 15%
      - (ii) Alarm of EMS or fire agency maintained passive carbon monoxide monitor
      - (iii) Targeted atmospheric carbon monoxide value 100 ppm or greater in the patient environment
    - (b) **and** one or more of the following:
      - (i) History of loss of consciousness during exposure (may have since resolved)
      - (ii) GCS persistently less than or equal to 13
      - (iii) Rapid decline of neurological symptoms including actively seizing patients with appropriate airway stabilization
      - (iv) Pregnancy
      - (v) Chest pain
      - (vi) Extremes of age
      - (vii) 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

## 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 IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**




Consider additional doses of naloxone.



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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); **OR** administer 4 mg/0.1 mL IN in one nare. Repeat as necessary to maintain respiratory activity. **(NEW '18)**

- 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.

## GG. OVERDOSE/POISONING: ABSORPTION (Continued)



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

Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.


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





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

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

Aged 28 days to adult: Administer 0.1 mg/kg 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); **OR** administer 4 mg/0.1 mL IN in one nare. May be repeated as necessary to maintain respiratory activity. ET dose: 0.2–0.25 mg/kg. **(NEW '18)**

- q)  If **organophosphate poisoning**, consider atropine 0.02 mg/kg IV/IO or IM every 5–10 minutes.

- r)  Consider antidote to specific agent if available.

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

4. Continue General Patient Care.

## HH. OVERDOSE/POISONING: INGESTION

1. Initiate General Patient Care.

2. Presentation

Patient may exhibit any of the following: nausea, vomiting, diarrhea, altered mental status, abdominal pain, rapid or slow heart rate, dyspnea, seizures, arrhythmias, chemical burns around or inside the mouth, or abnormal breath odors.

3. Treatment



DO NOT GIVE ANYTHING BY MOUTH WITHOUT MEDICAL CONSULTATION!

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



a) Identify substance and amount ingested.

b)  Consider activated charcoal **without** Sorbitol 1 gram/kg PO.

c) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**


Consider additional doses of naloxone.




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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); **OR** administer 4 mg/0.1 mL IN in one nare. Repeat as necessary to maintain respiratory activity. **(NEW '18)**

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






f)  If **dystonic, extrapyramidal, or mild allergic reaction**, consider diphenhydramine.  
25 mg IV or IM

## 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 **(NEW '18)**



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:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**





## HH. OVERDOSE/POISONING: INGESTION (Continued)



- p) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Aged 28 days to adult: Administer 0.1 mg/kg 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); **OR** administer 4 mg/0.1 mL IN in one nare. May be repeated as necessary to maintain respiratory activity. ET dose: 0.2–0.25 mg/kg. **(NEW '18)**
- 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 18<sup>th</sup> 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 **(NEW '18)**



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 with LR)
- 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.



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, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

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 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); **OR** administer 4 mg/0.1 mL IN in one nare. Repeat as necessary to maintain respiratory activity. **(NEW '18)**  
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:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

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:**  
Aged 28 days to adult: Administer 0.1 mg/kg 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); **OR** administer 4 mg/0.1 mL IN in one nare. May be repeated as necessary to maintain respiratory activity. ET dose: 0.2–0.25 mg/kg. **(NEW '18)**
  - 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.

## LL. EXCITED DELIRIUM SYNDROME (ExDS)

1. Initiate General Patient Care
2. Presentation:
  - a) Excited delirium syndrome (ExDS) is a potentially life-threatening condition in which a person is in a psychotic and extremely agitated state. Mentally, the subject is unable to process rational thoughts or to focus their attention. Physically, the body's systems are functioning at such a high rate that they begin to shut down and fail. When these two factors occur at the same time, a person can act erratically enough that they become a danger to self and to the public.
  - b) History of present illness often includes:
    - (1) Ingestion of a stimulant or hallucinogenic drug
    - (2) Drug/alcohol withdrawal
    - (3) Psychiatric patient who is off of medication
  - c) Signs and symptoms: ExDS is characterized as having a minimum of bizarre and aggressive behavior and one of the above history. The more signs and symptoms the patient exhibits, the more likely the patient is to have ExDS and the higher the risk for complications.
    - (1) Tachycardia
    - (2) Hypertension
    - (3) High body temperature
    - (4) Dilated pupil
    - (5) Incoherent or nonsensical speech
    - (6) Rapid or inconsistent breathing patterns
    - (7) Paranoia
    - (8) Skin changes:
      - (a) Hot/dry skin (in the anticholinergic patient)
      - (b) Profuse sweating (in the cocaine/MDMA/methamphetamine patient)
    - (9) Shivering
    - (10) Inappropriate removal of clothing
    - (11) Patients who present after receiving multiple TASER or other less lethal energy by law enforcement



MANY LIFE-THREATENING MEDICAL EMERGENCIES PRESENT WITH SIMILAR SIGNS OF EXDS. EXAMPLES INCLUDE HYPOGLYCEMIA, HYPOXIA, SEIZURES, HEAD INJURIES, AND SEPSIS. EMS PROVIDERS MUST ALWAYS ASSESS FOR THE POSSIBILITY OF OTHER EMERGENCY MEDICAL CAUSES FOR THE PATIENT'S PRESENTATION.



ANOTHER KEY SYMPTOM THAT OCCURS JUST PRIOR TO THE ONSET OF SUDDEN DEATH IN A PATIENT EXPERIENCING EXDS IS "INSTANT TRANQUILITY." THIS SYMPTOM IS NOTED WHEN A PATIENT WHO HAS BEEN VERY VIOLENT AND AGITATED SUDDENLY BECOMES QUIET AND LETHARGIC. THIS IS A SIGN OF IMMINENT CARDIOPULMONARY ARREST. PATIENTS WHO HAVE UNDERGONE PERIODS OF PROLONGED PHYSICAL STRUGGLE WITHOUT SEDATION WITH MEDICATION ARE AT HIGH RISK FOR CARDIAC ARREST. ALL EFFORTS MUST BE MADE BY ALS PROVIDERS TO EXPEDITIOUSLY ADMINISTER MEDICATION TO THE AGITATED AND STRUGGLING EXDS PATIENT. **(NEW '18)**

## LL. EXCITED DELIRIUM SYNDROME (ExDS) (Continued)



3. Treatment (BLS) **(NEW '18)**
- a) Ensure scene is secure and safe.
  - b) Initiate patient care.
    - (1) Obtain a measured temperature, as these patients often have severe hyperthermia.
    - (2) If possible, attempt to identify the amount, route, and time of any substance ingested.
    - (3) Suspected ExDS patients with evidence of head injury or traumatic mechanism of injury should receive Spinal Protection Protocol.
  - c) Patients displaying signs of ExDS do not have medical capacity to refuse care.
    - (1) If a suspected ExDS patient resists the delivery of care, ALS resources, EMS supervisors (where available), and law enforcement shall be requested to facilitate the treatment and transport of the patient in a safe and effective manner.
    - (2) Patients who exhibit violent behavior shall require a police officer to accompany the patient during transport. Appropriate physical restraint procedures should be utilized per Restraint Protocol.




PATIENTS DISPLAYING SIGNS AND SYMPTOMS OF EXDS SHALL BE TREATED AND TRANSPORTED AT THE ADVANCED LIFE SUPPORT LEVEL. ALS CARE AND TREATMENT WILL BE GUIDED BY THE SIGNS AND SYMPTOMS THAT THE PATIENT IS EXHIBITING, AS WELL AS POSSIBLE OCCULT INJURIES THAT MAY HAVE OCCURRED WHILE THE INDIVIDUAL WAS BEING SUBDUED. THE APPROPRIATE LIFESAVING TREATMENT FOR EXDS IS THE ADMINISTRATION OF MEDICATION, FLUID RESUSCITATION, AND DECREASING HYPERTHERMIC CORE BODY TEMPERATURE.



PATIENTS WHO HAVE RECEIVED MULTIPLE ROUNDS OF ENERGY FROM CONDUCTED ELECTRICAL WEAPONS (INCLUDING T.A.S.E.R.) AND ARE DISPLAYING SIGNS OF EXDS ARE AT HEIGHTENED RISK FOR SUDDEN CARDIAC DEATH. THESE PATIENTS SHOULD BE TREATED WITH MEDICATION AND CLOSELY MONITORED FOR ANY EVIDENCE OF HEMODYNAMIC COLLAPSE.



- d) Establish IV/IO access. Consider blood draw if possible.
- e) Administer 20 mL/kg IV fluid bolus LR if tachycardiac and/or hyperthermic.
- f) Check glucometer and treat accordingly.
- g) Administer ketamine.
  - (1) Administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg.
    - (a) If severe agitation persists, administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg. Maximum total IV/IO dose 200 mg.
    - (b) If agitation persists after second dose of ketamine, consider midazolam 2.5 mg IV/IO.
  - (2) If IV/IO unavailable:
    - (a) Administer 4 mg/kg IM. Maximum total IM dose 400 mg.
    - (b) If severe agitation persists after IM ketamine dose, administer midazolam 5 mg IM.
    - (c)  Additional dose of 4 mg/kg IM ketamine for persistent agitation requires medical consultation.




## LL. EXCITED DELIRIUM SYNDROME (ExDS) (Continued)

- h) Consider the administration of cold packs to the groin, neck, and axilla for patients displaying evidence of hyperthermia.



PATIENTS DISPLAYING SIGNS AND SYMPTOMS OF ExDS SHOULD NOT RECEIVE HALDOL AND/OR BENADRYL FOR CHEMICAL RESTRAINT. THESE MEDICATIONS MAY WORSEN AN ANTICHOLINERGIC CRISIS. HALDOL MAY INCREASE THE POSSIBILITY OF CARDIAC DYSRHYTHMIA BY PROLONGING THE QT INTERVAL, AND MAY ALSO INCREASE THE CHANCES OF A SEIZURE BY LOWERING THE BODY'S SEIZURE THRESHOLD.



- i) Establish IV/IO access. Consider blood draw if possible.
- j) Administer 20 mL/kg IV fluid bolus LR if tachycardiac and/or hyperthermic.
- k) Check glucometer and treat accordingly.
- l) Administer ketamine.
  - (1)  Patients who have not yet reached their 13<sup>th</sup> birthday require medical consultation: Administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg. Maximum total IV/IO dose 200 mg.
  - (2) Patients aged 13 years to not yet reached their 18<sup>th</sup> birthday: Administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg. Maximum total dose 200 mg.
  - (3) If severe agitation persists, administer repeat dose 1 mg/kg IV/IO to a maximum single dose of 100 mg.
  - (4) If agitation persists after second dose of IV/IO ketamine, consider midazolam 0.1 mg/kg SLOW IVP/IO over 1–2 minutes. Maximum single dose 2.5 mg.
  - (5) If IV/IO is unavailable:
    - (a)  Patients who have not yet reached their 13<sup>th</sup> birthday require medical consultation: Administer 4 mg/kg IM. Maximum IM dose 400 mg.
    - (b) Patients aged 13 years to not yet reached their 18<sup>th</sup> birthday: Administer 4 mg/kg IM. Maximum IM dose 400 mg.
    - (c) If severe agitation persists, administer midazolam 2.5 mg IM.
    - (d)  Additional dose of 4 mg/kg IM ketamine for persistent agitation requires medical consultation.
- m) Consider the administration of cold packs to the groin, neck, and axilla for patients displaying evidence of hyperthermia.

### 4. Continue General Patient Care.

## MM. PAIN MANAGEMENT



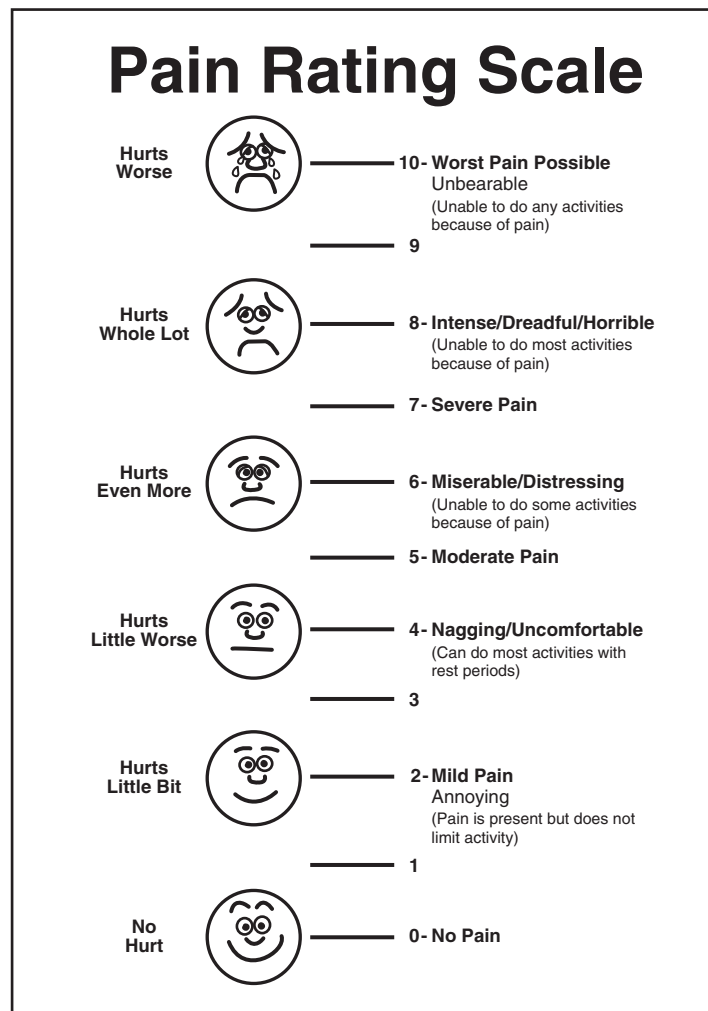
1. Initiate General Patient Care.

2. Presentation

Pain may be present in many different conditions. Management of pain in the field can help to reduce suffering, make transport easier, and allow the emergency department personnel to initiate specific treatment sooner.

3. Treatment Indications

- a) Measure level of pain. Ask adults to rate their pain on a scale from 0 (**no pain**) to 10 (**worst pain imaginable**). Young children can be asked to rate their pain using the **FACES** scale, which provides 5 levels of pain perception.





## 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.




- 
- 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 analgesic, including patients who are MOLST and/or EMS/DNR patients or being pre-medicated for a procedure .

## 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/IO/IN/IM. IN administration max 1 mL per nare (**NEW '18**)
  - (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) Ketamine IV/IO/IN/IM (**NEW '18**)



INDICATED FOR MUSCULOSKELETAL EXTREMITY/BACK PAIN. NOT FOR CHEST PAIN, ABDOMINAL/FLANK PAIN, OR HEADACHE.


- (i) Administer 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - a. Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - b. If IV unavailable, administer 0.5 mg/kg IN/IM (If delivery device is available; divide administration of the dose equally between the nares to a maximum of 1 mL per nare).
  - c. Reassess in 15 minutes, If pain remains moderate to severe, then administer a second dose of ketamine 0.5 mg/kg IN/IM.



- 
- (d) 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**

## MM. PAIN MANAGEMENT (Continued)

- (e) Fentanyl IV/IO/IN/IM. IN administration max 1 mL per nare **(NEW '18)**
  - (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.
- (f) Ketamine IV/IO/IN/IM **(NEW '18)**



INDICATED FOR MUSCULOSKELETAL EXTREMITY/BACK PAIN. NOT FOR CHEST PAIN, ABDOMINAL/FLANK PAIN, OR HEADACHE.

- (i) Administer 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - a. Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - b. If IV unavailable, administer 0.5 mg/kg IN/IM (If delivery device is available; divide administration of the dose equally between the nares to a maximum of 1 mL per nare).
  - c. Reassess in 15 minutes, If pain remains moderate to severe, then administer a second dose of ketamine 0.5 mg/kg IN/IM



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 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. **(NEW '18)**




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.

- 4. Continue General Patient Care. **(NEW '18)**



## 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  
5 years of age or greater: 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  
5 years of age or greater: 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.  
5 years of age or greater: 0.5 mg 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.



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) 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.
  - 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.



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

- w)  Consider additional doses of albuterol or epinephrine.

## 4. Continue General Patient Care.

## QQ. RESPIRATORY DISTRESS: CROUP



1. Initiate General Patient Care.

2. Presentation

Forms of Croup:

**Mild** - Barky cough exhibited without stridor at rest (Priority 2)

**Moderate** - Barky cough with stridor at rest without agitation, may exhibit mild respiratory distress (Priority 2)

**Severe** - Stridor at rest, signs of severe respiratory distress that is associated with agitation or decreased level of consciousness (Priority 1)



IF EPIGLOTTITIS IS SUSPECTED, I.E., DROOLING WITH ABOVE SIGNS AND SYMPTOMS, DO NOT INITIATE THIS PROTOCOL WITHOUT APPROPRIATE MEDICAL DIRECTION.



3. Treatment

a) Ensure that the patient has a patent airway and adequate respiratory effort. Assess respiratory status looking specifically for signs and/or symptoms of respiratory distress (nasal flaring, retractions, increased/decreased respirations, skin color, change in level of consciousness).




b) Place patient on cardiac monitor and record vital signs. (This may be done concurrently with medication administration if patient is unstable.)

c) MILD: For children exhibiting symptoms of a mild croup presentation, administer dexamethasone 0.5 mg/kg PO up to a maximum dose of 10 mg.

d) MODERATE: For children who exhibit symptoms of a moderate croup presentation, administer dexamethasone 0.5 mg/kg PO up to a maximum dose of 10 mg. If no change in patient's condition, then administer 2.5 mL of epinephrine 1:1,000 via nebulizer.

e) SEVERE: If respiratory distress is so severe that respiratory arrest is imminent:  
(1) First, administer 0.01 mg/kg of epinephrine 1:1,000 IM (max single dose of 0.5 mg).

(2) Then administer dexamethasone 0.5 mg/kg IV up to a maximum dose of 10 mg AND 2.5 mL of epinephrine 1:1,000 via nebulizer. If IV not established, give IM dexamethasone.

f)  Establish communications with the appropriate facility and obtain medical direction if patient is less than 1 year of age, if additional nebulized epinephrine is needed due to level of distress, or if other interventions or directions are needed.



ALL PATIENTS WHO RECEIVE NEBULIZED EPINEPHRINE **MUST** BE TRANSPORTED BY AN ADVANCED LIFE SUPPORT UNIT TO THE APPROPRIATE MEDICAL FACILITY.

4. Continue General Patient Care.

## RR. RESPIRATORY DISTRESS: PULMONARY EDEMA/CONGESTIVE HEART FAILURE

1. Initiate General Patient Care.

2. Presentation

Accurate diagnosis of congestive heart failure (CHF)/acute pulmonary edema (APE) as the cause of respiratory distress can be challenging. The most accurate identification of CHF/APE is made using the medical history, risk factors, medications, and physical exam with interpretation of blood pressure.

CHF/APE is difficult to distinguish, at times, from other respiratory causes. Factors most associated with a short-of-breath patient having CHF include: **a history of CHF**, exam features **of jugular venous distension and EKG evidence of Atrial Fibrillation**. CHF patients are commonly on anti-hypertensive and cardiac medicines. **Orthopnea** (use of additional pillows to prop the head up during sleep), **Dyspnea on Exertion** and **Paroxysmal Nocturnal Dyspnea (PND)** are symptoms associated with CHF/APE. Blood pressure is frequently elevated, usually greater than 160/100 but not uncommonly greater than 180/120.

EMS providers should strongly consider CHF/APE in patients possessing the factors above, presenting with acute respiratory distress, tachypnea, hypoxia, rales, or wheezing and marked hypertension, even in the absence of peripheral edema.



GERIATRIC PATIENTS DEMONSTRATING MARKED HYPERTENSION IN ASSOCIATION WITH SHORTNESS OF BREATH/RESPIRATORY DISTRESS AND WHEEZING (IN THE ABSENCE OF ASTHMA OR INFECTION) STRONGLY SUGGESTS CHF/APE.

Acute Respiratory Distress from CHF may range from mild to severe, life-threatening cases of Acute Pulmonary Edema. This classification is for patients with Systolic BP greater than 110 mmHg.

- a) **Asymptomatic – dyspnea on exertion but no symptoms at rest.**
- b) **Mild – mild dyspnea at rest, despite O<sub>2</sub> treatment. Able to speak in full sentences.**
- c) **Moderate – moderate dyspnea. O<sub>2</sub> saturation less than 93% on oxygen. Systolic BP usually greater than 150. Unable to speak in full sentences. Normal mental status.**
- d) **Severe – severe dyspnea, respiratory failure, hypoxia (O<sub>2</sub> saturation less than 90% on oxygen), diaphoresis, Systolic BP commonly greater than 180. One word sentences, altered consciousness.**

The goals of treatment are to reduce the pressure of blood returning to the heart (preload) and the resistance that the left ventricle must pump against (afterload). The most effective and safe medication for these goals is nitroglycerin (NTG).

## RR. RESPIRATORY DISTRESS: PULMONARY EDEMA/CONGESTIVE HEART FAILURE (Continued)



### 3. Treatment

- a) Position patient in high Fowler's position.
- b) Rate the patient's difficulty breathing on a scale where 0 is "no trouble breathing" and 10 is "the worst trouble breathing."



- 
- c) Continuous positive airway pressure (CPAP) should be considered for moderate dyspnea and must be implemented in severe dyspnea. (Use early; attempt to administer 3 doses of NTG while setting up, acclimatizing the patient, and applying CPAP.)



PERFORM 12-LEAD EKG (IF AVAILABLE), AND IF INFERIOR WALL WITH POSTERIOR WALL EXTENSION MI IS PRESENT, WITHOLD NTG. CONSULT FOR FURTHER ADMINISTRATION.

- d) Establish IV access with LR.
- e) Identify rhythm and treat according to appropriate algorithm.
- f) For patients with hypertension and moderate to severe symptoms, administer NTG (does not require IV before administration). If SBP drops below 90 mmHg, treat with medical fluid bolus: initial bolus 250–500 mL, may repeat once.
  - (1) Asymptomatic - apply oxygen per GPC to maintain O<sub>2</sub> saturation greater than 93%.
  - (2) Mild - administer low dose NTG 0.4 mg SL at 3–5 minute intervals to a maximum dose of 1.2 mg.
  - (3) Moderate and severe - CPAP is preferred therapy. Until CPAP is applied, administer high dose NTG. Assess BP before each administration.




CPAP IS THE PREFERRED THERAPY. DO NOT REMOVE CPAP TO CONTINUE ADMINISTERING NTG.

High Dose NTG until CPAP is applied or if CPAP is not tolerated. (Dose at 3–5 minute intervals.)

- (4) Administer 1 dose of NTG 0.4 mg SL and apply 1 inch of NTG paste.
- (5) Administer 1 dose of NTG 0.8 mg SL.
- (6) Continue 0.8 mg SL NTG dosing to achieve a 20% reduction in SBP.



IF BLOOD PRESSURE IS LOW, CONSIDER MEDICAL FLUID BOLUS(ES) FOLLOWED BY DOPAMINE.




- g)  Consider dopamine 2–20 **mcg**/kg/min. Titrate to SBP 100 mmHg or medical-consultation-directed BP. IV infusion pump preferred.

## RR. RESPIRATORY DISTRESS: PULMONARY EDEMA/CONGESTIVE HEART FAILURE (Continued)



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

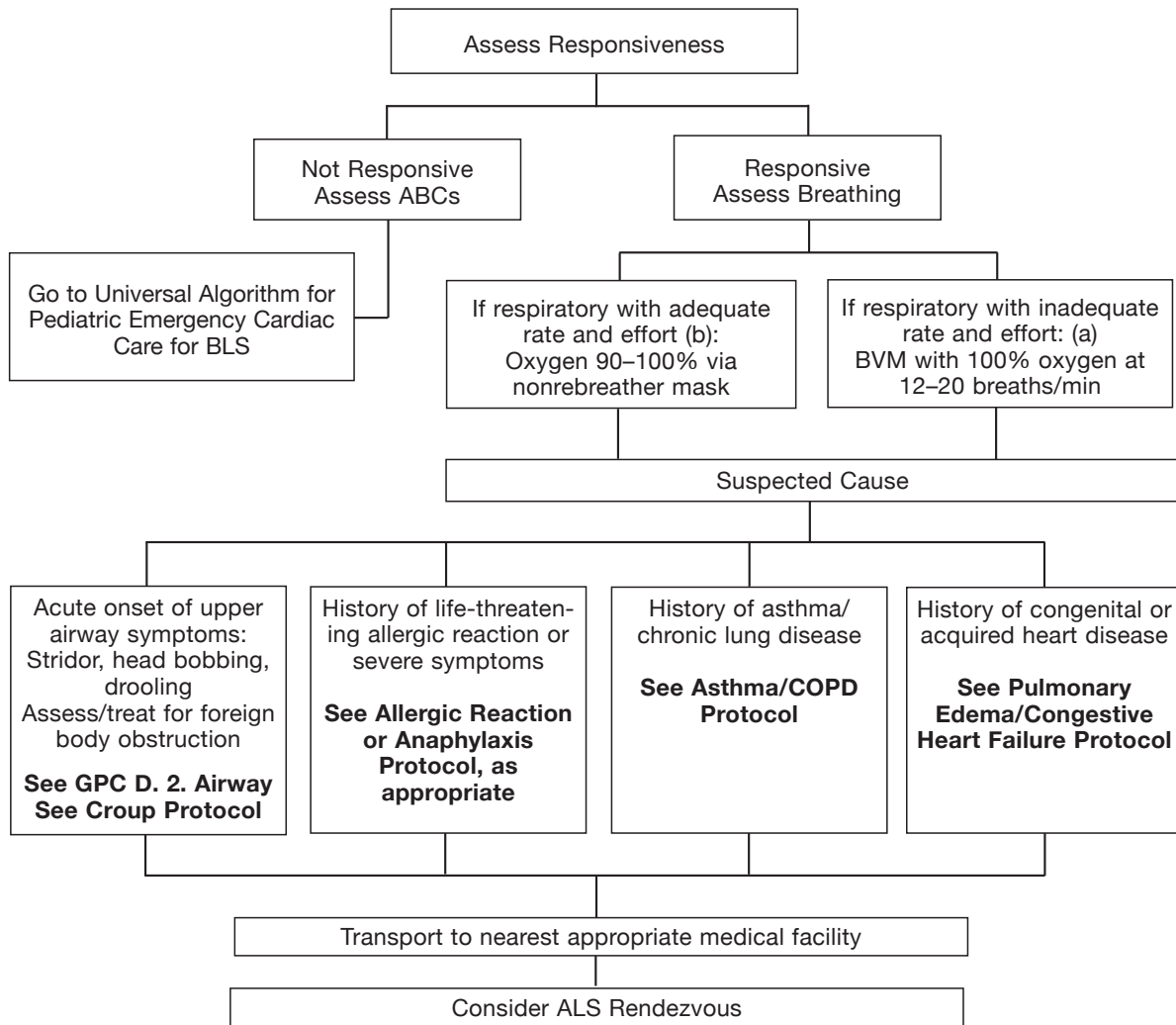


- h) Position patient in semi-Fowler's position.
- 
- i) Establish IV access with LR.
  - j) Identify rhythm and treat according to appropriate algorithm.
  - k) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer.
  - l)  Consider albuterol.  
For children less than 2 years, albuterol 1.25 mg  
For children greater than or equal to 2 years, albuterol 2.5 mg
  - m)  Consider morphine.  
0.1 mg/kg SLOW IVP/IO/IM (1–2 mg/min)  
Maximum dose 5 mg
  - n)  Consider dopamine.  
2–20 **mcg**/kg/min  
Titrate to pediatric medical consultation directed BP.  
IV infusion pump preferred.
- 4. Continue General Patient Care.
  - 5. Consider transport to the pediatric specialty center that follows patient.



6.

### UNIVERSAL ALGORITHM FOR PEDIATRIC RESPIRATORY DISTRESS FOR BLS



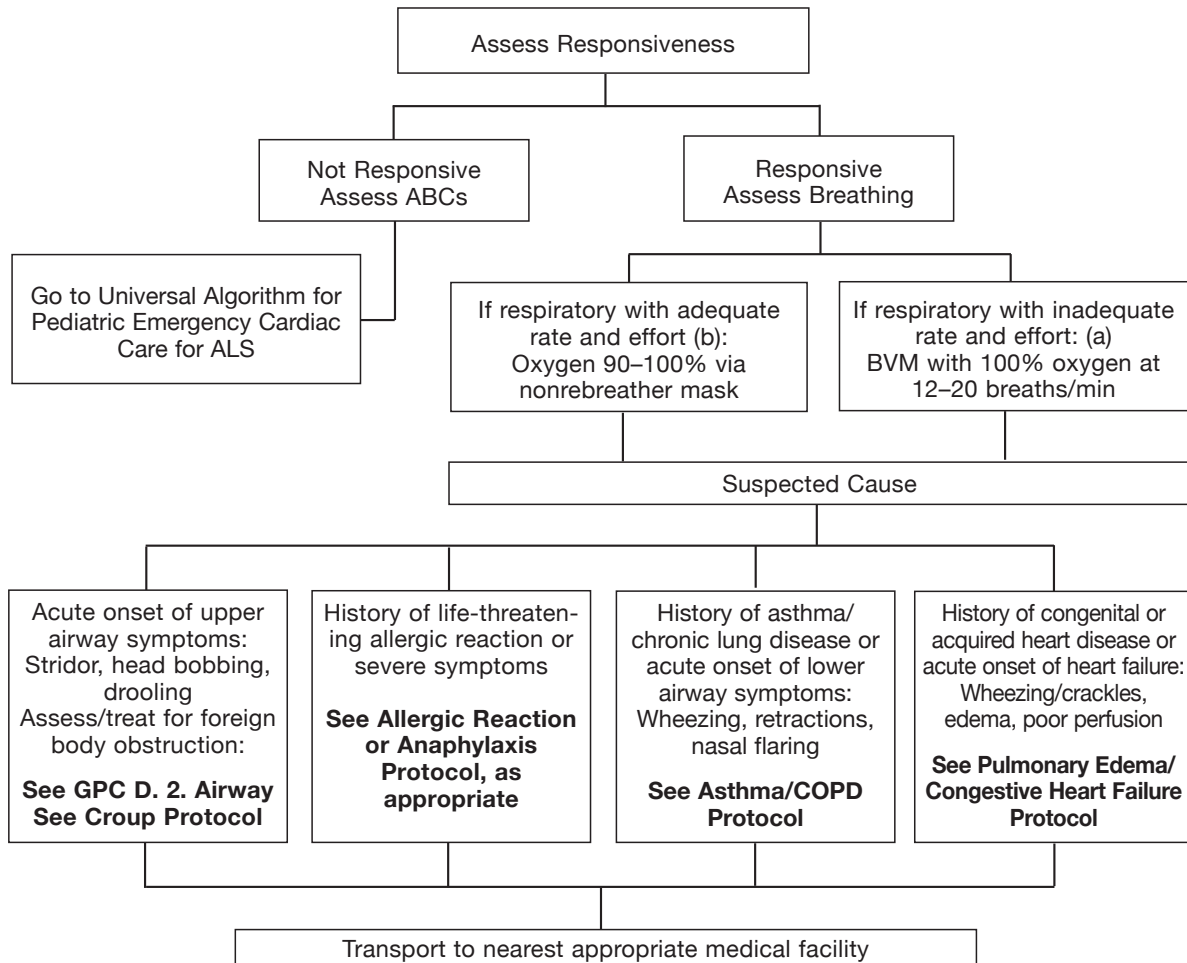
(a) Inadequate RR: Infant less than 20 breaths per minute, Child less than 16 breaths per minute, Adolescent less than 12 breaths per minute. Inadequate effort: Poor chest rise, shallow respirations/poor air movement, cyanosis, severe retractions, paradoxical breathing.

(b) For children with chronic lung disease or congenital heart disease: Maintain or increase home oxygen to maintain patient's target saturations.



7.

## UNIVERSAL ALGORITHM FOR PEDIATRIC RESPIRATORY DISTRESS FOR ALS



(a) Inadequate RR: Infant less than 20 breaths per minute, Child less than 16 breaths per minute, Adolescent less than 12 breaths per minute. Inadequate effort: Poor chest rise, shallow respirations/poor air movement, cyanosis, severe retractions, paradoxical breathing.

(b) For children with chronic lung disease or congenital heart disease: Maintain or increase home oxygen to maintain patient's target saturations.



## 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 EtCO<sub>2</sub> 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 SpO<sub>2</sub> 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).
- h)  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 '18)**

- 4. Continue General Patient Care.


## TT. SEPSIS: PEDIATRIC



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### 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 pediatric septic patient may be difficult to identify due to a poor history or providers may have difficulty identifying an obvious source of infection, as many pediatric sepsis patients are very young children or infants.
- c) The following pediatric patients are at greater risk for sepsis and should have their temperature measured:
  - (1) Altered mental status
  - (2) Asplenia (spleen removed from treatment of trauma or illness)
  - (3) Bone marrow or solid organ transplant
  - (4) Cancer patients
  - (5) Cerebral Palsy
  - (6) Sickle Cell Disease
  - (7) Central or indwelling catheters
  - (8) Immunodeficiency or immunosuppression
  - (9) Bed ridden
  - (10) Severe mental delay
- d) For a pediatric patient, who has not reached their 18<sup>th</sup> birthday, to qualify for this protocol, they must have a known or suspected infection AND also present with at least three of the Pediatric Sepsis Rule-In Criteria by Age.
- e)  A patient not meeting three or more Pediatric Sepsis Rule-In Criteria by Age may be treated under this protocol with Pediatric Base Station approval if sepsis is suspected by the prehospital provider.



### ALTERED MENTAL STATUS REQUIRES GLUCOSE CHECK.

- f) Patients who meet the sepsis rule-in criteria and have at least one of the High risk Sepsis Rule-In Criteria by Age (shaded) should receive aggressive standing order fluid therapy. Other patients meeting the pediatric sepsis rule-in criteria but not having one of the high risk signs may be treated only after contacting a Pediatric Base Station for medical consultation.

## TT. SEPSIS: PEDIATRIC (Continued)

<b>Pediatric Sepsis Rule-In Criteria by Age</b>						
Suspected or known infection plus three criteria						
	<b>Less than 28 days</b>	<b>1-12 months</b>	<b>1 year but less than 2 years</b>	<b>2-4 years</b>	<b>5-12 years</b>	<b>13-17 years</b>
Heart Rate (sustained)	greater than 205 bpm	greater than 205 bpm	greater than 190 bpm	greater than 140 bpm	greater than 140 bpm	greater than 100 bpm
Respiratory Rate	greater than 60 rpm	greater than 60 rpm	greater than 40 rpm	greater than 40 rpm	greater than 34 rpm	greater than 25 rpm
Temp	greater than 38.0 C° or greater than 100.4 F°					
Cap Refill/Skin	Delayed (greater than 3 seconds), mottled					
Systolic BP (mmHg)	less than 60	less than 70	(less than 70+ (age x2))	(less than 70+ (age x2))	(less than 70+ (age x2))	less than 90
Mental Status	Unresponsive, confused, inappropriate, lethargic					
High Risk Condition	Cancer, Asplenia, Sickle Cell Disease, bone marrow or solid organ transplant, central or indwelling line/catheter, immunodeficiency or immunosuppression					
Meeting any of these criteria indicates standing order initiation of a fluid bolus.						



IF A PEDIATRIC PATIENT MEETS THE ABOVE **PEDIATRIC SEPSIS RULE-IN CRITERIA BY AGE**, THIS PATIENT IS A PRIORITY 1 OR 2 PATIENT AND REQUIRES NOTIFICATION AS “SEPSIS ALERT” TO THE NEAREST APPROPRIATE FACILITY PRIOR TO ARRIVAL.



IF A PEDIATRIC PATIENT MEETS ANY OF THE **SEPSIS RULE-IN PLUS ONE OR MORE OF THE SHADED AREAS IN THE CHART**, CONSULTATION WITH A DESIGNATED PEDIATRIC BASE STATION IS REQUIRED AND SHOULD BE COMBINED WITH LOCAL BASE STATION CONSULTATION.

### 3. Treatment




- a) Carefully monitor airway and respiratory status. Manage as required using the appropriate respiratory distress protocol (especially for patients with suspected pneumonia).




- b) Place patient on cardiac monitor.
- c) If patient meets the pediatric sepsis rule-in criteria and meets one of the high risk criteria (shaded), initiate IV/IO access and provide a 20 mL/kg bolus of LR IV/IO over 5–20 min.  
Maximum single dose of 2L.
- d) Monitor closely for signs of respiratory distress, rales or delayed capillary refill (greater than 2 seconds). If respiratory status deteriorates rapidly, stop bolus and obtain medical consultation.
- e) For volume-sensitive children administer initial fluid bolus of 10 mL/kg LR IV/IO (max of 250 mL). (Volume-sensitive children are children who need smaller fluid bolus volumes due to special needs including neonates (birth to 28 days), congenital heart diseases, chronic lung disease, or chronic renal failure.)

**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.
- 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

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 Acute Stroke Ready, Primary, or Comprehensive Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital. Providers should obtain and document a contact telephone number for one or more individuals who have details about the patient’s medical history so that the physician may obtain and validate additional patient information. **(NEW '18)**

## 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 ACUTE STROKE READY, PRIMARY, OR COMPREHENSIVE 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 18<sup>TH</sup> 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. Providers should obtain and document a contact telephone number for one or more individuals who have details about the patient's medical history so that the physician may obtain and validate additional patient information.  
**(NEW '18)**



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

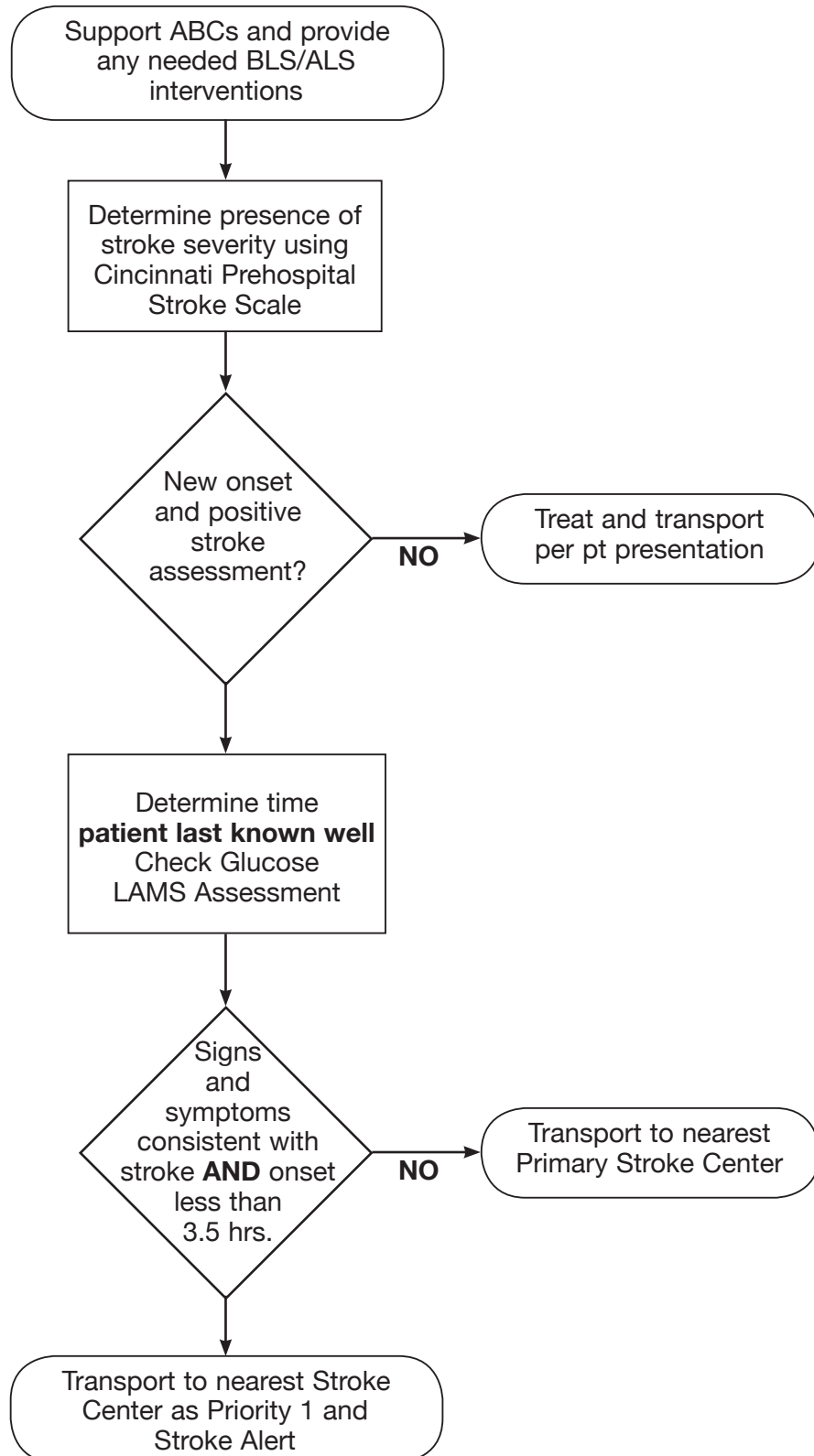
**UU. STROKE: NEUROLOGICAL EMERGENCIES (Continued)**

- 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.



## UU. STROKE: NEUROLOGICAL EMERGENCIES (Continued)

### EMS STROKE ALGORITHM



## UU2. SYNCOPE

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 15<sup>TH</sup> 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.



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.

## VI. TRAUMA PROTOCOL: BURNS (Continued)

- b) Do what is necessary to stop the burning process. If water is used to extinguish the fire, remove wet clothing and dry the patient to prevent hypothermia.
- c) Administer oxygen in as high a concentration of oxygen as possible (*note: pulse oximetry is not reliable in the presence of carbon monoxide or cyanide exposure*).
- d) Determine percent of body surface area (BSA) burned and depth.
- e) Treat associated trauma.
- f) For burns greater than 10%, follow Hypothermia Protocol as well.
- g) Remove all rings, bracelets, and other jewelry.
- h) Cover wounds appropriately (with a clean sheet or Mylar blanket—sterile dressings no longer recommended).
- i) For chemical burns, brush off dry chemical, remove clothing, flush with water.




DO NOT GIVE ANYTHING BY MOUTH.


DO NOT PLACE ICE OR ICE PACKS ON ANY PATIENT WITH BURNS GREATER THAN 5% TOTAL BODY SURFACE AREA.

CONSIDER UTILIZING AEROMEDICAL RESOURCE IF PATIENT IS MORE THAN 30 MINUTES FROM A BURN CENTER/HYPERBARIC MEDICINE SPECIALTY CENTER BY GROUND.



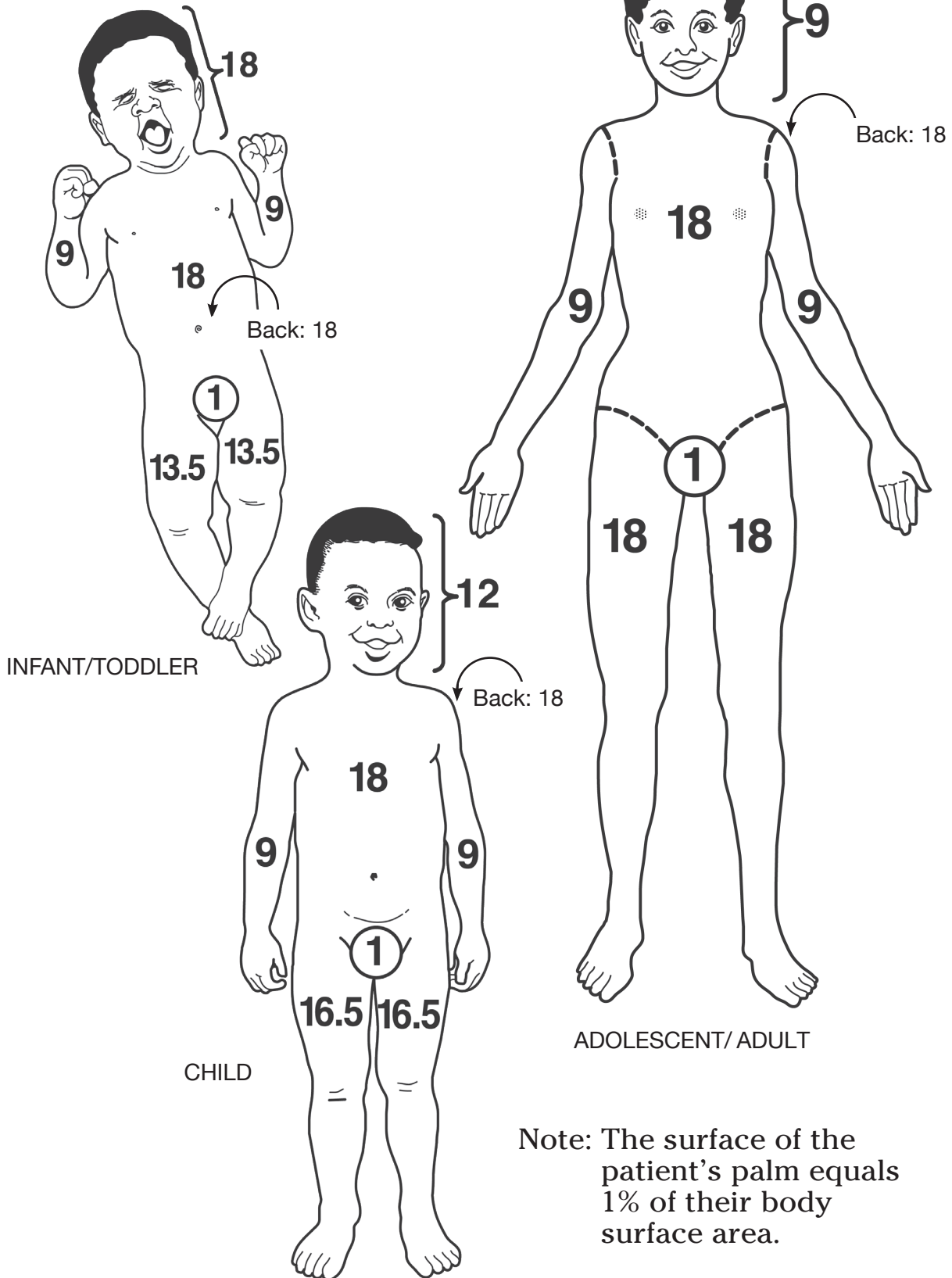
- 
- j) Establish IV access with LR, if appropriate.
    - (1) 10 mL/kg bolus.
    - (2) For shock patients, administer a fluid bolus of 20 mL/kg LR followed by a second 20 mL/kg LR if needed. Titrate to a systolic pressure of 100 mmHg.
  - k) Administer opioid per Pain Management Protocol.
  - l)  Consider additional fluid administration. Maximum dose 2,000 mL without medical consultation.



- 
- m) Establish IV access with LR, if appropriate.
    - (1) 10 mL/kg bolus.
    - (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.
  - n)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO.
  - o) Administer opioid per Pain Management Protocol.

4. Continue General Patient Care.

**RULE OF NINES**



Note: The surface of the patient's palm equals 1% of their body surface area.

## WW. TRAUMA PROTOCOL: EYE TRAUMA

1. Initiate General Patient Care.

2. Presentation

The patient may present with profuse bleeding, avulsions, lacerations, foreign objects, impaled objects, and/or soft tissue damage to the eye(s) and/or surrounding facial areas.

3. Treatment



NEVER APPLY PRESSURE TO THE EYEBALL OR GLOBE!

IF THE PATIENT HAS OTHER ASSOCIATED TRAUMA OR BURNS, TRANSPORT THE PATIENT TO THE APPROPRIATE TRAUMA OR BURN CENTER; OTHERWISE, TRANSPORT THE PATIENT TO THE NEAREST EYE TRAUMA CENTER, IF APPROPRIATE.

DO NOT USE CHEMICAL COLD PACKS ON THE FACE.



- a) **Foreign objects NOT embedded in the eye(s):** Flush with copious amounts of water (preferably sterile), normal saline, or LR from the bridge of the nose outward.
- b) **Injury to orbits (area around the eye):** Consider head stabilization and Spinal Protection Protocol.
- c) **Lacerations/injuries to the eyeball or globe:** Shield affected eyeball and dress other eye to reduce movement and protect loss of fluids; consider head stabilization and spinal protection and elevate the head to decrease intraocular pressure.
- d) **Impaled objects:** Stabilize object, shield affected eyeball, and dress other eye to reduce movement.



- 
- e) Establish IV access with LR, if appropriate.
  - f) Administer opioid per Pain Management Protocol.

## WW. TRAUMA PROTOCOL: EYE TRAUMA (Continued)



- g) **Foreign objects NOT embedded in the eye(s):** Flush with copious amounts of water (preferably sterile), normal saline, or LR from the bridge of the nose outward.
- h) **Injury to orbits (area around the eye):** Consider head stabilization and Spinal Protection Protocol.
- i) **Lacerations/injuries to the eyeball or globe:** Shield affected eyeball and dress other eye to reduce movement and protect loss of fluids; consider head stabilization and spinal protection and elevate the head to decrease intraocular pressure.
- j) **Impaled objects:** Stabilize object, shield affected eyeball, and dress other eye to reduce movement.



- k) Establish IV/IO access with LR, if appropriate.
  - l) Administer opioid per Pain Management Protocol.
4. Continue General Patient Care.



## XX. TRAUMA PROTOCOL: HAND/UPPER/LOWER EXTREMITY TRAUMA

1. Initiate General Patient Care.
2. Presentation
  - a) Patient may exhibit injuries to skeletal or soft tissue components of the hand or upper extremity at or below the level of the mid-humerus, including complete or incomplete amputations of the elements of the hand or upper extremity, crush or degloving injuries, and other trauma resulting in loss of perfusion or suspected nerve injury (e.g., compartment syndrome).

### Upper Extremity

- b) Indications for:

Referral of adult patients to the Curtis National Hand Center at Union Memorial Hospital **or**

Referral of pediatric patients to the nearest Pediatric Trauma Center (children who have **not** reached their 15<sup>th</sup> birthday)

Stable patients with an isolated upper extremity injury at or below the mid-humerus

(Hand Center and/or nearest appropriate trauma center)



- (1) Complete or incomplete hand or upper extremity amputation
- (2) Partial or complete finger or thumb amputation
- (3) Degloving, crushing, or devascularization injuries of hand or upper extremity
- (4) High-pressure injection injuries to hand or upper extremity
- (5) Complicated nerve, vessel, or compartment syndrome (excessive swelling and pain of extremity with possible evolving nerve deficit) injury of the forearm and hand

### Lower Extremity

- c) Indications for Referral to Pediatric or Adult Trauma Center: Patient may exhibit injuries to skeletal or soft tissue components with complete or incomplete amputation of ankle/foot lower extremity, complicated nerve, vessel, or compartment syndrome (excessive swelling and pain of extremity with possible evolving nerve deficit injury).



LIFE BEFORE LIMB.

TOE INJURIES FROM LAWN MOWER ARE NOT CANDIDATES FOR REIMPLANTATION AND PATIENTS SHOULD GO TO THEIR LOCAL MEDICAL FACILITY.

- d) Contraindications for referral to a Hand Center
  - (1) Patients with unstable or abnormal vital signs
  - (2) Patients with major and/or multiple system trauma
- e) Contraindication for referral to Pediatric or Adult Trauma Center  
Patients with toe amputation (partial or complete)

## XX. TRAUMA PROTOCOL: HAND/UPPER/LOWER EXTREMITY TRAUMA (Continued)



### 3. Treatment


- a) Package amputated extremity in sealed plastic bag (keep dry) and place **on top** of ice to keep cool. **DO NOT FREEZE.**




DO NOT SUBMERGE IN WATER OR FREEZE AMPUTATED PART.

USE TIME, DISTANCE, WEATHER, AND PROXIMITY TO DESIGNATED TRAUMA CENTER TO DETERMINE MODE OF TRANSPORT. IF ESTIMATED TRANSPORT TIME TO DESIGNATED HAND CENTER IS LESS THAN 30 MINUTES, USE GROUND TRANSPORT.



- 
- b) Establish IV access with LR, if appropriate.
  - c) Administer fluid bolus, if appropriate.  
20 mL/kg of LR IV  
Titrate to a systolic pressure of 100 mmHg.
  - d) Administer analgesia per Pain Management Protocol.
  - e)  Consider additional fluid administration.  
Maximum dose 2,000 mL without medical consultation



- 
- f) Establish IV/IO 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. If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg LR IV/IO.
  - h)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO.
  - i) Administer analgesia per Pain Management Protocol.

### 4. Continue General Patient Care.

## YY. TRAUMA PROTOCOL: MULTIPLE/SEVERE TRAUMA

1. Initiate General Patient Care.

2. Presentation

The patient may present with hypovolemic or neurogenic shock, hypotension, hypertension, rapid or slow heart rate, unequal pupils, shallow or absent respirations, decreased distal pulses, decreased motor and sensory function in extremities, internal or external bleeding, fractures, or lacerations.



WHILE TIME, DISTANCE, AND PROXIMITY ARE ALL FACTORS TO BE CONSIDERED IN THE TRIAGE DECISION, THE TRAUMA DECISION TREE SHOULD BE USED TO DETERMINE WHO SHOULD BE TRANSPORTED TO THE NEAREST APPROPRIATE TRAUMA CENTER AND WHEN THE TRANSPORT SHOULD OCCUR.


CHILDREN WHO MEET INCLUSION BASED ON THE TRAUMA DECISION TREE AND WHO HAVE **NOT** REACHED THEIR 15<sup>TH</sup> BIRTHDAY SHOULD BE TRANSPORTED TO A PEDIATRIC TRAUMA CENTER.



3. Treatment

- a) Apply Spinal Protection Protocol for blunt trauma patients. Patients with isolated penetrating trauma should not have spinal immobilization performed.
- b) Control bleeding and immobilize patient, if blunt mechanism indicates. Spinal immobilization should not be performed on patients with isolated penetrating mechanism. If mechanism includes both blunt and penetrating trauma, apply Spinal Protection Protocol. Backboard may be used for patient transfer maneuvers.
- c) Hyperventilate the head-injured patient as follows:  
Adult/Adolescent (greater than 13 years of age): 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
  - (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis **or**
  - (2) Who is manifesting a rapidly decreasing GCS **or**
  - (3) With on-line medical consultation
- d) Consider pelvic stabilization technique if indicated.




- e) Establish IV access with LR; administer 20 mL/kg bolus. Titrate to a systolic pressure of 100 mmHg.
- f)  Consider additional fluid administration. Maximum dose 2,000 mL without medical consultation

## YY. TRAUMA PROTOCOL: MULTIPLE/SEVERE TRAUMA (Continued)



- 
- g) Apply Spinal Protection Protocol for blunt trauma patients. Patients with isolated penetrating trauma should not have spinal immobilization performed.
  - h) Control bleeding and immobilize patient, if blunt mechanism indicates. Spinal immobilization should not be performed on patients with isolated penetrating mechanism. If mechanism includes both blunt and penetrating trauma, apply Spinal Protection Protocol. Backboard may be used for patient transfer maneuvers.
  - i) Hyperventilate the head-injured patient as follows:
    - Adult/Adolescent (greater than 13 years of age): 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
  - j) Who has signs of herniation such as unequal pupils, posturing, or paralysis **or**
    - (1) Who is manifesting a rapidly decreasing GCS **or**
    - (2) With on-line medical consultation



- 
- k) Establish IV/IO access with LR.
  - l) 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.
  - m)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO.
4. Continue General Patient Care.

## 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

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

### Glasgow Coma Score

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**Total (3-15)**

## ZZ. TRAUMA PROTOCOL: SEXUAL ASSAULT

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.

### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION

1. Initiate General Patient Care.
2. Presentation **(NEW '18)**
  - a) **“Full Spinal protection”** refers to the act of protecting the spinal cord from further injury.
  - b) **“Spinal immobilization”** is the act of placing a patient on a backboard with cervical collar for the purpose of trying to prevent excessive movement of the spinal column.
  - c) Indications for initiating spinal protection:
    - (1) 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 cervical, thoracic, or lumbar spinal pain, tenderness, or deformity
      - (b) Signs and symptoms of new paraplegia or quadriplegia
      - (c) Focal neurological deficit (sensory or motor)
      - (d) Altered mental status or disorientation
      - (e) Distracting injury: Any injury (e.g., fracture, chest, or abdominal trauma) associated with significant discomfort that could potentially distract from a patient’s ability to accurately discern or define spinal column pain or tenderness.
    - (2) Indications for referral to an Adult Specialty Spinal Center.
      - (a) 15 years of age or older **AND**
      - (b) Signs and symptoms of new paraplegia or quadriplegia in the presence of trauma **AND**
      - (c) Patent airway **AND**
      - (d) Hemodynamically stableIf considering referral to Adult Specialty Spinal Center, consult with both the nearest Trauma Center and the Adult Spinal Specialty Center, when possible.



3. Treatment
  - a) Initiate General Patient Care.
  - b) All patients meeting the Spinal Protection Protocol shall have manual in-line cervical spine stabilization and application of a correctly sized cervical collar.
  - c) Minimize flexion, extension, and rotation of the spinal column.
  - d) Patients meeting the Spinal Protection Protocol who are with neurological deficit, or not able to ambulate on their own accord, **shall** be immobilized with cervical collar and a backboard.

### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION (Continued)

- e) The following patients only need application of a cervical collar and do not need to be placed in full immobilization with a backboard:
  - (1) Patients who are found by EMS providers to be standing or ambulatory,
  - (2) Patients who have a GCS of 15 and are able to safely extricate themselves from the environment (e.g., vehicle seat) without gross movement (flexion, extension, or rotation) of the spinal column, and
  - (3) Patients who do not have evidence of a neurological deficit.
- f) Patients who are placed in a cervical collar without a need for immobilization on a backboard should be assisted in minimal movement to the EMS stretcher and allowed to lie down supine on their own accord.
- g) Patients meeting Spinal Protection Protocol and not requiring immobilization with a backboard should be secured to the EMS stretcher in a supine position with the head elevated at 30 degrees.
- h) Backboards may be used for patient extrication and patient transfer for patients not meeting Spinal Protection Protocol; however, other devices are preferred (e.g., sheet, Reeves sleeve, or scoop stretcher).
- i) If the backboard is used for extrication from the scene to an ambulance, the patient should be removed from the backboard as soon as possible. The stretcher mattress will provide support in place of the backboard.
- j) Interfacility transport patients who have already been removed from a backboard should not be placed back on the backboard prior to transport.
- k) Helmet Removal
  - (1) If patient is wearing a helmet, the goals are assessment and management of the airway, breathing, and circulation followed by protection of the spinal column by maintaining neutral alignment of the spinal column.
  - (2) If patient is wearing helmet and no shoulder pads, removal of the helmet is indicated.
  - (3) If patient is wearing helmet with shoulder pads, removal of the helmet is acceptable only with concurrent removal of shoulder pads. Under these conditions, removal of the helmet is indicated for management of the airway or other facial trauma.
- l) Patients found with backboard applied before EMS arrival
  - (1) If EMS providers find patient immobilized on a backboard applied prior to arrival, the principles of the Spinal Protection Protocol still apply.



### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION (Continued)



- m) Establish IV/IO access with LR, if appropriate.
- n) Administer fluid bolus, if appropriate.  
20 mL/kg of LR IV  
Titrate to a systolic blood pressure of 100 mmHg.
- o) Consider dopamine.  
2–20 **mcg**/kg/min IV/IO  
Titrate to a systolic blood pressure of 100 mmHg.
- p) Consider additional fluid administration.  
Maximum dose 2,000 mL without medical consultation.



-----  
In children who have not reached their 15<sup>th</sup> birthday:

Indications for initiating spinal protection:

- q) 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** the presence of or inability to assess one or more of the following should receive spinal protection.
  - (1) Midline spinal pain, tenderness, or deformity
  - (2) Signs and symptoms of new paraplegia or quadriplegia
  - (3) Focal neurological deficit
  - (4) Altered mental status or disorientation
  - (5) Distracting injury
  - (6) Neck pain or torticollis
  - (7) High impact diving incident or high risk motor vehicle crash (i.e., head on collision, rollover, ejected from the vehicle, death in the same crash, or speed greater than 55 mph)
  - (8) Substantial torso injury
  - (9) Conditions predisposing to spine injury

Indications for referral to a Pediatric Trauma Center:

- (10) Patient is less than 15 years of age **AND**
- (11) Signs and symptoms of new paraplegia or quadriplegia in the presence of trauma **AND**
- (12) Patent airway **AND**
- (13) Hemodynamically stable



Consult with nearest Trauma Center and, when possible, the nearest Pediatric Trauma Center.

- r) Initiate General Patient Care.
- s) All patients meeting the Spinal Protection Protocol shall have manual in-line cervical spine stabilization and application of a correctly sized cervical collar.

### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION (Continued)

- t) Minimize flexion, extension, and rotation of the spinal column.
- u) Patients meeting the Spinal Protection Protocol who are with neurological deficit, not able to ambulate on their own accord, or who are unable to respond during assessment **shall** be immobilized with cervical collar and a backboard.
- v) The following patients only need application of a cervical collar and do not need to be placed in full immobilization with a backboard:
  - (1) Patients who are found by EMS providers to be standing or ambulatory
  - (2) Patients who have a GCS of 15 and are able to safely extricate themselves from the environment (e.g., vehicle seat) without gross movement (flexion, extension, or rotation) of the spinal column, and
  - (3) Patients who do not have evidence of a neurological deficit.
- w) Patients who are placed in a cervical collar without a need for immobilization on a backboard should be assisted in minimal movement to the EMS stretcher and allowed to lie down supine on their own accord.
- x) Patients meeting Spinal Protection Protocol and not requiring immobilization with a backboard should be secured to the EMS stretcher in a supine position with the head elevated at 30 degrees.
- y) Backboards may be used for patient extrication and patient transfer for patients not meeting Spinal Protection Protocol; however, other devices are preferred (e.g., sheet, Reeves sleeve, or scoop stretcher).
- z) If the backboard is used for extrication from the scene to an ambulance, the patient should be removed from the backboard as soon as possible. The stretcher mattress will provide support in place of the backboard.
- aa) Interfacility transport patients who have already been removed from a backboard should not be placed back on the backboard prior to transport.
- bb) Helmet Removal
  - (1) If patient is wearing a helmet, the goals are assessment and management of the airway, breathing, and circulation followed by protection of the spinal column by maintaining neutral alignment of the spinal column.
  - (2) If patient is wearing helmet and no shoulder pads, removal of the helmet is indicated.
  - (3) If patient is wearing helmet with shoulder pads, removal of the helmet is acceptable only with concurrent removal of shoulder pads. Under these conditions, removal of the helmet is indicated for management of the airway or other facial trauma.

### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION (Continued)

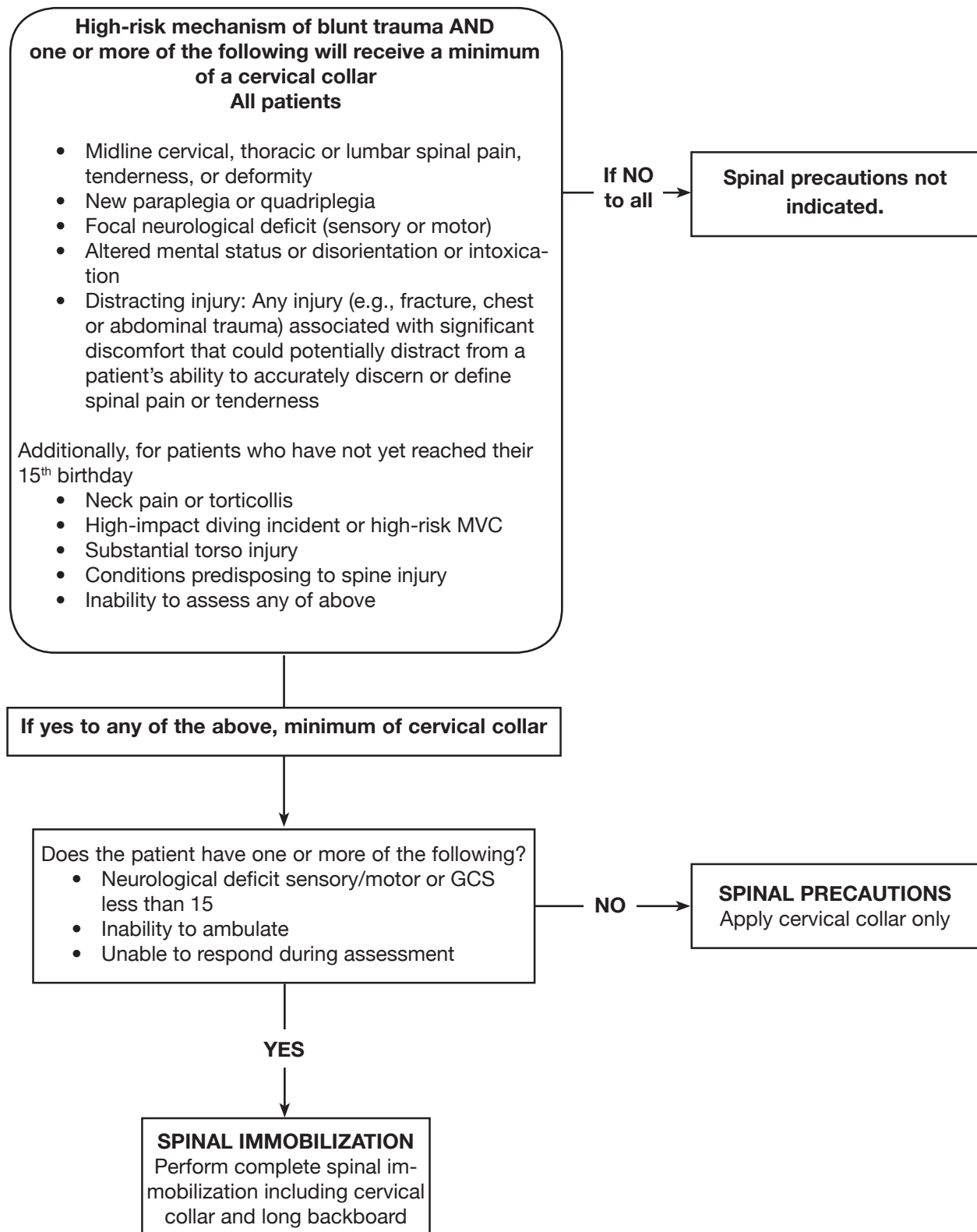
- cc) Patients found with backboard applied before EMS arrival
  - (2) If EMS providers find patient immobilized on a backboard applied prior to arrival, the principles of the Spinal Protection Protocol still apply.



- 
- dd) Establish IV/IO access with LR, if appropriate.
  - ee) Administer fluid bolus, if appropriate.
    - 20 mL/kg of LR IV
    - Titrate to a systolic blood pressure of 100 mmHg.
  - ff) Consider dopamine.
    - 2–20 **mcg**/kg/min IV/IO
    - Titrate to a systolic blood pressure of 100 mmHg.
  - gg) Consider additional fluid administration.
    - Maximum dose 2,000 mL without medical consultation
4. Continue General Patient Care.

### AAA. TRAUMA PROTOCOL: SPINAL PROTECTION (Continued)

#### SPINAL PROTECTION ALGORITHM (NEW '18)



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## BBB. TRAUMA PROTOCOL: TRAUMA ARREST (NEW '18)

1. Initiate General Patient Care.

2. Presentation

Early cardiac arrest secondary to trauma is usually due to severe hypoxia, neurologic injury, or massive hemorrhage. The patient is unresponsive, pulseless, and apneic.



3. Treatment

- a) Rapid assessment and extrication
- b) Determine if patient meets the criteria for termination of resuscitation for a patient in traumatic arrest. If patient meets criteria, discontinue resuscitation. If criteria are not met, continue resuscitation.
- c) Perform spinal immobilization for blunt trauma patients only. Patients with isolated penetrating trauma should not have spinal immobilization performed. If mechanism includes both blunt and penetrating trauma, perform spinal immobilization.
- d) CPR with high-quality chest compressions and minimal interruptions.
- e) Consider AED if arrest is believed to be medical in nature and the patient meets the criteria.
- f) Treat reversible causes of traumatic arrest.
  - (1) Open airway and ensure adequate ventilation, insert necessary adjunct; consider the need for advanced airway earlier in the resuscitation of the trauma arrest patient.
  - (2) Seal open chest wounds with occlusive dressings.
  - (3) Control life-threatening external hemorrhage.

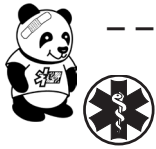


PENETRATING TRAUMA PATIENTS HAVE AN IMPROVED CHANCE OF SURVIVAL WITH THE IMMEDIATE APPLICATION OF HEMORRHAGE CONTROL AND ALS BILATERAL NEEDLE DECOMPRESSIONS WHILE PREPARING AND LOADING THE PATIENT FOR IMMEDIATE TRANSPORT. IF THE PENETRATING TRAUMA PATIENT IS FOUND IN A RHYTHM OTHER THAN ASYSTOLE, AND THE TRAUMA CENTER IS WITHIN 15 MINUTES, COMPLETE THE TREATMENTS FOR REVERSIBLE CONDITIONS AND TRANSPORT THE PATIENT. IF TRANSPORT TIME EXCEEDS 15 MINUTES, GO TO LOCAL EMERGENCY DEPARTMENT OR FREESTANDING EMERGENCY MEDICAL FACILITY. BLUNT TRAUMA ARREST SHOULD HAVE ALL THE REVERSIBLE CAUSES OF ARREST PERFORMED ON SCENE BEFORE TERMINATION OF RESUSCITATION OR TRANSPORT IF ROSC IS ACHIEVED.



- g) Establish IV/IO access with LR. Begin rapid administration of 20 mL/kg bolus of LR IV/IO.
- h) Treat reversible causes of traumatic arrest.
  - (1) Open airway and ensure adequate ventilation, insert necessary adjunct; consider the need for advanced airway earlier in the resuscitation of the trauma arrest patient.
  - (2) Seal open chest wounds with occlusive dressings.
  - (3) Control life-threatening external hemorrhage.
  - (4) Bilateral Needle Decompression Thoracostomy. Catheters should not be removed once placed.
  - (5) Establish IV/IO access with LR. Begin rapid administration of 20 mL/kg bolus of LR IV/IO.
  - (6) Identify rhythm and refer to appropriate algorithm.

## BBB. TRAUMA PROTOCOL: TRAUMA ARREST (Continued)



- 
- i) Rapid assessment and extrication
  - j) Perform spinal immobilization for blunt trauma patients only. Patients with isolated penetrating trauma should not have spinal immobilization performed. If mechanism includes both blunt and penetrating trauma, perform spinal immobilization.
  - k) CPR
  - l) Consider AED if arrest is believed to be medical in nature. (See Section IV, AED.)



A PATIENT IN CARDIOPULMONARY ARREST SECONDARY TO TRAUMA SHOULD BE TAKEN TO THE NEAREST APPROPRIATE PEDIATRIC TRAUMA CENTER. CONSIDERATION SHOULD BE GIVEN TO TRANSPORTING THE PATIENT TO THE NEAREST EMERGENCY DEPARTMENT OR ADULT TRAUMA CENTER IF THE PEDIATRIC TRAUMA CENTER IS MORE THAN 10 MINUTES ADDITIONAL TRANSPORT TIME!



- 
- m) Establish IV/IO access with LR.
  - n) 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.
  - o) If traumatic arrest is suspected due to multi-system blunt trauma, or due to penetrating neck, chest, or abdominal trauma, bilateral needle decompressions should be performed. Once manufacture assembled pneumothorax kit catheters are placed, **do not remove.**
4. Continue General Patient Care.

## CCC. TRAUMA DECISION TREE

### Measure vital signs and level of consciousness and assess for major injury

#### Category Alpha

- |   |
|---|
| <input type="checkbox"/> GCS less than or equal to 13   |
| <input type="checkbox"/> Systolic BP less than 90 mmHg (Adult) less than 60 mmHg (Peds)   |
| <input type="checkbox"/> Respiratory rate less than 10 or greater than 29 (less than 20 in infant age less than one year) or need for ventilatory support |

**YES**

Transport to trauma center or specialty center per protocol; alert trauma team; consider helicopter transport if quicker and of clinical benefit (refer to GPC Section I).

**NO**

Assess for other injuries.

#### Category Bravo

- |  |   |  |
|--|---|--|
| <input type="checkbox"/> 2 or more proximal long-bone fractures                  | <input type="checkbox"/> Crushed, degloved, mangled, or pulseless extremity                                   | <input type="checkbox"/> Pelvic fracture   |
| <input type="checkbox"/> Amputation proximal to wrist or ankle                   | <input type="checkbox"/> Open or depressed skull fracture   | <input type="checkbox"/> Paralysis (spine) |
| <input type="checkbox"/> Chest wall instability or deformity (e.g., flail chest) | <input type="checkbox"/> Penetrating injuries to head, neck, torso, or extremities proximal to elbow and knee |  |

**YES**

Transport to trauma center or specialty center per protocol; alert trauma team; consider helicopter transport if quicker and of clinical benefit (refer to GPC Section I).

**NO**

Evaluate for evidence of mechanism of injury and high-energy impact.

#### Category Charlie

- |  |   |
|--|---|
| <input type="checkbox"/> High Risk Auto Crash <ul style="list-style-type: none"> <li>Intrusion (including roof) greater than 12 in. occupant site; greater than 18 in. any site</li> <li>Ejection (partial or complete) from vehicle</li> <li>Death in same passenger compartment</li> <li>Vehicle telemetry data consistent with high risk of injury</li> </ul> | <ul style="list-style-type: none"> <li>Rollover without restraint</li> <li>Auto v. pedestrian/bicyclist thrown, run over, or with significant (greater than 20 mph) impact</li> <li>Motorcycle crash greater than 20 mph</li> </ul> |
| <input type="checkbox"/> Falls <ul style="list-style-type: none"> <li>Adult: greater than 20 feet (one story is equal to 10 feet)</li> <li>Pediatric: greater than 10 feet or 3 times the child's height</li> </ul>  | <input type="checkbox"/> Exposure to blast or explosion   |

**YES**

Transport to Trauma Center; alert trauma team. Patients within a **30-minute drive time** of the closest appropriate trauma/specialty center shall go by ground unless there are extenuating circumstances. Receiving Trauma Center medical consultation required when considering whether helicopter transport is of clinical benefit (refer to GPC Section I).

**NO**

Evaluate for other considerations.

#### Category Delta

- |  |  |
|--|--|
| <input type="checkbox"/> Older adults <ul style="list-style-type: none"> <li>Risk of injury/death increases after age 55</li> <li>SBP less than 110 may indicate shock after age 65</li> <li>Low-impact mechanisms (e.g., ground-level falls) may result in severe injury</li> </ul> | <input type="checkbox"/> Burns <ul style="list-style-type: none"> <li>Without trauma mechanism, triage to Burn Center</li> <li>With trauma mechanism, triage to Trauma Center</li> </ul>   |
| <input type="checkbox"/> Children<br>(Should be triaged to Pediatric Trauma Center)  | <input type="checkbox"/> Pregnancy greater than 20 weeks<br><input type="checkbox"/> EMS provider judgment<br><input type="checkbox"/> Anticoagulants and bleeding disorders<br>(Patients with head injury are at high risk for rapid deterioration) |

**YES**

Consider medical direction and transport to trauma center. Patients within a **30-minute drive time** of the closest appropriate trauma/specialty center shall go by ground unless there are extenuating circumstances. Receiving Trauma Center medical consultation required when considering whether helicopter transport is of clinical benefit (refer to GPC Section I).

**NO**

Transport according to protocol.



## IV. APPENDICES

### A. GLOSSARY

**AED:** Automated External Defibrillation or Automated External Defibrillator

**Alternative Airway Device:** An airway adjunct other than an endotracheal tube that may include the laryngeal tube airway device (e.g., King LTS-D™) or laryngeal mask airway with design to facilitate hospital endotracheal intubation **(NEW '18)**

**AMI:** Acute Myocardial Infarction

**APGAR score:** An acronym and method of scoring to determine the condition of a newly born infant (see APGAR chart on page 114)

**Apnea:** An absence of spontaneous respirations

**Aspiration:** The act of taking fluid (e.g., vomitus, mucus, or blood) from the body via a suction device or the act of taking foreign material or vomit into the lungs

**Asymptomatic:** The lack of any evidence or indication of illness, disease, or physical disturbance of patient's condition

**AVPU:** A method of determining and recording a patient's mental status or level of consciousness where "A" stands for Alert, "V" stands for responsive to Verbal stimuli, "P" stands for responsive to Painful stimuli, and "U" stands for Unresponsive

**Barotrauma:** Injury sustained as a result of exposure to excessive environmental pressure changes (e.g., blast injury or underwater pressure injury)

**BPM:** Breaths per minute

**BSI:** Body Substance Isolation

**BVM:** Bag-Valve-Mask

**Carte blanche:** Full discretionary power

**Children with Special Healthcare Needs (CSHN):** Children with chronic illness or conditions requiring specialized assessment, treatment, technology, or transport destination

**CISM:** Critical Incident Stress Management

**Commercial ambulance:** Ambulance licensed by the State Office of Commercial Ambulance Licensing and Regulation

**Continuous CPR:** Chest compressions asynchronous with ventilation and infrequent, minimal interruptions (less than 10 seconds each)

**COPD:** Chronic Obstructive Pulmonary Disease (e.g., asthma, emphysema, bronchitis)

**Cricothyroidotomy (needle or surgical):** A syringe with a needle attached or a scalpel is used to make a puncture hole or surgical incision through the cricothyroid membrane that overlies the trachea. A needle catheter or ET tube is passed into the trachea and then attached to a jet insufflation device or bag-valve device to ventilate the patient.

**Critical:** Approaching death or having the nature of a crisis (e.g., time-critical, critical injury)

**CRT-(I):** Cardiac Rescue Technician-Intermediate

**CVA:** Cerebral Vascular Accident/Stroke

**Cyanotic:** Bluish color of the skin or mucus membranes caused by lack of oxygen to the tissue

**DCAP BTLS:** Acronym for signs of injuries to assess during a physical examination of patients: D = Deformity, C = Contusions, A = Abrasions, P = Punctures/penetrations, B = Burns, T = Tenderness, L = Lacerations, S = Swelling

**Defibrillation:** Administration of electrical current(s) to the heart in an effort to normalize rhythm

**Defibrillation set (stacked shocks):** Includes a set of three successive shocks either biphasic or monophasic standard 200 J, 300 J, 360 J, or peds 2–4 J/kg

**Distracting Injury:** Any injury (e.g., fracture, chest, or abdominal trauma) associated with significant discomfort that could potentially distract from a patient's ability to accurately discern or define spinal column pain or tenderness

**DNR:** Do Not Resuscitate

**Dystonic:** Any impairment of muscle tone, which may be manifested by prolonged muscle contractions that may cause twisting and repetitive movements or abnormal posture. These movements may be in the form of rhythmic jerks. Symptoms that “appear” to be of a focal seizure-like nature in an awake and alert person with no history of seizures but who probably has a recent history of anticholinergic medication use (e.g., anti-psychotic, anti-vomiting).

**EJ:** External Jugular vein of the neck; peripheral IV access site

**Emergency Information Form:** A two-page form, designed by the American Academy of Pediatrics and American College of Emergency Physicians (AAP and ACEP), that provides a brief summary of special health care needs including: diagnosis, usual pattern of disease, emergency action plan, primary and specialty doctors and hospitals. Can be downloaded and data entered at <http://www.aap.org/advocacy/eif.doc>.

**Emetic:** Referring to a substance that causes vomiting

**eMEDS®:** electronic Maryland EMS Data System (a patient care reporting system)

**EMR:** Emergency Medical Responder

**EMS:** Emergency Medical Services

**EMT:** Emergency Medical Technician

**EOC:** Emergency Operations Center

**Erythema:** Redness or inflammation of the skin or mucous membranes that is the result of dilatation and congestion of superficial capillaries

**ETA:** Estimated Time of Arrival

**EtCO<sub>2</sub>:** Non-invasive measurement (numeric and/or waveform) of carbon dioxide (CO<sub>2</sub>) levels in exhaled breaths (end-tidal CO<sub>2</sub>)

**Extrapyramidal:** Pertaining to tissues and structures outside of the cerebrospinal pyramidal tracts of the brain that are associated with movement of the body, excluding stimulation from the motor neurons, the motor cortex, and the corticospinal and corticobulbar tracts. Symptoms that “appear” to be of a focal seizure-like nature in an awake and alert person with no history of seizures but who probably has a recent history of anticholinergic medication use (e.g., anti-psychotic, anti-vomiting).

**Fluid Bolus:** The administration of a fluid dose as rapidly as possible, usually over five to twenty minutes, to a patient with clinical signs of shock

**GCS:** Glasgow Coma Scale (a tool to evaluate injury and illness severity)

**Hemodynamically Stable:** When a patient’s vital signs (including pulse oximeter or EKG if available) are all within normal for the patient’s age range, the patient does not have active bleeding, and there are no signs of distress (skin conditions or capillary refill are normal) as observed over time

**Hemodynamically Unstable:** When a patient exhibits any of the following: abnormal vital signs for age range (including pulse oximeter or EKG if available), active bleeding, or there are signs of distress (skin conditions or capillary refill are abnormal)

**Hemostatic Dressing:** A bandage or gauze with impregnated hemostatic agent that hastens the hemostasis/clotting process

**HTN:** Hypertension

**Hypoxia:** Too little oxygen in the cells

**IM:** Intramuscular injection

**IN:** Intranasal administration

**IV:** Intravenous line or administration of medication through IV

**IVP:** Intravenous Push

**IWMI:** Inferior Wall Myocardial Infarction

**J:** Joules or watts-seconds of electrical energy for defibrillation or cardioversion

**JVD:** Jugular Vein (external) Distention

**kg:** Kilogram, metric measure of weight equal to 1,000 grams (1 kg = 2.2 pounds)

**KVO:** Keep Vein Open. A slow IV flow rate.

**Laryngectomy:** The removal of the larynx and separation of the airway from the mouth, nose, and esophagus. Patients with a laryngectomy breathe through an opening in the neck called a stoma. Patients with a laryngectomy are not able to breathe or be intubated through the mouth or nose.

**Lividity:** Venous pooling in dependent body parts

**LOC:** Level of Consciousness

**LR:** Lactated Ringer's (a type of isotonic IV solution)

**MAIS:** Maryland Ambulance Information System for recording confidential patient care data (a patient care report).

**MCI:** Mass Casualty Incident. Occurs when the number of victims exceeds the number of medical personnel or resources immediately available and is declared by the local jurisdiction.

**Meconium:** The first feces of an infant

**Medical Consultation (On-Line Medical Direction):** With an atmosphere of courtesy and respect, direct voice/data communication between a provider and an EMS Base Station physician, or a jurisdictionally affiliated physician, or with an "on-scene physician." This communication is bi-directional and provides the provider with medical direction while providing the physician or the receiving hospital with valuable information on the patient. This exchange can take place on-scene, over a telecommunications device, or in the hospital setting.

**Medical Protocol:** A guideline for the provision of patient care

**mL:** Milliliter (the symbol for a metric measure of volume)

**MOI:** Mechanism of Injury

**MOLST:** Medical Orders for Life-Sustaining Treatment

**NDT:** Needle Decompression Thoracostomy

**Near Drowning:** A short duration of submersion under water with possible short-term loss of consciousness

**Neonatal (also neonate):** A term that describes an infant from 1 hour to 28 days of life

**Newly Born (also called newborn):** A term that describes an infant within the first hour after delivery

**NOI:** Nature of Illness

**Notification:** An “information only call” directly to the receiving hospital through the jurisdictional EOC or EMS communication system not requiring medical consultation and that may follow local standing operational procedures

**NRB:** Non-Rebreather Mask

**NTG:** Nitroglycerin

**Nurse Practitioner:** An individual who has been licensed as a Registered Nurse and certified as a Nurse Practitioner by the Maryland Board of Nursing. This does not include individuals who are only Registered Nurses or Licensed Practical Nurses.

**OIC:** Officer in Charge

**On-Scene Physician:** On-Scene physician may be the patient’s identified private physician or a bystander physician who is physically on location. Care rendered or orders given by the on-scene physician should be documented, including the identification of the physician. All on-scene medical direction shall be consistent with *The Maryland Medical Protocols for EMS Providers*. Any medical procedure that is not consistent with the protocols shall only be rendered by the on-scene physician, who shall also accompany the patient to the hospital. Any extraordinary care by EMS providers pursuant to the protocols may be approved only by the EMS Base Station physician or a system medical director (based on COMAR 30.02.03.02A.).

**OPQRST:** Used to recall pertinent questions (**O**nset, **P**rovocation, **Q**uality, **R**adiation, **S**everity, **T**ime) to ask when obtaining a patient history for medical emergencies

**Optional Supplemental Program (OSP):** A voluntary jurisdictional program that requires MIEMSS approval

**Pallor:** An unnatural paleness or absence of color in the skin

**PCM:** Patient Controlled Medications (a medication delivery system under a patient’s control)

**PCR:** Patient Care Report (equivalent to MAIS) document used to record pertinent patient information regarding assessment, treatment, and transport (this is a confidential medical record)

**Pilot Program (PP):** A program designed to test a new project or procedure in order to determine its effect on EMS (requires MIEMSS approval and reporting all uses to MIEMSS)

**Plethora:** A term applied to the beefy red coloration of a newborn

**PMD:** Program Medical Director

**PO:** By mouth (*per os*)

**PPE:** Personal Protective Equipment

**Provider:** Includes EMR, EMT, CRT-(I), and paramedic

**Pulse Oximetry:** A non-invasive measurement of arterial oxygen saturation using infrared absorption frequencies

**PVC:** Premature Ventricular Contraction

**Recovery Position:** The position (patient flat on left lateral side) or placement of patients to reduce risk of aspiration

**RMD:** Regional Medical Director

**RVMI:** Right Ventricular Myocardial Infarction

**SAFER:** **S**tabilize, **A**ssess and acknowledge, **F**acilitate, **E**ncourage, and **R**ecover OR **R**eferral

**SAMPLE:** Used to aid in obtaining pertinent patient history (S = Symptoms and signs patient is exhibiting, A = patient Allergies, M = patient Medications (prescription and non-prescription), P = Past medical history, L = what and when was the patient's Last oral intake, E = Events prior to arrival, or simply, the history of the current emergency)

**SC:** Subcutaneously

**Sign:** Any objective evidence or indication of illness, disease, or physical disturbance of patient's condition

**SL:** Sublingual (under the tongue)

**SMOI:** Significant Mechanism Of Injury

**SOP:** Standard Operational Procedure (defined by local jurisdiction or region)

**Spinal Immobilization:** The act of placing a patient on a backboard with cervical collar for the purpose of trying to prevent excessive movement of the spinal column

**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**

<b>PROCEDURE</b>	<b>EMR</b>	<b>EMT</b>	<b>CRT-(I)</b>	<b>PM</b>
<b>ADMINISTRATION OF MEDICATIONS</b>				
Buccal, Oral, Sublingual	-	SO	SO	SO
SC, IV, Rectal, Nebulizer	-	-	SO	SO
Intramuscular	-	OSP	SO	SO
Intranasal <b>(NEW '18)</b>	SO	SO	SO	SO
Intraosseous	-	-	SO	SO
Intradermal PPD (Public Safety Personnel only)	-	-	-	OSP
<b>AIRWAY MANAGEMENT</b>				
Alternative Airway Device (King Airway®) <b>(NEW '18)</b>	-	-	SO	SO
BiPAP	-	-	-	OSP
Carbon Dioxide Detector (ALS required)	-	SO	SO	SO
Capnograph <b>(ALS required since 2015)</b>	-	-	SO	SO
CPAP	-	-	SO	SO
Cricothyroidotomy	-	-	-	PP
Direct Laryngoscopy	-	-	SO	SO
Gastric Tube (BLS "Burp," ALS insert)	-	-	SO	SO
Laryngeal Mask Airway Device <b>(NEW '18)</b>	-	-	OSP	OSP
Nasotracheal Intubation	-	-	-	SO
Oropharyngeal/Nasopharyngeal Airway	SO	SO	SO	SO
Orotracheal 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
<b>CHEMICAL RESTRAINT</b>	-	-	SO/MC	SO
<b>ELECTROCARDIOGRAM</b>				
Standard Limb Leads	-	-	SO	SO
12-Lead	-	PP	SO	SO
<b>ELECTRICAL THERAPY</b>				
Automated External Defibrillator	SO	SO	SO	SO
Cardioversion	-	-	SO/MC	SO/MC
Defibrillation	-	-	SO	SO
Transcutaneous Cardiac Pacing	-	-	SO	SO
<b>GLUCOMETER</b>	-	OSP	SO	SO
<b>HIGH PERFORMANCE CPR</b>	SO	SO	SO	SO
<b>INTRAVENOUS THERAPY</b>				
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
<b>PRONOUNCEMENT OF DEATH</b>	-	SO	SO	SO
<b>SKELETAL STABILIZATION/IMMOBILIZATION</b>	SO	SO	SO	SO
<b>BLEEDING MANAGEMENT: TOURNIQUET / HEMOSTATIC DRESSING</b>	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)**

<b>PROCEDURE</b>	<b>EMR</b>	<b>EMT</b>	<b>CRT-(I)</b>	<b>PM</b>
<b>VALSALVA MANEUVER</b>	-	-	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
<b>PICC</b> —peripherally inserted central catheter or <b>CVA</b> —central venous access line, capped only	-	SO	SO	SO
<b>PICC</b> —peripherally inserted central catheter or <b>CVA</b> —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 <sub>2</sub> (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)**

<b>MEDICATIONS</b>	<b>EMR</b>	<b>EMT</b>	<b>CRT-(I)</b>	<b>PM</b>
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) <b>(NEW '18)</b>	-	-	SO	SO
Dexamethasone	-	-	SO	SO
Dextrose	-	-	SO	SO
Diazepam	-	-	MC	SO/MC
Diltiazem	-	-	MC	MC
Diluent D5W, NS, LR	-	-	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 <b>(NEW '18)</b>	SO	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)**

<b>MEDICATIONS</b>	<b>EMR</b>	<b>EMT</b>	<b>CRT-(I)</b>	<b>PM</b>
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)

#### 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.



### 3. ALBUTEROL (PROVENTIL, VENTOLIN)

*(Patient Prescribed, Patient Assisted)*

*(Also applies to other fast-acting bronchodilators)*

#### a) Indications

- (1) Signs and symptoms of respiratory distress
- (2) Bronchospasm/wheezing associated with:
  - (a) Asthma
  - (b) Chronic bronchitis
  - (c) Emphysema
  - (d) Allergic reactions (anaphylaxis)

#### b) Adverse Effects

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

#### c) Precautions

- (1) May cause severe bronchospasm from repeated excessive use.
- (2) Patient must have their own physician-prescribed hand-held aerosol inhaler.


#### d) Contraindications

Inhaler not prescribed for the patient

#### e) Preparations

Hand-held (unit dose) aerosol inhaler

#### f) Dosage

- (1) Adult: Patient may receive a maximum of 2 doses (4 puffs) over a 30-minute period.
- (2) Pediatric: Patient may receive a maximum of 2 doses (4 puffs) over a 30-minute period.
- (3)  Additional doses may be administered with medical consultation.



#### 4. 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





**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.



## 7. NALOXONE (NARCAN) PUBLIC SAFETY AND EMR (NEW '18)

### a) Pharmacology

Reverses all effects due to opioid (morphine-like) agents. This drug will reverse the respiratory depression and all central and peripheral nervous system effects.

### b) Pharmacokinetics

- (1) Onset of action is within a few minutes with intranasal (IN) administration.
- (2) Patients responding to naloxone may require additional doses and transportation to the hospital since most opioids/narcotics last longer than naloxone.
- (3) Has no effect in the absence of opioid/narcotic.

### c) Indications

To reverse respiratory depression induced by opioid/narcotic agent.

### d) Contraindications

Patients under 28 days of age

### e) Adverse Effects

Opioid withdrawal

### f) Precautions

- (1) Naloxone may induce opiate withdrawal in patients who are physically dependent on opioids.
- (2) Certain drugs may require much higher doses of naloxone for reversal than are currently used.
- (3) Should be administered and titrated so respiratory efforts return, but not intended to restore full consciousness.
- (4) Intranasal naloxone must be administered via nasal atomizer.
- (5) Naloxone has a duration of action of 40 minutes; the effect of the opioid/narcotic may last longer than naloxone and patients should be encouraged to be transported.



PROVIDERS MUST CONTACT A BASE STATION PHYSICIAN FOR PATIENTS WISHING TO REFUSE TRANSPORT AFTER BLS ADMINISTRATION OF NALOXONE.

### g) Dosage

- (1) Adult: Administer 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare.
- (2) Pediatric (child aged 28 days to adult): Administer 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare.
- (3) Repeat as necessary to maintain respiratory activity.

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## 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

### 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% SpO<sub>2</sub>)
- (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 SpO<sub>2</sub> 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 SpO<sub>2</sub> at 100%

Percent O <sub>2</sub> 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<sub>2</sub> 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

- (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.



### 3. ADENOSINE (ADENOCARD)

#### a) Pharmacology

- (1) Naturally occurring purine nucleoside
- (2) Used to treat narrow complex tachycardia, PSVT with WPW
- (3) Slows conduction through the AV node
- (4) No effect on ventricular contractility
- (5) Causes peripheral vasodilatation (often dramatic)

#### b) Pharmacokinetics

Onset of action within 5–20 seconds following an IV dose;  
half-life is 10 seconds

#### c) Indications

- (1) To slow the rate of narrow complex tachycardia
- (2) Is only effective on SVT/PSVT
- (3) No effect on VT, atrial fibrillation, or flutter
- (4) In stable, wide complex tachycardia (possible VT) for pediatric with caution

#### d) Contraindications

- (1) Known hypersensitivity
- (2) History of moderate to severe asthma or active bronchospasm
- (3) Polymorphic or irregular wide complex tachycardia

#### e) Adverse Effects

Flushing, dyspnea, chest pressure, nausea, headache, dizziness,  
and hypotension

#### f) Precautions

- (1) Effects antagonized by theophylline.
- (2) Effects enhanced by dipyridamole (Persantine), digitalis, carbamazepine, calcium channel blockers, and benzodiazepines.
- (3) Be prepared for up to 40 seconds of asystole

#### g) Dosage

- (1) Adult:  
6 mg rapid IVP bolus followed by a rapid flush  
Give 12 mg if no response within 2 minutes.  
Give 12 mg more if no response within another 1–2 minutes.



REDUCE DOSAGE BY HALF FOR PATIENTS WITH TRANSPLANTED HEARTS AND THOSE TAKING  
DIPYRIDAMOLE OR CARBAMAZEPINE.

- (2) Pediatric: 0.1 mg/kg rapid IVP/IO; maximum initial dose 6 mg.  
Second and third doses: 0.2 mg/kg rapid IVP/IO; maximum single  
additional dose 12 mg.



#### 4. ALBUTEROL SULFATE (PROVENTIL, VENTOLIN)

##### a) Pharmacology

- (1) Synthetic sympathomimetic amine (a type of stimulant)
- (2) Stimulates beta-2 adrenergic receptors of the bronchioles
- (3) Minimal effect on blood pressure
- (4) Minimal cardiac effects
- (5) Main effect is bronchodilation.
- (6) It may cause some vasodilation as evidenced by headache or flushing.

##### b) Pharmacokinetics

- (1) Bronchodilation begins within 5–15 minutes after inhalation.
- (2) Peak effect occurs in 30–120 minutes.
- (3) Duration of action is usually 3–4 hours.

##### c) Indications

- (1) To reverse bronchospasm (wheezing)
- (2) Hyperkalemia


##### d) Contraindications

Known hypersensitivity

##### e) Adverse Effects

Tachycardia, palpitations, peripheral vasodilation, tremors, nervousness, headache, sore throat, PVCs, nausea, and vomiting

##### f) Precautions

- (1) Bronchospasm may worsen in rare situations due to patient tolerance or hypersensitivity.
- (2) If respirations worsen, consider discontinuing use.
- (3) Should be used with caution in patients with hyperthyroidism or coronary artery disease.
- (4) Use with caution when administering to patients taking MAO inhibitors or tricyclic antidepressants, which may be potentiated by albuterol.
- (5)  Medical direction required before administering to pregnant patient or patient having a cardiac history.





**g) Dosage**

**Bronchospasm**

- (1) Adult: 2.5 mg by nebulized aerosol connected to 6–8 lpm of oxygen; may repeat one time
- (2) Pediatric: May repeat one time; connect to 6–8 lpm of oxygen
  - (a) **Age two or older:** 2.5 mg by nebulized aerosol
  - (b) **Age less than two years:** 1.25 mg by nebulized aerosol

**Hyperkalemia**

- (3)  Adult: 20 mg (if available) by nebulized aerosol connected to 6–8 lpm of oxygen
- (4)  Pediatric
  - (a) **Age two or older:** 2.5 mg by nebulized aerosol
  - (b) **Age less than two years:** 1.25 mg by nebulized aerosol



## 5. AMIODARONE

### a) Pharmacology

Prolongs duration and refractory period of action potential. Slows electrical conduction, electrical impulse generation from sinoatrial node, and conduction through accessory pathways. Also dilates blood vessels.

### b) Pharmacokinetics

Amiodarone primarily alters/blocks the potassium and sodium ion permeability across the myocardial membrane, which in effect, stabilizes the ion channels and changes impulse conduction through the myocardium. Amiodarone also has some effects on beta receptors, and calcium channels

### c) Indications

- (1) Prevent recurrence of ventricular fibrillation/tachycardia after defibrillation and conversion to supraventricular rhythm
- (2) Ventricular tachycardia (VT)
- (3) Ventricular fibrillation (VF)

### d) Contraindications

- (1) Second or third degree AV blocks
- (2) Sensitivity to amiodarone
- (3) Idioventricular escape rhythms
- (4) Accelerated idioventricular rhythm
- (5) Sinus bradycardia or arrest or block
- (6) Hypotension
- (7) Cardiogenic shock
- (8) Ventricular conduction defects
- (9) Iodine hypersensitivity

### e) Adverse Effects


- (1) Bradycardia
- (2) Hypotension
- (3) Prolonged QT interval

### f) Precautions

May prolong the QT interval increasing risk of torsades de pointes, and VF. Amiodarone inhibits atrioventricular conduction and decreases myocardial contractility, increasing the risk of AV block or of hypotension with any calcium channel blocker.



**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





## 7. ATROPINE SULFATE

### a) Pharmacology

- (1) Parasympatholytic (vagolytic action)
- (2) Anticholinergic (accelerates the heart rate)


### b) Pharmacokinetics

- (1) Accelerated heart rate within minutes of IV injection.
- (2) Peak effect is seen within the first 15 minutes.
- (3) Atropine disappears rapidly from the blood.
- (4) Excreted in the urine within the first 12 hours.

### c) Indications

- (1) Symptomatic bradycardia
- (2) Organophosphate poisoning
- (3) Nerve agents

### d) Contraindications

- (1) Known hypersensitivity
- (2) Dysrhythmias in which enhancement of conduction may accelerate the ventricular rate and cause decreased cardiac output (e.g., atrial fibrillation, atrial flutter, or PAT with block)
- (3) Relative Contraindications (weigh risk/benefits):
  - (a)  AV block at His-Purkinje level (second-degree Type II AV Block and third-degree AV Block)
  - (b) Suspected acute myocardial infarction or ischemia
  - (c) Glaucoma

### e) Adverse Effects

- (1) Excessive doses of atropine can cause delirium, restlessness, disorientation, tachycardia, coma, flushed and hot skin, ataxia, blurred vision, dry mucous membranes.
- (2) Ventricular fibrillation and tachycardia have occurred following IV administration of atropine.

### f) Precautions

Not clinically significant



**g) Dosage**

(1) Adult:

Bradycardia: Administer 0.5–1 mg IVP repeated every 3–5 minutes to a total dose of 0.04 mg/kg

(2) Pediatric:

Bradycardia: Administer 0.02 mg/kg IV/IO; maximum single dose 0.5 mg; ET 0.04–0.06 mg/kg, dilute 5 mL; repeat once

(3)  Organophosphate poisoning:

(a) Adult: Administer 2–4 mg IVP or IM every 5–10 minutes.

(b) Pediatric: Administer 0.02 mg/kg IVP/IO or IM every 5–10 minutes.

(4) Nerve agent exposure

See MARK I / DuoDote Protocol.



## 8. ATROVENT (IPRATROPIUM)

### a) Pharmacology

- (1) Anticholinergic (parasympatholytic) bronchodilator
- (2) Bronchodilator is site-specific, not systemic
- (3) Dries respiratory tract secretions
- (4) Most effective in combination with a beta-adrenergic bronchodilator

### b) Pharmacokinetics

- (1) Improved pulmonary function in 15–30 minutes
- (2) Peak effects occur in 1–2 hours
- (3) Duration of action is usually 4–5 hours

### c) Indications

- (1) Allergic reactions/anaphylaxis
- (2) Bronchial asthma
- (3) Reversible bronchospasms associated with chronic bronchitis and emphysema

### d) Contraindications

- (1) Hypersensitivity to the drug
- (2) Hypersensitivity to atropine
- (3) Less than one year of age

### e) Adverse Effects

- (1) More common: dry mouth, cough, or unpleasant taste
- (2) Less common: vision changes, eye burning or pain, dizziness, headache, nervousness, palpitations, sweating, trembling, chest tightness, rash, hives, or facial sweating

### f) Precautions

- (1) Use with caution in patients with congestive heart failure, heart disease, hypertension, glaucoma, and with elderly patients.
- (2) May worsen the condition of glaucoma if it gets into the eyes. Having the patient close their eyes during nebulization may prevent this.
- (3) Not to be used as a single agent—must be used in combination with a beta-agonist.



**g) Dosage**

(2) Adult:

Single administration ONLY, 500 **mcg** (2.5 mL) by nebulized aerosol connected to 6–8 lpm of oxygen in combination with albuterol 2.5 mg.

(2) Pediatric:

Single administration ONLY. In combination with albuterol, nebulized aerosol is connected to 6–8 lpm of oxygen.

(a) **Less than 1 year of age:** contraindicated

(b) **Age 1 year but less than 2 years:**  
250 **mcg** (1.25 mL) by nebulized aerosol

(c) **Age 2 and older:**  
500 **mcg** (2.5 mL) by nebulized aerosol



## 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 '18)

- (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



## 11. DEXTROSE

### a) Pharmacology

Dextrose is a water-soluble monosaccharide found in corn syrup and honey.

### b) Pharmacokinetics

- (1) Dextrose restores circulating blood sugar and is rapidly utilized following IV injection.
- (2) Excess dextrose is rapidly excreted unchanged in the urine.

### c) Indications

Correction of altered mental status due to low blood sugar (hypoglycemia) seizures and cardiac arrest

### d) Contraindications

Known hyperglycemia

### e) Adverse Effects

May worsen hyperglycemia (high blood sugar)

### f) Precautions

- (1) May worsen preexisting hyperglycemia
- (2) Tissue necrosis if extravasation occurs

### g) Dosage

#### (1) Adult:

- (a) If blood glucose is less than 70 mg/dL, administer 10% dextrose in 50 mL (5 grams) 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.
  - (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).

#### (2) Pediatric:

- (a) **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.

- (b) **(NEW '18) Patients 28 days up to 4 years** - if blood glucose is less than 70 mg/dL, administer 2–4 mL/kg of 10% dextrose IV/IO to a maximum of 25 grams.

Recheck glucose after first dose.



If blood glucose is less than 70 mg/dL, obtain medical consultation to administer second dose of D10W.

- (i) If unable to start IV and blood glucose is less than 70 mg/dL, administer 0.5 mg glucagon IM/IN.
- (ii)  Medical consult for additional dosing to a maximum of 3 mg IM/IN


- (c) **(NEW '18) Patients 5 years up to patient's 18<sup>th</sup> birthday** -if blood glucose is less than 70 mg/dL, administer 2–4 mL/kg of 10% dextrose IV/IO to a maximum of 25 grams.

Recheck glucose after first dose.



If blood glucose is less than 70 mg/dL, obtain medical consultation to administer second dose of D10W.

- (i) If unable to start IV and blood glucose is less than 70 mg/dL, administer 1 mg glucagon IM/IN.

- (ii)  Medical consult for additional dosing to a maximum of 3 mg IM/IN



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## 12. DIAZEPAM (VALIUM)

### a) Pharmacology

- (1) Sedation, hypnosis, alleviation of anxiety, muscle relaxation, anticonvulsant activity
- (2) Little cardiovascular effect

### b) Pharmacokinetics

- (1) Onset of action is extremely rapid following IV administration.
- (2) Half-life ranges from 20–90 minutes.

### c) Indications

- (1) Sustained and/or recurrent seizures
- (2) Severe nerve agent exposure

### d) Contraindications

- (1) Known hypersensitivity, head injury
- (2) Should be used with caution in patients with altered mental status, hypotension, or acute narrow angle glaucoma

### e) Adverse Effects

- (1) Lightheadedness, motor impairment, ataxia, impairment of mental and psychomotor function, confusion, slurred speech, amnesia
- (2) Additive effect with ethanol
- (3) Irritability and excitation may be seen paradoxically.

### f) Precautions

- (1) Respiratory depression may occur with IV administration, especially if given too rapidly.
- (2) Respiratory support may be required.
- (3) Use with caution in pregnant patients, persons ingesting alcohol, or persons ingesting sedatives.

### g) **Dosage (paramedic may perform without consult for patients with active seizures if midazolam is not available.)**

- (1) Adult: Administer 2.5–10 mg in 2.5 mg increments SLOW IVP/IM (IM requires all providers to obtain medical consultation.)  
Maximum total dose 10 mg
- (2) Pediatric: Administer 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  
Rectal Dose: Administer up to 0.2 mg/kg; maximum total dose 10 mg

Severe nerve agent exposure (providers may administer without consult):

- (3) Adult: Administer 10 mg IM.
- (4) Pediatric: greater than 30 kg: Administer 10 mg via auto-injector or 0.1 mg/kg IM, 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 and IV fluid bolus with LR; evaluate legs.
- (3) Bradycardia: Consider atropine (0.5 to 1 mg); if necessary, consider pacing.



## 14. DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)


### a) Pharmacology

Antihistamine

### b) Pharmacokinetics

- (1) Effect begins within 15 minutes of IV dose.
- (2) Peak effect 1–4 hours
- (3) Metabolized by the liver
- (4) The half-life ranges from 2–10 hours.

### c) Indications

- (1) Allergic reaction
- (2) Anaphylaxis
- (3)  Dystonic reactions


### d) Contraindications

Known allergy to diphenhydramine


### e) Adverse Effects

Drowsiness, loss of coordination, blurred vision, headache, hypotension, tachycardia, palpitations, thickening of bronchial secretions leading to chest tightness, and wheezing

### f) Precautions - Should be used with caution in patients with:

- (1) Severe vomiting
- (2) Alcohol intoxication
- (3)  Medical consultation required for:
  - (a) Asthma
  - (b) Nursing mothers

### g) Dosage

- (1) Adult: Administer 25–50 mg SLOW IVP or IM
- (2) Pediatric: Administer 1 mg/kg SLOW IV/IO or IM
- (3)  Medical consultation required for administration in mild allergic reaction.



## 15. DOPAMINE HYDROCHLORIDE (INTROPIN)

### a) Pharmacology

- (1) Alpha and beta adrenergic receptor stimulator
- (2) Dopaminergic receptor stimulator
- (3) Precursor of norepinephrine
- (4) At low doses, less than 2 **mcg**/kg/min
  - (a) Dilates renal and mesenteric blood vessels
  - (b) Venoconstricts
  - (c) Arterial resistance varies
- (5) At moderate doses, 2–6 **mcg**/kg/min beta1 stimulating effect on heart  
Results in increased cardiac output
- (6) High dose, 6–10 **mcg**/kg/min  
Exhibits alpha1 effects; peripheral vasoconstriction including renal and mesenteric vessels, increases left and right ventricular preload
- (7) Doses greater than or equal to 10 **mcg**/kg/min  
Alpha1 stimulating effects may reverse mesenteric and renal artery dilatation resulting in decreased blood flow, causing increased preload due to effects on venous system

### b) Pharmacokinetics

- (1) Extremely rapid onset of action
- (2) Extremely brief duration of action
- (3) The rate of administration may be used to control the effect of dopamine.

### c) Indications

- (1) Cardiogenic shock
- (2) Septic shock
- (3) Anaphylactic shock
- (4) Hypovolemic shock (after sufficient volume replacement)

### d) Contraindications

- (1) Preexisting tachydysrhythmias
- (2) Uncorrected hypovolemia



**e) Adverse Effects**

- (1) Anginal pain
- (2) Tachydysrhythmias
- (3) Nausea and vomiting
- (4) Hypertension
- (5) Undesirable degree of vasoconstriction

**f) Precautions**

- (1) Extravasation should be reported to the hospital staff on arrival.
- (2) Patients receiving monoamine oxidase (MAO) inhibitors are extremely sensitive to the effects of dopamine and should receive a much lower dosage than is usually given.
- (3) Patients with pheochromocytoma are extremely sensitive to dopamine and may develop profound hypertension in response to minimal doses.

**g)  Dosage**

- (1) For IV infusion use only
- (2) In general, the infusion rate is adjusted to blood pressure and clinical response.
- (3) Adult: Administer 2–20 **mcg**/kg/min IV drip titrated to BP of 100 systolic or medical consultation selected BP; initial infusion rate 2–5 **mcg**/kg/min
- (4) Pediatric: Administer 2–20 **mcg**/kg/min IV drip titrated age specific BP or medical consultation selected BP; initial infusion rate is 2 **mcg**/kg/min



## 16. EPINEPHRINE 1:10,000/1:1,000

### a) Pharmacology

- (1) The administration of epinephrine causes increases in:
  - (a) Systemic vascular resistance
  - (b) Systemic arterial pressure
  - (c) Heart rate (positive chronotropic effect)
  - (d) Contractile state (positive inotropic effect)
  - (e) Myocardial oxygen requirement
  - (f) Cardiac automaticity
  - (g) AV conduction (positive dromotropic effect)
- (2) Causes bronchial dilation by smooth muscle relaxation

### b) Pharmacokinetics

- (1) IV administered epinephrine has an extremely rapid onset of action.
- (2) Is rapidly inactivated by the liver
- (3) Subcutaneous administration of epinephrine results in slower absorption due to local vasoconstriction.
- (4) Local massage will hasten absorption.
- (5) Topically applied nebulizer within the respiratory tract, epinephrine has vasoconstrictor properties that result in reduction of mucosal and submucosal edema. It also has bronchodilator properties that reduce airway smooth muscle spasms.

### c) Indications

- (1) Cardiac arrest
- (2) Moderate to severe allergic reaction/anaphylaxis
- (3) IV epinephrine should be reserved for cardiac arrest patients and for impending cardiac arrest due to anaphylactic shock.
- (4) Bronchial asthma
- (5) Respiratory stridor (suspected croup)
- (6) Dopamine replacement indications for epinephrine drip (**NEW '18**)

### d) Contraindications

- (1) Hypertension
- (2) Preexisting tachydysrhythmias with a pulse (ventricular and supraventricular)
- (3) Use with pregnant women should be avoided whenever possible.

### e) Adverse Effects

- (1) Tachydysrhythmias (supraventricular and ventricular)
- (2) Hypertension
- (3) May induce early labor in pregnant women





- (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/IO 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
- (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.
- (5) As replacement for dopamine with the following dosing by indication  
**(NEW '18)**
- (a)  Cardiogenic (post-ROSC or acute heart failure)
- (i) Adult: 0.05 – 0.3 mcg/kg/min.
- (ii) Pediatric: 0.05 – 0.3 mcg/kg/min.
- (b)  Sepsis
- (i) Adult: 0.05 – 0.3 mcg/kg/min.
- (ii) Pediatric: 0.05 – 0.3 mcg/kg/min.
- (c)  Hypovolemic shock (after sufficient volume replacement)
- (i) Adult: 0.05 – 0.3 mcg/kg/min.
- (ii) Pediatric: 0.05 – 0.3 mcg/kg/min.
- (d) Anaphylaxis
- (i) Adult: 0.5 mcg/kg/min.
- (ii) Pediatric: 0.5 mcg/kg/min



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.

### 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/IO/IN/IM. IN administration max 1 mL per nare (**NEW '18**)
  - (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/IO/IN/IM. IN administration max 1 mL per nare. **(NEW '18)**
  - (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 18<sup>th</sup> 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 18<sup>th</sup> 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
- (5) Excited delirium (**NEW '18**)

### e) Adverse Effects

- (1)  Extrapyramidal 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 18<sup>th</sup> birthday:**  
2.5–5 mg IM or IV



## 20. KETAMINE (KENTANEST, KETASET, KETALAR) (NEW '18)

### 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.



ONSET OF ACTION FOR **IV/IO** KETAMINE MAY BE 5–10 MINUTES.

ONSET OF ACTION FOR **IN/IM** KETAMINE MAY TAKE UP TO 15–20 MINUTES.

### c) Indications

- (1) The patient reports moderate to severe pain.
- (2) The patient displaying signs and symptoms of excited delirium syndrome.

### d) Contraindications

- (1) Known hypersensitivity to ketamine
- (2) Penetrating eye injury



INDICATED FOR MUSCULOSKELETAL EXTREMITY/BACK PAIN. NOT FOR CHEST PAIN, ABDOMINAL/FLANK PAIN, OR HEADACHE.

### 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, seizure activity, or emergence from sedation.
- (3) Some patients who have received ketamine for control of excited delirium syndrome go on to requiring advanced airway management. ALS providers should closely monitor such patients to anticipate airway needs.



TO AVOID DOSING ERRORS, PROVIDERS SHOULD BE AWARE AND CONFIRM PROPER SELECTION OF CONCENTRATION PRIOR TO ADMINISTRATION. KETAMINE IS PROVIDED FOR IM OR IN ADMINISTRATION IN 100 MG PER ML CONCENTRATION. FOR IV ADMINISTRATION, KETAMINE IS PROVIDED IN 10 MG PER ML.




**g) Dosage**

(1) Pain Management


- (a) Adult: Administer 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - (i) Reassess in 5–10 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - (ii) If IV unavailable, administer 0.5 mg/kg IN/IM (if delivery device is available; divide administration of the dose equally between the nares to a maximum of 1 mL per nare).
  - (iii) Reassess in 15 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.5 mg/kg IN/IM.
- (b) Pediatric: Administer 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - (i) Reassess in 5-10 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.2 mg/kg IV/IO over 1–2 minutes. Maximum single dose 20 mg.
  - (ii) If IV unavailable, administer 0.5 mg/kg IN/IM (if delivery device is available, divide administration of the dose equally between the nares to a maximum of 1 mL per nare).
  - (iii) Reassess in 15 minutes. If pain remains moderate to severe, then administer a second dose of ketamine 0.5 mg/kg IN/IM.



(2) Excited Delirium Syndrome

(a) Adult

- (i) IV dosing: Administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg.
  - a. If severe agitation persists, administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg. Maximum total IV/IO dose 200 mg.
  - b. If agitation persists after second dose of IV/IO ketamine, consider midazolam 2.5 mg IV/IO.
- (ii) IM dosing: 4 mg/kg IM. Maximum total IM dose 400 mg.
  - a. If severe agitation persists after IM ketamine dose, administer midazolam 5 mg IM.
  - b.  Additional dose of 4 mg/kg IM ketamine for persistent agitation requires medical consultation.

(b) Pediatric

- (i) IV dosing: For children 13 to 18 years of age, administer 1 mg/kg IV/IO. Maximum single IV/IO dose 100 mg. Maximum total IV/IO dose 200 mg.
  - a.  Patients who have not yet reached their 13<sup>th</sup> birthday require medical consult: Administer 1 mg/kg IV/IO. Maximum single IV dose 100 mg. Maximum total IV/IO dose 200 mg.
  - b. If severe agitation persists, administer 1 mg/kg IV/IO. Maximum single IV dose 100 mg.

- c. If agitation persists after second dose of IV ketamine, consider midazolam 0.1 mg/kg in 2.5 mg increments SLOW IVP/IO over 1–2 minutes. Maximal single dose of midazolam 2.5 mg.
- (ii) IM dosing: Patients aged 13 to 18 years, administer 4 mg/kg IM. Maximum IM dose 400 mg.
  - a.  Patients who have not yet reached their 13<sup>th</sup> birthday require medical consult: Administer 4 mg/kg IM. Maximum IM dose 400 mg.
  - b. If severe agitation persists, administer midazolam 2.5 mg IM.
  - c.  Additional dose of 4 mg/kg IM ketamine for persistent agitation requires medical consultation.

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## 21. LACTATED RINGER'S

### a) Pharmacology

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



## 22. 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

- (2) 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)  
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.)



## 23. 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.

**(NEW '18)**




### 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.





## 24. 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

- (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

(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

- (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) **(NEW '18)**

- (a) If severe agitation persists after second dose of IV/IO ketamine, consider midazolam 2.5 mg IV/IO.
- (b) If IV/IO unavailable:
- (i) If severe agitation persists after IM ketamine dose, administer midazolam 5 mg IM.



- 
- (c) Patients aged 13 to not yet reached their 18<sup>th</sup> birthday:
- (i) If severe agitation persists after second dose of IV/IO ketamine, consider midazolam 0.1 mg/kg SLOW IVP/IO over 1–2 minutes. Maximum single dose 2.5 mg.
- (ii) If IV/IO unavailable:
- a. If severe agitation persists after IM ketamine dose, administer midazolam 2.5 mg IM.



## 25. 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.
- (3) Pulmonary Edema/Congestive Heart Failure (Pediatric only)

### 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



**f) Precautions**

- (1) Naloxone reverses all effects.
- (2) 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.

**g) Dosage**

- (1) Adult: IV/IM
  - (a) Administer 0.1 mg/kg to a maximum initial dose of 20 mg.
  - (b) 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.
  - (c)  Obtain on-line medical direction for additional doses, if required.
- (2) Pediatric: IV/IM
  - (a) Administer 0.1 mg/kg to a maximum initial dose of 20 mg.
  - (b) 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.
  - (c)  Obtain on-line medical direction for additional doses, if required.
- (3) Pediatric Pulmonary Edema/CHF
  - (a) 0.1 mg/kg SLOW IVP/IO/IM (1–2 mg/min).  
Maximum dose 5 mg.



## 26. NALOXONE (NARCAN)

### a) Pharmacology

Reverses all effects due to opioid (morphine-like) agents. This drug will reverse the respiratory depression and all central and peripheral nervous system effects.

### b) Pharmacokinetics

- (1) Onset of action is within a few minutes if administered IVP and within 5 minutes if administered IN.
- (2) Intramuscular and pediatric/neonatal endotracheal administration results in a slower onset of action.
- (3) Patients responding to naloxone may require additional doses and transportation to the hospital since most opioids last longer than naloxone.
- (4) Has no effect in the absence of opioids

### c) Indications

To reverse respiratory depression induced by opioids

### d) Contraindications

Patients under 28 days of age.

### e) Adverse Effects

Opioid withdrawal

### f) Precautions

- (1) Naloxone may induce opioid withdrawal in patients who are physically dependent.
- (2) Certain drugs may require much higher doses of naloxone for reversal than are currently used.
- (3) Should be administered and titrated so respiratory efforts return, but not intended to restore full consciousness

### g) Dosage (NEW '18)

- (1) Adult: Administer 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); **OR** administer 4 mg/0.1 mL IN in one nare. Repeat as necessary to maintain respiratory activity.
- (2) Pediatric: Administer 0.1 mg/kg 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); **OR** administer 4 mg/0.1 mL IN in one nare. May be repeated as necessary to maintain respiratory activity. ET dose: 0.2–0.25 mg/kg



## 27. 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.





## 28. 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.



## 29. **ONDANSETRON (ZOFRAN)**

### **a) Pharmacology**

A selective blocking agent of the serotonin 5-HT<sub>3</sub> 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.



### 30. 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**

- (1) If evidence of hypoxia (Less than 94% SpO<sub>2</sub>)
- (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 SpO<sub>2</sub> 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 SpO<sub>2</sub> at 100%

Percent O <sub>2</sub> 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 <sub>2</sub> READINGS MAY OCCUR IN THE FOLLOWING PATIENTS: HYPOTHERMIC, HYPOPERFUSION (SHOCK), CO POISONING, HEMOGLOBIN ABNORMALITY, ANEMIA, AND VASOCONSTRICTION.		



## 31. 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.



### 32. VERAPAMIL (Isoptin) (NEW '18)

(CRT-I & Paramedic only)

#### a) Pharmacology

Calcium channel blocker

#### b) Pharmacokinetics

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

#### c) Indications

- (1) Narrow complex symptomatic atrial fibrillation or atrial flutter

#### d) Contraindications

- (1) Hypotension below 90 mmHg, second or third degree heart block, hypersensitivity to the drug
- (2) Patient with history of Wolf-Parkinson-White syndrome
- (3) Ventricular tachycardia
- (4) Patients less than 18 years of age

#### e) Precautions

Use cautiously in patients with renal failure, congestive heart failure or on beta blockers.

#### f) Adverse Effects

- (1) Hypotension (see Treatment of Overdose or Other Adverse Reactions)
- (2) Bradycardia
- (3) Vomiting
- (4) Nausea
- (5) Headache

#### g) Significant Interactions

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

#### h) Dosage

##### (1) Adult:

- a) 2.5–10 mg slow IV over 2 minutes; if response is not adequate, repeat in 15 minutes with a dosage of 2.5–10 mg slow IV over 2 minutes with medical consultation.

##### (2) Pediatric:

Contraindicated for patients less than 18 years of age.



**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:
  - (a) If lungs are clear, administer fluid bolus 20 mL/kg of LR; titrate to a systolic blood pressure of 100 mmHg.
  - (b) If rales are present, administer fluid bolus, maximum of 250 mL of LR. Titrate to a systolic of 100 mmHg.
  - (c) Administer calcium chloride 500 mg SLOW IVP
- (3) Bradycardia: Consider atropine (0.5–1 mg); if necessary, consider pacing

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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<sup>®</sup>, Groshong<sup>®</sup>, Broviac<sup>®</sup>, Cook<sup>®</sup>)

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<sup>®</sup>, Neo-PICC<sup>®</sup>)

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.

- (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 5 mL flushes with NS/RL. **Be sure there are no air bubbles in the syringe.** Attach a stopcock if available.  
**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) Use sterile latex-safe gloves.
- (6) If multiple lumens or ports, determine from patient/family which catheter is most appropriate for use, if possible, or refer to the EIF Form. This is usually the **white** port.
- (7) Clean the existing cap on catheter with alcohol for 30 seconds.
- (8) Clamp all lines with special clamps that do not have teeth, which might damage the catheter.
- (9) Access the appropriate catheter port with a 10 mL syringe.
- (10) Unclamp the catheter line to be accessed and aspirate 5 mL of blood/heparinized solution and discard to confirm placement and access patency. Delete this step if less than 2 Fr PICC catheter, as this may damage the catheter (the lumen is very small and the catheter wall may collapse and any blood in the catheter will form a clot).  
**NOTE:** Contact MEDICAL CONSULTATION if unable to aspirate blood/fluid, or less than 2 Fr catheter.
- (11) Reclamp the catheter any time you are changing lines or syringes. Remember that regular clamps may damage the central line tubing.
- (12) Attach the flush syringe and unclamp.
- (13) Flush with 5 mL NS/RL. **Be sure there are no air bubbles in the syringe or tubing.**
- (14) Clamp this line again with the special clamp.



## 2. AIRWAY MANAGEMENT: BAG-VALVE-MASK VENTILATION

### a) PURPOSE

- (1) Bag-valve-mask (BVM) ventilation is the technique of providing rescue breathing for patients with inadequate respiratory effort or cardiac arrest. Patients in respiratory failure may respond to BVM ventilation and not require endotracheal intubation.
- (2) A BVM may also be used to administer inhaled medications for patients with severe respiratory failure.

### b) INDICATIONS

- (1) Inadequate respiratory rate
  - (a) Adult less than 8
  - (b) Adolescent (13–18 years of age) less than 12
  - (c) Child (1–12 years of age) less than 16
  - (d) Infant/Toddler (less than 1 year of age) less than 20
- (2) Inadequate respiratory effort
  - (a) Absent or diminished breath sounds
  - (b) Paradoxical breathing (chest and abdomen moving in opposite directions)
  - (c) Cyanosis or oxygen saturation less than 90% on 100% oxygen by nonrebreather with the exception of patients with chronic hypoxemia
- (3) Symptomatic Bradycardia
  - (a) Adult/Adolescent (greater than 13 years of age) Heart rate less than 60
  - (b) Child (1–12 years of age) Heart rate less than 80
  - (c) Infant (less than 1 year of age) Heart rate less than 100
- (4) Cardiac arrest
- (5) Altered mental status  
Glasgow Coma Scale of 8 or less

### c) CONTRAINDICATIONS

None

### d) POTENTIAL ADVERSE EFFECTS / COMPLICATIONS

- (1) Gastric distension
- (2) Vomiting
- (3) Increased intracranial pressure as a result of increased vagal stimulation if mask applied over the patient's eyes

**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)



#### a) INDICATIONS

- (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.

#### 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% O<sub>2</sub> via appropriate delivery system.
- (3) Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO<sub>2</sub>) 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 EtCO<sub>2</sub> 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.

#### 4. AIRWAY MANAGEMENT: LARYNGEAL TUBE AIRWAY DEVICE (KING LTS-D™) (NEW '18)



##### a) PURPOSE

To provide an alternative means of ventilating patients who cannot be intubated via laryngoscopy.

##### b) INDICATIONS

Inability to place an endotracheal tube in a patient who has no gag reflex (including patients who cannot be intubated following the administration of succinylcholine).

##### c) CONTRAINDICATIONS

- (1) Responsive patients with an intact gag reflex
- (2) Lack of an appropriately-sized device
- (3) Known esophageal disease or ingestion of caustic substances

##### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) The LTS-D airway does not protect against the effects of regurgitation and aspiration.
- (2) High airway pressures may divert gas either to the stomach or to the atmosphere.
- (3) Intubation of the trachea cannot be ruled out as a potential complication of the insertion of the LTS-D airway. After placement, perform standard checks for breath sounds and utilize an appropriate carbon dioxide monitor.

##### e) PROCEDURE

- (1) Inspect all components of the LTS-D for visible damage.
- (2) Select appropriately sized LTS-D airway as specified by manufacturer.
- (3) Test cuffs by injecting the maximum volume of air (by size) as specified by manufacturer and lubricate with water soluble jelly.
- (4) Maintain cervical immobilization (if indicated) and lift tongue and jaw upward with one hand. Ideal position of the head is in the “sniffing position”; however, the LTS-D airway can be inserted with the head in neutral position.
- (5) Insert LTS-D airway using a lateral approach and advance the tip behind the base of the tongue while rotating the tube back to midline so the blue line faces the patient’s chin.
- (6) Without exerting excessive force, advance tube until base of connector is aligned with teeth and gums.
- (7) Inflate cuff and ventilate patient. Gently withdraw the tube until ventilation becomes easy and free-flowing.
- (8) Adjust cuff inflation to obtain a seal of the airway.
- (9) Ventilate and evaluate lung ventilation (breath sounds, absence of gastric sounds, chest rise, EtCO<sub>2</sub>, oxygen saturation).
- (10) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub> level.
- (11) If unable to achieve adequate ventilation using LTS-D airway, remove device, reinsert, and attempt again. If unable to ventilate, reattempt bag-valve-mask ventilation and consider obstructed airway maneuvers.



## 5. AIRWAY MANAGEMENT: GASTRIC TUBE

### a) PURPOSE

A naso/orogastric tube is passed to relieve the gastric distension or pressure in an effort to reduce the risk of aspiration and increase the intrathoracic volume.

### b) INDICATIONS

- (1) All pediatric intubated patients
- (2) Intubated adult patients exhibiting signs and symptoms of gastric distension that compromise ventilation or circulation
- (3) Although there are other indications for the use of gastric tubes (e.g., gastric lavage and feeding), none appear to be appropriate for use in the prehospital phase of treatment in Maryland.

### c) CONTRAINDICATIONS

- (1) History of esophageal varices
- (2) Esophageal or gastric surgery within the past 6 weeks
- (3) Anatomical deformity complicating nasal passage of the tube (nasogastric)
- (4) Suspected basilar skull fracture

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Tracheal intubation with gastric tube
- (2) Epistaxis
- (3) Coiling or knotting of tube in the stomach or esophagus
- (4) Trauma to the nose, esophagus, or stomach
- (5) Triggering vomiting
- (6) Intracranial placement of gastric tube in patients with unidentified skull fractures

### e) PRECAUTIONS

Have suction available since vomiting may be induced.





**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


### **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) EtCO<sub>2</sub> 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 and hypotension is not present, morphine/fentanyl or midazolam, or a combination of both, may be given by direct medical consultation to achieve mild sedation. (NEW '18)



## 7. AIRWAY MANAGEMENT: NEEDLE DECOMPRESSION THORACOSTOMY (NDT)

### a) PURPOSE (NEW '18)

Needle Decompression Thoracostomy is the procedure of introducing a needle/catheter with a minimum length of 3.25 inches and a minimum diameter of 14 gauge (with add-on flutter valve attached) into the pleural space of the chest to provide temporary relief for the patient suffering from a tension pneumothorax.

### b) INDICATIONS



MEDICAL CONSULTATION IS REQUIRED UNLESS THE DELAY WOULD COMPROMISE PATIENT CARE.

- (1) Patients who are assessed to have a life-threatening tension pneumothorax in extremis with diminished/absent lung sounds, hypotension, and/or arrest.
- (2) If traumatic arrest is suspected due to multi-system blunt trauma, or due to penetrating neck, chest, or abdominal trauma, bilateral needle decompression should be performed. Once catheters are placed, **do not remove**.
- (3) Allowable site: second intercostal space anterior midclavicular line

### c) CONTRAINDICATIONS

- (1) Patients with suspected simple pneumothorax
- (2) Patients whose tension pneumothorax can be relieved by the removal of an occlusive dressing from an open chest wound

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Intercostal vascular or nerve injury
- (2) Pneumo/hemothorax
- (3) Direct damage to the lung
- (4) Pericardial/cardiac injury
- (5) Infection

### e) PRECAUTIONS

- (1) Reassessment of catheter patency
- (2) Second decompression may need to be performed if reaccumulation, catheter occlusion, or dislocation is evident.



## **8. OBSTRUCTED AIRWAY FOREIGN BODY REMOVAL: DIRECT LARYNGOSCOPY**

### **a) PURPOSE**

The attempted correction of a foreign-body airway obstruction through direct laryngoscopy should be accomplished only by a Maryland licensed CRT-(I) or paramedic. This is accomplished after the ALS provider has determined (by noting repeated unsuccessful attempts at dislodging the object by applying the standard basic method of foreign body removal by BLS providers or the ALS provider) that the object cannot be dislodged by these means. The patient must be unconscious and supine before this method is attempted.

### **b) INDICATIONS**

Patient must be unconscious due to foreign body upper airway obstruction that has not resolved with standard basic methods for foreign body removal.

### **c) CONTRAINDICATIONS**

None

### **d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

Trauma to the oral pharynx, vocal cords, esophagus, or trachea

### **e) PRECAUTIONS**

It is important to distinguish the foreign body from portions of the patient's anatomy.



## 9. AIRWAY MANAGEMENT: OROTRACHEAL INTUBATION

### a) PURPOSE

- (1) Endotracheal intubation involves the passage of an endotracheal tube with direct visualization or digital manipulation through the larynx and into the trachea to provide direct maximum ventilatory support for a patient.
- (2) Blind digital intubation is accomplished without the laryngoscope.

### b) INDICATIONS

- (1) Cardiac arrest
- (2) Respiratory arrest, patient without gag reflex
- (3) Deep coma, patient without gag reflex
- (4) Patient in extremis, in severe respiratory distress with extremely poor air exchange, or agonal respirations (gag reflex may be present)

### c) CONTRAINDICATIONS

Upper airway obstruction due to foreign objects

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Intubation of the esophagus
- (2) Trauma to the oral pharynx, vocal cords, esophagus, or trachea
- (3) Right mainstem bronchus intubation
- (4) Vomiting
- (5) Increased intracranial pressure as a result of increased vagal stimulation
- (6) Pneumothorax/tension pneumothorax from high pressure ventilation or underlying preexisting trauma

### e) PRECAUTIONS

- (1) When the patient cannot be intubated (following no more than two tracheal intubation attempts), avoid future intubation attempts until the patient reaches the hospital, unless otherwise directed by the physician.

- (2) Confirmation of ET placement

As it has been determined that no single method of assessment is 100% reliable, the position of the endotracheal tube must be assessed to be properly in the trachea by all means available to the EMS provider. The following methods may be used to confirm proper placement of the endotracheal tube:

  - (a) Visualization of the ET tube protruding adequately past the vocal cords and into the trachea
  - (b) Auscultation of all lung fields to confirm adequate air exchange
  - (c) Auscultation of the epigastrium to deny disturbance of the gastric fluids upon ventilation
  - (d) Observation of the bilateral expansion of the thorax
  - (e) EtCO<sub>2</sub> detection device. At a minimum, utilize colorimetric devices (required for all intubated patients).
  - (f) The esophageal detection device
  - (g) Documentation of tube depth at the lip
  - (h) Other clinical signs of improved perfusion and ventilation (e.g., pupillary response, skin color, etc.)
- (3) Once initial placement is confirmed:
  - (a) The tube must be adequately secured
  - (b) The patient must be prepared for transport in such a fashion as to minimize movement of the head and neck. This may include the use of a long backboard, and cervical collar, or other means of stabilization of the head and neck.
- (4) Placement of the tube should be verified by all means possible (as in “(2)” above) and as often as possible as part of the providers’ ongoing assessments. It has been further noted that flexion of the neck can cause 3–5 cm displacement of the ET tube dislodging the tube from the trachea. At a minimum this reconfirmation should occur
  - (a) Once the patient is prepared for transport,
  - (b) Anytime the patient is moved,
  - (c) Anytime dislodgment of the tube is suspected, and
  - (d) When responsibility for care is transferred to any other provider.
- (5) During routine reporting procedures, documentation of proper placement should include which methods were utilized and at which points, in the care of the patient, verification was accomplished.
- (6) Maintain neutral alignment of head and neck with cervical stabilization when intubating trauma patients.
- (7) The Blind Digital method may be utilized for intubation of a patient in whom hyperextension of the cervical spine may be contraindicated. It may also benefit patients with severe facial trauma. However, it must be emphasized that this can be a difficult procedure, and the provider must be certain that the patient cannot bite.

f) **SUGGESTED SIZES FOR ENDOTRACHEAL TUBES AND SUCTION CATHETERS**

**Equipment Sizes**

AGE	ORAL AIRWAY	BAG-VALVE-MASK	ETT SIZE	ETT BLADE	SUCTION CATHETER	GASTRIC TUBE
Premature	0	NEONATAL	2.5-3.0	0	6F	5F
Newborn	0	NEONATAL	3.0-3.5	0-1	6F	5-8F
3 mo.	1	INFANT	3.5	1	6-8F	5-8F
6 mo.	1	INFANT	3.5-4.0	1	8F	8F
1 yr.	1	INFANT	4.0	1	8F	8F
2 yrs.	2	CHILD	4.0-4.5	1-2	8-10F	8-10F
3 yrs.	2	CHILD	4.5	2	10F	10F
4 yrs.	3	CHILD	4.5-5.0	2	10F	10-12F
6 yrs.	4	CHILD	5.0-5.5	2	10F	12-14F
8 yrs.	4	CHILD	5.5-6.0	2	10-12F	14F
10 yrs.	5	CHILD	5.5-6.5	3	12F	14F
12 yrs.	5	ADULT SMALL	6.5-7.0	3	12F	14-18F
14 yrs.	5	ADULT	6.5-7.5	3	12-14F	16-18F
ADULT	5	ADULT	7.0-10.0	4	12-14F	16-18F



ENDOTRACHEAL TUBE SELECTION FOR A CHILD SHOULD BE BASED ON 16 PLUS CHILD'S AGE DIVIDED BY FOUR [ (16 + YEAR) / 4 = TUBE SIZE ] OR SIZE RECOMMENDED BY LENGTH-BASED RESUSCITATION TAPE (E.G., BROSLOW TAPE).

UNCUFFED ENDOTRACHEAL TUBES ARE RECOMMENDED FOR CHILDREN LESS THAN 8 YEARS OF AGE OR LESS THAN 25 KG.

AGE IN THE CHART IS A QUICK REFERENCE. ONE SIZE LARGER AND ONE SIZE SMALLER SHOULD BE ALLOWED FOR INDIVIDUAL VARIATIONS. USE A LENGTH-BASED TAPE IF AVAILABLE.

## 10. AIRWAY MANAGEMENT: TRACHEOSTOMY CHANGE



### a) PURPOSE

Changing a tracheostomy tube may be required to reestablish a patent airway in patients who present with respiratory distress secondary to tracheostomy tube occlusion or obstruction that has not been relieved through suctioning.

### b) INDICATIONS

- (1) Inability to ventilate with BVM
- (2) Ineffective spontaneous ventilations (poor chest rise, decreased breath sounds bilaterally)
- (3) Hypoxia, cyanosis, or decreased O<sub>2</sub> saturation levels, not relieved by suctioning
- (4) Increased work of breathing
- (5) Altered mental status secondary to hypoxia

### c) CONTRAINDICATIONS

None

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Inability to reinsert a tracheostomy tube
- (2) Edema at stoma site
- (3) Inability to maintain adequate chest rise and fall with assisted ventilations due to air leak around uncuffed tracheostomy tube



PATIENTS GREATER THAN EIGHT YEARS OF AGE WHO REQUIRE ASSISTED VENTILATIONS WILL NEED TO HAVE A CUFFED TUBE INSERTED TO PREVENT AIR LEAK AROUND THE TUBE AND ENSURE ADEQUATE CHEST RISE. IF AN APPROPRIATE SIZED CUFFED TRACHEOSTOMY TUBE IS NOT AVAILABLE, THEN ALS PROVIDERS MAY USE AN ET TUBE.

### e) PROCEDURE

- (1) Two providers or provider and trained family member
- (2) Use latex-safe sterile gloves and equipment.
- (3) Position patient with the head and neck hyperextended to expose the tracheostomy site.
- (4) Explain procedure to patient/family.
- (5) Have new tracheostomy tube nearby.
- (6) To remove the tracheostomy tube:
  - (a) If a double cannula tracheostomy tube is in place, attempt to change inner cannula first and reassess the patient to see if the obstruction is relieved. If the patient continues to have respiratory distress, change the entire tracheostomy tube. If cuffed, deflate using a 10 mL syringe.
  - (b) Carefully cut the tracheostomy ties.



- (c) Remove the tracheostomy tube, outward and backward towards the chest.
  - (d) Lubricate the new tracheostomy tube with lubricating jelly or saline/water.
  - (e) Insert new tracheostomy tube into stoma, inward and downward towards the lungs.  
**NOTE: STOP IF YOU MEET RESISTANCE** (see (7) below).
  - (f) If cuffed tracheostomy tube is used, once the tube has been inserted, inflate the cuff with an appropriate amount of air to avoid air leak around the tube (1–3 mL for pediatric tubes and 5–10 mL for adult tubes).
  - (g) Reassess the patient.
  - (h) With good chest rise and fall and improved skin color, secure the tracheostomy tube with ties or Velcro at the back of the neck, so only one fingertip fits between the neck and the ties.
- (7) If you meet resistance inserting the tracheostomy tube, do NOT force the tube into the stoma. Request ALS rendezvous, if appropriate. Assess the patient:
- (a) Reposition the patient, hyperextend the neck area.
  - (b) Reoxygenate using BVM to stoma site, with infant mask and appropriate size reservoir bag for the patient's size. Assess for chest rise and fall.
  - (c) If inadequate rise and fall of the chest, AND the patient has not had a laryngectomy, attempt BVM orally while placing an occlusive dressing over the stoma site. If a laryngectomy patient, you will only be able to ventilate with BVM at the stoma site.
  - (d) Attempt to insert a half-size smaller tracheostomy tube after lubricating with lubricating jelly or saline/water.
  - (e) Proceed with (6) f-g-h above.
  - (f) If you meet resistance, reassess the patient. Reoxygenate as needed.
  - (g) Insert a suction catheter through the tracheostomy tube, and use the suction catheter as a guide to insert the tracheostomy tube.
  - (h) Proceed with (6) f-g-h above.
  - (i) If ALS, attempt to insert a similar sized endotracheal tube into the stoma. If cuffed endotracheal tube is used, inflate the cuff with an appropriate amount of air to avoid air leak around the tube (1–3 mL for pediatric tubes and 5–10 mL for adult tubes).
  - (j) If ALS and unable to insert the ET tube into the stoma, AND the patient has not had a laryngectomy, attempt to intubate orally and apply an occlusive dressing over the stoma site.
  - (k) If you continue to have problems, STOP, consult the Base Station and continue BVM ventilations orally, or BVM to tracheostomy site ventilations if a laryngectomy patient, while en route to the closest appropriate hospital.

## 11. AIRWAY MANAGEMENT: TRACHEOSTOMY SUCTIONING



### a) PURPOSE

Tracheostomy suctioning may be required to maintain a patent airway in patients who present with respiratory distress secondary to tracheostomy tube occlusion or obstruction.

### b) INDICATIONS

- (1) Increased secretions from tracheostomy site or a mucous plug
- (2) Hypoxia, cyanosis, or decreased oxygen saturation levels
- (3) Increased work of breathing
- (4) Altered mental status secondary to hypoxia

### c) CONTRAINDICATIONS

None

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Bleeding at tracheal stoma site
- (2) Dislodgment of tracheostomy tube
- (3) Exaggerated cough reflex with introduction of saline
- (4) Increased hypoxia/respiratory distress
- (5) Infection

### e) PROCEDURE

- (1) Two providers or provider and trained family member
- (2) Use latex-safe sterile gloves and equipment.
- (3) Position patient with the head and neck hyperextended to expose the tracheostomy site.
- (4) Pre-oxygenate patient at the tracheostomy site:
  - (a) NRB mask if patient has adequate effective spontaneous respirations
  - (b) BVM if ventilator-dependent or there are ineffective spontaneous respirations
- (5) Select appropriately sized suction catheter (2 x internal diameter of tracheostomy tube).
- (6) Insert suction catheter:
  - (a) Measure from the tracheostomy site to the sternal notch.

**OR**

  - (b) Insert until there is a cough reflex.
- (7) Apply suction ONLY as the catheter is withdrawn, rotating the catheter in a twisting motion between thumb and finger.
- (8) Suction for maximum of 10 seconds.
- (9) Reoxygenate and reevaluate patient.
- (10) Repeat suction procedure as needed (for thick secretions instill 3–5 cc sterile saline/water prior to repeat suctioning).

## 12. AIRWAY MANAGEMENT: VENTILATORY DIFFICULTY SECONDARY TO BUCKING OR COMBATIVENESS IN INTUBATED PATIENTS

### a) INDICATIONS

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

### b) CONTRAINDICATIONS

Unsecured airway

### c) PROCEDURE (NEW '18)

- (1) Midazolam up to 0.05 mg/kg IVP over 1–2 minutes, titrated to abate bucking and relax ventilation while maintaining systolic BP greater than 90 mmHg. Maximum single dose is 5 mg.
- (2) If ventilatory difficulty is thought to be the result of pain response, opioid may be used per Pain Management Protocol in addition to or instead of midazolam: Titrate to abate bucking and relax ventilation while maintaining systolic BP greater than 90 mmHg.
- (3) Continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub> level.
- (4) Obtain on-line medical direction if further problems present.



- (5) Midazolam up to 0.05 mg/kg IVP over 1–2 minutes, titrated to abate bucking and relax ventilation while maintaining systolic BP: greater than 60 in neonates, 70 in infants, and  $[70 + (2 \times \text{years}) = \text{systolic BP}]$  for patients greater than 1 year of age. Maximum single dose is 5 mg.
- (6) If ventilatory difficulty is thought to be the result of pain response, opioid may be used per Pain Management Protocol in addition to or instead of midazolam: Titrate to abate bucking and relax ventilation while maintaining systolic BP: greater than 60 in neonates, 70 in infants, and  $[70 + (2 \times \text{years}) = \text{systolic BP}]$  for patients greater than 1 year of age.
- (7) Continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub> level.
- (8) Obtain on-line medical direction if further problems present.

## 13. VENTILATORY MANAGEMENT

### a) PURPOSE

- (1) Manual ventilation using a bag-valve-mask (BVM) or mechanical (machine) ventilation can be an effective method for managing a patient in the pre-hospital environment when performed correctly. Ventilatory management is important at both the BLS and ALS levels.
- (2) Special considerations such as etiology of respiratory failure and method of achieved airway management, including intubation (e.g., rapid sequence intubation), may require the advanced life support provider to provide additional care.

### b) INDICATIONS

- (1) Any condition requiring assisted or artificial ventilation with a bag-valve-mask or mechanical (machine) ventilation
- (2) All patients will require manual ventilation after the placement of an advanced airway. Inadequate respiratory rate may be secondary to underlying respiratory pathology or the result of pharmacologic intervention secondary to medications used in rapid sequence intubation.

### c) CONTRAINDICATIONS

None

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Gastric distension, vomiting, and/or aspiration
- (2) Hypoxemia
- (3) Secretions and tube/bag obstruction
- (4) Barotrauma
- (5) Patient agitation
- (6) Equipment failure



### e) PROCEDURE/PRECAUTIONS:

- (1) Have suction available and ensure a patent airway using a BLS airway adjunct (OPA or NPA).
- (2) Rate of **initial** ventilation by single hand bag-valve technique should generally be the following:
  - (a) For all ages except neonates, 1 breath every 5 seconds (8–12 breaths/min)
  - (b) For a neonate, 1 breath every 3 seconds (higher rates may be required)
- (3) **AVOID** hyperventilating unless patient exhibits signs of brainstem herniation (e.g., unequal pupils, posturing). Hyperventilation is associated with increased mortality.

- (4) In the absence of contraindications (e.g., CPR or spinal trauma), consider elevating the head of the bed to 30 degrees.
- (5) Continuous pulse oximetry shall be used. If a sudden drop in SpO<sub>2</sub> is observed, assess airway patency and consider obstruction (e.g., tongue, vomitus, blood), poor seal around BVM, and flow of oxygen being administered (LPM).



- 
- (6) A gastric tube should be considered for gastric decompression whenever distention is caused by BVM ventilation. Gastric distention can reduce effectiveness of ventilations.
  - (7) Waveform capnography and patient-specific considerations:
    - (a) Continuous EtCO<sub>2</sub> shall be used whenever an advanced airway has been placed.
    - (b) Continuous EtCO<sub>2</sub> monitoring is encouraged for all other manually-ventilated patients.
    - (c) The waveform shape and reading can contribute to an understanding of the underlying pathology.
    - (d) Waveform capnography is utilized to optimize manual ventilation. Deliver ventilations to achieve a target EtCO<sub>2</sub> level of 35–40 mmHg if patient has a pulse.
    - (e) EtCO<sub>2</sub> can be used to assess trends during a cardiac arrest and may contribute to understanding the pathology. A sudden substantial increase in EtCO<sub>2</sub> may indicate ROSC.
    - (f) Hypercapnia is seen in patients experiencing respiratory failure as a result of obstructive disease, such as asthma and COPD. Chronic baseline hypercapnia should be considered when ventilating to a target EtCO<sub>2</sub>.
    - (g) A target EtCO<sub>2</sub> of 30–35 mmHg should be used for the rare patient who exhibits signs of brainstem herniation. Lower EtCO<sub>2</sub> has been associated with increased mortality.
  - (8) If advanced airway is placed and patient does not have adequate chest rise, absent or significantly diminished breath sounds, or decreased SpO<sub>2</sub> or abnormal EtCO<sub>2</sub> levels, consider the **DOPES** mnemonic:
    - “**D**”: Is the tube displaced? Assess for bilateral breath sounds and reassess tube depth and compare to initial depth noted after insertion.
    - “**O**”: Is an obstruction present? Suction the tube with a flexible suction catheter.
    - “**P**”: Are there signs of a tension pneumothorax? If present, perform needle decompression thoracostomy.
    - “**E**”: Is there an equipment malfunction? Check oxygen flow in tubing and level in portable cylinder, determine whether SpO<sub>2</sub> and EtCO<sub>2</sub> devices are working correctly, and ensure the cuff is adequately inflated.
    - “**S**”: If history of asthma or COPD is known, consider extending the interval between ventilations to avoid stacked ventilations.

- (9) Consider using a positive end expiratory pressure (PEEP) valve on the BVM, especially if the patient is hypoxemic (start at 5 cm H<sub>2</sub>O).
- (10) If combativeness or bucking prevents the delivery of adequate ventilations, management shall be guided by the Ventilatory Difficulty Secondary to Bucking Protocol.

## 14. ELECTRICAL THERAPY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)



### a) INDICATIONS

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

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

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
  - (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
    - (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.



## 16. ELECTRICAL THERAPY: DEFIBRILLATION

### a) PURPOSE

Defibrillation involves the delivery of non-synchronized direct electric current (mono or biphasic) to the myocardium of a patient exhibiting ventricular fibrillation or ventricular tachycardia without palpable pulses/blood pressure. The objective of defibrillation is to depolarize the entire myocardium, which, it is hoped, will result in allowing a single reliable pacemaker site to assume pacemaker control at a rate capable of producing an adequate cardiac output.

### b) INDICATIONS

- (1) Ventricular fibrillation
- (2) Ventricular tachycardia without palpable pulse or BP

### c) DOSAGE

- (1) Adult
  - (a) Initial delivered energy monophasic 360 J or biphasic 120–200 J
  - (b) Subsequent delivered energy monophasic 360 J or biphasic increasing joules setting, if device allows
- (2) Pediatric
  - (a) Initial delivered energy 2 J/kg (monophasic or biphasic)
  - (b) Subsequent delivered energy 4 J/kg (monophasic or biphasic)
  - (c) If refractory after 4 shocks, increase dosage to 6 J/kg, 8 J/kg, then 10 J/kg.

### d) CONTRAINDICATIONS

None

### e) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

- (1) Burns to the skin
- (2) Deactivation of patient's implanted pacemaker

### f) PRECAUTIONS

- (1) Patients who are fully digitalized may require less than the normal recommended delivered energy.
- (2) 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.



## 17. ELECTRICAL THERAPY: EXTERNAL TRANSCUTANEOUS CARDIAC PACING

### a) PURPOSE

Non-invasive cardiac pacing, also referred to as external or transcutaneous pacing, involves the temporary application of externally applied electrodes to deliver an adjustable electrical impulse directly across an intact chest wall for the purpose of rhythmically stimulating the myocardium to increase the mechanical heart rate.

### b) INDICATIONS

(1) It is indicated for the treatment of hemodynamically compromised patients in settings where cardiac output is compromised due either to the complete failure of cardiac rhythm or to an insufficient rate of the patient's intrinsic pacemaker.

(2) Bradycardia (EKG other than second-degree Mobitz Type II or third-degree AV Block)

(3) Second-degree Mobitz Type II and third-degree AV block with a systolic BP of less than 80 mmHg, or 80–100 mmHg with shock-like signs or symptoms



In the presence of Mobitz II and third-degree AV block, medical consultation is required for atropine administration.

(4) Pacing may be indicated in certain instances in which the heart rate is 60–75 BPM and shock-like symptoms persist.



Pacing in these instances requires medical consultation from a physician



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(5) Pediatric patients with profound symptomatic bradycardia unresponsive to optimal airway management, oxygenation, epinephrine, and atropine

### 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.
  - (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.
    - (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.

- (4) If the Go-Team is dispatched, the EMS medical commander will contact them using the “Trauma Line” (or other radio) to update them about the circumstances of the entrapment and the patient’s condition.
- (5) When the Go-Team arrives on the scene, they are to report to the on-scene incident commander and operate within the Incident Command System.
- (6) Once the patient is extricated, the EMS system will transport the patient to the appropriate facility under established EMS guidelines with consultation by the Go-Team physician.
- (7) The Go-Team will document the care they provide and file a patient care report with the State EMS Medical Director at MIEMSS.



## **19. IV ACCESS AND MAINTENANCE: EXTERNAL JUGULAR (EJ) INTRAVENOUS ACCESS**

### **a) PURPOSE**

The external jugular vein is a large vessel in the neck that may be used by a CRT-(I) or paramedic for intravenous cannulation.

### **b) INDICATIONS**

EJs are appropriate when IV access is emergently indicated, but an extremity vein cannot be catheterized.

### **c) CONTRAINDICATIONS**

- (1) Inability to visualize the vein
- (2) Suspected spinal trauma

### **d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

Hematoma, pain, infiltration, infection, dislodged catheter, nerve injury, thrombosis, air embolism, airway occlusion, and pneumothorax

### **e) PRECAUTIONS**

Carefully secure EJ catheter and tubing.





## 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 mg 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.

**(NEW '18) Patient 28 days or greater until the 18th birthday** - if blood glucose is less than 70 mg/dL, administer 2–4 mL/kg of 10% dextrose IV/IO to a maximum of 25 grams.

Recheck glucose after first dose.



If blood glucose is less than 70 mg/dL, obtain medical consultation to administer second dose of D10W.

(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 18<sup>th</sup> birthday: 1 mg

28 days–4 years of age: 0.5 mg

## 21. HIGH PERFORMANCE CPR (NEW '18)

### a) PURPOSE

To improve survival of sudden out-of-hospital cardiac arrest patients in Maryland. High Performance Cardio-Pulmonary Resuscitation (HPCPR) employed with Code Resource Management (CRM) is a proven concept based on a team approach that ensures effective and efficient use of EMS resources. This systematic change in treatment and management of cardiac arrest patients has demonstrated effectiveness in Maryland, and provides an example for systems embarking on measuring and improving care that is based upon proven research and practices.

### b) INDICATIONS

Patients in cardiac arrest who are greater than 24 hours old.

### c) CONTRAINDICATIONS

- (1) Patients meeting the criteria for Pronouncement of Death in the Field Protocol
- (2) Patients who are less than 24 hours old

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

None

### e) PRECAUTIONS

None

### f) IMPORTANT ROLE OF DISPATCHER TELEPHONE CPR (T-CPR)

- (1) Immediate recognition of unresponsiveness, activation of EMS system response via 9-1-1, and initiation of CPR by the lay rescuer is essential to maximize survival.
- (2) In an unresponsive patient, rapid recognition of agonal (gaspings) respirations, or no respirations should prompt dispatcher-directed compressions to the caller (Dispatch-directed T-CPR).
- (3) Dispatch-directed T-CPR delivers CPR prior to EMS system arrival and presents a patient more responsive to EMS interventions, thus providing the ability to improve survival.

### g) PROCEDURE FOR HIGH PERFORMANCE CPR

- (1) The first provider at the patient's side will assess and initiate compressions.
- (2) **Effective Compressions** - Manual chest compressions should be initiated immediately upon identification of cardiac arrest, as long as the scene is safe. When compressions are done manually, compressors should be rotated **every 2 minutes** in order to maintain high-quality compressions. Ideally, one compressor is on each side of the patient's chest: one person compressing the chest and the other person ready to start. Chest compressions will be performed at a depth of at least 2 inches allowing for complete recoil of the chest after each compression.



For patients **less than one year of age**, compressions will be performed at a depth of 1½ inches. For patients **greater than one year old up to age 13**, compressions will be at a depth of 2 inches.

- (3) Compressions should be accomplished with equal time given for the down and up motion and achieve a rate of 100–120 per minute.
- (4) **Continuous Compressions** - Chest compressions will be performed at a rate of 100–120 per minute and will NOT be interrupted during the two-minute cycle for any reason. Other treatments such as ventilations, IV access, or intubation attempts will be done while compressions are ongoing. After completion of a two-minute cycle, a brief pause to assess pulses and/or defibrillate will be limited to less than 10 seconds.
- (5) **Defibrillation** – placement of the defibrillator pads will not interrupt chest compressions
  - (a) Automatic External Defibrillation
 

The AED will be powered on as soon as the cardiac arrest is confirmed. Do not interrupt chest compressions to remove clothing or place defibrillation pads. If the AED charges after analyzing, chest compressions will be performed while the device charges, then the patient will be “cleared” and defibrillated. Compressors will hover over the patient with hands ready during defibrillation so compressions can start immediately after a shock. Another two-minute cycle of compressions will be immediately performed. Pulse checks will not occur after a shock, but only after the AED prompts “no shock advised.” If no pulse is palpated, or if unsure, immediately perform another two minutes of CPR.
  - (b) Cardiac Monitor/Defibrillator
 

When a manual defibrillator is in use, it will be charged to the appropriate energy level as the end of the compression cycle nears (approximately 1 minute and 45 seconds into a two-minute cycle). At the end of the two-minute cycle, the patient will be cleared, the rhythm will then be interpreted rapidly, and the patient will either be defibrillated or the defibrillator energy charge will be cancelled. This sequence must be performed within 10 seconds. During this sequence, the compressors will hover over the patient with hands ready. If a shock is delivered, the compressor will immediately resume CPR. Rhythm interpretation will not occur after a shock, but only occur after the two-minute cycle of CPR is performed. If a shock is not indicated, check for a pulse. If patient remains pulseless, immediately resume HPCPR.
- (6) **Ventilations** - Ventilations will be performed without stopping chest compressions. Ventilations are important but can impede the cardiac output from compressions. Thus, rescuers should not provide too many breaths or use excessive force. One ventilation will be given every 10th compression during recoil (upstroke). Once an advanced airway is in place, ventilations will be interposed asynchronously with uninterrupted compressions (1 ventilation every 6 seconds, for all ages). Ventilation volume should be low volume (approximately 500 cc), best approximated by a three finger or end of bag squeeze. High performance, continuous compressions remain the priority. Ensure ventilations are adequate with bag-valve-mask attached to 100% oxygen. Providers will not interrupt compressions to obtain an advanced airway.



For children **up to age 13**, maintain a ratio of 2 ventilations every 30th compression for single rescuer CPR or 2 ventilations every 15th compression for two or more rescuer CPR.

Rescuers Should	Rescuers Should Not
Perform chest compressions at a rate of 100-120/min	Compress at a rate slower than 100/min or faster than 120/min
Compress to a depth of at least 2 inches (5 cm)	Compress to a depth of less than 2 inches (5 cm) or greater than 2.4 inches (6 cm)
Allow full recoil after each compression	Lean on the chest between compressions
Minimize pauses in compressions	Interrupt compressions for greater than 10 seconds
Ventilate adequately (2 breaths after 30 compressions, each breath delivered over 1 second, each causing chest rise)	Provide excessive ventilation (ie, too many breaths or breaths with excessive force)

(7) **Advanced Life Support** - ALS providers will address defibrillation, IV/IO access, medication administration, and advanced airway placement, as indicated within these protocols; however, the placement of an advanced airway is no longer an early focus of cardiac arrest management and will not interrupt chest compressions. Nasal capnography may be utilized to optimize CPR performance and evaluation of ROSC, with use of bag-valve-mask ventilation.

(8) **Return of Spontaneous Circulation (ROSC)** – Refer to ROSC Protocol.

(9) **Quality Improvement/Performance Metrics** – Time to CPR, time to defibrillation, and quality of CPR are all factors that have been shown to have a positive impact on survival. One metric that field crews can use to evaluate performance is CPR Fraction.

(a) CPR Fraction – The time CPR is being performed divided by the total time of the cardiac arrest. This fraction is typically reported as a percentage.

(i) A target goal for crews, that has been associated with improvements in survival, is a CPR fraction of equal to or greater than 80%.

(ii) Minimizing pre-shock pauses (e.g., charging defibrillator while providers performing chest compressions)

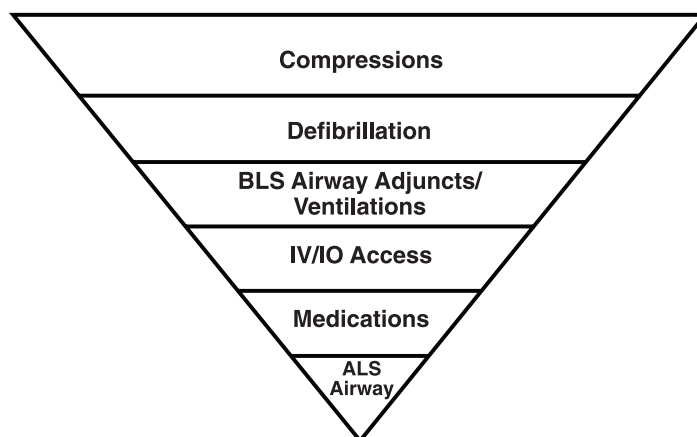
(iii) Feedback is best provided in real time or as close to the provision of care as possible.

(b) CPR compression rates should be between 100 and 120 per minute.

(c) Compression pauses should always be less than 10 seconds.

#### h) **PROCEDURE: CODE RESOURCE MANAGEMENT (CRM)**

Crews should coordinate their duties keeping the call priorities in mind. Intervention priorities are (in order of highest to lowest):



The number of personnel on a given incident and the qualifications of those personnel can vary; however, the priorities remain the same. Appropriate crew roles are outlined below:

**2 provider crew:**

Provider 1 – Chest compressions

Provider 2 – Ventilate, attach/operate AED/defibrillator, assume crew leader responsibilities (providers rotate positions every two minutes)

*Roles remain the same even if providers are ALS equipped*

**3 provider crew:**

Provider 1 – Chest compressions

Provider 2 – Ventilate

Provider 3 – Crew Leader, attach/operate AED/defibrillator  
(Providers 1 and 2 rotate every two minutes)

Roles remain the same even if providers are ALS equipped

**4 provider crew:**

Provider 1 – Chest compressions

Provider 2 – Ventilate

Provider 3 – Attach/operate AED/defibrillator

Provider 4 – Crew leader

(Providers 1, 2, and 3 rotate every two minutes)

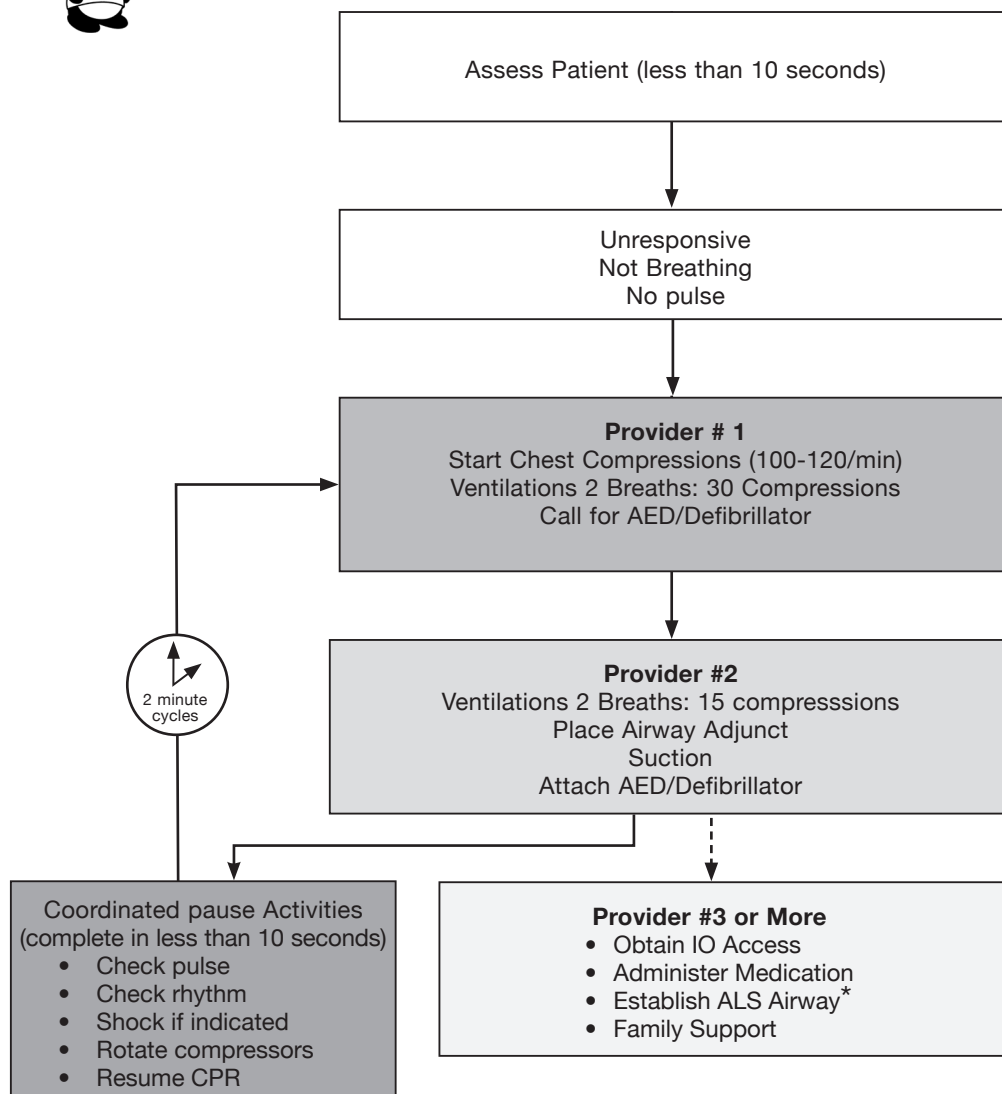
*\*\* Once first two roles have begun treatment, ALS providers will establish IV/IO and administer medications.*

**Greater than 4 providers** - Utilize the same initial assignments as the four provider crew. The crew leader will assign additional roles such as informing the family of patient status, gathering patient information, and documenting the medical interventions performed on the call. If resources allow, rotate additional providers to do chest compressions to achieve optimal performance.

**Crew leader** - The crew leader will keep time, record interventions performed during the arrest, give compression feedback and ensure rotation of personnel doing compressions every two minutes. Verbal announcements of time should occur at one minute, 30 seconds before reassessment, 15 seconds left, and countdown to reassessment at 10 seconds.



## PEDIATRIC HIGH PERFORMANCE CPR (HPCPR)



Pediatric HPCPR Team Member Initial Roles	
<b>Provider #1:</b>	<ul style="list-style-type: none"> <li>• Chest compressions at 100-120 per minute</li> <li>• Call for AED</li> </ul>
<b>Provider #2:</b>	<ul style="list-style-type: none"> <li>• Ventilate at 2 breaths:15 compressions</li> <li>• Attach AED</li> </ul>
<b>Provider #3 or MORE:</b>	<ul style="list-style-type: none"> <li>• Assume timekeeper role</li> <li>• Assume AED role</li> <li>• IO Access</li> <li>• Medications</li> <li>• Establish ALS Airway</li> <li>• Family Support</li> </ul>

Essentials of High Performance CPR for Pediatrics
1. Ensure proper chest compression rate <ul style="list-style-type: none"> <li>• 100-120/min</li> </ul>
2. Ensure proper compression depth <ul style="list-style-type: none"> <li>• Less than 1year – 1 ½ inches (4 cm)</li> <li>• Greater than or equal to 1 year – 2 inches (5 cm)</li> </ul>
3. Minimize interruptions (less than 10 second pause)
4. Ensure full chest recoil
5. Coordinate 2 minute cycles
6. Rotate Compressor

\* Once an advanced airway is in place, one ventilation every 6 seconds interposed asynchronously

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## 22. INTRAOSSEOUS INFUSION

### a) PURPOSE

The administration of fluids and medications via intraosseous (IO) 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 :
    - (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 :
- (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 (1<sup>st</sup> 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 (2<sup>nd</sup> 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.



**Special Consideration:**

**Consider medevac transport if ground transport greater than 60 minutes to a trauma or specialty center would deplete limited EMS resources in the community.**

**d) CONTRAINDICATION FOR MEDEVAC REQUEST**

EMS/DNR-B or MOLST B patients are not candidates for field medevac transport.



ALL REQUESTS FOR SCENE HELICOPTER TRANSPORTS SHALL BE MADE THROUGH SYSCOM.

**e) FORMAL REQUEST PROCESS**

The Systems Communications Center (SYSCOM) at MIEMSS serves as the communications center for the dispatching and management of Maryland's public safety helicopter resources. This mission is accomplished through the partnership between jurisdictional 9-1-1 call-centers and SYSCOM operations at MIEMSS. All helicopter requests must be routed through SYSCOM. The Medevac Request Data form is designed to provide a consistent standard by which SYSCOM receives "request" information. Considering the variety in the types of requests received by SYSCOM (e.g., medevac, search-and-rescue, law enforcement tracking) the information requested will vary, depending on the nature of the request. The county communications centers and the EMS providers that make the request should be familiar with the Medevac Data Request form to provide essential data to SYSCOM for prompt dispatch of the requested helicopter support.

EMS provider and 9-1-1 center medevac request process:

- (1) Decision made to request medevac based on indication and principles above (if 9-1-1 center has enough information from phone interrogation of call, and trauma indications meet Trauma Decision Tree Category Alpha or Bravo, the 9-1-1 center operator does not have to wait for EMS provider to arrive on scene to make medevac request).
- (2) If indicated, consult with trauma/specialty center for physician authorization to use medevac for transport and acceptance of the patient.
- (3) Essential information gathered to complete the Medevac Data Request form (most of this is handled by 9-1-1 center).
- (4) Contact SYSCOM for formal medevac request.
- (5) Select and secure landing zone following optimal landing zone setup and safety tips.

## Medevac Data Request Form

### ***Maryland Helicopter Dispatch Request***

1	Identify Call Origin & Operator ID
2	Identify Request Type: <b>Medevac, Search &amp; Rescue, Airborne Law Enforcement</b>
3	Jurisdictional Incident Number & 9-1-1 Dispatch Time

### ***Medevac Dispatch***

1	Incident Type
2	Incident Location: Community & Site
3	Landing Zone
4	ADC Map Page/Grid OR Lat/Lon
5	Primary Condition
6	Severity, Category & Priority
7	Adult or Pediatric or Estimated Age?
8	Multiple Patients?
9	ALS Unit & LZ Contact Info
10	Additional Relevant Information

### ***Search & Rescue Dispatch***

1	Incident Type
2	Incident Location: Community & Site
3	ADC Map Grid OR Lat/Lon Info for LZ
4	Primary Target Description
5	Time Last Observed
6	Ground Contact Unit
7	Additional Relevant Information

### ***Airborne Law Enforcement Dispatch***

1	Incident Type
2	Incident Location: Community & Site
3	ADC Map Grid OR Lat/Lon Info for LZ
4	Primary Target
5	Time Last Observed
6	Ground Contact Unit
7	Additional Relevant Information

## f) HELICOPTER SAFETY

### (1) OPTIMAL LANDING ZONE (LZ) SETUP

- (a) **150 x 150 foot area close to the incident scene and free from obstructions is the minimum required with a 175 x 175 foot area preferred.**  
(In mass casualty incident, identify a large enough area to land multiple large helicopters.)
- (b) The landing zone should be a flat surface that is firm, free of overhead obstructions, and free of any debris that can blow up into the rotor system. The maximum allowable slope is 10 degrees.
- (c) Obstacles such as wires, poles, signs, etc. can be difficult to see from the aircraft. If wires are present at or near the scene, this information must be relayed to the flight crew prior to landing.
- (d) Advise the flight crew on overhead radio contact if there are any obstructions in the area, obstructions at the edge of the LZ, or any obstructions in-line with the departure or approach path.
- (e) The landing zone will not be located near fixed objects that may be susceptible to wind damage or unsecured objects (e.g., patio furniture, small boats) that may become airborne as the AW-139 aircraft produces a significant amount of main and tail rotor wash.
- (f) If the roadway is too narrow, or numerous trees or other obstacles are present, another area must be selected as an alternate LZ and checked for obstacles and other unsafe conditions. After the LZ Officer has evaluated all areas, the best unobstructed landing site must be secured and the flight crew advised of any unsafe conditions they may encounter during the landing.

**NOTE:** In determining landing zones, be aware that helicopter take-offs and landings can be done in a vertical manner; however, these landings limit the pilot's visibility of the LZ. Increased power requirements on the helicopter may eliminate land-back areas should an engine malfunction occur, making the approach slower and causing extended periods of rotor wash.

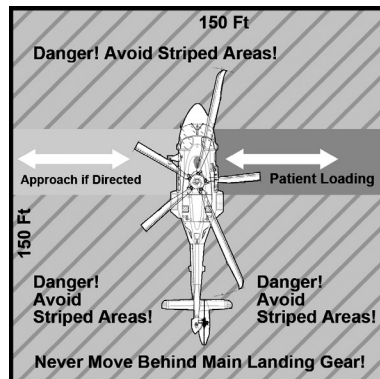
### (2) ADDITIONAL LANDING ZONE TIPS

- (a) The LZ Officer should walk the area on both sides of the LZ and check for hazards. During night operations, walk the LZ with a flashlight that is directed up and down to detect wires in and around the LZ.
- (b) 45-Degree Test—The LZ Officer should stand in the middle of the LZ with one arm extended at a 45-degree angle in front of him/her. Any objects at or above this line are obstacles and need to be reported to the incoming aircraft. This test is done for the full 360 degrees.
- (c) Do not recommend landing zones that contain loose material such as gravel. The rotor wash will cause stones or gravel to become airborne, striking personnel and/or damaging vehicles.

- (d) When a roadway is to be used as an LZ, all traffic must be stopped in both directions of the roadway, even on multi-lane highways or inter-states.
- (e) The LZ Officer will ensure that enough personnel is available to prevent any breach of LZ security by pedestrians while the helicopter is approaching, on the ground, or while departing. Failure to do so may cause injuries and/or delay patient transport.
- (f) Do not allow traffic to use the roadway until after the aircraft has departed. Traffic will be stopped at least 200 feet in both directions from the landing zone.
- (g) Do not use flares or cones to mark the landing zone: they will become airborne during the landing. (Weighted cones/lights that are designed for aircraft operations are generally acceptable.)
- (h) The flightcrew is the final authority when selecting an LZ. On some occasions, the flightcrew may not choose to utilize the ground personnel's suggested LZ and choose an alternate LZ. This decision is usually based on information that is unknown to the ground personnel (e.g., wind, aircraft performance limitations).

(3) APPROACHING THE AIRCRAFT

*Personnel should only approach MSP aircraft under the following conditions:*



AW-139

- (a) Hearing and eye protection shall be utilized at all times when approaching the aircraft.
- (b) Only when accompanied by an MSP flight crew member to the aircraft Response personnel are usually limited to four when loading patients. The crew will provide additional guidance prior to these personnel approaching the aircraft.
- (c) In an emergency situation when it becomes necessary to render assistance or rescue occupants of the helicopter. In such cases: **DO NOT APPROACH THE AIRCRAFT UNLESS THE MAIN ROTOR HAS STOPPED!**
- (d) Only approach the aircraft from the Safe Zone (see diagram).

- (i) Never approach the aircraft from the rear areas due to the hazards existing from the tail rotor.

***REMAIN CLEAR OF THE REAR AND TAIL ROTOR AT ALL TIMES!***

- (ii) If it becomes necessary to go from one side of the aircraft to the other, this will be done by walking around the front of the aircraft; however, do not walk under the rotor blades.
- (iii) Personnel shall not wear hats and loose clothing when approaching the aircraft. Do not lift anything above shoulder height (e.g., IV bags).
- (e) If the aircraft has landed on a slope or hill, care must be taken when approaching the aircraft from the downhill side. Uphill side approaches should be avoided, as the main rotor blade is spinning and is lower to the ground on one side of the aircraft. The Trooper/Flight Paramedic will provide additional guidance in this situation.
- (f) Never bring the patient to the aircraft prior to advising the Trooper/Flight Paramedic of the patient's information. Very high noise levels found in the general proximity of the aircraft make communication and patient turnover impossible.
- (g) If debris gets in the eyes and it impairs the vision, do not continue to approach or egress from the aircraft. Personnel will immediately "take a knee," and the Trooper/Flight Paramedic will provide assistance.

(4) MISCELLANEOUS SAFETY TIPS

(a) **Aircraft Doors**

Personnel should not attempt to open or close any aircraft doors. If a person is in the aircraft, they should remain inside until the flight crew member opens the door, thus preventing damage to the door and greatly reducing the risk of an aircraft door opening inadvertently in flight.

(b) **Vehicles**

- (i) No vehicles or personnel shall be permitted within 200 feet of the aircraft.
- (ii) Do not direct spotlights onto the landing area or at the aircraft, but keep vehicle's emergency lights displayed until the aircraft is overhead. Once the LZ has been confirmed and verified by the flight crew, vehicle lighting can be reduced to running lights or parking lights for night vision purposes.

## 25. PATIENT-INITIATED REFUSAL OF EMS

### a) Initiate General Patient Care.

For the purposes of this protocol, a patient is defined as any person encountered by in-service rescue or emergency medical personnel with an actual or potential injury or medical problem. (The term “patient,” in this protocol only, refers both to patients and to persons who are potential patients. This protocol is not intended to determine the legal status of any person, the establishment of a provider-patient relationship, or a legal standard of care.)



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A minor patient is defined as a patient who has not reached their 18<sup>th</sup> birthday and is not

- (1) Married, **OR**
- (2) Parent of a child, **OR**
- (3) Requesting:
  - (a) Treatment for drug abuse or for alcoholism,
  - (b) Treatment for Sexual Transmitted Infection (STI) or for contraception,
  - (c) Treatment of injuries from alleged rape or sexual offense, **OR**
- (4) Living separate and apart from the minor’s parent, parents, or guardian, whether with or without consent of the minor’s parent, parents, or guardian, and is not self-supporting, regardless of the source of the minor’s income.

An authorized decision maker for minor patients is defined as an adult who identifies themselves as the parent or guardian, or has written authorization for medical decision making or states that they have written authorization for medical decision making. Providers may request the parent or guardian to present identification and will document the name of the individual who identifies themselves as the decision maker.



IN CASES OF ALLEGED RAPE OR SEXUAL OFFENSE, LAW ENFORCEMENT OR SOCIAL SERVICES SHALL BE NOTIFIED.

- ### b) These persons may have requested an EMS response or may have had an EMS response requested for them. Because of the hidden nature of some illnesses or injuries, an assessment must be offered and performed, to the extent permitted, on all patients. For patients initially refusing care, attempt to ask them, “Would you allow us to check you out and evaluate whether you are OK?”



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IF THE AUTHORIZED DECISION MAKER REFUSES TO PERMIT THE EMS PROVIDER TO EXAMINE A MINOR PATIENT TO DETERMINE THE SEVERITY OF THE ILLNESS OR INJURY, THEN CONSIDER CONTACTING LAW ENFORCEMENT FOR ASSISTANCE. CONSIDER CONSULTATION WITH PEDIATRIC BASE STATION.

- c) Each patient's assessment shall include:
  - (1) Visual assessment - injuries, responsiveness, level of consciousness, orientation, respiratory distress, gait, skin color, diaphoresis
  - (2) Primary survey - airway, breathing, circulation, and disability
  - (3) Vital signs - pulse, blood pressure, respiratory rate and effort, pulse oximeter when available
  - (4) Secondary survey - directed by the chief complaint
    - (a) Medical calls - exam of lungs, heart, abdomen, and extremities. Blood glucose testing for patients with Diabetes Mellitus. Neurological exam for altered consciousness, syncope, or possible stroke.
    - (b) Trauma calls - for patients meeting criteria in the Maryland Medical Protocols Trauma Decision Tree recommending transport to a Trauma Center: exam of neck and spine, neurological exam, palpation and auscultation of affected body regions (chest, abdomen, pelvis, extremities).
  - (5) Capability to make medical decisions (complete questions 1 through 4 on the Patient-Initiated Refusal of EMS form):
    - (a) Disorientation to person, place, time, situation
    - (b) Evidence of altered level of consciousness resulting from head trauma, medical illness, intoxication, or other cause
    - (c) Evidence of impaired judgment from alcohol or drug ingestion
    - (d) Language communication barriers were removed by assuring "language line" translation when indicated
    - (e) The patient understands the nature of the illness
- d) Following the assessment, complete items 5 through 9 on the Patient-Initiated Refusal of EMS Form, noting the presence of conditions that may place the patient at higher risk of hidden illness/injury or of worse potential outcome.

## Management

- (1) Patients at the scene of an emergency who meet criteria to allow self-determination shall be allowed to make decisions regarding their medical care, including refusal of evaluation, treatment, or transport. These criteria include:
  - (a) Medical capacity to make decisions - the ability to understand and discuss and understanding of the nature and consequences of the medical care decision
  - (b) Adult (18 years of age or greater)
  - (c) Those patients who have not reached their 18<sup>th</sup> birthday and are:
    - (i) Married, **OR**
    - (ii) Parent of a child, **OR**
    - (iii) Requesting:
      - a. Treatment for drug abuse or for alcoholism,
      - b. Treatment for STI or for contraception,
      - c. Treatment of injuries from alleged rape or sexual offense, **OR**



- (iv) Living separate and apart from the minor's parent, parents, or guardian, whether with or without consent of the minor's parent, parents, or guardian, and is self-supporting, regardless of the source of the minor's income.
  - (d) A patient who has been evaluated by EMS providers as having 'no' answers to questions 1, 2, 3a, 3b, and 4 on the Patient-Initiated Refusal of EMS form shall be considered to be medically capable to make decisions regarding their own care.
  - (e) Patients with 'no' answers to questions 1, 2, 3a, 3b, and 4 on the Patient-Initiated Refusal of EMS form but one or more 'yes' answers to questions 5 through 8 (medical conditions) have a higher risk of medical illness. The EMS provider should consider consulting medical direction if the patient does not wish transport. The purpose of the consultation is to obtain a "second opinion" with the goal of helping the patient realize the seriousness of their condition and accept transportation.
  - (f) If the EMS provider is unsure whether the patient has adequate ability to make medical decisions, they should seek medical consultation.
  - (g) At any time the EMS provider identifies patient conditions that indicate that the patient should be transported to a hospital, and the patient is refusing transport, then the provider should seek medical consultation.
- (2) Any person at the scene of an emergency requesting an EMS response, or for whom an EMS response was requested, and who is evaluated to have any one of the following conditions, shall be considered incapable of making medical decisions regarding care and shall be transported, with law enforcement involvement, to the closest appropriate medical facility for further evaluation:
- (a) Continued altered mental status from any cause including altered vital signs, influence of drugs and/or alcohol, metabolic causes (CNS or hypoglycemia), head trauma, or dementia
  - (b) Attempted suicide, danger to self or others, or verbalizing suicidal intent
  - (c) Acting in an irrational manner, to the extent that a reasonable person would believe that the medical capacity to make decisions is impaired
  - (d) Severe illness or injury to the extent that a reasonable and medically capable person would seek further medical care
  - (e) On an Emergency Petition
- (3) Further care should be provided according to Maryland Medical Protocols, "III E. Behavioral Emergencies" or other protocol sections as appropriate, based on patient's condition.
- e) Base Station Hospital Physician Consultation



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 their 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	
	<b>For Adults</b>			
	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
	<b>For minor/pediatric patients</b>			
	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 they 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.

**c) CONTRAINDICATIONS**

See treatment protocols.

**d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

See IV Maintenance Therapy for EMT.

**e) PRECAUTIONS**

All sharps must be properly disposed of in an appropriate container.

## 27. PHYSICAL AND CHEMICAL RESTRAINTS

### a) PURPOSE

To prevent harm to patient and/or others

### b) INDICATIONS

- (1) Patient restraints (physical and/or chemical) should be utilized only when necessary and only in situations where the patient is exhibiting behavior that the EMS provider believes will present a danger to the patient or others.
- (2) The procedure does apply to patients treated under implied consent.

### c) PROCEDURE

- (1) The physical restraint procedure applies to patients greater than 1 year of age.
  - (a) Ensure that the scene is safe.
  - (b) Ensure sufficient personnel are present to control the patient while restraining. **USE POLICE ASSISTANCE WHENEVER AVAILABLE.**
  - (c) Position the patient for safe transport:



PATIENT POSITIONING SHOULD BE MODIFIED WHEN RESTRAINING PATIENTS WITH LIMITED MOBILITY (E.G., CONFINED TO BED OR WHEELCHAIR). USE PASSIVE RESTRAINT AND PLACE PATIENTS WITH PREVIOUS INJURY OR PREEXISTING CONDITIONS, SUCH AS OSTEOPOROSIS OR CONTRACTURE, IN A NEUTRAL POSITION.

PATIENTS ARE NOT TO BE RESTRAINED IN A PRONE, HOBBLER, OR HOG-TIED POSITION. WHENEVER POSSIBLE, ALL PATIENTS WHO ARE PHYSICALLY RESTRAINED AND CONTINUE TO FIGHT THE RESTRAINTS SHOULD BE CONSIDERED FOR CHEMICAL RESTRAINT.

Method (Be prepared to logroll immediately in the event of vomiting.)

- (i) Place patient face up or on their side, if at all possible.
- (ii) Secure extremities:  
For adults, use 4-point restraints (ideally with one arm up and the opposite arm down) or use a sheet to carefully wrap the patient before applying a Reeves-type stretcher. For patients 12 years and under, use 3-point restraints (two arms, one leg) or use a sheet to carefully wrap the patient before applying a Reeves-type stretcher.



IF POLICE HANDCUFFED THE PATIENT, JOINTLY WITH POLICE, REPOSITION THE PATIENT IN FACE-UP POSITION WITH HANDS ANTERIOR AND SECURED TO STRETCHER.

- (iii) If necessary, utilize cervical-spine precautions to control violent head or body movements.
- (iv) Place padding under patient's head. Pad any other area needed to prevent the patient from further harming him or herself or restricting circulation.




- (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 18<sup>th</sup> 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.



## 28. NEUROPROTECTIVE INDUCED HYPOTHERMIA (THERAPEUTIC) AFTER CARDIAC ARREST - SCENE AND INTERFACILITY TRANSFER

### a) Indications:

Increased brain temperature contributes to ischemic brain damage in patients post-cardiac arrest. Studies have shown that lowering brain temperature, even by a few degrees, decreases ischemic brain damage. In studies of out-of-hospital cardiac arrest, induced hypothermia protocols have contributed to improved neurological outcomes. The initiating of hypothermia without the ability to continue the hypothermic intervention is detrimental.

### b) Patient Inclusion Criteria:

- (1) 18 years of age or older
- (2) Return of spontaneous circulation post-cardiac arrest
- (3) Comatose (GCS less than 8) after return of spontaneous circulation
- (4) Secured airway with adequate ventilation (intubation preferred; ventilate slowly at the rate of 10–12 per minute for target EtCO<sub>2</sub> of 40–45 mmHg)
- (5) Systolic Blood Pressure (SBP) can be maintained at 90 mmHg or greater spontaneously or with fluids and/or pressors. (Target is SBP greater than 110 or Mean Arterial Pressure (MAP) equal to or greater than 80)
- (6) Destination hospital must have ability to continue hypothermic intervention.

### c) Patient Exclusion Criteria:


- (1) Cardiac instability
  - (a) Refractory or recurrent dysrhythmia
  - (b) Inability to maintain SBP at least 90 mmHg (MAP greater than 80) despite use of fluids and pressors
- (2) Active bleeding or history of coagulopathy or thrombocytopenia (Thrombolytic/Fibrinolytic therapy does not preclude use of hypothermia)
- (3) Pregnancy
- (4) Trauma patients
- (5) Environmental hypothermia or initial temperature of 32°C

### d) Procedure:

- (1) Institute cooling as early as possible. Core temperature goal is 33°C.
- (2) Actively cool by applying ice/cold packs bilaterally to patient's neck, axilla, and femoral groins.

#### **PLUS**

- (3) Reduce the covering on the patient while maintaining dignity.

- (4) If patient begins shivering, administer midazolam  
 Adult: (Reduce the below IV/IO/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) Additional doses to a maximum of 10 mg requires medical consultation for all providers.
- (5) Consider turning on vehicle air conditioning to assist with cooling en route.
- (6) Document initial GCS and pupillary response.
- (7) Transport to a Cardiac Interventional Center (by air or ground) that can maintain the hypothermic intervention.
- (8) Interfacility maintenance of hypothermic interventions techniques and monitoring of core temperature by Specialty Care Transport team must be maintained from the sending hospital to the destination hospital with either commercial ambulance equipment or sending hospital resources. Vital signs will be documented every 15 minutes with core temperature. Do not allow core temperature to drop below 33°C.

## **29. 12-LEAD ELECTROCARDIOGRAM**

### **a) PURPOSE**

Coronary heart disease is the single largest cause of death in US 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. Providers should be aware of both typical and atypical presentations.

### **b) INDICATIONS**

- (1) Chest pain 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.
- (2) 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.
- (3) 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.
- (4) Shortness of breath. This symptom often accompanies chest discomfort. However, it can also occur prior to the chest discomfort.
- (5) Other signs. These may include breaking out in a cold sweat, nausea, lightheadedness, syncopal episode, or a sense of impending doom.
- (6) Post cardiac arrest with ROSC.

### **c) PROCEDURE**

- (1) Position patient.
- (2) Place chest and limb leads.
- (3) Acquire 12-lead (15-lead, if trained) and document the patient's last name, first initial, age, and gender. These identifiers should be on the transmission copy (if able to transmit) and shall be on the delivered printed copy.
- (4) Continue patient care.

### 30. ACUPRESSURE FOR NAUSEA

**a) PURPOSE**

Acupressure on the P6 point can be used to reduce the intensity of nausea for patients where ondansetron is not preferable or available. It may be helpful as adjunct therapy for patients who have received ondansetron.

**b) INDICATION**

- (1) Patients with active nausea and vomiting
- (2) As adjunct therapy to patients receiving ondansetron
- (3) To prevent or reduce motion sickness

**c) CONTRAINDICATION**

None

**d) ADVERSE EFFECTS**

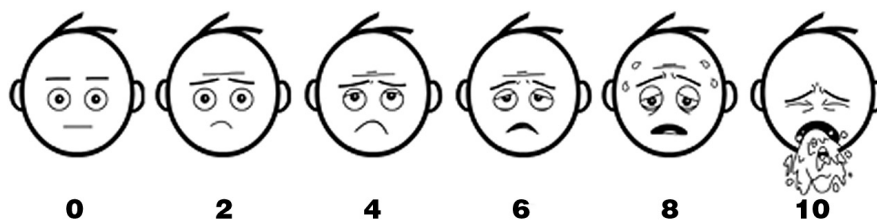
Redness, swelling, discomfort at site if commercial wrist bands are used

**e) PRECAUTIONS**

Patients experiencing nausea should receive a complete assessment, especially if cardiac risk factors are present.

**f) PROCEDURE**

- (1) Identify P6 point.
  - (a) Place three of the patient's fingers on the patient's opposite forearm at the wrist crease.
  - (b) Mark the space between the two tendons on the forearm as the P6 point.
- (2) Apply pressure at this point for several seconds and encourage the patient to take over care, or apply a commercial device per manufacturer's instructions. Have patient or parent maintain firm pressure. Onset of relief is between 30 seconds and 5 minutes.
- (3) Reassess patient, rescore on BARF Scale at 5 minutes, and document response to therapy.



**BARF Nausea Scale**

### 31. MULTIPLE CASUALTY INCIDENT/UNUSUAL EVENT

A Multi-Casualty Incident (MCI) or Unusual Event is any event where the number of injured persons exceeds the normal capabilities of the EMS Operational Program in whose jurisdiction the event takes place. Due to the size of the incident, the responding EMS Operational Program may require additional resources and/or must distribute patients to multiple hospitals.

Local EMS Operational programs should have a plan or operational procedures that address response to multiple patient incidents or unusual events. This protocol does not supersede those plans. There are some general practices and procedures that must be followed to ensure the EMS system can be prepared to respond appropriately to support a local response.



ALERT: THIS PROTOCOL IS SIMPLY A LIST OF REQUIRED TASKS IN THE EVENT OF AN UNUSUAL EVENT. IT IS NOT ALL-INCLUSIVE. ALL PROVIDERS ARE ENCOURAGED TO REVIEW LOCAL EMERGENCY RESPONSE PLANS, THE MARYLAND TRIAGE SYSTEM TRAINING PROGRAM, START/JUMPSTART, AND NIMS PRACTICES AND PROCEDURES ON AT LEAST AN ANNUAL BASIS.

#### Procedure

- a) Assess scene and recognize that the incident is an MCI or Unusual Event. The definition of MCI or Unusual Event for the purposes of this protocol is an incident that causes more than 5 patient encounters or that involves unusual circumstances that suggest it could place an extraordinary strain on EMS or health care resources. The following events are **examples** of an MCI or Unusual Event.
  - (1) More than five patients from one or related incidents
  - (2) Multi-patient events that require specialized rescue
  - (3) Three or more immediate (Priority 1) patients
  - (4) Multiple pediatric patients requiring specialty resources
  - (5) More than one burn patient meeting burn center referral criteria
  - (6) Use of more than two medevac helicopters
  - (7) Use of Medical Ambulance Bus (MAB)
  - (8) Multiple patients with unusual signs and symptoms
  - (9) Unresolved WMD related activity that could result in multiple patients (active shooter, bomb threat, intentional WMD agent release, etc.)
  - (10) Decontamination of more than 5 patients resulting in at least one transport
  - (11) Unresolved hazardous material incident that has the potential to affect multiple patients
  - (12) Evacuation of a licensed health care facility or housing complex for individuals requiring special assistance

- b) Notify EMRC or the Regional EMRC as soon as the incident is recognized to be an MCI or Unusual Event. Use the specific terms “MCI” or “Unusual Event” when communicating with EMRC to be clear this protocol is being enacted. This should be done as early in the incident as possible when there is a strong suspicion that such an event has occurred so that EMRC may begin to notify hospitals and response partners of the incident. Responding units can request their dispatchers notify EMRC before the scene is fully assessed if there is reasonable information to suggest that the incident meets the criteria above. As soon as available, the following information should be relayed to EMRC.
  - (1) Type and general description of the incident
  - (2) General location or address of the incident
  - (3) Age range of patients
  - (4) Estimated number of patients by priority
  - (5) Approximate number of patients involved
  - (6) Any hazardous agents involved
  
- c) Initiate the incident command structure according to local SOPs and/or the National Incident Management System. Update EMRC with more details about the incident as they become available.
  
- d) Consider utilization of the MCI Communications Protocol (Section II.G.6)
  
- e) Triage patients using the START/JumpSTART methods (Section II.D.7.e).
  - (1) Identify the patient’s triage category by utilizing the appropriately colored triage ribbon and securely attach a MIEMSS-approved Triage Tag.
  
- f) Do not delay transport of patients for extensive patient care procedures. Provide only the care required to sustain life and limb during transport to the hospital.
  
- g) Track the care, movement, and disposition of EVERY patient utilizing the locally approved triage/treatment/transport logs and/or the state electronic patient tracking system (PTS). Patient information should be written on the triage tag and be entered directly into the PTS as it becomes available.
  
- h) Consider the need for and request specialty resources through the local dispatch center and/or emergency management as per local procedures. These may include,
  - (1) Mass Casualty Support Units (MCSU) – (Medical Supply Caches)
  - (2) Medical Ambulance Buses
  - (3) CHEMPACK (Organophosphate antidotes - contact EMRC)
  - (4) Ambulance Strike Teams or EMS Taskforces
  - (5) Shock Trauma Go-Team

- i) The Transportation Group Supervisor and Medical Communications Coordinator responsibilities should be assigned as early as possible. They are the critical link to EMRC, hospitals, and the health care system. Their duties include:
  - (1) Establish a final checkpoint through which all transport units **MUST** pass to ensure accountability of all patients.
  - (2) EMRC will have notified hospitals and acquired their bed availability based on the information originally received and will transmit that information to the scene when requested.
  - (3) Coordinate through EMRC the patient destination, and communicate the number of patients, general illnesses, ages, and triage category on each transport unit as they leave the scene to the receiving facilities.
  - (4) If a central point of contact cannot be established, individual transport units **MUST** communicate the above information individually through EMRC to the receiving hospitals during transport. Those units must announce that they are associated with the MCI or Unusual Event.
  
- j) Coordinate with law enforcement and, if requested, assist the Coroner or Medical Examiner with identification and disposition of deceased casualties.
  
- k) After the last patient has been transported, notify 9-1-1 dispatch center and EMRC that last patient has been transported. Demobilize scene, stand down or release resources dedicated to incident, and complete appropriate documentation. Cooperate with local officials, EMRC, hospitals, and emergency management to complete a final accounting of the disposition of all the patients.

## **32. POTENTIALLY VOLATILE ENVIRONMENTS WITH LIFE-SUSTAINING INTERVENTIONS**

### **a) BACKGROUND**

- (1) A review of past active assailant incidents has shown that the conventional prehospital practice of not entering the scene until it is deemed safe by law enforcement (LE) has been associated with additional loss of life.
- (2) This protocol is designed to be all-hazards in nature. It is meant to provide a clinical concept of operations that empowers trained and equipped, but not necessarily tactical, EMS prehospital providers, to access casualties and expedite life-sustaining interventions closer to the point and time of injury. For active assailant and other LE-related incidents, EMS providers shall be under LE escort. EMS providers shall use appropriate personal protective equipment as defined by local jurisdiction.
  - (a) Examples of such potentially volatile environments include, but are not limited to:
    - (i) Active assailant (active shooter/IED) situations
    - (ii) Post-blast detonations
    - (iii) Intentional release of a chemical agent
    - (iv) Industrial accident/explosion
    - (v) Hazardous materials incident
    - (vi) Structural collapse/urban search and rescue situations
    - (vii) Transportation mishaps with limited scene access
    - (viii) In the immediate aftermath of a natural disaster such as a tornado

### **b) INTRODUCTION**

- (1) This protocol provides guidelines for the type of intervention and care that should be rendered at various proximities to a threat in a potentially volatile environment.
- (2) By definition, potentially volatile environments are dynamic in nature. Scene conditions may change and emergent evacuation of responders and patients may interfere with the delivery of interventions described in this protocol.

### **c) INDICATIONS**

- (1) This protocol does not replace or supersede the general patient care practices in *The Maryland Medical Protocols for EMS Providers*, which are still to be followed once the concern of active threat has been mitigated.
- (2) Use of this protocol is an acknowledgement by the EMS provider that the situation is:
  - (a) Unique, austere, and different than the conventional environment of care in which EMS medicine is usually rendered AND
  - (b) The application of standard prehospital emergency practices could unnecessarily jeopardize the safety of the patient and/or medical provider.
- (3) An active assailant incident or Potentially Volatile Environments with Life-Sustaining Interventions (PVE/LSI) Protocol is declared.



**d) CONTRAINDICATIONS**

- (1) Absent the presence of perceived or actual threat, standard general patient care practices should be followed.

**e) ZONES OF CARE/OPERATIONS**

- (1) The zones described below are intended to standardize the terminology used by responding emergency medical providers in Maryland and to establish a common understanding of the interventions to be performed within each zone.
- (2) **Hot Zone (Direct Threat):** (Integrated Tactical EMS) Operational area with a direct and immediate threat to personal safety or health
  - (a) The overarching priority in the Hot Zone is mitigation of active threat. Medical care is a secondary function to threat mitigation.
  - (b) Medical providers must be an integrated tactical medic (i.e., TEMS) to operate in this environment. Medical priorities are to prevent casualties and responders from sustaining additional injuries and include prompt evacuation to a more secure zone.
    - (i) If at all possible, casualties should self-evacuate.
    - (ii) Goals of care include keeping the response team engaged in neutralizing the threat, minimizing public harm, and controlling life-threatening extremity hemorrhage.
      - a. Control of severe hemorrhage in the direct threat environment is best accomplished with commercially available tourniquets.
      - b. Tourniquet should be placed as high up on the limb as possible without taking the time to expose the area.
      - c. For full or partial amputation, immediately place a tourniquet if possible.
      - d. Cardiopulmonary resuscitation (CPR) is not indicated in this environment.
    - (iii) In circumstances of chemical agent exposure, administration of Nerve Agent Antidote Kits (NAAK/MARK-1) might be warranted if available.

- (3) **Warm Zone (Indirect Threat):** (Limited LSI) Area with a potential threat to personal safety or health
- (a) **Evacuation of patients to a completely safe area is the primary objective of care in this area. The following care guidance is dependent on the availability of equipment, supplies, and the appropriate level providers. Extrication should NOT be delayed to provide advanced or involved treatment measures.**
- (i) The Warm Zone typically exists between the Hot Zone and Cold Zone, but is not geographic and depends on the evolving situation.
  - (ii) Responders must remain cognizant that scene security can change instantly.
  - (iii) A focused and deliberate approach to providing patient care should occur.
  - (iv) The potential benefits of providing medical care in these zones must outweigh the risks of the ongoing tactical operation and/or delaying opportunity to evacuate the patient.
  - (v) Care in the Warm Zone typically occurs at or near the point of injury once scene stabilizing measures have occurred. Care may also take place at a casualty collection point (CCP).
  - (vi) A CCP is a location concealed and covered from immediate threat where victims can be assembled for movement from areas of risk to the triage/treatment area. Multiple CCPs may be required, which may be located in the Warm or Cold Zone. CCPs should be established and locations communicated as early as possible through operations to ALL responders.
  - (vii) If possible, an abbreviated triage system should be set up to identify the priority for the extrication of patients. The use of ribbons or markers to clearly identify immediate and delayed (red and yellow, respectively) patients is highly recommended. Deceased individuals should also be labeled/tagged appropriately to prevent repeat assessments by multiple providers.
  - (viii) Medical care in the Warm Zone should be limited to essential interventions only and is guided by the mnemonic **“MARCHED”**
    - a. M – Massive Hemorrhage Control
      - i. Massive hemorrhage remains the greatest threat to life in most trauma patients. Attaining hemorrhage control is the top priority.
      - ii. Tourniquets remain the preferred means of hemorrhage control for life-threatening bleeding in this environment.

1. If a tourniquet was applied in the Hot Zone, it should be reassessed.
2. Tourniquets applied over clothing are not as effective and may need to be adjusted.
3. Tourniquets should only be discontinued by an appropriately trained ALS provider in consultation with medical control.
4. Other methods of hemorrhage control include deep wound packing with either sterile gauze or hemostatic impregnated gauze.
5. Vascular injuries in the neck, groin, and axilla (i.e., junctional zones) are not amenable to traditional extremity tourniquets. In addition, effective pressure dressings are often extremely difficult to apply. Hemostatic impregnated dressings with direct pressure (minimum 5 minutes with continuous pressure is preferred) have shown useful in such situations.

(b) A – Airway management

- (i) Patients in the Warm Zone with airway issues are high priority for evacuation due to their often intense resource requirements.
- (ii) Consider applying oxygen if available and indicated.
- (iii) Unconscious casualty without airway obstruction:
  - a. Chin lift or jaw thrust maneuver
  - b. Nasopharyngeal airway
  - c. Place casualty in the recovery position
- (iv) Casualty with airway obstruction or impending airway obstruction:
  - a. Chin lift or jaw thrust maneuver
  - b. Nasopharyngeal airway
  - c. Allow casualty to assume position that best protects the airway, including sitting up or leaning forward
  - d. Place unconscious casualty in the recovery position
- (v) If previous measures unsuccessful, if time and resources permit, consider per protocol:
  - a. Supraglottic Devices (e.g., King LT™, EASYTube®, or Combitube™).
  - b. Oro/nasotracheal intubation
  - c. Surgical cricothyroidotomy

- (c) R – Respirations
  - (i) The chest/upper abdomen should be assessed for any evidence of an open chest wound and an occlusive dressing should be applied accordingly.
  - (ii) Tension pneumothorax remains a significant cause of preventable death in trauma patients.
    - a. In suboptimal environments that interfere with complete physical assessment, any patient with significant blunt or penetrating chest trauma who displays dyspnea should be treated as a developing tension pneumothorax and receive needle decompression, if appropriate.
    - b. To be effective, needle decompression needs to be performed using at least a 3.25 inch, 14g needle/catheter or needle decompression thoracostomy kit.
- (d) C – Circulation
  - (i) In general, healthy adult trauma patients with a radial pulse and normal mentation do not need IV therapy in the Warm Zone.
  - (ii) Patients with evidence of hypotension:
    - a. If the patient displays signs of a closed head injury, IV fluid therapy is indicated to maintain at least a radial pulse or SBP of at least 90 mmHg.
    - b. Patients in hypovolemic shock should receive a one-time 500 mL bolus of IV fluid.
  - (iii) Patients in traumatic cardiac arrest should be considered deceased and no CPR should be performed in this zone.
- (e) H – Hypothermia
  - (i) Hypothermia in trauma patients has been associated with increased mortality. Hypothermia is easier to prevent than treat.
    - a. Patients should be moved to a warmed location if possible.
    - b. Efforts should be made to minimize heat loss.
- (f) E – Everything else
  - (i) Consider Mark I/DuoDote for suspected organophosphate/nerve agent exposure.
  - (ii) Dependent upon resource availability, burns, eye injuries, and acute pain should be managed per *The Maryland Medical Protocols for EMS Providers*.
- (g) D – Documentation
  - (i) Key findings and interventions should be conveyed to the next phase of care.

- (4) **Cold Zone:** (Traditional Patient Care Protocols) Area surrounding the Warm Zone. Responders can operate without concern of danger or threat to personal safety or health.
- (a) Casualties are moved from the Warm Zone to the Cold Zone by way of an evacuation corridor(s).
    - (i) Evacuation Corridor: An area transitioning between the Warm and Cold Zone that is secured from immediate threat and allows for a mitigated risk in transporting victims from the CCP to the triage/treatment area beyond the outer perimeter.
  - (b) Once in the Cold Zone, casualties will require re-triage, particularly assessing for the development of a life-threatening condition and effects of Warm Zone therapy.
    - (i) If massive hemorrhage has not been addressed or has been ineffectively managed, it should be immediately readdressed with strategies mentioned above.
  - (c) Patients should be triaged and transported per standard practices.
  - (d) Medical care in the Cold Zone should be dictated by resource availability and, when possible, equate to the general patient care standards in *The Maryland Medical Protocols for EMS Providers*.
  - (e) CPR may have a larger role during the evacuation phase especially for patients with electrocution, hypothermia, non-traumatic arrest, or near drowning; however, it is still casualty count/resource dependent.

### 33. EMERGING INFECTIOUS DISEASE

1. Initiate General Patient Care.

2. Presentation

An emerging infectious disease (EID) is an infectious disease for which incidence in humans has increased in the past two decades or threatens to increase in the near future. These diseases, which respect no national boundaries, include

- a) New infections resulting from changes or evolution of existing organisms
- b) Known infections spreading to new geographic areas or populations
- c) Previously unrecognized infections appearing in areas undergoing ecologic transformation
- d) Old infections reemerging as a result of antimicrobial resistance in known agents or breakdowns in public health measures.

The most recent example is Ebola Viral Disease (EVD). EIDs that meet this protocol will be posted on the MIEMSS website under the Infectious Disease Tab. Seasonal influenza is not considered an EID, but some of the same principles of infection control may apply to the more common infectious diseases.

e) Signs and Symptoms of an EID are based on specific case definitions for the disease:

(1) EVD case definition includes:

Travel history or exposure **and** a set of signs and symptoms that are included in the case definition, which has evolved over time.

(2) Other future EID diseases may vary in their signs and symptoms, and could include:

- (a) Respiratory congestion
- (b) Sneezing/Coughing
- (c) Nausea/Vomiting
- (d) Skin rashes, hives, or “poxes”
- (e) Swollen lymph nodes
- (f) General malaise
- (g) Loss of appetite
- (h) Hemorrhage from mucosal membranes
- (i) Descending neurological deficits

f) Case Definition

As EIDs become more prevalent, the Centers for Disease Control and Prevention (CDC) typically publish a description of each disease, which is utilized to determine whether to include or exclude a Patient Under Investigation (PUI) for specific testing or treatment and specific isolation or quarantine measures. These case definitions will be posted on the MIEMSS website and include specific guidance on the identification, treatment, and appropriate transport of these patients and the appropriate use of PPE.

g) Modes of transmission

- (1) In direct transmission, an infectious agent is transferred from a reservoir to a susceptible host by direct contact or droplet spread.
  - (a) Direct contact occurs through skin-to-skin contact, kissing, and sexual intercourse. Direct contact also refers to contact with soil or vegetation harboring infectious organisms.
  - (b) Droplet spread refers to spray with relatively large, short-range aerosols produced by sneezing, coughing, or even talking. Droplet spread is classified as direct because transmission is by direct spray over a few feet, before the droplets fall to the ground.
- (2) Indirect transmission refers to the transfer of an infectious agent from a reservoir to a host by suspended air particles, inanimate objects (vehicles), or animate intermediaries (vectors).
  - (a) Airborne transmission occurs when infectious agents are carried by dust or droplet nuclei suspended in air. Airborne dust includes material that has settled on surfaces and become re-suspended by air currents as well as infectious particles blown from the soil by the wind. In contrast to droplets that fall to the ground within a few feet, droplet nuclei may remain suspended in the air for long periods of time and may be blown over great distances
  - (b) Vehicles that may indirectly transmit an infectious agent include food, water, biologic products (blood), and fomites (inanimate objects such as handkerchiefs, bedding, or surgical scalpels).
  - (c) Vectors such as mosquitoes, fleas, and ticks may carry an infectious agent through purely mechanical means or may support growth or changes in the agent.



### 3. Treatment

- a) If the presence of an EID at a scene is known prior to entering, don the appropriate PPE and limit entry into the scene to essential personnel only. If an EID is discovered during assessment, immediately don the appropriate PPE, clear the scene of non-essential personnel and initiate the recommended decontamination procedures.
- b) Initiate General Patient Care.
- c) Treat the patient according to the signs and symptoms presented and according to the MIEMSS guidance for the specific EID. Procedures that increase risk of distributing fluids or secretions should be limited to those absolutely necessary to maintain life and provide the patient with a reasonable level of comfort.
- d) Contain any bodily fluids or respiratory excretions prior to transporting the patient. A SURGICAL mask may be placed on the patient to limit respiratory droplet aerosolization.



N-95 SHOULD **NEVER** BE PLACED ON A PATIENT AS THEY RESTRICT THE EXCHANGE OF RESPIRATORY GASES AND TYPICALLY HAVE A ONE-WAY EXPIRATORY VALVE THAT ALLOWS DROPLETS TO BE AEROSOLIZED UPON EXPIRATION DEFEATING THE PURPOSE OF PLACING A MASK ON THE PATIENT.

- e) Transport the patient to the appropriate hospital.  
Hospitals have been categorized into three levels based on their capabilities to assess and treat PUIs for designated EIDs. A list of designated EIDs will be published on the MIEMSS website.
- (1) Frontline Hospitals (DHMH designated) – All hospitals with emergency departments must have the capability to accept, identify, and isolate a PUI for a designated EID, then follow the approved procedures to notify the local health department to arrange for transfer to an Assessment Hospital. These patients will typically be transferred within 24 hours.
  - (2) Assessment Hospitals (DHMH designated) – A facility that has the capability to receive, isolate, and provide care for a patient while testing is completed to confirm or deny the diagnosis of the suspected EID. The patient will remain at that hospital for 4 to 5 days until the patient is discharged or transfer to an designated Treatment Hospital
  - (3) Treatment Hospitals (DHMH designated) – A facility assessed by the CDC to have the capability to admit and provide comprehensive care for and manage a patient with a confirmed designated EID, until the patient is no longer ill or has died.
- f) Transport from the scene  
PUIs 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 **NOT** indicated for the PUI patient
- g) Transport of a health department monitored patient  
Individuals who were exposed and have some risk of contracting the disease may be monitored or even quarantined by the health department. MIEMSS will be notified by DHMH if these patients become ill and require transportation by EMS to hospitals and will contact the local jurisdictional or waived commercial EMS Operational Program to arrange that transport. DHMH will determine the destination hospital.
- h) Interfacility Transfer  
Transfers between hospitals will be completed by EMSOPs who have been granted a waiver from licensing to modify an ambulance specifically to transport an EID patient and have specific plans, training and quality assurance processes in place to do so. Public Safety EMSOPs may be called upon as a backup if the waived commercial services are not available. DHMH will determine the destination hospital in these cases.



- i) Communication  
EMS providers transporting PUIs for designated EIDs **MUST** contact the receiving hospital via EMRC **prior to beginning that transport** and enter the hospital through the entrance designated by the receiving hospital. The **term PUI must be used** to ensure the hospital understands and is prepared to receive the patient. Obtaining medical direction from the closest Frontline and Assessment Hospitals is always an option to determine the appropriate destination.

- j) Refusal of transport  
If a PUI for a designated EID refuses care or transport, the EMS provider should remove him/herself from the immediate presence of the patient and contact the local health department through their dispatch center or locally defined procedures and provide as much of the following information about the patient that is available.

- (1) Full name
- (2) Age
- (3) Gender
- (4) Home address
- (5) Contact phone numbers
- (6) Current location
- (7) Recent travel history
- (8) Signs and symptoms being displayed
- (9) Recent contact history with Ebola patients

The EMS provider should expect to be involved in a discussion of the situation with health department and law enforcement officials, and if a quarantine/isolation order is issued, should be prepared to assist law enforcement in carrying out that order.



- 
- k) Treat the patient according to the signs and symptoms presented and according to the MIEMSS guidance for the specific EID. Limit invasive procedures and any that increase risk of distributing fluids or secretions to those absolutely necessary to maintain life and provide the patient with a reasonable level of comfort.



- 
- l) Pediatric patients under the age of 15 discovered at the home or in a non-health care environment should be transported to a Treatment Hospital that is also a pediatric trauma center if transport times are not longer than 45 minutes greater than transport to the nearest Frontline Hospital ED. If transport times are longer than 45 minutes greater than transport to the nearest Frontline Hospital ED, the patient should be taken to an Assessment Hospital (if within 45 minute transport time) or the closest Frontline Hospital.

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## F. LIDOCAINE INFUSION FOR INTERFACILITY TRANSPORT



### a) PURPOSE

A CRT-(I) or paramedic who is performing an interfacility transport may utilize this protocol. During interfacility transports, a CRT-(I) or paramedic may monitor a patient on a continuous IV lidocaine infusion as long as the following criteria have been met.

### b) INDICATIONS

The lidocaine infusion must have been started by the hospital staff prior to an interfacility transfer. IV lidocaine infusions may NOT be started by the prehospital provider in the prehospital setting.

### c) CONTRAINDICATIONS

Patients who are clinically unstable, including but not limited to, unstable vital signs and blood pressure, current arrhythmia, and active chest pain



### d) PROCEDURE

- (1) Follow the appropriate ALS algorithm and maintain the infusion as directed by the sending physician.
- (2) The sending physician must document the infusion to be administered on the patient's transport record or transport note, including the concentration of the medication and the infusion rate.
- (3) 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.
- (4) The total volume of lidocaine infused must be recorded on the patient care report.
- (5) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report at least every 15 minutes.
- (6) When in doubt, contact the **sending** physician for medical direction.

### e) SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pumps(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.

## G. MORPHINE SULFATE INFUSION FOR INTERFACILITY TRANSPORT



### a) PURPOSE

A paramedic who is performing an interfacility transport may utilize this protocol. During interfacility transports, a paramedic may monitor a patient on a continuous morphine sulfate infusion as long as the following criteria have been met.

### b) INDICATIONS

The morphine sulfate infusion must have been started by the hospital staff prior to an interfacility transfer. Morphine infusions may NOT be started by the prehospital provider in the prehospital setting.

### c) CONTRAINDICATIONS

Patients who are clinically unstable, including but not limited to, unstable vital signs and blood pressure

### d) PROCEDURE

- (1) Maintain the infusion as directed by the sending physician.
- (2) The sending physician must document the infusion to be administered on the patient's transport record or transport note, including the infusion rate.
- (3) 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.
- (4) The total volume of morphine infused must be recorded on the patient care report.
- (5) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report at least every 15 minutes.
- (6) When in doubt, contact the **sending** physician for medical direction.

### e) SPECIAL CONSIDERATIONS


The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pumps(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, a paramedic.

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

## **H. ADULT RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE**

### **1. Rapid Sequence Intubation (RSI) Pilot Program**

#### **a) Indications**

- (1) Inability to tolerate laryngoscopy, and:
  - (a) GCS less than or equal to 8 with respiratory rate less than or equal to 8 or greater than or equal to 35 or
  - (b) GCS less than or equal to 8 with oxygen saturation less than or equal to 90% on non-rebreather face mask
- (2)  On-line medical direction for RSI may be requested in the following situations:
  - (a) GCS less than or equal to 8 with clenched jaw, inability to adequately suction airway, and without above respiratory parameters
  - (b) Respiratory extremis with contraindications to nasotracheal intubation (respiratory rate greater than or equal to 35 with air hunger, use of accessory muscles, and oxygen saturation less than or equal to 90% on non-rebreather face mask)

#### **b) 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/Presence of hemodialysis access
- (2) Patients who have not yet reached their 15<sup>th</sup> birthday
- (3) History of malignant hyperthermia

#### **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
  - (b) Bag-Valve-Mask (BVM)
  - (c) Suction
  - (d) RSI kit
    - (i) Prepare medications
    - (ii) Alternative airway device, Cricothyroidotomy equipment
  - (e) Capnograph

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

**d) RSI Procedure**

(1) Sedation

Adequate sedation must be provided to prevent awareness during paralysis from neuromuscular blockade.

**(NEW '18) 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. If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30–60 seconds. May repeat 0.15 mg/kg IVP in 2–3 minutes if inadequate sedation.

**OR**

**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.

**OR**

**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.

Only one sedative agent should be administered prior to succinylcholine unless otherwise directed by medical consultation.

- (2) For patients with head injury or suspected increased intracranial pressure, administer lidocaine 1 mg/kg (40–100 mg) IVP over 1–2 minutes.
- (3) In-line cervical spine stabilization by second caregiver (in trauma setting)
- (4) Apply cricoid pressure (by third caregiver).
- (5) Succinylcholine: Administer 1.5 mg/kg rapid IVP. Maximum single dose is 200 mg.
- (6) Intubate trachea and verify ET placement.
- (7) If inadequate relaxation after 2–3 minutes, administer atropine 1 mg to avoid bradycardic response and repeat succinylcholine 1 mg/kg IVP. Maximum single dose is 200 mg.

**e) Successful Endotracheal Tube Placement**

- (1) Release cricoid pressure and secure ET.
- (2) Ventilate to EtCO<sub>2</sub> 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 for 30 seconds.

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

- (5) Insert an approved alternative airway device (refer to Laryngeal Mask Airway Optional Supplemental Program or Laryngeal Tube Airway Device procedure). **(NEW '18)**
- (6) Attach capnograph and ventilate to desired EtCO<sub>2</sub> level.
- (7) If significant resistance to ventilation occurs as succinylcholine wears off (4–5 minutes), or if patient exhibits difficulty in tolerating an approved alternative airway device as succinylcholine wears off, refer to Ventilatory Difficulty Secondary to Bucking Protocol.

**g) If Unable to Ventilate**

Insert an approved alternative airway device (refer to Alternative Airway Device Protocol).

- h)** If still unable to ventilate using an approved alternative airway device, remove and perform cricothyroidotomy (refer to Cricothyroidotomy Protocol).

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

**a) Indication**

Patients successfully intubated with an endotracheal tube, an approved alternative airway device, or 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) **(NEW '18) 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. If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 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: Administer 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**

**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, titrated to abate bucking and relax ventilation while maintaining systolic BP greater than 90 mmHg. Maximum single dose is 5 mg.



Additional doses require medical consultation. **(NEW '18)**

- (2) If ventilatory difficulty is thought to be the result of pain response, **Ketamine:** Dose 2 mg/kg IVP over 60 seconds. May repeat 1 mg/kg IVP every 10–15 minutes as necessary to a total of three doses as necessary.



Additional doses require medical consultation.

**OR**

Opioid may be used per Pain Management Protocol in addition to, or instead of, midazolam, ketamine, or etomidate. Titrate to abate bucking and relax ventilation while maintaining systolic BP greater than 90 mmHg.

- (3) If significant resistance to ventilation continues, the paramedic may administer:
- (a) Vecuronium 0.05 mg/kg IVP. Maximum single dose is 10 mg.



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. USE OF VECURONIUM REQUIRES FUNCTIONING EtCO<sub>2</sub> MONITORING. VECURONIUM MAY ONLY BE USED IF CONTINUOUS, BREATH TO BREATH EtCO<sub>2</sub> MONITORING CAN BE PROVIDED.

- (b) Dose may be repeated in 4–6 minutes if necessary.

(c) **Maintenance of amnesia**

Follow above dosing of either **etomidate** or **ketamine** with required repeat dosing every 10–15 minutes.

- (4) Continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub>.
- (5) Obtain on-line medical direction if further problems present.





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

**3. Protocol for Cricothyroidotomy (Surgical and Needle)**

**a) Indications**

- (1) Inability to ventilate despite having tried BVM with oropharyngeal/nasopharyngeal airway, ET placement, and an alternative airway device (if not contraindicated)
- (2) Inability to place ET in the setting of life-threatening upper airway hemorrhage
- (3) Completely obstructing upper airway foreign body that cannot be removed via BLS maneuvers or Magill forceps with direct visualization

**b) Preparation**

- (1) Prepare suction and cricothyroidotomy kit.
- (2) Begin at sternal notch and locate cricoid cartilage.
- (3) Palpate cricothyroid membrane anteriorly between cricoid cartilage and thyroid cartilage.
- (4) Prepare skin with betadine or alcohol swabs.

**c) Surgical Cricothyroidotomy**

- (1) Stabilize thyroid cartilage and make vertical incision (1–1½ inches) over cricothyroid membrane. Alternatively, a needle puncture dilator device may be utilized.
- (2) Palpate cricothyroid membrane with gloved finger and carefully make transverse incision through membrane. Insert scalpel handle and rotate 90 degrees.
- (3) Insert a 6.0 mm cuffed ET tube, using the natural curve of tube.
- (4) Insert ET tube to just beyond cuff.
- (5) Inflate cuff and ventilate patient.
- (6) Monitor oxygen saturation and EtCO<sub>2</sub> level.
- (7) Secure ET tube. (Do not cut or trim ET tube.)
- (8) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating successful cricothyroidotomy, refer to Ventilatory Difficulty Secondary to Bucking or Combativeness Protocol.

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

**Protocol for Cricothyroidotomy (Continued)**

**d) Needle Cricothyroidotomy**



ONLY NEEDLE CRICOTHYROIDOTOMY SHOULD BE PERFORMED FOR PATIENTS LESS THAN THE AGE OF 8 WHO REQUIRE CRICOTHYROIDOTOMY.

- (1) Insert 12- or 14-gauge over-the-needle catheter through the cricothyroid membrane at a 45-degree angle toward the feet. Aspiration of air with a syringe indicates tracheal entry.
- (2) Hold needle in place and advance catheter, then remove needle.
- (3) Attach catheter hub to intermittent jet oxygen insufflator valve.
- (4) Manually secure catheter at hub at all times to prevent kinking or displacement.
- (5) Monitor oxygen saturation.
- (6) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating cricothyroidotomy, refer to Ventilatory Difficulty Secondary to Bucking or Combativeness Protocol.

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

**4. RSI Quality Assurance Process**

**a) Individual Paramedic Approval for RSI Pilot Participation**

- (1) Successful completion of small group training includes all five of the following:
  - (a) Classroom lecture
  - (b) Mannequin instruction
  - (c) Cadaver lab, including cricothyroidotomy
  - (d) Anesthesia computerized mannequin simulator
  - (e) Must demonstrate proficiency through skills testing and written test
- (2) Successful completion of individualized operating room training
  - (a) Individual operating room training with Attending Anesthesiologist, and
  - (b) Must demonstrate proficiency to Attending Anesthesiologist's satisfaction

**b) Ongoing Demonstration of Proficiency**

- (1) A verification of all RSI skills and review of RSI principles of safety will be performed on a quarterly basis. In one of the quarters, this will be accomplished via direct observation in the operating room. In another quarter, substitute instruction and demonstration of skill proficiency may be approved by the program medical director on an individual basis. In a third quarter, the medical director will perform this during a full paramedic skills evaluation. A fourth quarter verification will be accomplished via an anesthesia mannequin simulator, an RSI skills module, or a documentation and review of a field utilization.
- (2) Ongoing Demonstration of Proficiency for surgical cricothyroidotomy
  - (a) 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.
  - (b) RSI providers who participate in the continuing education program for the surgical cricothyroidotomy pilot will satisfy this requirement.
- (3) Documentation of the quarterly verification process shall be submitted to the State EMS Medical Director on an annual basis.

**c) Review of Each Call**

- (1) Mechanism for follow-up of each call will be in accordance with the Quality Review Procedure for Pilot Programs (formerly "Class B" Additional Procedure Algorithm) of the Maryland Medical Protocols, with the following additions:
  - (a) Immediate notification of your jurisdictional RSI supervisor for all RSI attempts
  - (b) Medical Director evaluation of all RSI attempts within 12 hours
  - (c) Maintenance of detailed RSI database
  - (d) All individual RSI attempts shall be documented after the jurisdictional review process on the approved RSI QA form and submitted to the State EMS Medical Director on a quarterly basis.

**d) Maintenance of detailed RSI database**

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

**I. PEDIATRIC RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE  
(For children who have not yet reached their 15<sup>th</sup> birthday)**

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**1. Rapid Sequence Intubation (RSI) Pilot Program**

**a) Indications**


- (1) Inability to tolerate laryngoscopy and have the following:
  - (a) GCS less than or equal to 8, indicated by a patient that will not: open eyes, cry, say words, or show purposeful movement in response to painful stimulus.

**AND**

  - (b) Respiratory insufficiency, demonstrated by oxygen saturation less than or equal to 90% on non-rebreather face mask, respiratory rate less than or equal to 8, or respiratory rate greater than or equal to 45 (age less than 1 yr), greater than or equal to 40 (age 1–5 yrs), greater than or equal to 35 (age 6–9 yrs) with signs of air hunger and accessory muscle use.



PATIENTS WITH AN IDENTIFIED DIFFICULT AIRWAY WHO CAN BE BAGGED TO AN OXYGEN SATURATION GREATER THAN 90% REQUIRE ON-LINE MEDICAL DIRECTION FOR RSI, PREFERABLY FROM A PEDIATRIC BASE STATION.

- (2)  On-line medical direction for RSI may be requested (preferably from a Pediatric Base Station), in the following situations:
  - (a) GCS less than or equal to 8 with clenched jaw, inability to adequately suction airway, and without above respiratory parameters
  - (b) Respiratory extremis with contraindications to nasotracheal intubation (respiratory rate greater than or equal to 35 with air hunger, use of accessory muscles, and oxygen saturation less than or equal to 90% on non-rebreather face mask)
  - (c) Identified difficult airway patient with a GCS less than or equal to 8 and signs of respiratory insufficiency who cannot tolerate laryngoscopy but is able to be bagged to an oxygen saturation greater than 90%

**b) 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/presence of hemodialysis access
- (2) History of malignant hyperthermia

**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.

**(NEW '18) 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. If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 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  $[70 + (2 \times \text{years}) = \text{systolic BP}]$  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.

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

- (4) In-line cervical spine stabilization by second caregiver (in trauma setting)
- (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.

**e) Successful Endotracheal Tube Placement**

- (1) Release cricoid pressure and secure ET.
- (2) Ventilate to EtCO<sub>2</sub> 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 for 30 seconds. **(NEW '18)**
- (5) Insert a laryngeal mask airway designed to facilitate hospital placement of an endotracheal tube (see Airway Management: Laryngeal Mask Airway Optional Supplemental Program). **(NEW '18)**

**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) **(NEW '18) 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. If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30–60 seconds. May repeat 0.15 mg/kg IVP in 2–3 minutes if inadequate sedation.

**OR**

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

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**

**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, titrated to abate bucking and relax ventilation 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 single dose is 5 mg.

- (2) If ventilatory difficulty is thought to be the result of pain response, **Ketamine**: Dose: 2 mg/kg IVP over 60 seconds. May repeat 1 mg/kg IVP every 10–15 minutes as necessary to a total of three doses as necessary.



Additional doses require medical consultation.

**OR**

Opioid may be used per Pain Management Protocol in addition to, or instead of, midazolam, ketamine, or etomidate. Titrate to abate bucking and relax ventilation 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.

- (3) If significant resistance to ventilation continues, the paramedic may administer:
- (a) Vecuronium 0.05 mg/kg IVP (may not be used for patients with needle cricothyroidotomy because of inability to monitor breath to breath  $\text{EtCO}_2$ ). Maximum single dose is 10 mg.




PRE-SEDATION MUST BE PROVIDED WHEN VECURONIUM IS ADMINISTERED TO A PATIENT WHO IS EITHER RESPONSIVE TO STIMULUS OR MAY BECOME RESPONSIVE TO STIMULUS DURING NEUROMUSCULAR BLOCKADE. VECURONIUM MAY ONLY BE USED IF CONTINUOUS, BREATH TO BREATH  $\text{EtCO}_2$  MONITORING CAN BE PROVIDED.

- (b) Dose may be repeated in 4–6 minutes if necessary.
- (c) **Maintenance of Amnesia**  
Follow above dosing of either **etomidate** or **ketamine** with required repeat dosing every 10–15 minutes.



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

- (4) Continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub>.
- (5)  Obtain on-line medical direction (preferably from a Pediatric Base Station), if further problems present.

**3. Protocol for Cricothyroidotomy  
Surgical (for 8 years old or greater) and Needle**

**a) Indications**

- (1) Inability to ventilate despite having tried BVM with oropharyngeal/nasopharyngeal airway, ET placement, and alternative airway device (if not contraindicated)
- (2) Inability to place ET in the setting of life-threatening upper airway hemorrhage
- (3) Completely obstructing upper airway foreign body that cannot be removed via BLS maneuvers or Magill forceps with direct visualization

**b) Preparation**

- (1) Prepare suction and cricothyroidotomy kit.
- (2) Begin at sternal notch and locate cricoid cartilage.
- (3) Palpate cricothyroid membrane anteriorly between cricoid cartilage and thyroid cartilage.
- (4) Prepare skin with betadine or alcohol swabs.

**c) Surgical Cricothyroidotomy for 8 years old or greater**

- (1) Stabilize thyroid cartilage and make vertical incision (1–1 1/2 inches) over cricothyroid membrane. Alternatively, a needle puncture dilator device may be utilized.
- (2) Palpate cricothyroid membrane with gloved finger and carefully make transverse incision through membrane. Insert scalpel handle and rotate 90 degrees.
- (3) Insert a 5 to 6.0 mm cuffed ET tube, using the natural curve of tube.
- (4) Insert ET tube to just beyond cuff.
- (5) Inflate cuff and ventilate patient.
- (6) Monitor oxygen saturation and EtCO<sub>2</sub> carbon dioxide level.
- (7) Secure ET tube. (Do not cut or trim ET tube.)
- (8) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating successful cricothyroidotomy, refer to Ventilatory Difficulty Secondary to Bucking or Combativeness Protocol.



ONLY NEEDLE CRICOTHYROIDOTOMY SHOULD BE PERFORMED FOR PATIENTS LESS THAN AGE 8 WHO MAY REQUIRE CRICOTHYROIDOTOMY.

**d) Needle Cricothyroidotomy**

- (1) Insert 12- or 14-gauge over-the-needle catheter through the cricothyroid membrane at a 45-degree angle toward the feet. Aspiration of air with a syringe indicates tracheal entry.
- (2) Hold needle in place and advance catheter, then remove needle.



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

- (3) Attach catheter hub to intermittent jet oxygen insufflator valve.
- (4) Manually secure catheter at hub at all times to prevent kinking or displacement.
- (5) Monitor oxygen saturation.
- (6) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating cricothyroidotomy, refer to Ventilatory Difficulty Secondary to Bucking or Combativeness Protocol.

**4. Pediatric RSI Quality Assurance Process**

**a) Individual Paramedic Approval for Pediatric RSI Pilot Participation**

- (1) Successful completion of small group training includes all of the following:
  - (a) Classroom lecture
  - (b) Mannequin instruction
  - (c) Must demonstrate proficiency through skills testing and written test
- (2) Successful completion of individualized operating room training
  - (a) Individual operating room training with Pediatric/Critical Care/Anesthesiology Attending approved by the Associate State EMS Medical Director for Pediatrics
  - (b) Must demonstrate proficiency to Attending Pediatric/Critical Care/Anesthesiologist's satisfaction

**b) Ongoing Demonstration of Proficiency**

- (1) A verification of all pediatric and adult RSI skills and review of pediatric and adult RSI principles of safety will be performed on a quarterly basis.
- (2) Documentation of the quarterly verification process shall be submitted to the State EMS Medical Director on an annual basis.

**c) Review of Each Call**

- (1) Mechanism for follow-up of each call will be in accordance with the Quality Review Procedure for Pilot Programs (formerly "Class B" Additional Procedure Algorithm) of the Maryland Medical Protocols, with the following additions:
  - (a) Immediate notification to jurisdictional RSI supervisor for all RSI attempts
  - (b) Medical Director evaluation of all RSI attempts within 12 hours
  - (c) Maintenance of detailed RSI database
  - (d) All individual RSI attempts shall be documented after the jurisdictional review process on the approved RSI QA form and submitted to the State EMS Medical Director on a quarterly basis.

## J. RAPID SEQUENCE INTUBATION PHARMACOLOGY

### 1. ETOMIDATE (AMIDATE)

#### a) Pharmacology

Hypnotic

#### b) Pharmacokinetics

A short-acting nonbarbiturate hypnotic agent without analgesic properties

#### c) Indications

Pre-sedation of responsive patients prior to administration of neuro-muscular blocking agents

#### d) Contraindications

Known hypersensitivity to etomidate

#### e) Adverse Effects

- (1) Respiratory depression or apnea
- (2) Hypotension (infrequent)
- (3) Involuntary myoclonus
- (4) Adrenal suppression (possible with repeated dosing)

#### f) Precautions

- (1) The effects of etomidate can be accentuated by CNS depressants such as opioids and alcohol.
- (2) Myoclonic movements are common and should not be confused for fasciculations due to a depolarizing neuromuscular blocking agent or seizure activity.

#### g) Dosage (NEW '18)

##### (1) Adult:

Administer 0.3 mg/kg IVP over 30–60 seconds.

If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30–60 seconds.

##### **Ventilatory Difficulty Secondary to Bucking or Combativeness in Intubated Patients:**

Administer 0.3 mg/kg IVP over 30–60 seconds. If the patient is hypotensive or the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30–60 seconds.

May repeat 0.15 mg/kg IVP every 15 minutes to a total of three doses.

##### Pediatric:

Administer 0.3 mg/kg IVP over 30–60 seconds.

If the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30–60 seconds. May repeat 0.15 mg/kg IVP after succinylcholine effects resolve and patient is bucking or combative. May repeat 0.15 mg/kg IVP every 15 minutes to a total of three doses.



Additional doses require medical consultation.

**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. 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.

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

**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.

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**K. TACTICAL EMS (NEW '18)**

**1. INTRODUCTION**

- a) Scope and Applicability
- (1) These protocols are intended for use during high-risk, large-scale, and extended law enforcement or homeland security operations.
  - (2) The Tactical Emergency Medical Services (TEMS) provider is not directly responsible for any person(s) outside the direct field of operations, whose care may safely be provided by the local EMS Operational Program.
  - (3) These protocols supplement the current version of *Maryland Medical Protocols for Emergency Medical Services Providers* and, at the Tactical Physician's discretion, may incorporate other EMS protocol components such as: Wilderness, Interfacility, Pilot/Optional, and WMD sections.
  - (4) The Tactical Emergency Medical Services Protocols shall be used only by Tactical EMS providers sponsored by a law enforcement agency and operating under law enforcement command.
  - (5) To be approved, there must be a written, integrated relationship between the EMS Operational Program and the TEMS program, with both the EMS Operational Program Medical Director and the TEMS Medical Director having signed off on the agreement.
  - (6) Tactical EMS Providers at the EMT or ALS levels may administer the medications and perform the procedures listed in these protocols only after receiving specific training on their use and only under the medical direction of a Tactical Physician.
  - (7) The primary function of the Tactical EMS Provider is to support law enforcement or homeland security operations by facilitating the health and safety of critical public safety personnel inside the perimeter of high-risk, large-scale, and extended operations.
  - (8) Once the patient is removed from the law enforcement perimeter of operations, the TEMS Protocol will end, the Maryland Medical Protocols for EMS Providers will be implemented, and the transition of care will be made to the local EMS agency.
  - (9) An exception may be made when the Tactical EMS Provider's specialized training is needed to manage a specific illness/injury.
    - (a) If the Tactical EMS Provider's specialized training is needed to manage the patient's illness/injury, then the highest-trained Tactical EMS Provider shall ride to the hospital with the patient to maintain medications that are not allowed by Maryland Medical Protocols for EMS Providers.
    - (b) If, during transport, Tactical EMS personnel encounter a significant conflict between TEMS Protocols and those of the transporting EMS agency, they should attempt to contact their own Tactical Physician and request a dual consult with the local Base Station Physician.
    - (c) If they cannot reach a Tactical Physician, they should contact the local EMS Base Station for on-line medical consultation.

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- b) Definition of Tactical Environment
  - (1) Any law enforcement or homeland security operation where deployed personnel are in a large-scale operation or where the risk of injury is sufficiently high as to warrant the presence of on-scene emergency medical services providers.
  - (2) Types of operations may include: high-risk warrant service, hostage-barricade situations, emergency ordinance disposal, executive protection details, civil demonstration or protest, dynamic training operations, aquatic operations, high-angle, search and rescue missions, and acts of terrorism.
  - (3) Any prolonged law enforcement deployment, where performance decrement or environmental issues may arise and the safety of the public and deployed law enforcement personnel would benefit from the presence of a Tactical EMS Provider to monitor these circumstances.
- c) Demonstration of Need
  - (1) Jurisdictions that seek approval for a Tactical EMS Program shall submit a demonstration-of-need letter outlining the necessity for the program.
  - (2) The letter shall be submitted to the State EMS Medical Director for approval and include the following:
    - (a) Name of organization and scope of the proposed Tactical EMS Team
    - (b) Name and qualifications of the Tactical Medical Director and other Tactical Physicians
    - (c) Name and qualifications of the Tactical EMS Coordinator and other Tactical EMS Providers
- d) Sponsoring Law Enforcement Agency Requirements
  - (1) Sponsoring Law Enforcement Agencies shall be responsible for
    - (a) Completing background investigations appropriate for medical providers working in and around law enforcement operations
    - (b) Providing appropriate personal protective equipment, to accommodate conditions that the team may reasonably encounter, to the Tactical EMS Providers and Tactical Physician(s) and ensure adequate training in the equipment's use and capabilities
    - (c) Providing written documentation to MIEMSS that addresses the medical liability and personal injury considerations of the Tactical EMS Providers/Physician(s)
- e) Tactical EMS Provider/Tactical Physician Minimum Training Requirements
  - (1) The Tactical EMS Provider shall be a Maryland-certified EMT or Maryland-licensed ALS provider and have successfully completed a nationally-recognized Counter-Narcotic Tactical Operation Medical Support/Integrated Force Health Provider Program (CONTOMS/IFHP) or equivalent Tactical Provider course that includes instruction and training in
    - (a) Team wellness and health management, including preventive medicine
    - (b) Providing care under fire/basic weapons safety
    - (c) Officer rescue
    - (d) Planning medical operations and medical intelligence
    - (e) Response to the active shooter



**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (f) Orientation to specialized medical gear personal protective equipment used in tactical medical operations
  - (g) Remote medical assessment (“medicine across the barricade”)
  - (h) Response and management of WMD events, including field-expedient decontamination (“hasty decon”) procedures
  - (i) Operational security, light and sound discipline, helicopter operations, pyrotechnic and other chemical agents, as utilized by law enforcement teams
  - (j) Less-than-lethal weaponry, the injuries they may cause, and any specific interventions required
- (2) The Tactical EMS Provider shall have responsibilities for part or all of these protocols, as summarized as follows, based on either EMT or ALS (CRT-I or paramedic) level certification.

INTERVENTION	EMT	ALS
Provision of access to medications: ibuprofen, naproxen, fexofenadine, cetirizine, pseudoephedrine, oxymetazoline nasal spray, Mylanta, cimetidine, loperamide, clove oil, acetaminophen, tramadol, caffeine, modafinil, ondansetron ODT, scopolamine patch, ophthalmologic proparacaine/tetracaine and fluorescein, prednisone PO, dexamethasone PO, albuterol MDI, aspirin, epinephrine 1 mg/mL IM, naloxone IN, glucose PO	●	●
Administration of medications in Protocol, not listed above		●
Cyanoacrylate tissue adhesive	●	●
Field expedient wound closure (stapling)		●
Conducted electrical weapon (CEW) dart removal	●	●

- (3) The Tactical EMS Provider shall document each patient contact utilizing a patient care report (PCR) (eMEDS®). The documentation must be consistent with current MIEMSS regulations for interventions, as summarized in the above table.
- (4) The Tactical Physician shall possess an unrestricted Maryland License (preferred Emergency Medicine, General/Orthopedic/Trauma Surgery, or Critical Care), have experience in on-line medical direction, and have completed a nationally-recognized (CONTOMS/IFHP or equivalent) tactical medical director’s course that includes instruction and training in the following topics:
- (a) History of/need for tactical EMS provision
  - (b) Administrative/command concerns and responsibilities
  - (c) Care under fire
  - (d) Special equipment/hazards in the tactical environment
  - (e) Forensic examination
  - (f) Medicine “across the barricade”
  - (g) Medical threat assessment

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- f) Quality Assurance Properties
  - (1) Individual Tactical EMS Providers must be approved for TEMS Program Participation by the TEMS Medical Director.
  - (2) Classroom lecture
  - (3) Mannequin instruction
  - (4) Must demonstrate proficiency through skills testing and written test
  - (5) Ongoing demonstration of proficiency
  - (6) A verification of all TEMS skills and review of TEMS principles of safety will be performed on an annual basis by the Medical Director, or the provider may document utilization of skills in the field
  - (7) Review of each call
    - (a) Upon completion of the tactical incident, notification of any implementation of the TEMS Protocol will be made to your jurisdictional TEMS supervisor, who will ensure notification to TEMS Medical Director.
    - (b) TEMS Medical Director will review and evaluate all TEMS interventions within 48 hours of resolution of the tactical incident and provide feedback.
  - (8) The TEMS program will maintain a detailed TEMS database and will provide an annual report to the State EMS Medical Director.

**2. GENERAL PROTOCOLS**

- a) Medical Direction
  - (1) Tactical EMS Providers may provide medical care using Tactical Medical Protocols only under the medical direction of a Tactical Physician.
  - (2) Immediately available telephone or radio contact during an operation shall be considered a reasonable substitute for in-person supervision of Tactical EMS Providers.
  - (3) In the absence of medical direction by a Tactical Physician, jurisdictional trained and designated Tactical EMS Providers should defer to their usual EMS protocols.
- b) Operational Command
  - (1) Operational command within a law enforcement perimeter of operation lies with the law enforcement commander. At times, the safety and success of the law enforcement objectives may override the need to care for casualties. The law enforcement commander is responsible for the care and movement of casualties within a law enforcement operation.

**3. SPECIAL CONSIDERATION FOR TACTICAL EMS**

- a) The execution of some law enforcement operations may require that minor illness or injury in essential public safety personnel be treated and, to the extent that it is medically safe to do so, that those treated personnel return to duty. Fitness for duty of public safety personnel with minor injuries or illnesses shall be determined by the law enforcement commander in consultation with a Tactical Physician.
- b) Prescription and over-the-counter (OTC) medications may be used for the treatment (or “symptomatic relief”) of constitutional symptoms as required to

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

promote the health, safety, and functionality of persons necessary to the operation. The Tactical EMS Provider(s) under the Tactical Physician will know the indications/contraindications for the medications available to them (as will be delineated under “Additional Medications for Tactical EMS,” to follow). At the EMT level, medications will be made available to those persons under the Tactical Provider’s care to self-select and self-medicate at the individual requesting person’s own discretion regarding appropriateness of use.

- c) The Tactical EMS Provider may provide care to all persons associated with the operation, and shall be responsible for initial access, assessment, and stabilization (within the scope of The Maryland Medical Protocols for EMS Providers) of those victims, bystanders, and suspects within the “warm” or “hot” zones until they may be extracted to local EMS providers. The Tactical EMS provider is not directly responsible for any person(s) outside the direct field of operations, whose care may safely be provided by the local EMS Operational Program.

**4. SPECIFIC PROCEDURES**

- a) Cyanoacrylate tissue adhesive
  - (1) Purpose: To limit blood loss, pain, and risk of secondary contamination/injury to a minor open wound
  - (2) Indications
    - (a) Clean wounds
    - (b) Minor bleeding wounds difficult to control with other interventions
    - (c) Wounds in personnel who must remain operational
  - (3) Contraindications
    - (a) Grossly contaminated wounds
    - (b) Greater than two hours since infliction of wound
    - (c) Macerated/crushed surrounding tissue
    - (d) Wounds near the eyes
  - (4) Potential adverse effects/complications
    - (a) This is not intended to constitute definitive wound closure; however, if properly cleaned prior to procedure, may be reviewed by physician without further intervention.
    - (b) Transient local pain at application site may be reported.
  - (5) Precautions
    - (a) Ask regarding previous reaction/exposure to agent.
    - (b) Advise patient of requirement for further evaluation by physician.
- b) “Field expedient” wound closure (stapling)
  - (1) Purpose: To limit blood loss and risk of secondary contamination injury to an open wound.
  - (2) Indications
    - (a) Clean wounds
    - (b) Delay in transportation to definitive care will be or is anticipated to be several hours
    - (c) Bleeding wounds difficult to control with other interventions
    - (d) Wounds in personnel who must remain operational

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (3) Contraindications
  - (a) Grossly contaminated wounds
  - (b) Greater than six hours since infliction of wound
  - (c) Macerated/crushed surrounding tissue
  - (d) Situations with less than two hours anticipated time to transportation to definitive care
  - (e) Facial wounds
- (4) Potential adverse effects/complications
  - (a) This is not intended to constitute definitive wound closure—this will minimize the risk for increased infection and increased foreign body retention.
- (5) Precautions
  - (a) Ask regarding local anesthetic allergies.
  - (b) Advise patient of requirement for further evaluation by physician.
- c) Impaled conducted electrical weapon dart removal
  - (1) ANY conducted electrical weapon dart impalement to the head, neck, hands, feet, or genitalia must be stabilized in place and evaluated by a physician.
  - (2) In order to safely transport the patient, attempted extraction may be made one time by a Tactical EMS Provider as long as the dart is not lodged in a location listed in (1) above and is not fully embedded up to the hub in tissue.
  - (3) All patients receiving conducted electrical weapon intervention will need to be transported to the emergency department for assessment.

**5. SUPPLEMENTAL FORMULARY FOR TACTICAL EMS**

- a) Tactical EMS providers may administer the following medications to support and maintain Tactical personnel in the operation environment. Bolded medications are required as part of the standardized TEMS load-out at the EMT or ALS level; the others are optional.
  - (1) Antihistamines/Decongestants
    - (a) Pseudoephedrine (Sudafed)**
    - (b) Cetirizine (Zyrtec)**
    - (c) Diphenhydramine (Benadryl)**
    - (d) Fexofenadine (Allegra)
    - (e) Oxymetazoline nasal spray (Afrin)
  - (2) Gastrointestinal
    - (a) Antacid (Mylanta or other equivalent antacid)**
    - (b) Cimetidine (Tagamet— or other equivalent H2 blocker)**
    - (c) Loperamide (Imodium)**
    - (d) 5-HT3 Antagonist (Zofran ODT/Ondansetron, 5-HT3 antagonist)**
    - (e) Metoclopramide (Reglan) (injectable)
    - (f) Dimenhydrinate (Dramamine),
    - (g) Meclizine (Antivert) (for motion sickness)
    - (h) Scopolamine transdermal

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (3) Ophthalmologicals
  - (a) Proparacaine or Tetracaine (Alcaine) ophthalmic**
  - (b) Fluorescein stain (and blue light)**
  - (c) Eye irrigation solution**
  - (d) Erythromycin ophthalmic ointment**
  - (e) pH paper**
- (4) Antimicrobials/antiviral (agent-specific training)
  - (a) Ciprofloxacin (following exposure or prophylaxis)**
  - (b) Triple Antibiotic Ointment (Bacitracin/Polymyxin/Neomycin)**
  - (c) Amoxicillin/Clavulanic acid (Augmentin)
  - (d) Cefazolin (Ancef) (PO or IV) (for trauma applications when transport delayed)
  - (e) Clindamycin (Cleocin)
  - (f) Trimethoprim/Sulfamethoxazole (Bactrim)
  - (g) Azithromycin (Zithromax)
  - (h) Doxycycline
  - (i) Mupirocin topical ointment (Bactroban)
  - (j) Emtricitabine and tenofovir (Truvada) (high-risk post-exposure management)
- (5) Steroids
  - (a) Prednisone (PO)**
  - (b) Dexamethasone (Decadron) (IV/IM and/or PO)
- (6) Analgesics/Anesthetics
  - (a) Acetaminophen (PO)**
  - (b) Ibuprofen (Motrin/Advil)**
  - (c) Naproxen (Aleve/Naprosyn) (PO)**
  - (d) Tramadol (Ultram) (PO)**
  - (e) Ketamine**
  - (f) Naloxone (Narcan) (IN and/or IV)**
  - (g) Lidocaine (transdermal for muscular relief, or IM/SQ for stapling as temporizing measure only, alternate dosing regimen)
  - (h) Fentanyl Transmucosal (PO)
  - (i) Clove oil (for topical dental analgesia)
  - (j) Ketorolac (Toradol) (injectable)
- (7) Sleep/Wake
  - (a) Caffeine (No-Doz)**
  - (b) Zaleplon (Sonata) (sleeper)
  - (c) Modafinil (Provigil)
- (8) Wound Management
  - (a) Cyanoacrylate tissue adhesive (Dermabond)**
  - (b) Topical hemostatic agent**
  - (c) Steri-strips**
  - (d) Staples
- (9) ACLS/Resuscitation
  - (a) Albuterol MDI**

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

(10) Anti-hypoglycemics

**(a) Oral glucose**

(11) Additional Medications for Tactical EMS: The following is a list of medications from the Maryland Medical Protocols that is strongly encouraged to be readily accessible to complement the Tactical Medic's Formulary.

Aspirin (EMT, ALS).....	Non-Operational
Atropine Multi-Dose (ALS) .....	Non-Operational
Dexamethasone (ALS) .....	Operational
Dextrose (ALS) .....	Non-Operational
Epinephrine 1:1,000, (EMT, ALS) .....	Non-Operational
Haldol (ALS) .....	Non-Operational
Morphine or Fentanyl for injection (ALS).....	Non-Operational
Midazolam (ALS) .....	Non-Operational
Nitroglycerin (ALS) .....	Non-Operational



**OPERATIONAL:** THE MEDICATION MAY BE GIVEN TO A LAW ENFORCEMENT MEMBER WHO MAY CONTINUE TO PERFORM THEIR ASSIGNED DUTIES.

**NON-OPERATIONAL:** ONCE THE MEDICATION HAS BEEN ADMINISTERED, THE LAW ENFORCEMENT MEMBER IS REMOVED FROM THEIR ASSIGNED DUTIES SINCE THE MEDICATION OR THE ASSOCIATED MEDICAL/TRAUMATIC COMPLAINT FOR WHICH THE MEDICATION IS INDICATED MAY IMPAIR THEIR ABILITY TO PERFORM CRITICAL LAW ENFORCEMENT TASKS AND DUTIES.

b) Tactical EMS Medical Formulary

(1) Antihistamines/Decongestants

**(a) Pseudoephedrine (Sudafed)**

- (i) AVAILABILITY.....30 mg or 60 mg tablets (OTC)
- (ii) ACTION.....Decongestant
- (iii) INDICATIONS.....Nasal congestion; rhinorrhea
- (iv) CONTRAINDICATIONS.....Known hypersensitivity;  
hypertension
- (v) PRECAUTIONS.....
- (vi) OPERATIONAL STATUS? .....Operational
- (vii) SIDE EFFECTS.....Insomnia
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....30–60mg, every 4–6 hours,  
as needed

**(b) Cetirizine (Zyrtec)**

- (i) AVAILABILITY.....10 mg tablet
- (ii) ACTION.....Non-sedating antihistamine
- (iii) INDICATIONS.....Allergic symptoms
- (iv) CONTRAINDICATIONS.....Known hypersensitivity
- (v) PRECAUTIONS.....Hypertension; liver/kidney dx
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....Dry mouth, urinary retention
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....10 mg/once daily

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**(c) Diphenhydramine (Benadryl)**

- (i) AVAILABILITY.....25 mg or 50 mg tablets
- (ii) ACTION .....Sedating antihistamine
- (iii) INDICATIONS .....Allergic symptoms
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS.....Hypertension; liver/kidney dx
- (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL
- (vii) SIDE EFFECTS.....Dry mouth, urinary retention, somnolence
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....25–50mg every 4–6 hours, as needed; per MD/DO

**(d) Fexofenadine (Allegra)**

- (i) AVAILABILITY.....60 mg tablet
- (ii) ACTION .....Non-sedating antihistamine
- (iii) INDICATIONS .....Allergic symptoms
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS .....Hypertension history; aLK CC <sup>a</sup>+
- (vi) OPERATIONAL STATUS.....Operational
- (vii) SIDE EFFECTS .....Dry mouth, urinary retention
- (viii) INTERACTIONS.....
- (ix) DOSAGE .....60mg/once or twice daily

**(e) Oxymetazoline nasal spray (Afrin)**

- (i) AVAILABILITY.....Nasal spray 0.05%
- (ii) ACTION .....Nasal vasoconstriction; decongestant
- (iii) INDICATIONS .....Rhinorrhea; sinus congestion and pain
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS .....aL CC <sup>a</sup>?
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....Nose bleed (minor) possible; often used in treatment of nose bleed
- (viii) INTERACTIONS.....
- (ix) DOSAGE .....Two sprays per nare, 2–3 times per day

**(2) Gastrointestinal**

**(a) Antacid (Mylanta or other equivalent antacid)**

- (i) AVAILABILITY.....Liquid (OTC)
- (ii) ACTION .....Antacid
- (iii) INDICATIONS .....GI upset, GERD, PUD, gastritis, esophagitis
- (iv) CONTRAINDICATIONS .....Known hypersensitivity



**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (v) PRECAUTIONS .....Some medications require acidic pH and should not be taken at same time with this medication: aK C+ (? 1st trimester) <sup>a?</sup>
- (vi) OPERATIONAL STATUS? .....Operational
- (vii) SIDE EFFECTS.....
- (viii) INTERACTIONS .....Loose stools possible
- (ix) DOSAGE .....15–45 mL every 4–8 hours
- (b) Cimetidine (Tagamet— or other equivalent H2 blocker)**
  - (i) AVAILABILITY .....200/300/400 mg tablets; 300 mg IV/IM
  - (ii) ACTION.....H2 blocker
  - (iii) INDICATIONS .....PUD, GERD, esophagitis, gastritis
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity; concomitant Proton Pump Inhibitor (PPI) use
  - (v) PRECAUTIONS .....aL CC <sup>a?</sup>
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....300 mg IV/IM/PO every 6–8 hours; 400 mg twice daily
- (c) Loperamide (Imodium)**
  - (i) AVAILABILITY .....2 mg tablet (OTC) and 1mg/5mL suspension
  - (ii) ACTION.....Anti-diarrheal
  - (iii) INDICATIONS.....Diarrhea
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity; hypertension; bloody diarrhea
  - (v) PRECAUTIONS.....aL CB <sup>a+</sup>
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS .....ENT dryness
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....4 mg first dose; 2 mg each subsequent episode until stool formed; maximum 16 mg per day
- (d) 5-HT3 Antagonist (Zofran ODT/Ondansetron, 5-HT3 antagonist)**
  - (i) AVAILABILITY .....IM/IV injectable; tablets
  - (ii) ACTION.....Anti-emetic; anti-motion sickness
  - (iii) INDICATIONS.....Nausea/vomiting
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity
  - (v) PRECAUTIONS.....aK CB <sup>a?</sup>
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....Per MD/DO



**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (e) Metoclopramide (Reglan) (injectable)
- (i) AVAILABILITY .....IM/IV injectable; 10 mg
  - (ii) ACTION .....Anti-emetic; promotes GI motility
  - (iii) INDICATIONS .....Nausea/vomiting
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity
  - (v) PRECAUTIONS .....Dystonic reaction risk (treat with diphenhydramine); may see sedation; aK CB <sup>a?</sup>
  - (vi) OPERATIONAL STATUS? .....NON-OPERATIONAL
  - (vii) SIDE EFFECTS .....Sedation; dystonia
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....10–20 mg IM/IV/PO every 4 hours, as needed; per MD/DO
- (f) Dimenhydrinate (Dramamine)
- (i) AVAILABILITY .....IM/IV injectable; 50 mg tablet
  - (ii) ACTION .....Anti-emetic; anti-motion sickness
  - (iii) INDICATIONS .....Nausea/vomiting
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity
  - (v) PRECAUTIONS .....May see sedation; aK CB <sup>a?</sup>
  - (vi) OPERATIONAL STATUS? .....NON-OPERATIONAL
  - (vii) SIDE EFFECTS .....Sedation
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....50–100 mg IM/IV/PO every 4 hours, as needed; per MD/DO
- (g) Meclizine (Antivert) (for motion sickness)
- (i) AVAILABILITY .....25–50 mg tablet
  - (ii) ACTION .....Anti-emetic; anti-motion sickness
  - (iii) INDICATIONS .....Nausea/vomiting
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity
  - (v) PRECAUTIONS .....May see sedation; aK CB <sup>a?</sup>
  - (vi) OPERATIONAL STATUS? .....NON-OPERATIONAL
  - (vii) SIDE EFFECTS .....Sedation
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....25–50 mg PO every 4 hours, as needed; per MD/DO
- (h) Scopolamine transdermal
- (i) AVAILABILITY.....1 mg patch
  - (ii) ACTION .....Anti-emetic; anti-motion sickness
  - (iii) INDICATIONS .....Nausea/vomiting/motion sickness prevention
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity, hx angle closure glaucoma; hypersensitivity to belladonna alkaloids, seizures, urinary retention
  - (v) PRECAUTIONS .....May cause sedation, disorientation underwater

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (vi) OPERATIONAL STATUS?.....Operational (if previously tolerated scopolamine)
- (vii) SIDE EFFECTS.....Sedation
- (viii) INTERACTIONS .....Use with caution when taking other potentially sedative drugs or anticholinergics
- (ix) DOSAGE .....1 mg patch every 3 days, as needed; per MD/DO

(3) Ophthalmologicals

**(a) Proparacaine or Tetracaine (Alcaine) ophthalmic**

- (i) AVAILABILITY .....Ocular anesthetic solution
- (ii) ACTION .....Topical anesthetic
- (iii) INDICATIONS .....To facilitate eye exam; relieve eye pain; per MD/DO
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS.....Ensure eye protection from foreign objects after exam
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS .....
- (viii) INTERACTIONS .....Eye pain
- (ix) DOSAGE .....1–2 drops per eye; per MD/DO

**(b) Fluorescein stain (and blue light)**

- (i) AVAILABILITY .....Single application strips
- (ii) ACTION.....Dye to facilitate eye exam
- (iii) INDICATIONS.....Suspected eye injury (foreign body/corneal abrasion)
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS.....N/A
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....N/A
- (viii) INTERACTIONS .....N/A
- (ix) DOSAGE .....One drop per eye

**(c) Eye irrigation solution**

- (i) AVAILABILITY .....100 mL, 200 mL bottles (other sizes may also be available)
- (ii) ACTION .....To facilitate irrigation of contaminants from the eye
- (iii) INDICATIONS.....Following exposure of foreign body or chemical to eye
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS.....Not be used in penetrating eye trauma
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....
- (viii) INTERACTIONS.....
- (ix) DOSAGE .....Irrigate until an eye pH of 7.4 is achieved

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**(d) Erythromycin ophthalmic ointment**

- (i) AVAILABILITY .....0.5% ointment
- (ii) ACTION .....Macrolide antibiotic
- (iii) INDICATIONS .....Per MD/DO—infectious exposures
- (iv) CONTRAINDICATIONS .....Known hypersensitivity to penicillins
- (v) PRECAUTIONS .....Topical use only
- (vi) OPERATIONAL STATUS? .....Operational
- (vii) SIDE EFFECTS.....GI upset; nausea/vomiting; diarrhea
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Per MD/DO

**(e) pH paper**

- (i) AVAILABILITY .....Rolls or precut pieces of paper (other sizes may also be available)
- (ii) ACTION .....To measure baseline and repeat pH during decontamination/ irrigation
- (iii) INDICATIONS .....Following exposure of foreign body or chemical to eye or skin
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS .....Not be used in penetrating eye trauma
- (vi) OPERATIONAL STATUS? .....Operational
- (vii) SIDE EFFECTS.....
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....One strip approximately 1–2 inches; per MD/DO

(4) Antimicrobials/antiviral (agent-specific training)

**(a) Ciprofloxacin (following exposure or prophylaxis)**

- (i) AVAILABILITY .....250/500/750 mg tablets; 400 mg IVPB; 250 or 500/5 suspension
- (ii) ACTION .....2nd generation quinolone antimicrobial agent
- (iii) INDICATIONS .....Per MD/DO—infectious exposures
- (iv) CONTRAINDICATIONS .....Known hypersensitivity
- (v) PRECAUTIONS .....aLK CC (teratogenicity unlikely) <sup>a?+</sup>
- (vi) OPERATIONAL STATUS? .....Operational
- (vii) SIDE EFFECTS.....GI upset, nausea/vomiting, diarrhea, yeast infection
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Per MD/DO

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**(b) Triple antibiotic ointment or equivalent  
(Bacitracin/Polymyxin/Neomycin)**

- (i) AVAILABILITY.....Topical ointment
- (ii) ACTION .....Polypeptide antibiotic
- (iii) INDICATIONS .....Per MD/DO—infected exposures
- (iv) CONTRAINDICATIONS.....Known hypersensitivity
- (v) PRECAUTIONS.....Topical use only
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS .....Local irritation, GI upset
- (viii) INTERACTIONS.....
- (ix) DOSAGE .....Apply to superficial scrapes,  
burns, wounds, prior to dry sterile  
dressing.

**(c) Amoxicillin/Clavulanate (Augmentin)**

- (i) AVAILABILITY.....875 or 125 mg tablets
- (ii) ACTION .....Beta-lactamase inhibitors
- (iii) INDICATIONS .....Per MD/DO—infected exposures
- (iv) CONTRAINDICATIONS.....Known hypersensitivity to penicillins
- (v) PRECAUTIONS.....Liver/Kidney dx
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS .....GI upset; nausea/vomiting; diarrhea
- (viii) INTERACTIONS .....
- (ix) DOSAGE.....Per MD/DO

**(d) Cefazolin (Ancef) (PO or IV) (for trauma applications when transport delayed)**

- (i) AVAILABILITY .....0.5–2 grams IM/IV
- (ii) ACTION .....1st generation Cephalosporin  
antimicrobial agent
- (iii) INDICATIONS .....Per MD/DO—infected exposures/  
trauma
- (iv) CONTRAINDICATIONS.....Known hypersensitivity to PCN or  
Cephalosporins
- (v) PRECAUTIONS.....aK CB <sup>a+</sup>
- (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL
- (vii) SIDE EFFECTS .....GI upset, nausea/vomiting, diarrhea,  
yeast infection
- (viii) INTERACTIONS .....
- (ix) DOSAGE .....Per MD/DO

**(e) Clindamycin (Cleocin)**

- (i) AVAILABILITY.....150 or 300 mg tablets;  
reconstituted liquid 75mg/5mL
- (ii) ACTION.....Antibiotic
- (iii) INDICATIONS.....Suspected pharyngitis or respiratory  
infection, cellulitis
- (iv) CONTRAINDICATIONS.....Hypersensitivity to clindamycin
- (v) PRECAUTIONS.....
- (vi) OPERATIONAL STATUS? .....Operational

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (vii) SIDE EFFECTS .....Diarrhea
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Pediatrics – 10 mg/kg every 8 hours  
Adult – 300 mg every 8 hours
- (f) Trimethoprim/Sulfadiazine (Bactrim)
  - (i) AVAILABILITY.....DS tablet
  - (ii) ACTION .....Sulfonamide antibiotic
  - (iii) INDICATIONS .....Per MD/DO— infectious exposures
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity
  - (v) PRECAUTIONS .....Liver/kidney dx, anemia,  
thrombocytopenia
  - (vi) OPERATIONAL STATUS? .....Operational
  - (vii) SIDE EFFECTS .....GI upset, nausea/vomiting, diarrhea
  - (viii) INTERACTIONS .....
  - (ix) DOSAGE .....Per MD/DO
- (g) Azithromycin (Zithromax)
  - (i) AVAILABILITY.....250 mg tablet
  - (ii) ACTION .....Macrolide antibiotic
  - (iii) INDICATIONS .....Per MD/DO— infectious exposures
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity to penicillins
  - (v) PRECAUTIONS.....Liver/kidney dx
  - (vi) OPERATIONAL STATUS.....Operational
  - (vii) SIDE EFFECTS .....GI upset, nausea/vomiting, diarrhea
  - (viii) INTERACTIONS .....
  - (ix) DOSAGE.....Per MD/DO
- (h) Doxycycline
  - (i) AVAILABILITY .....100 mg tablet
  - (ii) ACTION.....Tetracycline antibiotic
  - (iii) INDICATIONS .....Per MD/DO— infectious exposures
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity to  
tetracyclines, pregnancy
  - (v) PRECAUTIONS.....Liver/kidney dx, photoreactivity rash
  - (vi) OPERATIONAL STATUS? .....Operational
  - (vii) SIDE EFFECTS .....GI upset, nausea/vomiting, diarrhea
  - (viii) INTERACTIONS .....
  - (ix) DOSAGE.....Per MD/DO
- (i) Mupirocin topical ointment (Bactroban)
  - (i) AVAILABILITY.....2% topical ointment
  - (ii) ACTION.....Other antibiotic
  - (iii) INDICATIONS .....Per MD/DO— infectious exposures
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity
  - (v) PRECAUTIONS.....Avoid eyes, limit prolonged use
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS .....Local irritation, GI discomfort
  - (viii) INTERACTIONS .....
  - (ix) DOSAGE.....Per MD/DO

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (j) Emtricitabine and tenofovir (Truvada) (high-risk post-exposure management)
  - (i) AVAILABILITY .....Tablet containing tenofovir DF 300 mg;  
emtricitabine 200 mg
  - (ii) ACTION .....Antiretroviral
  - (iii) INDICATIONS .....Per MD/DO— infectious exposures
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity
  - (v) PRECAUTIONS .....Liver/kidney dx
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....GI upset, nausea/vomiting, diarrhea
  - (viii) INTERACTIONS .....
  - (ix) DOSAGE .....Per MD/DO
- (5) Steroids
  - (a) Prednisone (PO)**
    - (i) AVAILABILITY .....PO; 1/5/10/20/50 mg tablets
    - (ii) ACTION .....Corticosteroid, anti-inflammatory
    - (iii) INDICATIONS .....Allergic reaction, auto-immune condition; per MD/DO
    - (iv) CONTRAINDICATIONS .....Known hypersensitivity
    - (v) PRECAUTIONS .....PUD/GERD/GI bleed history; aL CC <sup>a+</sup>
    - (vi) OPERATIONAL STATUS?.....Operational
    - (vii) SIDE EFFECTS.....GI upset/nausea
    - (viii) INTERACTIONS.....
    - (ix) DOSAGE.....40 mg to 60 mg once daily;  
per MD/DO
  - (b) Dexamethasone (Decadron) (IV/IM and/or PO)**
    - (i) AVAILABILITY .....PO or IV/IM; tablets
    - (ii) ACTION .....Corticosteroid, anti-inflammatory
    - (iii) INDICATIONS .....Allergic reaction, auto-immune condition; per MD/DO
    - (iv) CONTRAINDICATIONS .....Known hypersensitivity
    - (v) PRECAUTIONS .....PUD/GERD/GI bleed history, aL CC <sup>a-</sup>
    - (vi) OPERATIONAL STATUS?.....Operational
    - (vii) SIDE EFFECTS.....GI upset/nausea
    - (viii) INTERACTIONS.....
    - (ix) DOSAGE.....10 mg once daily; per MD/DO
- (6) Analgesics/Anesthetics
  - (a) Acetaminophen (PO)**
    - (i) AVAILABILITY .....Tablet: 325 and 500mg
    - (ii) ACTION .....Pain medication
    - (iii) INDICATIONS.....Mild to moderate pain
    - (iv) CONTRAINDICATIONS .....Known hypersensitivity, liver disease,  
PUD/GERD/GI bleed history
    - (v) PRECAUTIONS .....aL CB <sup>a+</sup>
    - (vi) OPERATIONAL STATUS?.....Operational
    - (vii) SIDE EFFECTS.....GI upset
    - (viii) INTERACTIONS.....
    - (ix) DOSAGE.....650–1,000 mg / 6 hours

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**(b) Ibuprofen (Motrin/Advil)**

- (i) AVAILABILITY.....200 mg tablet (OTC) and 100mg/5mL suspension; 600 mg and 800 mg tablets
- (ii) ACTION.....Non-steroidal anti-inflammatory pain medication
- (iii) INDICATIONS.....Mild to moderate pain
- (iv) CONTRAINDICATIONS.....Known hypersensitivity, renal insufficiency (not failure), PUD/GERD/GI bleed history
- (v) PRECAUTIONS.....Do not use with other NSAIDs; caution with concomitant steroid use; aL CB (D in 3rd trimester) <sup>a+</sup>
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....GI upset/nausea, GI bleeding risk
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....400–600 mg / 4–6 hours or 600–800 mg / 6–8 hours

**(c) Naproxen (Aleve/Naprosyn) (PO)**

- (i) AVAILABILITY.....Tablet: 220/375/500 mg PO tablets
- (ii) ACTION.....Non-steroidal anti-inflammatory pain medication
- (iii) INDICATIONS.....Mild to moderate pain
- (iv) CONTRAINDICATIONS.....Known hypersensitivity, renal insufficiency (not failure), PUD/GERD/GI bleed history
- (v) PRECAUTIONS.....Do not use with other NSAIDs; caution with concomitant steroid use; aL CB (D in 3rd trimester)
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....GI upset/nausea, GI bleeding risk
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....220–500 mg every 12 hours

**(d) Tramadol (Ultram) (PO)**

- (i) AVAILABILITY.....50 and 100 mg PO tablets
- (ii) ACTION.....Pain medication
- (iii) INDICATIONS.....Moderate to moderately severe pain
- (iv) CONTRAINDICATIONS.....Known hypersensitivity, seizure Disorder, SSRI/TCA/MAOI use, renal or hepatic insufficiency (adjust dose)
- (v) PRECAUTIONS.....Caution with concomitant opioid use; aLiver CC <sup>a?</sup>
- (vi) OPERATIONAL STATUS?.....Operational (if no side effects reported)
- (vii) SIDE EFFECTS.....Potential dizziness/nausea
- (viii) INTERACTIONS.....Antidepressants, antipsychotics, Warfarin, Digoxin, Tegretol, Quinidine
- (ix) DOSAGE.....50–100 mg every 4–6 hours; 400 mg per day maximum



**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

**(e) Ketamine**

*Formulary per General Patient Care Protocols*

**(f) Naloxone (Narcan) (IN and/or IV)**

*Formulary per General Patient Care Protocols*

**(g) Lidocaine (transdermal for muscular relief, or IM/SQ for stapling as temporizing measure only, alternate dosing regimen)**

- (i) AVAILABILITY.....1% (10mg/mL) ampules/vials
- (ii) ACTION.....Injectable anesthetic
- (iii) INDICATIONS.....Local pain/injury
- (iv) CONTRAINDICATIONS.....Known hypersensitivity
- (v) PRECAUTIONS.....Should not exceed 4 mg/kg or 300 mg
- (vi) OPERATIONAL STATUS.....Operational
- (vii) SIDE EFFECTS.....With high doses: seizures, lightheadedness, ringing in ears
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Topical application to site of dental pain

**(h) Fentanyl Transmucosal (PO)**

- (i) AVAILABILITY.....Lozenge / lollipop 800 mcg
- (ii) ACTION.....Opioid analgesic
- (iii) INDICATIONS.....Severe pain/injury
- (iv) CONTRAINDICATIONS.....Known hypersensitivity
- (v) PRECAUTIONS.....Controlled substance. Patient should not bite or chew the lozenge, but rather allow it to dissolve slowly in the mouth.
- (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL
- (vii) SIDE EFFECTS.....Patient must be monitored for CNS/ respiratory depression
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Oral application for patient directed analgesia; patient should remove the lollipop once pain is controlled

**(i) Clove oil (for topical dental analgesia)**

- (i) AVAILABILITY.....Topical liquid (OTC)
- (ii) ACTION.....Topical (dental) anesthetic
- (iii) INDICATIONS.....Dental pain/injury
- (iv) CONTRAINDICATIONS.....Known hypersensitivity
- (v) PRECAUTIONS.....Penetrating/open intra-oral wounds
- (vi) OPERATIONAL STATUS?.....Operational
- (vii) SIDE EFFECTS.....
- (viii) INTERACTIONS.....
- (ix) DOSAGE.....Topical application to site of dental pain



**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (j) Ketorolac (Toradol) (injectable)
  - (i) AVAILABILITY.....30 mg/mL IV/IM
  - (ii) ACTION.....Non-steroidal anti-inflammatory pain medication
  - (iii) INDICATIONS.....Mild to moderate pain
  - (iv) CONTRAINDICATIONS .....Known hypersensitivity, renal insufficiency (not failure), PUD/GERD/ GI bleed history
  - (v) PRECAUTIONS.....Do not use with other NSAIDs; caution with concomitant steroid use; aPlasma CC (D 3rd trimester) <sup>a?</sup>
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....GI upset/nausea; GI bleeding risk
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE.....15–30 mg IM/IV every 6–8 hours
- (7) Sleep/Wake
  - (a) Caffeine (No-Doz)**
    - (i) AVAILABILITY .....200 mg tablet
    - (ii) ACTION.....Enhances alertness
    - (iii) INDICATIONS.....Suspected caffeine withdrawal headache; to facilitate functioning with limited rest periods
    - (iv) CONTRAINDICATIONS .....Known hypersensitivity
    - (v) PRECAUTIONS .....aL CB <sup>a?</sup>
    - (vi) OPERATIONAL STATUS?.....Operational
    - (vii) SIDE EFFECTS.....Insomnia
    - (viii) INTERACTIONS.....
    - (ix) DOSAGE.....200 mg / 3–4 hours as needed
  - (b) Zaleplon (Sonata) (sleeper)**
    - (i) AVAILABILITY .....10 mg capsule
    - (ii) ACTION.....Anxiolytic/hypnotic; shortest t-1/2 of agents available
    - (iii) INDICATIONS.....Facilitate rest during non-operational periods in prolonged deployment/ transportation; minimum 4-hour block required for usage (6 hours preferred)
    - (iv) CONTRAINDICATIONS .....Known hypersensitivity, unsecure location, lack of assured 4-hour non-operational period
    - (v) PRECAUTIONS.....May not drive/operate machinery/use weapons for minimum 4 hours post-administration; aL CC <sup>a-</sup>
    - (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL (x 4 hours after administration)
    - (vii) SIDE EFFECTS.....Sedation

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (viii) INTERACTIONS.....Alcohol/other sedatives  
potentiate effect
- (ix) DOSAGE.....10–20 mg with assured 4-hour non-  
operational block, as approved by  
MD/DO and Team Commander
- (c) Modafinil (Provigil)
  - (i) AVAILABILITY .....200 mg tablet
  - (ii) ACTION.....Enhances alertness/concentration
  - (iii) INDICATIONS.....To facilitate functioning with limited  
rest periods
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity
  - (v) PRECAUTIONS.....aL CC <sup>a</sup>?
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....Insomnia, mild blood pressure  
elevation
  - (viii) INTERACTIONS.....
  - (ix) DOSAGE .....200 mg once daily
- (8) Wound Management
  - (a) Cyanoacrylate tissue adhesive (Dermabond)**
    - (i) AVAILABILITY .....Single use ampoules
    - (ii) ACTION.....Tissue adhesive
    - (iii) INDICATIONS.....Minor trauma
    - (iv) CONTRAINDICATIONS.....Known hypersensitivity
    - (v) PRECAUTIONS.....Avoid near eyes
    - (vi) OPERATIONAL STATUS?.....Operational
    - (vii) SIDE EFFECTS.....Transient local discomfort
    - (viii) INTERACTIONS .....N/A
    - (ix) DOSAGE .....As required for wound closure,  
2–4 layered applications
  - (b) Topical hemostatic dressing**
    - (i) AVAILABILITY .....Individual use packages
    - (ii) ACTION.....Promotes blood clotting
    - (iii) INDICATIONS.....Hemorrhage
    - (iv) CONTRAINDICATIONS.....Known hypersensitivity
    - (v) PRECAUTIONS.....Standard/universal precautions  
for wound care
    - (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL
    - (vii) SIDE EFFECTS.....N/A
    - (viii) INTERACTIONS .....N/A
    - (ix) DOSAGE.....Single or multiple dressings  
applied to bleeding wound
  - (c) Steri-strips**
    - (i) AVAILABILITY .....Individual use packages
    - (ii) ACTION.....Facilitates closure of wounds
    - (iii) INDICATIONS.....Superficial wounds
    - (iv) CONTRAINDICATIONS.....Known hypersensitivity to adhesive

**PILOT PROGRAM  
TACTICAL EMERGENCY MEDICAL SERVICES PROTOCOL**

- (v) PRECAUTIONS.....Standard/universal precautions for wound care
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....N/A
  - (viii) INTERACTIONS.....N/A
  - (ix) DOSAGE.....Single or multiple dressings applied for wound closure; per MD/DO
- (d) Staples
- (i) AVAILABILITY.....Individual use staple dispensers
  - (ii) ACTION.....Facilitates closure of wounds
  - (iii) INDICATIONS.....Wounds
  - (iv) CONTRAINDICATIONS.....Contaminated wounds, wounds with foreign body material
  - (v) PRECAUTIONS.....Standard/universal precautions for wound care
  - (vi) OPERATIONAL STATUS?.....Operational
  - (vii) SIDE EFFECTS.....N/A
  - (viii) INTERACTIONS.....N/A
  - (ix) DOSAGE.....Single or multiple dressings applied for wound closure; per MD/DO
- (9) ACLS/Resuscitation
- (a) Albuterol MDI**
- (i) AVAILABILITY.....0.83 mcg metered dose inhaler
  - (ii) ACTION.....Bronchodilator
  - (iii) INDICATIONS.....Respiratory distress/bronchospasm
  - (iv) CONTRAINDICATIONS.....Known hypersensitivity
  - (v) PRECAUTIONS.....Standard/universal precautions for respiratory patient
  - (vi) OPERATIONAL STATUS?.....NON-OPERATIONAL (without MD/DO consult)
  - (vii) SIDE EFFECTS.....N/A
  - (viii) INTERACTIONS.....N/A
  - (ix) DOSAGE.....2 puffs, may be repeated two additional times. Additional doses per MD/DO
- (10) Anti-hypoglycemics
- (a) Oral glucose**
- Formulary per General Patient Care Protocols*

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**PILOT PROGRAM  
TRANSPORT TO FREESTANDING EMERGENCY MEDICAL FACILITY AT BULLE ROCK  
(BASE STATION)**

**L. TRANSPORT TO FREESTANDING EMERGENCY MEDICAL FACILITY AT BULLE ROCK (BASE STATION) (NEW '18)**

**1. PURPOSE**

To define the type of patient an EMS service may transport to a MIEMSS-designated freestanding 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)
- c) If the freestanding emergency medical facility is a MIEMSS-designated Acute Stroke Ready Facility, patients of all priority that meet stroke criteria may be transported to the Acute Stroke Ready Facility, as long as the transport time to a Primary Stroke or Comprehensive Stroke Center is greater than 15 additional minutes.

**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

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**PILOT PROGRAM  
ON-SCENE PROTOCOL AND ALTERNATIVE DISPATCH PROTOCOL DURING  
DECLARED PUBLIC HEALTH EMERGENCIES FOR PANDEMIC INFLUENZA**

**M. ON-SCENE PROTOCOL AND ALTERNATIVE DISPATCH PROTOCOL DURING  
DECLARED PUBLIC HEALTH EMERGENCY FOR PANDEMIC INFLUENZA**

This protocol is designed to be implemented only when there is a significant infectious disease that has impacted the health care system to the extent that all hospital beds are full, the EMS/Dispatch work force is significantly depleted due to absenteeism, and the calls for EMS support overwhelm resources to manage all calls. MIEMSS, in collaboration with DHMH and Local health officers, would activate this protocol to provide authorization for the adjustment in the prehospital standard of care.

**MANAGING ARRESTS**

If the patient is in cardiac arrest, CPR for 5 cycles, than apply AED. Shock and continue to shock with 5 cycles CPR if indicated.

- 1) If a pulse returns, initiate patient transport as quickly as possible to a higher level of medical care (the ED or rendezvous with ALS, whichever has a shorter ETA).
- 2) If no shock is indicated and there is no return of pulse, consult medical direction to withdraw care and leave patient on scene.

Follow normal *Maryland Medical Protocol for EMS Providers* and conduct General Patient Care assessment; make sure you are using appropriate universal precautions.

Follow the sequential steps below:

- 1) If patient has an obvious **non-flu related illness or injury**, apply appropriate *Maryland Medical Protocol for EMS Providers*, then treat and transport appropriately.
- 2) If patient has **Critical Vital Signs (Table #1)**, transport patient to ED.
- 3) If patient has **Normal Vital Signs (Table #1)**, then go to Case Definition Signs and Symptoms for Flu (Table #2).
  - a) If the patient has **three or more Case Definition Signs or Symptoms for Flu**, transport patient to Alternate Care Facility.
  - b) If the patient has **two or less Case Definition Signs or Symptoms for Flu**, EMS provider shall call for Medical Consult (state central resource physician) to determine if EMS provider can leave the patient on scene, and advise the patient to self-quarantine and call a nurse/public health hotline for further assistance.



**PILOT PROGRAM  
ON-SCENE PROTOCOL AND ALTERNATIVE DISPATCH PROTOCOL DURING  
DECLARED PUBLIC HEALTH EMERGENCIES FOR PANDEMIC INFLUENZA**

<b>Table 1. Assess Patient's Vital Signs</b>				
	<b>Critical Adult Vital Signs</b>	<b>Critical Pediatric Vital Signs</b>	<b>Normal Adult Vital Signs</b>	<b>Normal Pediatric Vital Signs</b>
	<b>Transport to ED</b>		<b>Consider Alternate Care</b>	
Pulse/ <i>Perfusion</i>	Equal or Greater than 130	<b>CRT greater than 2 seconds</b>	Less than 130	<b>CRT less than or equal to 2 seconds</b>
RR/ <i>Distress</i>	Equal or Greater than 30	<b>Greater than 45 or increased work of breathing Neonate: Less than 30 Infant: Less than 20 Child: Less than 15</b>	Less than 30	<b>Unlabored breathing or Neonate: 30–45 Infant: 20–45 Child: 15–45</b>
Systolic BP	Less than 90	<b>Neonates: Less than 60 Infants: Less than 70 Children under 10 years of age: Less than 70 + (2 x years)</b>	Equal or Greater than 90	<b>Neonates: Equal or greater than 60 Infants: Equal or greater than 70 Children under 10 years of age: Equal or greater than 70 + (2 x years)</b>
Pulse Ox	Less than 92 on room air	<b>Less than 92 on room air</b>	Equal or Greater than 92	<b>Equal or Greater than 92</b>
AVPU	Pain or Unresponsive	<b>Pain or Unresponsive</b>	Alert or Verbal	<b>Alert or Verbal</b>
Lung sounds	Rales/Wheezing	<b>Rales/Wheezing</b>	Clear	<b>Clear</b>

<b>Table 2. Case Definition Signs and Symptoms for FLU</b>	
1. Difficulty breathing with exertion	7. Sore throat
2. Has doctor-diagnosed flu	(no difficulty breathing or swallowing)
3. Cough	8. Nasal congestion
4. Fever	9. Runny nose
5. Shaking chills	10. Muscle aches
6. Chest pain (pleuritic)	11. Headache

**PILOT PROGRAM  
ON-SCENE PROTOCOL AND ALTERNATIVE DISPATCH PROTOCOL DURING  
DECLARED PUBLIC HEALTH EMERGENCIES FOR PANDEMIC INFLUENZA**

<b>Maximize the Use of Limited Resources Alternative Dispatch Protocols</b>				
<b>Dispatch Priority Level</b> (match vendor or call center based dispatch protocol/tiered algorithm)	<b>Response</b> (Standard Operating Mode)	Level 1(A) Activation of Card 36 and ONLY for use in 6, 10, 18, and 26 DSS1 BELOW IS BACK UP STRATEGY FOR EMD WITHOUT CARD 36	Level 2(B) Implement Declining Response / Configuration CAD Table (Moderate) + Card 36 (6,10,18 & 26)  DSS2	Level 3(C) Implement Declining Response / Configuration CAD Table (Severe) + Card 36 (6,10,18 & 26)  DSS 3
<b>Classification 1 (*Echo)</b> Confirmed Cardiac Arrest (Not Breathing, Unresponsive per 911 call) (MPD cards - 2, 6, 9, 11,15, 31)	Closest AED Unit <u>and</u> Closest 1st Responder <u>and</u> Closest ALS Ambulance	Closest AED Unit <u>and</u> Closest 1st Responder <u>and</u> Closest BLS Ambulance if available	-Closest AED Unit and -Closest 1st Responder if available	- Closest AED Unit if available - If no unit available, no response
<b>Classification 2 (*Delta)</b> Life Threatening Emergency/Potentially Life Threatening/Confirmed Unstable Patient(s)	Closest 1st Responder <u>and</u> Closest ALS Ambulance	- Closest 1st Responder <u>and</u> Closest ALS Ambulance if available; - BLS ambulance if ALS unit not available	Closest 1st Responder <u>and</u> Closest Ambulance available (ALS or BLS)	- Closest 1st Responder <u>and</u> Closest Ambulance if available (ALS or BLS)
<b>Classification 3 (*Charlie)</b> Non-Critical/Currently Stable Patient(s) Requiring ALS Assessment	Closest ALS Ambulance	Closest Ambulance available (ALS or BLS)	Closest Ambulance available (ALS or BLS)	- Closest 1st Responder if available or - Closest stand-in responder unit
<b>Classification 4 (*Bravo)</b> BLS Assessment for unknown/possibly dangerous scenes	Closest 1st Responder <u>and</u> Closest BLS Ambulance	Closest 1st Responder <u>and</u> Closest BLS Ambulance if available	Closest 1st Responder	- Trauma Closest 1st Responder - Medical Referral to Nurse or Health Department Advice Phone service if available; or self-transport to Alternate Care Site
<b>Classification 5 (*Alpha)</b> BLS Treatment	BLS Ambulance	Alternate Care Referral	Alternate Care Referral	Alternate Care Referral
<b>Classification 6 (*Omega)</b> Non-Ambulance Care	Alternate care such as Poison Control Center; Police/Fire service call, etc.	Alternate care such as Poison Control Center; Police/Fire service call, etc.	Alternate care such as Poison Control Center; Police/Fire service call, etc.	Alternate care such as Poison Control Center; Police/Fire service call, etc.

**PILOT PROGRAM  
AIRWAY MANAGEMENT: VIDEO LARYNGOSCOPY  
FOR OROTRACHEAL INTUBATION**

**N. AIRWAY MANAGEMENT: VIDEO LARYNGOSCOPY FOR  
OROTRACHEAL INTUBATION**

**1. PURPOSE**

Endotracheal intubation using video laryngoscopy involves visualizing the glottic opening using specialized technology to view “around the corner” and pass the endotracheal tube, under optimal visualization, into the trachea. The purpose is to provide airway and ventilatory support for apnea, hypoxia, hypoventilatory respiratory failure, or respiratory insufficiency.

The video laryngoscope device must have the following features:

- a) Color monitor
- b) Anti-fog mechanism
- c) Video recording device
- d) Appropriately-sized blade for the patient being intubated **(NEW '18)**

**2. INDICATION**

Video laryngoscopy and orotracheal intubation is indicated for patients who meet one or more of the following criteria and for whom appropriately-sized equipment is available: **(NEW '18)**

- a) Apnea or agonal respirations
- b) Airway reflex compromised
- c) Ventilatory effort compromised
- d) Injury or illness involving the airway
- e) Potential for airway or ventilatory compromise

**3. CONTRAINDICATIONS**

Lack of an appropriately-sized laryngoscope blade for the patient being intubated. **(NEW '18)**

**4. POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

- a) Trauma to the mouth, pharynx, larynx, trachea, esophagus
- b) Right mainstem bronchus intubation
- c) Vomiting
- d) Secondary brain injury resulting from hypoxia and/or hypotension
- e) Displacement of a properly placed endotracheal tube
- f) Esophageal intubation

**5. PRECAUTIONS**

- a) Attempt visualization and endotracheal intubation up to two times. If additional attempts are indicated, consult medical direction and consider what changes would result in improved visualization and success at endotracheal placement of the ET tube.
- b) Confirm placement of the endotracheal tube in the trachea as described in AIRWAY MANAGEMENT: OROTRACHEAL INTUBATION.

**PILOT PROGRAM  
AIRWAY MANAGEMENT: VIDEO LARYNGOSCOPY  
FOR OROTRACHEAL INTUBATION**

**6. PROCEDURE**

- a) Insert the Video Laryngoscope Device midline into the pharynx.
- b) Advance the Video Laryngoscope Device midline to center the vocal cords on the video screen.
- c) Pass the endotracheal tube between the vocal cords, remove the stylet, and advance the tube to the desired depth.
- d) Secure the endotracheal tube and verify correct placement.

**7. TRAINING AND DOCUMENTATION**

- a) Providers must complete didactic and practical training.
  - (1) Description of technique
  - (2) Demonstration of device (features, operation, troubleshooting)
  - (3) Documentation requirements
  - (4) Mannequin scenarios
  - (5) *In vivo* practice
- b) Providers must complete the Video Laryngoscopy Procedure Form after each patient encounter in which the Video Laryngoscopy Device is used.
- c) Program Medical Directors must review each patient encounter in which the Video Laryngoscope Device is used and provide a quarterly report to the Office of the Medical Director on the approved video laryngoscopy QA form.

**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)**

**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 15<sup>th</sup> 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**

**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 18<sup>th</sup> 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**

<b>Hendrich II Fall Risk Model™</b>			
Confusion Disorientation Impulsivity		4	
Symptomatic Depression		2	
Altered Elimination		1	
Dizziness Vertigo		1	
Male Gender		1	
Any Administered Antiepileptics		2	
Any Administered Benzodiazepines		1	
<b>Get Up &amp; Go Test</b>			
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	
<b>A Score of 5 or Greater = High Risk</b>		<b>Total Score</b>	
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## **R. VASCULAR DOPPLER DEVICE**

### **1. PURPOSE**

When pulses are difficult to detect, or when a blood pressure cannot be measured using a stethoscope, a vascular Doppler device can be utilized.

### **2. INDICATION**

Inability to palpate a pulse.

### **3. CONTRAINDICATIONS**

Patients who have not yet reached their 18<sup>th</sup> birthday.

### **4. POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

None

### **5. PRECAUTIONS**

When utilizing a Doppler device, avoid applying too much pressure with the device over the artery, this may obliterate the pulse you are attempting to detect.

### **6. PROCEDURE**

- a) Identify the appropriate artery (e.g., carotid, brachial, radial, femoral, dorsalis pedis).
- b) A large dollop of gel is applied to the site and to the device.
- c) The device is held gently over the artery (too much pressure may obliterate the pulse), and the volume adjusted to hear the pulsation.
- d) If the pulse is located, the area should be wiped clean, and the exact site should be marked with a pen or marker.
- e) If blood pressure is being taken, the provider finds the pulse and listens as the cuff is inflated. When the pulse sound disappears, you have identified the systolic pressure.
- f) If no pulse is found, then sliding the device around the appropriate area or changing the angle of the device slightly may identify the location of the pulse. Be careful not to apply too much pressure on the skin.

### **7. TRAINING AND DOCUMENTATION**

- a) Providers must complete practical training.
- b) Description of technique
- c) Demonstration of device (features, operation, troubleshooting)
- d) Documentation requirements (eMEDS®)
- e) Scenario

## S. PREHOSPITAL ULTRASOUND

### 1. PURPOSE

- a) Many high-impact, high-mechanism trauma patients do not exhibit signs and/or symptoms of internal bleeding in the first hour of the event. Utilizing prehospital ultrasound technology allows an additional non-invasive exam to increase survival and decrease morbidity and mortality from internal hemorrhage. A FAST exam will be completed in the following order with at least a six-second recording of each exam. In addition, patients who have the possibility of abdominal aortic aneurysm can benefit from the prehospital ultrasound exam. Finally, anytime the Termination of Resuscitation Protocol is being utilized and prehospital ultrasound is available, it gives an additional non-invasive exam to confirm and record provider's suspicion of the absence of cardiac activity.
- b) For patients presenting with torso or abdominal pain or who present with high-impact, high-mechanism trauma, a prehospital FAST exam will be performed.
  - (1) Morison's perihepatic view
  - (2) Pelvic view
  - (3) Perisplenic view
  - (4) Cardiac view
- c) For patients who have a high clinical suspicion for abdominal aortic aneurysm, an abdominal ultrasound will be completed.
- d) Before termination of resuscitation, a cardiac ultrasound will be completed.

### 2. INDICATIONS

- a) When a patient presents with either obvious or possible high-impact, high-mechanism torso or abdominal trauma
- b) To confirm the presence or absence of wall motion in the cardiac arrest patient
- c) When a patient exhibits severe abdominal pain with radiation to the back, flank, and/or groin area.

### 3. CONTRAINDICATIONS

- a) Patients who have not reached their 15th birthday

### 4. PROCEDURE

- a) Initiate General Patient Care.
- b) Initiate appropriate trauma and or medical emergency protocol including all BLS/ALS interventions.
- c) The trained provider will complete the appropriate prehospital ultrasound exam recording for at least six seconds.



ALERT: AT NO TIME SHOULD A PREHOSPITAL FAST EXAM DELAY PATIENT TRANSPORT.

- d) Exam will be interpreted and relayed to the consulting hospital. In some cases, for example trauma patients for whom time and distance play a significant factor (category Charlie and Delta), the consulting physician may change the hospital destination based on the results of the prehospital ultrasound exam.

**PILOT PROGRAM  
PREHOSPITAL ULTRASOUND**

- e) Continue patient care as appropriate for either medical and or traumatic emergency.
- f) Assure exam is transmitted to the receiving facility through closed, secure network with patient care report.

**5. PREHOSPITAL ULTRASOUND QUALITY ASSURANCE PROCESS**

- a) Requirements for paramedics participating in prehospital ultrasound pilot participation:
  - (1) Successful completion of small group six-hour didactic training.
  - (2) Successful completion of small group six-hour clinical rotation and direct observation by physician in one of the receiving facility emergency rooms. A minimum of ten ultrasounds must be successfully completed.
  - (3) Yearly continuing education will be completed to include at least four hours of either didactic, clinical, and/or use of ultrasound education and/or technology.
- b) Ongoing Demonstration of Proficiency  
A verification of prehospital ultrasound education and competence shall be reviewed by the Jurisdictional Medical Director or by his or her designee at any time requested. Although ultrasound is a non-invasive procedure, awareness and clinical interpretation must be maintained.
- c) Review of each call
  - (1) Mechanism for follow-up of each call will be in accordance with the Quality Review Procedure for Pilot Programs of *The Maryland Medical Protocols for EMS Providers*.
  - (2) Immediate notification to the jurisdictional Quality Assurance Officer
  - (3) Jurisdictional Medical Director evaluation of all prehospital ultrasounds within twelve hours of incident

**PILOT PROGRAM  
STABILIZATION CENTER**

**T. STABILIZATION CENTER (NEW '18)**

**1. Initiate General Patient Care**

**2. Presentation**

Patients eligible for entry into the Stabilization Center must be without an acute medical or traumatic complaint. If the patient is not requesting evaluation for an emergency medical condition and substance use is suspected, including suspected opioid patients who have improved with naloxone, patient must consent to be evaluated and transported to the Stabilization Center. Then the Paramedic must complete the Stabilization Inclusion Checklist.

**3. Treatment**

Initiate patient screening. All answers must be “NO” for the referral protocol to continue. For any “YES” answers, consultation with an adult Base Station is required.

Patient with acute medical or traumatic complaint	YES	NO
Pediatric patient (Age less than 18)	YES	NO
Systolic BP greater than 220 or less than 80 mm Hg	YES	NO
Diastolic BP greater than 120 or less than 50 mm Hg	YES	NO
Pulse greater than 110	YES	NO
Pulse less than 50	YES	NO
Respiratory rate greater than 22	YES	NO
Respiratory rate less than 10	YES	NO
Blood glucose greater than 300 mg/dl	YES	NO
Blood glucose less than 70 mg/dl	YES	NO
Pulse oximetry less than 92% and/or supplemental oxygen required	YES	NO
GCS less than 13	YES	NO
Patient refuses transport to stabilization center?	YES	NO
Evidence of significant head or truncal trauma ?	YES	NO
Evidence of new head trauma (ecchymoses, hematomas)	YES	NO
Evidence of uncontrolled bleeding?	YES	NO
Patient requires more than minimal assistance with ambulation →Assistive devices (cane, walker permitted) →Assistance/stabilization of more than one limb required	YES	NO

**4. Medical consultation is required for any “YES” response.**

**5. If all answers are “NO” or medical consultation approves if a “YES” occurs, the patient shall be transported to the Stabilization Center.**



**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 PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

**V. ALTERNATIVE DESTINATION PROGRAM (NEW '18)**

**1. PURPOSE**

To provide quality care in a more timely fashion, with potential for cost savings for patients, and a rapid return to service for EMS units. This program may also allow patients to receive care within their HMO services, where their medical records and physicians are readily available.

Any Maryland EMS Operational Program (EMSOP) may establish an alternative destination program tailored to the needs of its community, if the program meets all the requirements set forth in this protocol. Montgomery County Fire and Rescue Services (MCFRS) conducted a pilot alternative destination program in FY 2017, which is detailed below beginning with “(b) Start Point.”

a) Background

- (1) 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% 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.
- (2) Montgomery County Alternative Destination Pilot Program
  - (a) In 2014 MCFRS 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 use of 9-1-1 services and disposition to an emergency department, and to better serve the state under the new Medicare All Payer System (waiver), Holy Cross Health, Kaiser Permanente, and MCFRS piloted the alternative destination program (ADP) protocol to optimize EMS resource use and assure appropriate patient care.
  - (b) Through a joint release, all entities involved provided a general notice to the population being serviced under the pilot for Phase 2.
  - (c) Montgomery County identified a highly-qualified “pilot triage expert” to consistently apply the Provider Quick Form, consent the patient, and make the destination determination. The designated expert was a state-certified EMT for Montgomery County who also is a registered nurse, and who was previously an ALS provider. Using a highly-qualified pilot triage expert not only reduces risks to the patient, but also requires special skills that are not necessarily applicable to all EMTs across Maryland.
  - (d) The objective of this quality improvement pilot was to assess the accuracy and safety of triaging dispatch-identified “IAED Alpha determinate code” BLS 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 PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

- b) Start Point  
Due to 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.
- c) Quality Improvement Design  
A literature review reveals there are multiple strategies to match the right patient with the right clinical resources. This is a modification of current practices, amended by the addition of the Kaiser CDU, ensuring access to the patient's own insurance and personal medical records, as well as improved continuity of care, in Phase 2.
- d) Benefits  
As emergency department off load times have increased, the alternative destination process may improve the EMS resource utilization. It is designed to improve patient satisfaction by providing patient cost savings and time savings while matching patients to the appropriate resource and continuity of care.
- e) Risks
  - (1) 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.
  - (2) There are multiple safety checks incorporated in this ADP pilot, so no patient is placed at increased risk. These include:
    - (a) The use of an EMS unit response for all patients, as would routinely occur
    - (b) 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.
    - (c) The use of the pilot triage expert, who has both EMS and nursing training and experience
    - (d) Medical director oversight group access and review of all ADP medical records through Holy Cross and Kaiser Permanente, with an objective State EMS Medical Director review
    - (e) 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 Holy Cross Hospital 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.
- f) End Points
  - (1) The ADP pilot metrics are designed to assess the benefit to the system of using the Provider Quick Form and the ADP pilot protocol.
  - (2) If, at any time, a patient has been identified as being placed at risk.
    - (a) A review demonstrates that the patient required admission to the hospital or observation unit, following under-triage to an alternative destination with proper use of the Provider Quick form, or a truly untoward outcome were to occur.
  - (3) If there has been no demonstrated benefit to the delivery of EMS services, such as extended EMS unit cycle time or availability.
  - (4) If the costs of delivering this program exceed benefit gained in EMS service to the community, as determined by MCFRS.

**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

- g) Analysis  
The ADP metrics will be compared before and after the implementation of this pilot protocol to determine if system improvement occurred. The Provider Quick Form will be reviewed and compared for accuracy and safety.
- h) 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 other EMS providers. If demonstrated to be accurate, safe, and reliable, the Provider Quick Form screening tool and the ADP pilot protocol could be considered for EMS provider trials with the goal of improving the delivery of EMS care.
- i) The patient satisfaction survey may demonstrate positive customer service.
- j) Phases
  - (1) The ADP pilot 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 1 and Phase 2. The Phase 2 documents will include the Kaiser CDU as an additional destination option.
    - (a) Phase 1 will use one alternative destination: Holy Cross Hospital Express Care in Silver Spring, Maryland. This will assure 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 and straightforward evaluation of the Provider Quick Form. 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.
    - (b) Phase 1 will be conducted for 60 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 outlined in the quality assurance section of this protocol. MIEMSS will review the summary report and metrics and, with Montgomery County, will evaluate the feasibility of moving the pilot into Phase 2. During this evaluative period, Phase 1 will continue unless the pilot is ceased due for any reason.
    - (c) After reviewing the results of Phase 1, the participants in this pilot, including MIEMSS, will determine the feasibility of implementing Phase 2 of the project. Phase 2 will allow for the addition of one alternative destination (Kaiser Permanente Gaithersburg Medical Center Clinical Decision Unit), assuming the conditions listed below are met.
    - (d) The addition of this second alternative destination will demonstrate how to program functions under a different cost structure. The destination added in Phase 2 of the pilot will have the following minimum patient care capabilities:
      - (i) 12-lead EKG
      - (ii) UA
      - (iii) Urine Pregnancy
      - (iv) Minor Suturing

**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

- (e) Phase 2 will be conducted for 60 days. Upon the conclusion of Phase 2, 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 outlined in the quality assurance section of this protocol.
- (2) This ADP pilot protocol cannot be extended or modified, including its timeline, without the approval of MIEMSS and the EMS Board.

**2. INDICATIONS**

Certain low-acuity Priority 3 patients who match the ADP pilot protocol criteria, within the geographic boundaries 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 ADP pilot protocol (Phases 1 and 2) will be run during the pilot hours on weekdays.

a) Receiving facilities Phase 1:

- (1) Holy Cross Hospital Express Care, located at 1500 Forest Glenn Rd, Silver Spring, Maryland, will be the receiving facility for all included patients.

b) Receiving facilities Phase 2:

- (1) Kaiser Permanente Gaithersburg Medical Center CDU, located at 655 Watkins Mill Road in Gaithersburg, Maryland, will be a receiving facility for Kaiser Permanente patients.
- (2) Holy Cross Hospital Express (see location above) will be a receiving facility for other insured or uninsured patients who select this alternative destination and 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 are 60 years of age or greater
- c) Patients who do not meet the criteria for the MIEMSS-approved inclusion/ exclusion checklist
- d) Patients who are not able to 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 pilot protocol may only be used by MCFRS EMS providers who are identified as pilot triage experts and specifically authorized to do so by the MCFRS medical director.
- b) General Patient Care Protocol
- c) Under the ADP pilot protocol, all patients will be offered an appropriate definitive care destination.
- d) For inclusion in the ADP pilot protocol, 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 emergency department
    - (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.

**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

- (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 (eg, airway or hemodynamic compromise)
  - (4) No requirement for either ALS monitoring or ALS interventions
  - (5) All affirmative answers on the ADP consent form
- e) In order to include the patient in the ADP pilot protocol, the authorized MCFRS EMS pilot triage expert must obtain a complete set of vital signs, a complete history, and a signed pilot consent, and they also must complete the Provider Quick Form.
- 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 emergency department per normal MCFRS practice.
- g) If patient is stable, has met the inclusion criteria of the ADP pilot protocol and Provider Quick form, and has a disease/injury process that can be safely treated by a primary care or urgent care practitioner:
  - (1) Phase 1
    - (a) The consented patient will be transported to Holy Cross Express Care.
    - (b) If patient refuses to participate, patient condition deteriorates, or changes their mind during transport and declines to participate, the patient will be taken to nearest full service emergency department.
  - (2) Phase 2
    - (a) Determine if the patient has Kaiser Permanente health insurance.
      - (i) If they are a Kaiser patient, they may be transported to the Kaiser CDU in Gaithersburg.
    - (b) If patient has other health insurance or is uninsured, or select this alternative destination, they should be transferred to Holy Cross Hospital Express Care in Silver Spring.
    - (c) Contact the 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 the patient. This contact must be made on a recorded line. Upon arrival, have the 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, or changes their mind during transport 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.



**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

**5. QUALITY ASSURANCE**

- a) The overall pilot is under the shared medical direction of MCFRS EMS medical director, who will collaborate with the 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 MIEMSS' state EMS medical director, will meet or hold a 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 evaluate any sentinel events as necessary.
- b) In addition, the medical directors and MCFRS operational leadership will meet weekly to review and a report to the state EMS medical director within three days of the conclusion of these meetings. The report will include:
  - (1) Report on PILOT METRICS (below)
  - (2) Patient satisfaction survey results
  - (3) Unscheduled reentry of patient into health care system within 72 hours of transport
  - (4) Any untoward events or formal patient complaints with detailed explanation
  - (5) Any deviation or challenges regarding the pilot triage experts' implementation of the ADP pilot protocol or Provider Quick Form.
- c) Pilot Metrics
  - (1) Each patient transported to and treated at any of the alternative destinations must have a discharge diagnosis. Data for any patients who are secondarily transported to another facility must also be captured.
  - (2) Number and type of upgrades from alternative destination (specific signs/ symptoms on presentation, where slipped though inclusion/exclusion criteria, and final diagnosis)
  - (3) Number of patients who qualified, the number who accepted transport to an alternative destination, and the number who refused (ideally with reason for refusal)
  - (4) The number of patients who were screened but failed one or more items on the Provider Quick Form checklist
  - (5) Any patients who failed to be accepted at one of the alternative facilities and reason for refusal
  - (6) Any identified problems by the pilot triage expert to comply with or apply the pilot protocol
  - (7) EMS average "arrival destination to back in service" time (turnaround time) for Holy Cross and the alternative facilities
  - (8) EMS "first unit notification time until transport unit is back in service" time (total call duration time)
  - (9) Patient standardized satisfaction survey results
    - (a) Did patient have additional unscheduled reentry into urgent care, PMD, or emergency department within 72 hours of alternative destination?
    - (b) Was patient satisfied with choice?
    - (c) Rate EMS care on scale of 1-5
    - (d) Rate destination care on scale of 1-5
    - (e) Any complications or complaints associated with care decision?
  - (10) What are their pre-implementation performance measures (above) for the units in the pilot area?

**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

**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. <b>Criterion 1:</b> Vital Signs are within these limits   | <input type="checkbox"/> | <input type="checkbox"/> |
| a. Respirations 12–18  |                          |                          |
| b. Blood Pressure:<br>100–140 systolic<br>60–100 diastolic   |                          |                          |
| c. Pulse: 60–100   |                          |                          |
| d. Temperature: less than 101 F and greater than 96 F  |                          |                          |
| 4. <b>Criterion 2:</b> 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. <b>Criterion 3:</b> Physical exam performed to assure patient does not have exclusion criteria.                 | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. <b>Criterion 4:</b> 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 <b>MCFRS Alternative Destination Pilot Consent Form.</b>                        | <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 <b>MCFRS Alternative Destination Pilot Consent Form</b>  |                          |                          |
| c. Provider Quick Form   |                          |                          |



**PILOT PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

**Criterion 4: Non-Emergency 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 PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

**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:

- Holy Cross Hospital Express Care in Silver Spring
- I DECLINE TO PARTICIPATE in the pilot and want to go to Holy Cross Emergency Department or nearest appropriate emergency department

PHASE 2:

- Kaiser Permanente Clinical Decision Unit in Gaithersburg
- Holy Cross Hospital Express Care in Silver Spring
- 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 PROGRAM  
ALTERNATIVE DESTINATION PROGRAM**

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: \_\_\_\_\_

**PILOT PROGRAM  
NALOXONE “LEAVE BEHIND” PROTOCOL**

**W. NALOXONE “LEAVE BEHIND” PROTOCOL (NEW '18)**

**1. PURPOSE**

Naloxone is a prescription medication indicated for the reversal of respiratory depression or unresponsiveness due to opioid overdose. Increasing the accessibility and availability of naloxone to family members, close friends, or the public, specifically those at risk for an opioid overdose, may reduce the chance of a prolonged hypoxic event or eventual cardiac arrest



MARYLAND EMS PROVIDERS APPROVED TO PARTICIPATE IN THIS PILOT PROTOCOL DO SO IN ACCORDANCE WITH THE MARYLAND DEPARTMENT OF HEALTH ORDER OF JUNE 1, 2017, “MARYLAND OVERDOSE RESPONSE PROGRAM STATEWIDE NALOXONE STANDING ORDER,” AND COMAR 13.3101.

**2. INDICATIONS**

- a) Following an administration of naloxone prior to arrival of EMS or as described by the *Maryland Medical Protocols for Emergency Medical Providers* or
- b) Following evaluation by a crisis intervention team at a fire/EMS station (e.g., Safe Station for opioid treatment referral) that has identified an opioid dependent individual when immediate placement cannot occur and the individual is released

**3. CONTRAINDICATIONS**

- a) “Leave Behind” naloxone shall not be dispensed to anyone who has not yet reached their 18<sup>th</sup> birthday.

**4. PROCEDURE**

- a) Following completion of all general patient care, which may include a patient-initiated refusal of care, naloxone hydrochloride(s) and necessary paraphernalia that has been approved by the EMS Operational Program in accordance with Maryland Department of Health Guidelines may be issued.
- b) Document the distribution of naloxone in the patient care report as required by the EMS Operational Program.

**5. REPORTING**

- a) Jurisdictions shall collect documentation on all distributions of naloxone hydrochloride(s) and necessary paraphernalia in this MIEMSS-approved method.
- b) Jurisdictions shall submit quarterly reports to the State EMS Medical Director to include jurisdictional incident numbers and the number of doses of naloxone hydrochloride distributed for each occurrence.

OPTIONAL SUPPLEMENTAL PROGRAM  
CYANIDE POISONING PROTOCOL

V. JURISDICTIONAL OPTIONAL PROTOCOLS SUPPLEMENTAL PROGRAMS/  
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



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  
GLYCOPROTEIN IIb/IIIa ANTAGONIST INFUSIONS FOR INTERFACILITY TRANSPORTS  
PARAMEDIC ONLY**



**B. GLYCOPROTEIN IIb/IIIa ANTAGONIST INFUSIONS FOR INTERFACILITY TRANSPORTS (Paramedic Only)**

**1. PURPOSE**

During interfacility transports, a paramedic may monitor a patient on a continuous IV Glycoprotein IIb/IIIa infusion as long as the following criteria have been met.

**2. INDICATIONS**

The Glycoprotein IIb/IIIa infusion must have been started by the hospital staff prior to an interfacility transfer. IV Glycoprotein IIb/IIIa transports may NOT be started by the prehospital provider in the prehospital setting.

**3. CONTRAINDICATIONS**

- a) Patients who are clinically unstable, including but not limited to unstable vital signs and blood pressure, or current arrhythmia
- b) Pediatric patients

**4. PROCEDURE**

- a) Maintain the infusion as directed by the sending physician.
- b) The sending physician must document the infusion to be administered on the patient's transport record or transport note. This includes the concentration of the medication and the infusion rate.
- c) The infusion must be maintained on an infusion pump designed for transport. The provider must be trained in the appropriate use of the specific make and model of the infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
- d) The total volume of Glycoprotein IIb/IIIa 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 at least 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 training of the 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, a paramedic.

**OPTIONAL SUPPLEMENTAL PROGRAM  
GLYCOPROTEIN IIb/IIIa ANTAGONIST INFUSIONS FOR INTERFACILITY TRANSPORTS  
PARAMEDIC ONLY**



## **GLYCOPROTEIN IIb/IIIa ANTAGONIST**

(Paramedic Only)

### **1. Pharmacology**

Platelet glycoprotein antagonist. This agent reversibly prevents fibrinogen and von Willenbrand's factor from binding to the Glycoprotein IIb/IIIa receptor, inhibiting platelet aggregation.

### **2. Pharmacokinetics**

Glycoprotein IIb/IIIa has a half-life of 2.5 hours. Metabolism of this drug is limited and is excreted via the kidneys.

### **3. Indications**

Patients with acute coronary syndrome including those with Percutaneous Coronary Intervention (PCI)

### **4. Contraindications**

- a) Hypersensitivity, active internal bleeding, history of bleeding, stroke within one month, major surgery with severe trauma, severe hypotension, history of intracranial bleeding, intracranial neoplasm, arteriovenous malformation/aneurysm, aortic dissection, or dependence on renal dialysis
- b) Pediatric patients

### **5. Side Effects/Adverse Reactions**

- a) Cardiovascular: Stroke, hypotension
- b) Systemic: Bleeding, anaphylaxis
- c) Other: Hematuria, thrombocytopenia

### **6. Precautions**

Glycoprotein IIb/IIIa is a medication designed to inhibit the clotting factor in blood. Patients on this medication should be protected from further injuries that may cause bleeding. Attempts to start IVs should not be made without a doctor's orders.

### **7. Dosage**



- a) INITIAL BOLUS: Given at sending facility and should be documented.
- b) MAINTENANCE IV DRIP: Follow Standard Dosing. Maintain drip based on patient weight and sending physician's orders.



IF CHEST PAIN OR HYPOTENSION DEVELOPS DURING TRANSPORT, THE PARAMEDIC MUST CONSULT WITH EITHER THE SENDING OR RECEIVING PHYSICIAN FOR FURTHER INSTRUCTIONS.

**OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY**

July 2018: Naloxone is required for Public Safety EMT and EMR (October '17) and remains Optional Supplemental Program for BLS Commercial Services (initially implemented September '13). **(NEW '18)**



**C. INTRANASAL NALOXONE FOR BLS PROVIDERS  
(COMMERCIAL EMT) (NEW '18)**

**1. PURPOSE**

When encountered with a patient exhibiting respiratory depression with a confirmed or suspected opioid/narcotic overdose, an EMT and EMR may administer intranasal naloxone provided the following criteria have been met.

**2. INDICATIONS**

A patient suffering respiratory depression caused by a known or suspected opioid/narcotic overdose

**3. CONTRAINDICATIONS**

- a) None clinically significant in the adult patient
- b) Patients less than 28 days old

**4. PROCEDURE**

- a) Ensure that naloxone is indicated and the medication is not expired.
- b) Inject volume of air into vial that is equal to desired volume of medication to be removed using a needle (blunt tip preferred) and 2 mL or 3 mL syringe.
- c) Pull back on syringe plunger to remove desired volume of medication.
- d) Use gradations on syringe to measure volume of medication to nearest 0.10 mL.
- e) Safely remove needle from syringe and dispose of in sharps container.
- f) Attach mucosal atomization device to luer-lock of syringe.
- g) Place tip of mucosal atomization device in the nare and briskly push the plunger forward, administering half of the total volume of medication (up to a MAXIMUM of 1 mL per nare).
- h) Repeat previous step in the other nare, delivering the remaining half of the medication.
- i) Monitor patient for response and continue supportive care.



IF EMS OPERATIONAL PROGRAM USES A DIFFERENT FORMULARY/CONCENTRATION OR MEDICATION PACKAGING (E.G., PRE-FILLED SYRINGE OR AMPULE), PROVIDERS MUST RECEIVE PROPER TRAINING REGARDING SAFETY, PREPARATION, AND CONVERSION TO INTRANASAL ATOMIZATION OF THE MEDICATION.

OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY

## 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 IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.



- 
- d) Obtain pulse oximetry, if available.
  - e) Administer glucose paste (10–15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes.
  - f) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.

**OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY**

**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 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 IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.



- 
- e) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.
  - f) Identify agent and mechanism of exposure.
  - g) Decontaminate as appropriate.
  - h) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.

OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY

**OVERDOSE/POISONING: INGESTION**

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, chemical burns around or inside the mouth, or abnormal breath odors.



3. Treatment

a) Identify substance and amount ingested.

b)  Consider activated charcoal **without** Sorbitol 1 gram/kg PO.

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

Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**


Consider additional doses of naloxone.



DO NOT GIVE ANYTHING BY MOUTH WITHOUT MEDICAL CONSULTATION! POISON INFORMATION CENTER RECOMMENDATIONS SHOULD BE SOLICITED IN CONJUNCTION WITH MEDICAL CONSULTATION, BUT MEDICATION ORDERS CAN ONLY BE ACCEPTED FROM AN APPROVED BASE STATION.

d) Identify substance and amount ingested.



e)  Consider activated charcoal **without** Sorbitol 1 gram/kg PO.



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

Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**

Consider additional doses of naloxone.

**OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY**

**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 rubber taste



3. Treatment
  - a) Identify markings (insects, bites, needlestick, etc.).
  - b) Do not apply distal and/or proximal constricting bands for a poisonous snake-bite to an extremity. Do remove any jewelry on the affected extremity.
  - c) Immobilize extremity.
  - d) Apply cool packs for relief of pain only.



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

- e) 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 auto-injector or patient's prescribed fast-acting bronchodilator.
- f) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**  
  
Consider additional doses of naloxone.
- g) Identify markings (insects, bites, needlestick, etc.).
- h) Do not apply distal and/or proximal constricting bands for a poisonous snakebite to an extremity. Do remove any jewelry on the affected extremity.



- 
- i) 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 auto-injector or patient's prescribed fast-acting bronchodilator.
  - j) **If patient has respiratory depression with decreased LOC, constricted pupils, and provider suspects an opioid/narcotic overdose:**  
Aged 28 days to adult: Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare. **(NEW '18)**  
  
Consider additional doses of naloxone.

**OPTIONAL SUPPLEMENTAL PROGRAM  
INTRANASAL NALOXONE FOR COMMERCIAL SERVICE BLS PROVIDERS  
BLS ONLY**

July 2018: Naloxone is required for Public Safety EMT and EMR (October '17) and remains Optional Supplemental Program for BLS Commercial Services (initially implemented September '13). **(NEW '18)**



## **Naloxone (Narcan)**

### **1. Pharmacology**

Reverses all effects due to opioid (morphine-like) agents. This drug will reverse the respiratory depression and all central and peripheral nervous system effects.

### **2. Pharmacokinetics**

- a) Onset of action is within a few minutes with intranasal (IN) administration.
- b) Patients responding to naloxone may require additional doses and transportation to the hospital since most opioids/narcotics last longer than naloxone.
- c) Has no effect in the absence of opioid/narcotic.

### **3. Indications**

To reverse respiratory depression induced by opioid/narcotic agent

### **4. Contraindications**

Patients under 28 days of age

### **5. Adverse Effects**

Opioid withdrawal

### **6. Precautions**

- a) Naloxone may induce opiate withdrawal in patients who are physically dependent on opioids.
- b) Certain drugs may require much higher doses of naloxone for reversal than are currently used.
- c) Should be administered and titrated so respiratory efforts return, but not intended to restore full consciousness.
- d) Intranasal naloxone must be administered via nasal atomizer.
- e) Naloxone has a duration of action of 40 minutes; the effect of the opioid/narcotic may last longer than naloxone and patients should be encouraged to be transported.



PROVIDERS MUST CONTACT A BASE STATION PHYSICIAN FOR PATIENTS WISHING TO REFUSE TRANSPORT AFTER BLS ADMINISTRATION OF NALOXONE.

### **7. Dosage (NEW '18)**

- a) **Adult:** Administer naloxone 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare.
- b) Pediatric:
  - (1) **Child aged 28 days to adult:**

Administer 2 mg IN, dividing administration of the dose equally between the nares to a maximum of 1 mL per nare, **OR** administer 4 mg/0.1 mL IN in one nare.
  - (2) **Child less than 28 days:**

Not Indicated

Repeat as necessary to maintain respiratory activity.



**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 or 2,000 units per hour, whichever is higher. **(NEW '18)**
- b) Pediatric: Not indicated.

**OPTIONAL SUPPLEMENTAL PROGRAM  
AIRWAY MANAGEMENT  
ALS ONLY**



**E. AIRWAY MANAGEMENT: LARYNGEAL MASK AIRWAY WITH DESIGN TO FACILITATE HOSPITAL ENDOTRACHEAL INTUBATION (NEW '18)**

**1. PURPOSE**

To provide an alternative means of ventilating patients who cannot be intubated via direct laryngoscopy with a laryngeal mask airway device that also facilitates hospital placement of an endotracheal tube.

**2. INDICATIONS**

Inability to place an endotracheal tube in a patient who has no gag reflex (including patients who cannot be intubated following the administration of succinylcholine)

**3. CONTRAINDICATIONS**

- a) Responsive patients with an intact gag reflex
- b) Lack of an appropriately-sized device

**4. POTENTIAL ADVERSE EFFECTS/COMPLICATIONS**

- a) The laryngeal mask airway provides limited protection against the effects of regurgitation and aspiration.
- b) High airway pressures may divert gas to the atmosphere.

**5. PROCEDURE**

- a) Inspect all components of the laryngeal mask airway for damage.
- b) Select appropriately-sized laryngeal mask airway as per manufacturer specifications.
- c) Lubricate with water soluble jelly.
- d) Maintain cervical immobilization (if indicated) and lift tongue.
- e) Insert laryngeal mask airway to indicated depth.
- f) Inflate cuff as per manufacturer specifications.
- g) Ventilate and evaluate lung ventilation (breath sounds, absence of gastric sounds, chest rise, EtCO<sub>2</sub>, oxygen saturation).
- h) Adjust cuff inflation and position as needed to obtain a seal of the airway.
- i) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired EtCO<sub>2</sub> level.
- j) If unable to achieve adequate ventilation using the laryngeal mask airway, remove device, reinstate BVM ventilation, and then attempt again. If unable to ventilate, consider obstructed airway maneuvers (if not yet performed) and refer to Cricothyroidotomy Protocol.

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**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
- 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.

**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 (SpO<sub>2</sub>) 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 EtCO<sub>2</sub> 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  
ANTIMICROBIAL INFUSION FOR INTERFACILITY TRANSPORT  
PARAMEDIC ONLY**

**H. ANTIMICROBIAL INFUSION FOR INTERFACILITY TRANSPORT  
(Paramedic Only)**

**1. PURPOSE**

During interfacility transports, a paramedic may monitor a patient on a continuous IV antimicrobial medication infusion as long as the following criteria have been met.

**2. INDICATIONS**

The antibiotics infusion must have been started by the hospital staff prior to an interfacility transfer. IV antimicrobial infusions may NOT be initiated by the prehospital provider.

**3. CONTRAINDICATIONS**

- a) Patients who have unstable vital signs or are being transferred to an intensive care environment
- b) Patients with allergic reaction to infusing antibiotic agent or class
- c) Pediatric patients

**4. PROCEDURE**

- a) Follow the appropriate ALS algorithm and maintain the infusion as directed by the sending physician/practitioner.
- b) The paramedic will review the sending physician's antibiotics order and will review the specific antibiotic agent to ensure appropriate administration, indications, and absence of contraindications.
- c) Unless not indicated per the medication profile, the antimicrobial 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 administration of the antibiotics infusion will be recorded on the patient care report to include the antibiotic agent's name, dose, rate, and volume infused during transport.
- e) When in doubt, contact the sending physician/practitioner for medical direction.

**5. SPECIAL CONSIDERATIONS**

- a) The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pump(s) being used.
- b) The ALS service or jurisdiction must provide and document training of the ALS providers on the general administration of antimicrobials. However, due to the vast array of antimicrobials, the paramedic must utilize a practice of evaluating each patient care situation with the use of current medication reference materials to ensure appropriate administration of the infusion.
- c) The ALS service or jurisdiction 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  
ANTIMICROBIAL INFUSION FOR INTERFACILITY TRANSPORT  
PARAMEDIC ONLY

**H. ANTIMICROBIAL INFUSION FOR INTERFACILITY TRANSPORT (continued)**

**1. Pharmacology**

Antimicrobials are agents that kill microorganisms or suppress their multiplication or growth.

**2. Pharmacokinetics**

Antimicrobial agents are classified functionally according to the manner in which they adversely affect a microorganism.

**3. Indications**

Treatment of known or suspected infectious disease, or as prophylaxis for an infectious process

**4. Contraindications**

- a) Patients who have unstable vital signs or are being transferred to an intensive care environment
- b) Patients with allergic reaction to specific antibiotic agent or class
- c) Pediatric patients

**5. Adverse Effects and Precautions**

Antimicrobials have various adverse effects depending on the specific agent's mechanism of action. Current medication reference materials should be consulted for specific patient situation.

**6. Dosage**

- a) Adult: Administer per practitioner order.
- b) Pediatric: Not indicated.



**OPTIONAL SUPPLEMENTAL PROGRAM  
MARK I / DUODOTE KITS**

**I. MARK I / DuoDote Kits (Atropine and 2-PAM Auto-Injectors)**

**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.)

<b>Nerve Agents</b>			
Signs and Symptoms of Chemical Agents			
		<b>Vapor Exposure</b>	<b>Liquid Exposure</b>
	<b>P</b> - Pinpointing pupils	✓	Not Seen
	<b>S</b> - Salivation	✓	Not Seen
<b>Mild</b>	<b>L</b> - Lacrimation (tearing)	✓	Not Seen
<b>Severe</b>	<b>U</b> - Urination	✓	✓
	<b>D</b> - Defecation	✓	✓
	<b>G</b> - Gastrointestinal; pain/gas	✓	✓
	<b>E</b> - Emesis (vomiting)	✓	✓
	<b>M</b> - Muscle twitching	✓	✓
	<b>C</b> - Convulsions	✓	✓
	<b>B</b> - Bradycardia	✓	✓
	<b>B</b> - Bronchospasm	✓	✓
	<b>B</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).
- (2) 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
- (3) 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 <sup>1</sup>	Repeat AtroPen® Dose <sup>1</sup>
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)

<sup>1</sup>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.

## MODERATE EXPOSURE

### Pediatric Doses for Nerve Agent Exposure



#### Moderate Exposure

Wt. (kg)	Atropine <sup>2</sup>	Repeat Dosing		2PAM Chloride <sup>3</sup> 600 mg in 20 mL  Multi-dose vial (50 mg/kg)
		Multi-dose vial (0.1 mg/kg) (IM or IV)	Repeat AtroPen <sup>®</sup> 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.

<sup>2</sup> Atropine auto-injectors (AtroPen<sup>®</sup>) 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.

<sup>3</sup> 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<sup>®</sup>/Mark I auto-injectors
2. Treatment with atropine and 2PAM supplied in vials.

#### 1. Severe Exposure Treated with DuoDote<sup>®</sup>/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<sup>®</sup> 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<sup>®</sup>/Mark I

- Children up to 21 kg, administer 1 DuoDote<sup>®</sup> or 1 Mark I kit.
- Children 22 to 33 kg, administer 2 DuoDote<sup>®</sup> 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 <sup>4</sup>	2PAM Chloride <sup>5</sup> 600mg	Diazepam <sup>6</sup> Multi-dose vial IV or IM
	AtroPen® dose <sup>4</sup> (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

<sup>4</sup> 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.

<sup>5</sup> Initial dose if only atropine has been given or repeat dose (60 minutes after initial DuoDote®/Mark I).

<sup>6</sup> 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**

**J. SPECIALTY CARE PARAMEDIC  
(Paramedic only)**

The scope of practice for the specialty care paramedic (SP) is defined by a floor and a ceiling of care. The entry level for this program is Maryland licensed paramedic. The floor of the SP is the existing *Maryland Medical Protocols for EMS Providers*, including the Optional Supplemental Protocols: CPAP, Glycoprotein II/III Antagonist, Heparin, Scene/Chronic Ventilator, and Mark I/DuoDote. (The Pilot Programs and the Optional Supplemental protocols **Wilderness** and **Transport of Acute Ventilator Interfacility Patient** are not included as part of ALS transports.) The medications and procedures listed within The Maryland Medical Protocols for EMS Providers may be administered by the SP based on the written interfacility transfer orders of the sending medical director of the commercial specialty care service (without manipulation of the *Maryland Medical Protocols for EMS Providers*) or receiving physician without having to request online base station medical consultation.

The ceiling for the SP is defined by the medications and procedures that are defined as “RN” or are not listed within the tables below. Those medications or skills that are listed as “RN” require familiarization by the SP but are the responsibility of the transport nurse or physician constituting the patient care team.

If a medication or procedure is listed within the scope of practice for the SP, it applies to both adult and pediatric patients unless otherwise noted.

The practice environment for these medications and procedures will be strictly for the interfacility transfer of patients and not extended into the realm of the 9-1-1 response unless otherwise noted.

Classification of Drugs and Procedures

SP	A specialty care paramedic (SP) may initiate, monitor, and maintain without a transport nurse if they have successfully completed an EMS Board-approved specialty care program. (The commercial ambulance must still meet the requirement of an additional ALS provider and EMT driver to complete the specialty care transport.)
RN	A transport nurse or physician is onboard – SP needs familiarity with the medication or procedure but SP may not perform or administer.

**OPTIONAL SUPPLEMENTAL PROGRAM  
SPECIALTY CARE PARAMEDIC  
PARAMEDIC ONLY**

Medication - Procedure		
<b>A. Medications</b>	<b>Specialty Care Paramedic (SP)</b>	<b>Team with Nurse (RN)</b>
1. Sedatives		
a. Etomidate (amidate)		RN
b. Lorazepam (ativan)	SP	
c. Midazolam (versed)	SP	
d. Propofol (diprivan)		RN
2. Analgesics		
a. Fentanyl (sublimaze)	SP	
b. Hydromorphone (dilaudid)		RN
c. Meperidine (demerol)		RN
d. Non-narcotic analgesics (e.g., Ketorolac)	SP	
3. Paralytics		
a. All types		RN
4. Antihypertensives		
a. All types		RN
5. Volume Expanders		
a. Albumin	SP	
b. Blood products		RN
c. Dextran	SP	
d. Hespan	SP	
e. Plasmanate	SP	
6. Vasopressors		
a. Dobutamine (dobutrex)		RN
b. Epinephrine – drip		RN
c. Norepinephrine (levaphed)		RN
d. Phenylephrine		RN
7. Bronchodilators		
a. Metaproterenol (alupent)	SP	
b. Theophylline – IV		RN
c. Terbutaline (brethine) - Inhaled	SP	
d. L-Albuterol (inhaled)	SP	
8. Anti-Anginals		
a. Atenolol (tenormin)		RN
b. Metoprolol (lopressor)		RN
c. Nitroglycerin (tridil) – IV	SP (adults only)	
d. Propranolol (inalderal)		RN



**OPTIONAL SUPPLEMENTAL PROGRAM  
SPECIALTY CARE PARAMEDIC  
PARAMEDIC ONLY**

Medication - Procedure (Continued)		
<b>A. Medications (Continued)</b>	<b>Specialty Care Paramedic (SP)</b>	<b>Team with Nurse (RN)</b>
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**

<b>Medication - Procedure (Continued)</b>		
	<b>Specialty Care Paramedic (SP)</b>	<b>Team with Nurse (RN)</b>
<b>B. Invasive Procedures</b>		
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	SP (adult only)	
5. Needle Cricothyroidotomy	SP	
6. Rapid Sequence Intubation		RN
7. Surgical Cricothyroidotomy	SP	
8. Urinary catheter insertion	SP	
<b>C. Non-Invasive Procedures</b>		
1. IV Pumps	SP	
2. Ostomy care	SP	
<b>D. System Monitoring</b>		
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
<b>E. Specialized Equipment</b>		
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	

## K. MECHANICAL CPR (NEW '18)

### 1. PURPOSE

Mechanical CPR (mCPR) devices perform chest compressions at a consistent and reliable rate and depth, never fatigue, and are not susceptible to other human factors that degrade resuscitation quality. Additionally, the use of an mCPR device while transporting an in-progress resuscitation allows for effective CPR and increases safety by allowing providers to be restrained during transport.

### 2. PRESENTATION

Patients in cardiac arrest who have an established resuscitation in progress

### 3. INDICATION

- a) Active cardiac arrest resuscitation
- b) Applied in a standby mode for transport to any patient
  - (1) who achieves ROSC, OR
  - (2) who providers believe will progress to cardiac arrest

### 4. CONTRAINDICATION

Patients who have not yet reached their 13th birthday

### 5. PROCEDURE:

- a) Application of an mCPR device may not begin until after 2 two-minute cycles of manual chest compressions.
- b) Any mCPR device must be applied in a manner that limits any break in compressions to less than ten seconds.
- c) The ten-second breaks for device application must only occur around a normal two-minute compression interval and simultaneously while performing rhythm interpretation and defibrillation.
- d) Apply the mCPR device according to manufacturer instructions, keeping in mind that minimizing breaks in compressions to less than 10 seconds may require that an mCPR device be applied over 2 or more two-minute cycles of chest compressions.
- e) Once applied, devices must be used in accordance with manufacturer recommendations, but the goal should be to limit breaks in compressions as little as possible. This goal can be accomplished by:
  - (1) Only pausing the mCPR device for rhythm interpretation
  - (2) Pausing only long enough to identify the rhythm, and then starting again
  - (3) Delivering defibrillations while chest compressions are in progress
- f) An mCPR device (if available) should be applied in a standby mode for transport to any patient who achieves ROSC or patients who providers believe will progress to cardiac arrest.

**OPTIONAL SUPPLEMENTAL PROGRAM  
MECHANICAL CPR**

**6. PRECAUTIONS**

Application of an mCPR device shall not cause delays in assessing for a shockable rhythm or the initiation of manual CPR.

**7. INITIAL TRAINING**

The jurisdictional medical director must certify that personnel have received a locally-approved training program prior to implementation.

**8. ONGOING DEMONSTRATION OF PROFICIENCY**

The jurisdictional medical director must reaffirm that EMSOP providers have received annual training with the mCPR device.

**OPTIONAL SUPPLEMENTAL PROGRAM  
PELVIC STABILIZATION BINDER DEVICE FOR  
SUSPECTED PELVIC FRACTURE PROCEDURE**

**L. PELVIC STABILIZATION BINDER DEVICE (NEW '18)**

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

**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.
- 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.
- 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.

**OPTIONAL SUPPLEMENTAL PROGRAM  
PELVIC STABILIZATION BINDER DEVICE FOR  
SUSPECTED PELVIC FRACTURE PROCEDURE**

**4. PRECAUTIONS**

- a) Incorrectly placing the pelvic stabilization binder device at the level of the iliac wing could cause harm by widening the pelvic fracture.  
Assess after application of the pelvic stabilization binder device.
- b) Continue with patient care.
- c) EMS providers should also assess distal pulses before and after the application of the pelvic stabilization binder device.
- d) For EMS units with long transport times and with patients requiring large volumes of fluid resuscitation, the patient will need to be periodically monitored to make sure that the device is not becoming too tight due to expansion of the pelvic area from accumulation of fluids that have third spaced to the pelvic area.
- e) If providers feel the device is becoming too tight, it should be slowly loosened and then reapplied.

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**OPTIONAL SUPPLEMENTAL PROGRAM  
TRANSPORT OF VENTILATED PATIENTS  
PARAMEDIC ONLY**

## **M. TRANSPORT OF ACUTE VENTILATED INTERFACILITY PATIENTS**

### **1. PURPOSE**

To define the indications for use of a mechanical ventilator by a paramedic for the acute ventilated patient

- a) The level of care required for the interfacility transport of the “**acute ventilated interfacility patient**” is beyond the routine training curriculum for a paramedic; this type of patient must be transported by a higher level health care provider who is credentialed, educated, and competent in dealing with the ventilator and the ventilated patient. **OR**
- b) When a critical interfacility transfer is needed and a credentialed, educated, and competent higher level health care provider is **genuinely unavailable**, a credentialed, educated, and competent paramedic (through a MIEMSS-approved training program) may attend the ventilator and the ventilated patient with the addition of a second ALS provider or advanced airway trained health care provider when determined appropriate by the sending/referring physician.

### **2. INDICATIONS**

**ACUTE VENTILATED PATIENTS** for the interfacility transport are defined as:

- a) Intubated **OR**
- b) Tracheostomy patient when the reason for transport is:
  - (1) For increased level of care from a hospital, **OR**
  - (2) To continue the same level of care in an acute care setting, **OR**
  - (3) The new tracheostomy patient, within the last 7 days

### **3. VENTILATOR STANDARDS**

- a) **ACUTE VENTILATOR DEVICE STANDARDS**
  - (1) The ventilator that the service is to use for the acute ventilated patient should be able to match the existing ventilator settings. The following minimum device features (including circuit) must be present for this category of patient:
    - (a) Set rate of ventilations
    - (b) Adjust delivered Tidal Volume
    - (c) Adjustable Pressure Support Settings
    - (d) Adjustable Inspiratory and Expiratory ratios (I:E ratio)
    - (e) Positive End-Expiratory Pressure (PEEP)
    - (f) Peak airway pressure gauge
    - (g) Continuous Expiratory Volume measurement (Required)
    - (h) Modes
      - (i) Assist Control (AC)
      - (ii) Synchronized Intermittent Mandatory Ventilation (SIMV)
      - (iii) Controlled Mechanical Ventilation (CMV)

**OPTIONAL SUPPLEMENTAL PROGRAM  
TRANSPORT OF VENTILATED PATIENTS  
PARAMEDIC ONLY**

- (i) Alarms
  - (i) Peak airway pressure
  - (ii) Disconnect
- (2) Strongly recommended options are:
  - Blend percentage oxygen
- (3) Must perform periodic maintenance (including calibration) meeting the manufacturer's specifications
- b) **ACUTE VENTILATOR USAGE**
  - (1) A ventilator maintained by the ambulance service or health care facility must be specifically designed for transport use and capable of providing the required settings.
  - (2) Continuous pulse oximeter and continuous capnography monitoring equipment must be used on all acute ventilated interfacility patients.
  - (3) Tracheal suctioning kits/catheters must be available.
  - (4) A tracheostomy replacement tube the same size and one size smaller shall be transported with the patient ventilated through a tracheostomy. (The endotracheal tube equivalent may be substituted.)

**4. POTENTIAL ADVERSE EFFECTS**

- a) Pneumothorax
- b) Barotrauma
- c) Hypoxemia
- d) Hyperventilation
- e) Hypoventilation
- f) Extubation of endotracheal or tracheostomy tube

**5. PRECAUTIONS**

If any problems arise with mechanical ventilation, the patient shall be disconnected from the ventilator and manually ventilated.

**6. OPTIONAL PROGRAM REQUIREMENTS**

- a) A special "Ventilated Patient" report form will be completed for each mechanically ventilated patient and will include vital signs, pulse oximeter readings, and lung sounds (recorded a minimum of every 5 minutes), and documentation of any of the following:
  - (1) cardiac arrest during transport,
  - (2) dislodgment of tracheostomy tube or endotracheal tube,
  - (3) equipment failure (with FDA report),
  - (4) discontinuance of ventilator and conversion to BVM,
  - (5) deterioration of patient, or
  - (6) the upgrading of patient care to critical care.
- b) The Optional Program will require a training program that meets or exceeds the "Acute Ventilated Interfacility Patient" curriculum and is approved by the operational program medical director with skills validation. A copy of the training program shall be reviewed and be approved or disapproved by MIEMSS.

OPTIONAL SUPPLEMENTAL PROGRAM  
TRANSPORT OF VENTILATED PATIENTS  
PARAMEDIC ONLY

## N. OPTIONAL PROGRAM TRANSPORT OF CHRONIC AND SCENE VENTILATED PATIENTS

### 1. PURPOSE

To define the indications for use of a mechanical ventilator:

a) Chronic ventilated patient

The level of care required for the interfacility transport of “**chronic ventilated patients**” is within the scope of practice of a paramedic who has been credentialed, is competent, and received adequate training specific to the patient’s condition and the equipment necessary to provide care. Exception: A CRT-I or EMT may transport a chronically ventilated patient who is going for routine medical care and has in attendance a patient provided attendant who can manage the patient’s own ventilator.

b) Patient ventilated at the scene of an emergency

The level of care required for the transport of a ventilated patient from the “**scene of an emergency**” is within the scope of practice of a paramedic who has been credentialed, is competent, and received adequate training specific to the patient’s condition and the equipment to provide care.

### 2. INDICATIONS

a) **CHRONIC VENTILATED PATIENTS** are defined as:

- (1) Have an established tracheostomy and ventilator settings that have no changes within 24 hours or changes reflecting improvement in the patient **and**
- (2) Point of origin or destination is:
  - (a) Long-term care facility,
  - (b) Home,
  - (c) Outpatient setting,
  - (d) Hospital; **and**
- (3) Reason for transport is:
  - (a) Return from or transport to a scheduled appointment, **or**
  - (b) For extended care, **or**
  - (c) For emergency treatment (but not complication of airway or respiratory distress); **and**
- (4) Ventilator settings are:
  - (a) Positive End-Expiratory Pressure (PEEP) less than or equal to 10
  - (b) Peak pressures less than or equal to 30, and
  - (c) No changes in the ventilator settings are required during the transport.

b) **SCENE OF AN EMERGENCY** – Out-of-Hospital

- (1) Point of origin is at the scene of an out-of-hospital emergency
- (2) A paramedic may utilize mechanical ventilation once the patient is intubated.
- (3) Reason for mechanical ventilation is respiratory arrest or when the patient is intubated and not bucking the ventilator.
- (4) Once the patient is on a ventilator, a second provider (EMT or higher) is required to assist with patient care.
- (5) Destination – closest appropriate hospital
- (6) Contraindicated in children 8 years of age or less.

**OPTIONAL SUPPLEMENTAL PROGRAM  
TRANSPORT OF VENTILATED PATIENTS  
PARAMEDIC ONLY**

**3. VENTILATOR STANDARDS**

**a) CHRONIC VENTILATOR DEVICE STANDARDS**

- (1) The ventilator that the service is to use for the acute or chronically ventilated patient should be able to match the existing ventilator settings. The following minimum device features (including circuit) must be present for this category of patient:
  - (a) Set rate of ventilations
  - (b) Adjust delivered Tidal Volume
  - (c) Adjustable Pressure Support Settings
  - (d) Adjustable Inspiratory and Expiratory ratios (I:E ratio)
  - (e) Positive End-Expiratory Pressure (PEEP)
  - (f) Peak airway pressure gauge
  - (g) Modes
    - (i) Assist Control (AC)
    - (ii) Synchronized Intermittent Mandatory Ventilation (SIMV)
    - (iii) Controlled Mechanical Ventilation (CMV)
  - (h) Alarms
    - (i) Peak airway pressure
    - (ii) Disconnect
- (2) Strongly recommended options are:
  - (a) Continuous Expiratory volume measurement
  - (b) Blend percentage oxygen
- (3) Must perform periodic maintenance (including calibration) meeting the manufacturer's specifications

**b) CHRONIC VENTILATOR USAGE**

- (1) Ventilator used is:
  - (a) The patient's own ventilator intended for home/transport use and have the patient, home-care provider, or staff member from the health care facility manage the ventilator, **or**
  - (b) A ventilator maintained by the ambulance service or health care facility specifically designed for transport use and capable of providing the required settings. If the patient's ventilator is the same as the company ventilator, the paramedic may manage the ventilator without the home-care provider accompanying patient. Exception: A CRT-I or EMT may transport a chronically ventilated patient who is going for routine medical care and has in attendance a patient provided attendant who can manage the patient's own ventilator.
- (2) Monitoring equipment must include pulse oximeter (provided by family or service).
- (3) Tracheal suctioning kits/catheters must be available.
- (4) A replacement tracheostomy tube the same size and one size smaller shall be transported with the patient ventilated through a tracheostomy. (The endotracheal tube equivalent may be substituted.)

**OPTIONAL SUPPLEMENTAL PROGRAM  
TRANSPORT OF VENTILATED PATIENTS  
PARAMEDIC ONLY**

c) **SCENE OF AN EMERGENCY VENTILATOR DEVICE STANDARDS**

Mechanical ventilator used must:

- (1) Be intended for transport use,
- (2) Deliver 100% oxygen, and
- (3) Have minimal parameters to set rate and volume (both adjustable to meet the needs of pediatric and adult patients)

**4. POTENTIAL ADVERSE EFFECTS**

- a) Pneumothorax
- b) Barotrauma
- c) Hypoxemia
- d) Hyperventilation
- e) Hypoventilation
- f) Extubation of endotracheal or tracheostomy tube

**5. PRECAUTIONS**

- a) Any acutely ill or injured **breathing** patient at the “scene of an emergency” requiring assisted ventilation shall be manually ventilated.
- b) If any problems arise with mechanical ventilation, the patient shall be disconnected from the ventilator and manually ventilated.
- c) The Optional Program will require a training program that meets or exceeds the “Chronic and Scene Ventilated Patient” curriculum and be approved by the operational program medical director. A copy of that training program shall be reviewed and be approved or disapproved by MIEMSS.



**OPTIONAL SUPPLEMENTAL PROGRAM  
EMT ACQUISITION OF 12-LEAD  
ELECTROCARDIOGRAPHY**

**O. 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  
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  
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**

**P. WILDERNESS EMS (NEW '18)**

**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. Five 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
      - (e) American Health Safety Institute
    - (3) Basic Life Support (BLS) providers include both the EMTs and WEMRs who meet these credentialing processes
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**

- b) As there is limited utility for a ground ambulance in the wilderness environment, the wilderness EMS jurisdiction need not be required to have a primary transport vehicle in order to be recognized as a wilderness EMS jurisdiction. However, since the patient will likely eventually need transport to definitive care by ground and/or air ambulance, the wilderness EMS jurisdiction needs to have a plan for transportation once the patient(s) is out of the wilderness environment. Thus, there must be readily available and functioning communication methods between the wilderness EMS jurisdiction and the local EMS jurisdiction. Further, in order to facilitate timely and appropriate post-wilderness care, if the WEMS program is not a section of a previously established public safety EMS transporting jurisdiction, the wilderness EMS jurisdiction must notify the jurisdiction that will be responsible for ground or air transport as soon as the need for transport has been confirmed. Ideally this communication should occur through direct communication with the transporting jurisdiction's emergency communication center rather than simply dialing 9-1-1.

**C. SCOPE OF PRACTICE**

- 1. Provision of medical care in the wilderness environment is unique in that delays of care due to the remoteness of the environment may be detrimental to the patient. In order to address the unique needs and specialized skills required to manage a patient in the wilderness, these protocols and the training required to utilize these protocols will serve to define the scope of practice of the WEMS provider. Therefore, THE TERM PROVIDER IS GENERIC AND DOES NOT IMPLY A SPECIFIC LEVEL OF MEDICAL TRAINING. THE WILDERNESS PROVIDER MAY BE TRAINED TO ANY LEVEL AND COULD BE A PHYSICIAN, PARAMEDIC, CARDIAC RESCUE TECHNICIAN, EMT, OR WILDERNESS EMERGENCY MEDICAL RESPONDER.
- 2. In order for the EMS provider to use these wilderness EMS protocols there must be a need demonstrated in which it is documented that without these protocols:
  - a) It would not be possible to safely extricate the patient from the environment or
  - b) There is a high risk of the patient or other public safety personnel incurring permanent disability or death without the use of the WEMS Protocols

**D. TRANSFER OF CARE**

- 1. Care is transferred from the WEMS provider to the transporting EMS provider at the point at which the patient is either:
  - a) No longer in the wilderness environment, or
  - b) The wilderness EMS provider has formally transferred care to the transporting provider.
- 2. There may be times in which the WEMS provider's expertise is needed after transfer of care to the transporting jurisdiction. If this is the case:
  - a) The highest trained WEMS provider shall ride to the hospital with the patient.
  - b) Conflicts shall be resolved by contacting the medical director for the WEMS jurisdiction and then the local EMS Base Station medical control.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

**E. DOCUMENTATION/QUALITY IMPROVEMENT**

1. At the completion of the rescue, the WEMS providers must fill out a patient chart in compliance with the MIEMSS charting system.
2. A brief written report shall be provided to the transporting agency with the following information:
  - a) Patient name, age, gender
  - b) Pertinent history of the case
  - c) Vital signs and other pertinent physical findings
  - d) Care rendered
3. WEMS providers must demonstrate proficiency to the WEMS Medical Director on an annual basis via skills testing and/or documentation of the utilization of skills in the field. This may be demonstrated through regular field training exercises.
4. Review of each call:
  - a) Upon completion of the WEMS event, notification of the utilization of the WEMS Protocols will be made to the appropriate EMS supervisor.
  - b) The WEMS Medical Director will review 100% of WEMS calls as soon as is reasonably possible. Ideally this should be done within 48 hours of the event.
  - c) The WEMS program will maintain a detailed WEMS database and will provide an annual report to the State EMS Medical Director.

**TREATMENT PROTOCOLS**

The wilderness EMS provider shall have responsibilities for part or all of these protocols, summarized as follows, based on BLS or ALS level of certification/licensure:

<b>Intervention</b>	<b>BLS</b>	<b>ALS</b>
Provision of access to medications: Ibuprofen, Acetaminophen, Oral electrolytes, Calcium Carbonate tablets (e.g. Tums), ranitidine, diphenhydramine, epinephrine, aspirin, albuterol, omeprazole ODT	•	•
Administration of medications in Protocol, not listed above		•
Hemorrhage control with hemostatic agent and tourniquet	•	•
King Airway	•	•
Surgical Cricothyroidotomy		• (Paramedic only)
Wound closure with steri-strips or other tissue tape	•	•
Wound closure with tissue adhesive		•
Pelvic Binder	•	•

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

**A. Airway**

1. Initiate general patient care as per the MIEMSS protocols.
2. Assess the patient's airway and determine if the patient's airway is patent, intact, or compromised.
3. If the airway is compromised, establish a patent airway using one of the following techniques:
  - a) Insert an oral-pharyngeal airway or naso-pharyngeal airway.
  - b) Tack the patient's tongue to the patient's lip using a safety pin.
  - c) Insert a KING airway per protocol.

**ALS SKILL (PARAMEDIC ONLY)**

- d) If unable to insert a KING airway and unable to keep the airway open with a non-invasive technique, then proceed to a surgical cricothyroidotomy.

**B. Cardiac Arrest**

1. Initiate general patient care as per the MIEMSS protocols.
2. Perform CPR.
3. If equipped with AED, utilize as appropriate.
4. Continue CPR and utilization of AED per protocol until there is Return of Spontaneous Circulation (ROSC).
5. If an AED is present, the resuscitation may be terminated per the TOR Protocol. TOR conditions requiring physician consult are waived, such that providers may terminate without consult.
6. If an AED is not present, the resuscitation may be terminated if there is no ROSC after 30 minutes of resuscitative efforts.
7. Resuscitation may also be terminated if rescuers are exhausted or in danger.

**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 (manual or 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 0.5 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.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

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/IO fluids, establish IV access and administer parenteral 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.

**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.
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 impregnated gauze or 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.



**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

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) Steri-strips or other tape (duct tape works well)

**ALS SKILL**

- (2) Tissue adhesive (Dermabond or similar product)
    - (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
    - (2) Cephalexin (Keflex) – 10 mg/kg or 500 mg every 6 hours
    - (3) Bactrim 5 mg/kg every 12 hours or 1 DS every 12 hours
    - (4) Clindamycin 10 mg/kg every 8 hours or 300 mg every 8 hours

**ALL PROVIDERS**

6. Cover wound with bacitracin antibiotic ointment.
7. Cover wound with sterile gauze and gauze wrap.

**H. Altered mental status**

1. The differential of altered mental status is quite broad, including:
  - a) Traumatic brain injury
  - b) Stroke
  - c) Infection
  - d) Acute coronary syndrome
  - e) Intoxication
  - f) Hypoglycemia
2. If there is any possibility of trauma, protect the patient's cervical spine.
3. If unable to check glucose with a glucometer, assume that the patient is hypoglycemic and treat accordingly.
  - a) Gently rub glucose paste on the inside of the patient's cheek, 10–15 grams.

**ALS SKILL**

- b) If carrying glucagon, administer 1 mg IM (0.5 mg if less than 25 kg).
- c) If carrying IV medications, administer dextrose.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

- d) 1 amp D50 IV for adults
- e) 1–2 mL/kg D50 for children greater than 2 years old
- f) 2–4 mL/kg D25 for children less than 2 years old

**ALL PROVIDERS**

- 4. Transport out of the wilderness.

**I. Traumatic Brain Injury**

- 1. Initiate general patient care as per the MIEMSS protocols.
- 2. Any patient with a blow to the head and the following findings should prompt the WEMS provider to initiate rapid transportation to a trauma center:
  - a) GCS less than 13 or a motor score less than 6
  - b) Rapidly declining GCS
  - c) Debilitating headache
  - d) Profuse vomiting
  - e) Raccoon's eyes
  - f) Battle's signs
  - g) Seizures
- 3. Control the cervical spine and airway as needed.
- 4. In a patient with a blow to the head, no loss of consciousness, but at least a brief period of confusion or loss of memory, closely observe and extricate from the wilderness environment. Watch for deterioration of mental status. The patient should be cleared by a physician prior to resuming activities at risk for head injury.

**J. Back Injury/Spinal Cord Injury**

- 1. Extrication of a fully immobilized patient from the wilderness environment can be quite difficult and pose increased risks to both the patient and rescuers. Therefore, despite a significant mechanism of injury, patients who have concern for spinal column injury and/or meet criteria for the Spinal Protection Protocol should be allowed to ambulate on their own volition as long as the patient is alert, reliable, and has no major neurological deficits.
- 2. Patients who have evidence of neurological deficit and/or those who are not able to safely ambulate on their own volition shall be secured in an extrication device in a manner that conforms, as much as possible, to the normal contours of the spine and minimizes, as much as possible, movement of the spinal column.
- 3. Any patient who has been secured in an extrication device should have placement of a diaper for control of urine, especially if the transport time to definitive care is expected to be greater than one hour.

**K . Diagnosis of fractures in the wilderness will be based on clinical findings rather than radiologic studies.**

- 1. Things to assess when considering if a patient has a possible fracture requiring immobilization are:
  - a) Ability of the patient to bear weight or use the affected limb
  - b) Evidence of angulations, deformities, crepitus, bruising
  - c) Did the patient hear a breaking sound or feel the bone breaking?

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

2. Assess distal neurological as well as vascular function.
3. If the patient does NOT have intact distal pulses, then manually reduce by bringing the affected area back to a near anatomic alignment.
4. The general principle of splinting is to immobilize the joint above and below the site of suspected fracture. Provide adequate padding. Splints may be commercially designed or improvised. Assess pulses before and after splinting. Perform frequent vascular checks during transportation.
5. Consider placing a diaper on the patient to catch urine—especially for fractures of the lower extremities that will prevent the patient from being able to urinate unaided.
6. Specific splinting guidelines are as follows:
  - a) Shoulder and upper arm
    - (1) Immobilize as needed for comfort.
    - (2) Place in a sling and swath.
  - b) Lower arm
    - (1) Immobilize, including the wrist and elbow.
    - (2) Place in sling and swath.
  - c) Hand
    - (1) Realign misangulated digits as needed.
    - (2) Place a soft roll of gauze in the hand.
    - (3) Wrap with a bandage.
  - d) Hip
    - (1) Immobilize both upper legs together, placing padding between the legs.
    - (2) Place on a stretcher.
    - (3) Carry out.
    - (4) Do not place patient in traction.
  - e) Pelvis
    - (1) Assess for injury to vagina or penis.
    - (2) Pelvic fracture is noted by instability of the pelvis.
    - (3) Immobilize with commercially available pelvic binder or improvised pelvic binder.
    - (4) Expedite transport to a trauma center.
  - f) Femur
    - (1) Immobilization of femur fractures with traction splints is no more effective than immobilization to the unaffected leg and transport on a stretcher. In the WEMS setting, the provider should use judgment and either use a traction splint or immobilize the injured leg to the unaffected leg.
    - (2) Immobilize the fractured leg to the uninjured leg with adequate padding or use a traction splint.
    - (3) Place padding behind the knees.
    - (4) Carry the patient out on a stretcher.
  - g) Knee
    - (1) Patellar fractures typically occur due to a direct blow to the patella.
    - (2) The patient is likely to have significant pain and not want to fully extend the knee.
    - (3) Immobilize with a circumferential splint ensuring that the popliteal artery behind the knee is not compromised.
    - (4) The patient may be able to ambulate out on own with a crutch and assistance.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

L. Dislocations

1. Considerations for reducing a dislocated joint in the wilderness:
  - a) Reductions are typically easier immediately after an injury, before the joint has become swollen and muscles are in spasm.
  - b) Extrication of a patient from the wilderness with a dislocated joint can be quite difficult, presenting increased risks to the patient and the rescuers.
  - c) Dislocated joints can result in compromise to vascular and/or neurological structures.
2. Always check neurological and vascular integrity before and after an attempted reduction.
3. Consider placing a diaper on the patient for control of urine—especially for dislocations of the lower extremities that may prevent the patient from being able to urinate unaided.
4. Specific reductions are as follows:
  - a) Shoulder
    - (1) The greater majority of shoulder dislocations are anterior. Mechanism is typically external rotation and abduction. The patient will complain of pain in the shoulder and will be resistant to bringing the arm into a position of rest across the body.
    - (2) Check for motor and vascular integrity in the hand.
    - (3) Also check for sensation in the outer aspect of the shoulder.
    - (4) Reduction technique  
External Rotation
      - (a) Lie the patient supine on a flat surface.
      - (b) Secure the patient's affected arm adducted to the patient's side.
      - (c) The elbow should be flexed to 90 degrees.
      - (d) Hold the patient's wrist and gently guide the arm into a slow external rotation while holding the upper arm fixed to the patient's side.
      - (e) Whenever the patient experiences pain, halt the procedure momentarily then continue.
      - (f) Continue guiding the forearm until it is lying perpendicular to the patient's side on the flat surface.
    - (5) Place the patient in a sling and swath.
  - b) Fingers
    - (1) Clinically diagnosed by obvious deformity and loss of function
    - (2) Reduction technique
      - (a) Maintain digit in partial flexion.
      - (b) Apply traction to the flexed digit while pushing the base of the phalanx back into place.
    - (3) Splint the fingers in an anatomic position with a roller gauze splint.
  - c) Hip
    - (1) Hip dislocations tend to be posterior. The patient's hip will be internally rotated and adducted. You may also notice the affected limb to appear shorter than the other limb.
    - (2) If equipped with ALS medications, pretreat with midazolam 5 mg IM. Alternatively pre-medicate with an oral analgesic.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

- (3) Reduction technique
  - (a) The patient should be lying supine flat on the ground.
  - (b) Flex the hip and knee to 90 degrees.
  - (c) Straddle the patient and apply traction in an upward direction while another provider is providing counter traction by holding the pelvis fixed to the ground.
- (4) Once reduced, the hip should be immobilized to the uninjured leg and the patient carried out on a stretcher.
- d) Knee
  - (1) Knee dislocations carry great risk of injury to the popliteal artery behind the knee.
  - (2) Assess for pulses in the foot.
  - (3) Reduction technique
    - Gently exaggerate the injury and then apply gentle traction to bring the joint to anatomic position.
  - (4) Splint the knee slightly flexed and carry the patient out.
  - (5) Expedite transport to a trauma center.
- e) Patella
  - (1) The patella will typically displace laterally with the knee held flexed by the patient for comfort.
  - (2) Reduction technique
    - (a) Gently extend the knee so that the lower leg is straight to the upper leg. This movement may result in the reduction of the dislocated patella.
    - (b) If the patella remains dislocated after extension of the knee, then apply gentle pressure on the lateral edge of the patella pushing the patella back into its anatomic location. Do not force the patella if it is not easily reducible.
  - (3) Splint the leg in extension.
  - (4) The patient may be able to ambulate with a crutch and assistance.
- f) Ankle
  - (1) Ankle dislocations are typically associated with fractures.
  - (2) There will be obvious deformity.
  - (3) There may be compromise of vascular structures.
  - (4) Reduction technique
    - Apply gentle traction to place the ankle back into its anatomic location.
  - (5) The ankle will likely remain unstable after reduction and may easily dislocate without splinting. Therefore, be prepared to splint the ankle immediately after reduction. Have one provider maintain the reduction, while another provider applies a splint.
  - (6) Carry the patient out of the wilderness.

**M. Ankle sprain**

- 1. An ankle sprain typically is described by the patient as twisting of the ankle after walking or tripping over a ledge. The patient will often be able to ambulate on the ankle with assistance. There should be no instability to the ankle.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

2. Management

- a) Support the ankle with an ACE wrap or other supportive device.
- b) Provide a walking aid for the patient such as a crutch or walking stick.
- c) Assist the patient in ambulating out of the wilderness.

N. Foot Care – Blister management

1. Blisters typically develop from a hiker wearing a shoe that has not been broken in and/or is not fitted properly. Wearing two pairs of socks often helps to prevent blisters.
2. Management
  - a) Cover the blister with mole-skin or mole foam.
  - b) In most cases you should NOT open the blister, as this increases the risk of infection.
  - c) You may open the blister with a scalpel or clean knife if the location of the blister is impeding the ability for the patient to self-extricate from the wilderness. Cut in the lines of the skin, drain the fluid, and then cover with antibiotic ointment and a sterile dressing.
  - d) Assist the patient in ambulating out of the wilderness.

O. Eye

1. Non-painful acute loss of vision
  - a) Patients with acute non-painful loss of vision may have occlusion of the artery to the eye or vasculitis of the artery.
  - b) If available, administer oxygen at high flow.

ALS SKILL

- c) Administer aspirin 325 mg po (adults only).

ALL PROVIDERS

- d) Expedite transport to the ophthalmology referral center.
2. Globe rupture
  - a) Rupture of the eye globe may be obvious or occult.
  - b) Obvious globe rupture will be diagnosed by bleeding from the orbit and irregularly shaped orbit and/or pupil that is not reactive to light.
  - c) Cover the affected eye with eye dressing, being careful not to put pressure on the globe, and expedite transport to the ophthalmology referral center.
3. Red Eye
  - a) Differential diagnosis of red eye includes:
    - (1) Foreign body
    - (2) Infection—either bacterial or viral
    - (3) Allergic reaction
    - (4) Globe rupture
    - (5) Acute angle closure glaucoma
  - b) Cover eye and expedite transport to ophthalmology referral center.
4. Foreign body in eye
  - a) If the provider is sure that the patient's discomfort is due to a foreign body, the provider may attempt to remove the foreign body.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

ALS SKILL

- b) Numb the eye with 2 drops tetracaine 0.5% ophthalmic solution (peds and adults).

ALL PROVIDERS

- c) Evert the eyelid.
- d) Remove any foreign particles with a moist cotton applicator or equivalent.
- e) **DO NOT FORCEFULLY REMOVE PARTICLES STUCK TO THE EYE.**
- f) Irrigate the eye with water clean enough to drink.

P. Nose - Epistaxis

1. Control bleeding by pinching nose until bleeding stops.
2. If unable to control bleeding, pack.

ALS SKILL

3. If you anticipate the packing to be in for greater than 24 hours, initiate antibiotic prophylaxis with either Augmentin or Bactrim.

ALL PROVIDERS

4. Transport out of wilderness.

Q. Teeth

1. Fractured tooth

- a) A fractured tooth that is bleeding is a dental emergency.
- b) The exposed nerve roots will typically be quite painful.
- c) Place a small piece of aspirin on the top of the exposed nerve roots. This will initially be painful to the patient, but the pain should quickly decrease and then be followed by significant relief of pain. You can also cover the exposed nerve roots with sugarless gum or wax.
- d) Have patient cover tooth with gauze.
- e) Transport out of wilderness.

2. Tooth avulsion

- a) Pick the tooth up by the top rather than the root.
- b) Irrigate tooth and socket gently with water clean enough to drink.
- c) **DO NOT SCRUB THE TOOTH.**
- d) Replace tooth in socket and have patient maintain tooth by keeping mouth closed as much as possible. You may fix the tooth in place with a piece of sugarless gum.
- e) Alternatively place tooth inside of cheek ensuring that the patient does not aspirate or swallow the tooth.
- f) If traveling in difficult terrain, it is acceptable to place tooth in container with clear liquid.

R. Burns

1. Clean burns with water clean enough to drink and gentle scrubbing as needed to remove debris.
2. If you expect to get the patient to a burn center within 24 hours, do not cover with antibiotic ointment. If transport to a burn center is expected to exceed 24 hours, then cover with antibiotic ointment.
3. Cover burn with sterile dressing.



**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

**ALS SKILL**

4. Treat pain
  - a) Ibuprofen 600 mg po every 6 hours; 10 mg/kg
  - b) Acetaminophen 3–5 yrs old 160 mg/5mL; 6–9 yrs old 320 mg/10mL; greater than 9 yrs old 640 mg/20mL or 650 mg po tab. May repeat dose every 6 hours as needed.
  - c) Oxycodone 5–10 mg every 6 hours as needed
  - d) For pediatrics administer 0.1 mg/kg of oxycodone every 6 hours as needed.
  - e) Morphine 0.1 mg/kg IV/IM to max dose 20 mg with repeat dose of 0.05 mg/kg to max dose of 10 mg every 1 hour as needed
  - f) Administer fentanyl 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.

**ALL PROVIDERS**

5. Transport to burn center if meeting burn center criteria (see Burn Protocol in MIEMSS treatment protocols).

**S. Anaphylaxis**

1. Severe allergic reactions present with diffuse hives, airway swelling, and signs of hypoperfusion.
2. Goals of treatment are to counteract the effects on the airway, respiratory system, and cardiovascular system.
3. Specific treatment
  - a) Epinephrine (manual or auto-injector)
    - (1) Less than 30 kg estimated weight, administer 0.15 mg IM
    - (2) Greater than 30 kg estimated weight and adults, administer 0.5 mg IM
  - b) Albuterol MDI 2 puffs may repeat every 5 minutes as needed

**ALS SKILL**

- c) Benadryl: Pediatric 1 mg/kg every 6 hours; Adults 25–50 mg every 8 hours
- d) Dexamethasone: Pediatric 0.5 mg/kg; Adults 10 mg po

**ALL PROVIDERS**

4. Expedite transport out of the wilderness.

**T. Hypothermia**

1. Hypothermia occurs when the body's ability to conserve and generate heat is not able to compensate for loss of heat.
2. The conditions that are most favorable for development of hypothermia mirror the most efficient methods for losing heat—wet and windy conditions. Therefore, temperatures just above freezing are often more favorable for the development of hypothermia than temperatures below freezing.
3. The beginning stages of hypothermia are clinically evident when a patient is cold and shivering. During this stage the patient will be able to re-warm themselves with passive warming techniques.
  - a) Remove the patient from the wet and windy conditions.
  - b) Remove any wet clothes.
  - c) Place the patient in sleeping bags or cover the patient with blankets (foil safety blankets work well). Another option is to place the patient's body into garbage bags, ensuring that the head is not covered with the bag.



**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

4. The point at which the patient is no longer shivering marks the beginning of severe hypothermia. If the patient is not shivering, the patient will not be able to self-generate heat. Also during this stage the patient may develop confusion and other neurological findings. Treatment will need to be active replacement of heat. Follow the steps in #3 above. In addition, add heat to the patient. Possible methods for adding heat include:
  - a) Have another person join the patient in a sleeping bag or under blankets.
  - b) Pack the patient's axilla and groin with warm packs or water bottles filled with warm liquids.
5. Profound hypothermia is marked by cardiac instability progressing to arrhythmias—ventricular fibrillation, severe bradycardias, and asystole. Handle the patient carefully so as to not induce ventricular fibrillation, but nevertheless remove the patient from the environment. If suspicious of cardiac arrest, check for a pulse for at least 30 seconds. If the patient is in cardiac arrest, attempt to warm the patient while performing CPR. Continue CPR until the patient is warm, he or she is transferred to the transporting EMS agency, or the rescuers are fatigued.
6. If the patient is alert and there is no concern for airway compromise, feed the patient per the nutrition guidelines. The treatment of hypothermia is aided by the patient having fuel to self-generate heat.

**U. Frostbite**

1. Frostbite is a localized tissue injury from freezing of tissue. Whereas hypothermia can occur in temperatures above freezing, tissue will not freeze unless temperatures are below freezing.
2. The beginning stages of frostbite are marked by periods of intermittent pain and swelling of the affected tissue. This period is actually called “frostnip” and does not require intervention other than removing the affected tissue from the cold environment.
3. Once the tissue is frostbitten the skin will be pale, cold, and numb. Underlying tissue may be soft and pliable or firm depending on the depth of the freezing.
4. Treatment should only be initiated if the provider is confident that there is no chance of the affected tissue refreezing. If the tissue is likely to continue to be exposed to a cold environment prior to the patient reaching definitive care, then the affected tissue should, as much as possible, be protected from the environment and covered with warm clothes and/or sterile dressing.
5. If the provider is reasonably sure the tissue will not be further exposed to the cold, then active treatment may be initiated.
  - a) Actively warm the affected tissue in warm water that has been measured with a thermometer to a temperature of 100.4–104 degrees Fahrenheit.

**ALS SKILL**

- b) Give ibuprofen 600 mg po every 6 hours for management of the frostbite (Peds dosing 10 mg/kg up to max of 600 mg).
- c) Manage pain as needed—see pain management section HH.

**ALL PROVIDERS**

6. Transport the patient to definitive care.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

V. Heat Exhaustion

1. Heat exhaustion is marked by intravascular volume depletion due to dehydration and excessive sweating in a hot environment.
2. Symptom include dizziness, excessive sweating, headache, confusion, nausea, and weakness.
3. Treatment
  - a) Remove the patient from the hot environment and keep in the shade.
  - b) Cool the patient by getting the patient wet and fanning.
  - c) Replace fluids.
4. Transport out of the wilderness.

W. Heat Stroke

1. Heat stroke is a true environmental emergency marked by injury to the neurological system as a result of excessive heat.
2. The patient may or may not be sweaty.
3. Symptoms include confusion, ataxia, and tachycardia.
4. Skin will be red and hot.
5. Treatment mirrors that for heat exhaustion.
  - a) Remove patient from the hot environment and keep in the shade.
  - b) Cool patient with water and fanning.
  - c) Place ice packs in axilla and groin; if shivering, remove the ice packs.
  - d) If the patient is alert, orally replace fluids.

X. Snake Bites

1. There are two wild snakes indigenous to the State of Maryland that are poisonous:
  - a) Northern Copperhead – The Northern Copperhead is identified by the coppery color to its head and the alternating tan and dark brown on its body. It likes to hide within woodpiles or under logs.
  - b) Timber Rattlesnake – The Timber Rattlesnake is a large, stout bodied snake that can grow up to 5 feet or more. It is typically identified by bands of dark chevrons on its back. Generally the snake likes to live in wooded areas but gravid females may be found sunning on open rocks.
2. Snake bites may or may not present with paired fang puncture wounds. A snake bite may also present with a single puncture wound or just a scratch.
3. The greater majority of bites will present with immediate onset of pain at the site of the bite. The bite will become swollen and erythematous.
4. Mark the site of erythema and monitor its progression.
5. Treatment
  - a) Gently clean the area and cover with a sterile dressing.
  - b) Do NOT attempt to suck out the venom with a commercial or improvised device.
  - c) Do not apply a distal and proximal constricting band for poisonous snakebite to an extremity. Splint the extremity. Remove any jewelry on affected extremity.
  - d) As much as possible keep the affected area below the level of the heart.
  - e) Unless absolutely necessary, the patient should be carried out rather than walked out on their own accord.
  - f) Calmly expedite transport out of the wilderness.
6. Do NOT try to catch the snake for identification purposes.

**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 or a tick key 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 dexamethasone 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. All providers should refer to the treatment protocols for ODT ondansetron.

**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**

**ALS SKILL**

3. Administer loperamide
4. Pediatric – (loperamide is generally not indicated for pediatric populations. However, in the wilderness it may be needed to prevent profound dehydration or to facilitate extrication. Use judiciously.)
5. 2–6 years of age or 13–20 kg 1 mg po three times a day
6. 6–8 years of age or 20–30 kg 2 mg bid
7. Adults–4 mg po for the first dose then 2 mg po after each subsequent loose stool up to a total of 16 mg in a 24 hour period
8. Contraindications for loperamide are diarrhea with fevers and bloody diarrhea.

**FF. Abdominal Pain**

1. Non-traumatic abdominal pain may indicate a surgical emergency.
2. In women, a ruptured ectopic pregnancy is a true emergency that may present with abdominal pain.
  - a) Check a female patient's urine for beta hCG using a commercial urine pregnancy test.
  - b) If the patient with abdominal pain is pregnant, expedite transport.
3. In non-pregnant females and all males with abdominal pain, monitor vital signs and patient symptoms. Concerning findings suggestive of a surgical abdomen include:
  - a) Instability of vital signs
  - b) Progressing pain
  - c) Rebound pain–pain with movement
  - d) Nausea and vomiting
4. If there is high concern for surgical abdomen, do not feed the patient and expedite transport.
5. All other patients with abdominal pain should be transported so as to not miss occult surgical disease.

**GG. Gastroesophageal reflux**

1. Gastroesophageal reflux (GERD) (or heartburn) is typically identified by the patient complaining of a burning, substernal chest pain. The patient also may complain of having a sour taste.
2. It is important to note that the patient with symptoms of GERD may actually have an acute coronary syndrome. Therefore, as you are treating the patient's symptoms, also assess for possible acute coronary syndrome and manage appropriately. Relief of symptoms with the recommended treatment for GERD does NOT rule out the possibility of acute coronary syndrome.
3. Management of GERD  
Tums 1–2 chewed every hour as needed to a max dose of 4 tablets

**HH. Pain Management**

1. Treatment of pain in the wilderness may at times be necessary in order to facilitate extrication and transport out of the wilderness. Therefore, treatment of pain not only benefits the patient by simply decreasing pain, treatment of pain also improves the safety of the patient and rescuers by decreasing the time spent in the wilderness.

**OPTIONAL SUPPLEMENTAL PROGRAM  
WILDERNESS EMS**

2. Mild to moderate pain can be treated with ibuprofen and/or acetaminophen.
  - a) Ibuprofen 600 mg every 6 hours orally; 10 mg/kg to max dose 600 mg for pediatric dosing
  - b) acetaminophen up to 650 mg every 6 hours orally; 160 mg/5mL for 3–5 years old; 320 mg/10 mL 6–9 years old

**ALS SKILL**

3. Management of severe pain will often require treatment with an opiate analgesic. While intravenous opiates may have a quicker onset and more easily titratable, oral opiate analgesics tend to have less acute respiratory depression.
  - a) If carrying parenteral morphine, administer 0.1 mg/kg IV/IM up to 20 mg IM. May repeat dose of 0.05 mg/kg every hour as needed.
  - b) Administer fentanyl 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.
  - c) Alternatively, administer Oxycodone 5–10 mg every 6 hours as needed. Pediatric dosing for oxycodone – 0.1 mg/kg every 6 hours

**FORMULARY**

acetaminophen (Tylenol)

- Availability 325 mg tablet; 160 mg/5 mL
- Action analgesic; anti-pyretic
- Indication mild to moderate pain; fever
- Contraindication known end stage liver disease
- Precautions
- Side effects
- Dose 3–5 years old 160 mg/5 mL every 6 hours as needed  
6–9 years old 320 mg/10 mL every 6 hours as needed  
10 years and above 640 mg/20 mL or 650 mg tab every 6 hours as needed

albuterol

- Availability 90 mcg/metered spray
- Action bronchodilator
- Indication shortness of breath; exacerbation of asthma/  
COPD; wheezing
- Contraindication
- Precautions
- Side effects
- Dose (Peds & Adult) start with 2 puffs every four hours as needed; may use up to 4 puffs every hour

**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

\* All levels of providers shall be authorized to manually draw up epinephrine with a needle and syringe from an ampule or vial after education and credentialing by the Wilderness jurisdictional medical director.

**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 <b>mcg</b> /kg IN/IV/IM to a max dose of 200 <b>mcg</b> with a repeat dose of 1 <b>mcg</b> /kg to a max dose of 200 <b>mcg</b> 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
hemostatic agent	
All levels of providers are authorized to use gauze impregnated with hemostatic agent.	
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**

**Q. 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.

**OPTIONAL SUPPLEMENTAL PROGRAM  
MARYLAND VACCINATION & TESTING PROGRAM FOR PARAMEDICS  
REFERENCE SHEET**

## **HEPATITIS B VACCINATION**

**Indications:**

Pre-exposure: preventive

**Contraindications:**

History of anaphylactic reaction to baker's yeast

**Adverse effects:**

Not clinically significant

**Precautions:**

- (1) Recipients must read and sign consent form.
- (2) CDC recommends antibody testing 1–2 months after the third dose to determine immunity.

**Dose:**

(three total, using a 3 mL syringe with 1" 25 gauge needle)

Initial 1 mL IM (deltoid)

2nd dose 4 weeks after initial; 1 mL IM (deltoid)

3rd dose 5–6 months after 2nd dose; 1 mL IM (deltoid)

## **INFLUENZA VACCINATION**

**Indications:**

- (1) Persons who attend to patients at high risk for complications (e.g., the elderly)
- (2) Persons with chronic medical conditions
- (3) Pregnant women who will be in the second or third trimester of pregnancy during influenza season
- (4) Providers of essential community services

**Contraindications:**

History of anaphylactic hypersensitivity to eggs

**Adverse effects:**

- (1) More common: soreness at the injection site that lasts up to 2 days
- (2) Less common: fever, malaise, myalgia beginning 6–12 hours after vaccination and persisting for 1 to 2 days.

**Precautions:**

- (1) Vaccine should be delayed in the presence of acute febrile illness; administer after symptoms have abated.
- (2) It takes two weeks to develop adequate antibodies against the vaccine virus strain.
- (3) Optimal time for organized vaccination campaigns is usually the period from October through mid-November.

**OPTIONAL SUPPLEMENTAL PROGRAM  
MARYLAND VACCINATION & TESTING PROGRAM FOR PARAMEDICS  
REFERENCE SHEET**

- (4) Because influenza vaccine contains only noninfectious viruses, it cannot cause influenza.
- (5) Recipients must read and sign consent or refusal form.

**Dose:** (using a 3 mL syringe with 1" 25 gauge needle)  
0.5–1 mL IM (deltoid)

**PURIFIED PROTEIN DERIVATIVE (PPD) TEST**

**Indications:**

Yearly administration for health care providers

**Contraindications:**

- (1) Previous positive reaction to PPD
- (2) History of TB

**Adverse effects:**

Not clinically significant

**Precautions:**

Recipients must read and sign consent form.

**Procedure**

- (1) Injection is given intradermally and should be read 48–72 hours post injection.
- (2) Feel the induration with your fingertips.
- (3) Measure with approved device in millimeters (mm).
  - (a) Less than 5 mm is negative.
  - (b) Equal to or greater than 5 mm requires clinical correlation and evaluation by jurisdictional medical director or other appropriate physician.

**Note:**

Do not use erythema as margins; measure only the induration.



## VI. RESEARCH PROTOCOLS

### A. PREHOSPITAL POINT OF CARE TESTING FOR SHOCK PILOT PROGRAM

#### 1. Indications

- a) **Category A** patients WITH
  - (1) Availability of thenar eminence and site for venous cannulation in AT LEAST ONE extremity (i.e., no patients with bilateral upper extremity amputations)
- b) **Category B** patients WITH
  - (1) Availability of thenar eminence and site for venous cannulation in AT LEAST ONE extremity (i.e., no patients with bilateral upper extremity amputations) AND
  - (2) Two or more long-bone fractures AND/OR
  - (3) Chest wall instability or deformity AND/OR
  - (4) Open or depressed skull fractures AND/OR
  - (5) Penetrating injuries to head/neck/torso/extremities AND/OR
  - (6) Pelvic fracture AND/OR
  - (7) Paralysis
- c) **Category C** patients WITH
  - (1) Availability of thenar eminence and site for venous cannulation in AT LEAST ONE extremity (i.e., no patients with bilateral upper extremity amputations) AND
  - (2) Patients in high risk auto crashes including any of the following:
    - (a) Intrusion greater than 12 inches on the occupant side
    - (b) Intrusion greater than 19 inches on the passenger side
    - (c) Ejection from the vehicle
    - (d) Death in the same passenger compartment
    - (e) Rollover without restraint
    - (f) Vehicle telemetry consistent with high risk of injury
    - (g) Auto vs. pedestrian/bicyclist thrown/run over with impact greater than 20 MPH
    - (h) Motorcycle crash with speed greater than 25 MPH
- d) **NOTE: STANDARD PATIENT CARE, AS SPECIFIED IN THE MARYLAND MEDICAL PROTOCOLS, WILL TAKE PRIORITY AT ALL TIMES. THIS PILOT PROGRAM MUST NOT INTERRUPT STANDARD PATIENT CARE AT ANY TIME.**

**EMS OPERATIONAL PROGRAM RESEARCH PROTOCOL  
MARYLAND STATE POLICE AVIATION COMMAND**

**2. Contraindications**

- a) Pregnant patients
- b) Prisoners
- c) Patients under the age of 18
- d) Patients dead on arrival
- e) Patients who will not be transported to the Shock Trauma Center
- f) Patients with upper extremity amputations, crushed, degloved, mangled, or pulseless upper extremities that preclude application of the InSpectra™ tissue oximeter and/or placement of a venous catheter (note: venous catheters may be placed in lower extremities)

**3. Procedures**

- a) I-STAT device
  - (1) A 2 mL blood sample will be obtained via a new venous cannula or closed vacutainer technique.
  - (2) ONLY PROVIDERS WHO HAVE BEEN FORMALLY TRAINED AND SIGNED OFF ON THIS PROTOCOL, AND ARE CURRENT AS PER QUALITY CONTROL REQUIREMENTS (SEE SECTION BELOW), MAY UTILIZE THIS DEVICE.
  - (3) ONLY THE GLUCOSE RESULT MAY BE USED FOR PATIENT CARE (IN LIEU OF GLUCOMETER TESTING AS PER THE MARYLAND MEDICAL PROTOCOLS), ALL OTHER RESULTS ARE FOR RESEARCH PURPOSES ONLY.
  - (4) Turn the device ON.
    - (a) Do NOT insert the cartridge to start the device.
    - (b) Do NOT open the cartridge pouch before scanning the barcode.
  - (5) Press “2” for I-STAT.
    - (a) If Quality Check Codes “69,” “140,” or “147” appear, STOP the test and this pilot protocol.
  - 6) Follow prompts.
  - (7) Scan the lot number on the cartridge pouch.
    - (a) Position barcode 3–9 inches from scanner window on the device.
    - (b) Press and hold “SCAN” to activate the scanner.
    - (c) Align the red laser light so it covers the entire barcode.
    - (d) The device will beep when it reads the barcode successfully.
    - (e) If the cartridge pouch does not have a barcode, enter the lot number manually using the numbered keys or press “ENT” to bypass this prompt.
  - (8) Obtain the blood sample.
  - (9) Fill and seal the cartridges with the blood sample.
    - (a) Cartridge priority: The CG4+ cartridge should be analyzed first (lactate, venous blood gas); time permitting, the EC8+ cartridge should be analyzed next (electrolytes, hemoglobin, glucose, base excess).
  - (10) Push the sealed cartridge (CG4+ first) into the device port until it clicks into place.

**EMS OPERATIONAL PROGRAM RESEARCH PROTOCOL  
MARYLAND STATE POLICE AVIATION COMMAND**

- (11) Wait for the test to complete.
- (12) Repeat the procedure above for the next cartridge (EC8+).
- (13) Only the glucose result may be used for patient care.
- (14) Upon arrival at the Shock Trauma Center, the results should be printed after the patient has been handed off to the trauma team. Only the glucose results may be shared with the hospital staff.
  - (a) Place the device in the cradle of an IR Link or align the IR windows of the handheld and the printer.
  - (b) Turn the printer ON.
  - (c) Press "PRT" for the displayed test records on the device.
- b) If the result is stored, select "Print Results" from the "Stored Results" menu. Select records to be printed by pressing the key(s) corresponding to the numbers beside the record(s). Press the "PRT" key to print the selected record(s).
- c) InSpectra™ Spot Check Tissue Oximeter
  - (1) **ONLY PROVIDERS WHO HAVE BEEN FORMALLY TRAINED AND SIGNED OFF ON THIS PROTOCOL, AND ARE CURRENT AS PER QUALITY CONTROL REQUIREMENTS (SEE SECTION BELOW), MAY UTILIZE THIS DEVICE.**
  - (2) Ensure the device is properly charged before use.
  - (3) Attach the optical cable to the Spot Check device.
  - (4) Connect the reusable StO<sub>2</sub> clip by connecting the prongs to the clip on the optical cable.
  - (5) Press the POWER ON button on the front of the device.
    - (a) The device should power on within 30 seconds.
  - (6) Cancel the SYSTEM CHECK button (see quality control procedures below) by pressing the SYSTEM CHECK button again to return to the main screen.
  - (7) Position the clip over the patient's thenar eminence.
    - (a) The device may only be used on clean, dry skin.
    - (b) If the skin is soiled, the skin should be cleaned with an alcohol or chlorhexidine prep.
    - (c) Ensure the clip is placed over the fleshy part of the thenar muscles.
  - (8) Check THI signal strength on the main screen.
    - (a) A THI greater than 5.0 indicates significant hemoglobin to obtain a tissue oximetry measurement.
  - (9) Record the tissue oximetry level (%) on the study collection data form. Do not leave the clip on the thenar eminence for more than 15 minutes.

**EMS OPERATIONAL PROGRAM RESEARCH PROTOCOL  
MARYLAND STATE POLICE AVIATION COMMAND**

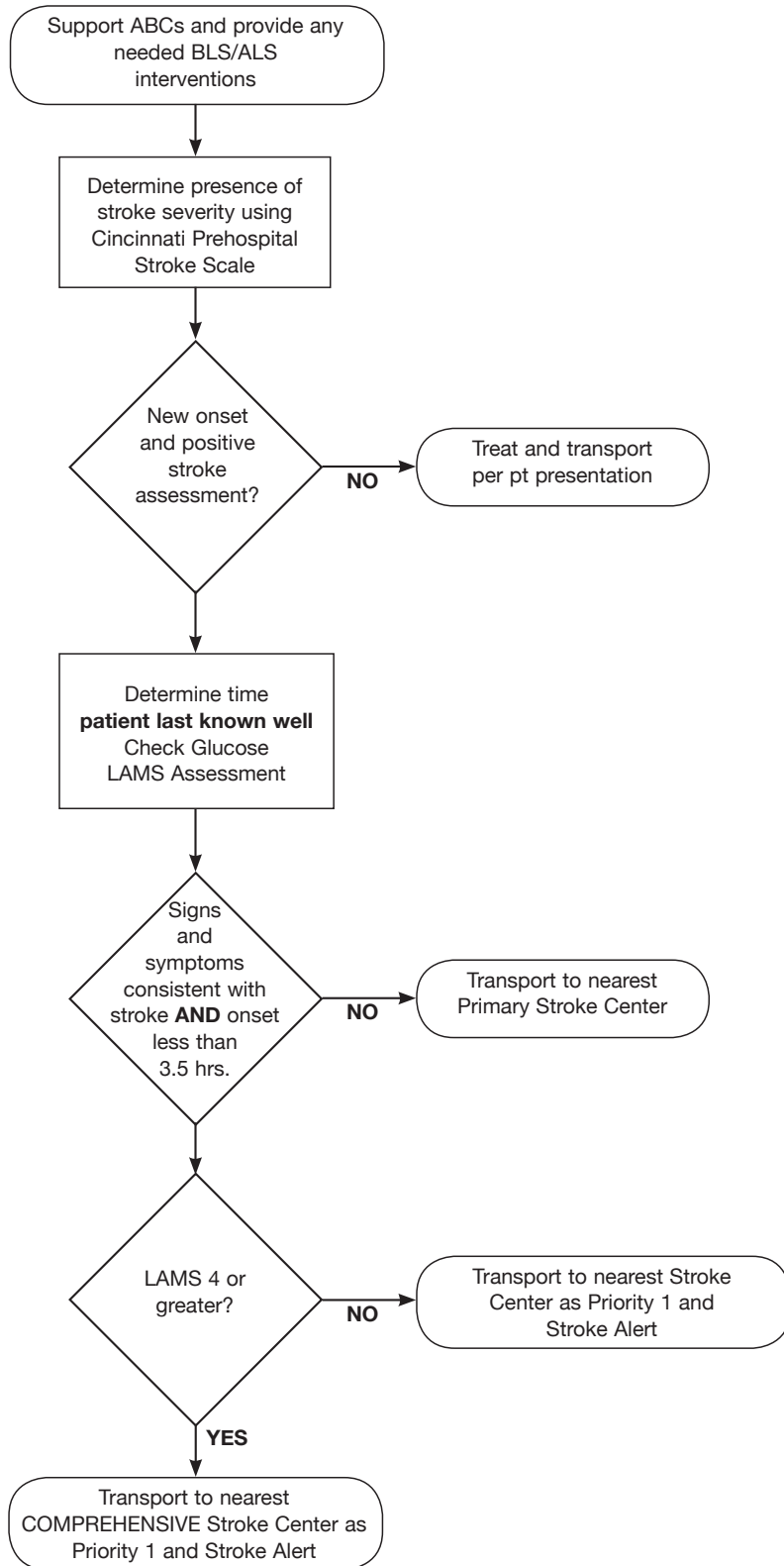
**4. Quality Control Procedures**

- a) I-STAT Device
  - (1) Daily procedures
    - (a) A quality control log will be maintained and reviewed by the Medical Director for all pilot program sites.
    - (b) The device must be tested every 24 hours using the external Electronic Simulator.
    - (c) Insert the external Electronic Simulator after the LCK or “Simulator Locked” message disappears from the display screen.
    - (d) A “PASS” must be displayed on the screen. The date and time of this result must be logged.
    - (e) If “FAIL” is displayed on the screen, repeat the procedure with the same Electronic Simulator. If “PASS” is displayed during the second test, the device is ready for use. If “PASS” is not displayed, the device cannot be used and the Medical Director or Primary Investigator must be notified immediately.
    - (f) Verify that all cartridges are refrigerated and within the expiration date printed on the boxes. Cartridges cannot be left unrefrigerated for longer than the time specified on the box for the cartridges. If any cartridges are expired, set the cartridges aside, do not use them, and contact the Medical Director or Primary Investigator.
  - (2) Monthly procedures
    - (a) A quality control log will be maintained and reviewed by the Medical Director for all pilot program sites.
    - (b) This may also be accomplished at the Shock Trauma Center.
    - (c) Click on the “Simulator Viewer” button on the Electronic Simulator and record the result in the quality control log.
- b) InSpectra™ Spot Check Device
  - (1) Daily procedures
    - (a) A quality control log will be maintained and reviewed by the Medical Director for all pilot program sites.
    - (b) The device should be checked daily.
    - (c) Power on the device.
    - (d) Press the “SYSTEM CHECK” button.
    - (e) In 20 seconds or less, the device should read GREEN with a checkmark indicating that the device is ready for use.
    - (f) If the device is out of range, the FAIL icon will remain on the screen and the System Check screen will be RED. Do not use the device if the SYSTEM CHECK fails. Place the device out of service and contact the Medical Director or Primary Investigator.

BALTIMORE CITY LAMS  
RESEARCH PROTOCOL

B. LAMS Stroke Research Protocol for Baltimore City Fire Department  
(NEW '18)

EMS STROKE ALGORITHM



**BALTIMORE CITY LAMS  
RESEARCH PROTOCOL**

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.
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 this adult patient also has a LAMS score of 4 or greater, they are to be transported to a Comprehensive Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital.

**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

**BALTIMORE CITY LAMS  
RESEARCH PROTOCOL**



IF PATIENT MEETS ABOVE STROKE CRITERIA, THIS PATIENT IS A PRIORITY 1 PATIENT AND REQUIRES NOTIFICATION OF THE NEAREST DESIGNATED STROKE CENTER OR COMPREHENSIVE 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.
4. Continue General Patient Care.

## C. PEDIATRIC DESTINATION DECISION TREE (PDTree) (NEW '18)

### 1. PURPOSE

This evidence-based decision support tool is designed to assist providers in choosing the facility type most likely to deliver definitive care for pediatric patients requiring transport. This represents an ideal destination choice. Destination selection for any individual patient will include other factors, including transport time, unit availability, and patient/family requests.

### 2. INDICATIONS

Current Maryland Medical Protocols for EMS Providers (MMP) should take precedence. The PDTree should be applied to patients considered “pediatric” ages by the MMP. For medical pediatric patients, this is birth up to the 18th birthday. For trauma patients, the PDTree may be used for patients from birth up to the 15th birthday. For this research protocol, both trauma and medical pediatric patients will be called “child.”

### 3. CONTRAINDICATIONS

- a) Pregnant patients
- b) Newly born infants should be transported (with their mother) to the closest appropriate facility able to receive the post-partum mother.

### 4. DEFINITIONS

- a) Pediatric Base Stations currently designated by MIEMSS include Johns Hopkins Hospital Children’s Center and Children’s National Medical Center. These Pediatric Base Stations may be consulted at any time by any Maryland EMS provider for on-line medical direction and assistance with destination decision-making.
- b) Specialty or Trauma Center is defined by current MIEMSS facility designations for Trauma, Eye, Burn, and Pediatric Specialty Centers.
- c) Medical Home is defined as the ED/hospital where the patient has their medical records and has established care by specific physicians to address the patient’s unique needs. Existing MMP suggests that EMS providers 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).
- d) Comprehensive Pediatric Center is defined as a hospital ED with pediatric ICU on-site.
- e) Regional Pediatric Care Center is defined as a hospital ED with inpatient pediatric services and/or a designated pediatric ED staffed by pediatric specialty trained physicians 24/7 or a Freestanding Emergency Medical Facility (FEMF) with designated pediatric ED staffed by pediatric specialty trained physicians 24/7.
- f) Nearest Appropriate Facility is defined as the closest hospital ED or FEMF that is available as an EMS transport destination.
- g) Feasibility of transport to the suggested destination type is left to the discretion of the EMS Operational Program.

### 5. PEDIATRIC DESTINATION DECISION TREE (See page 450-5)

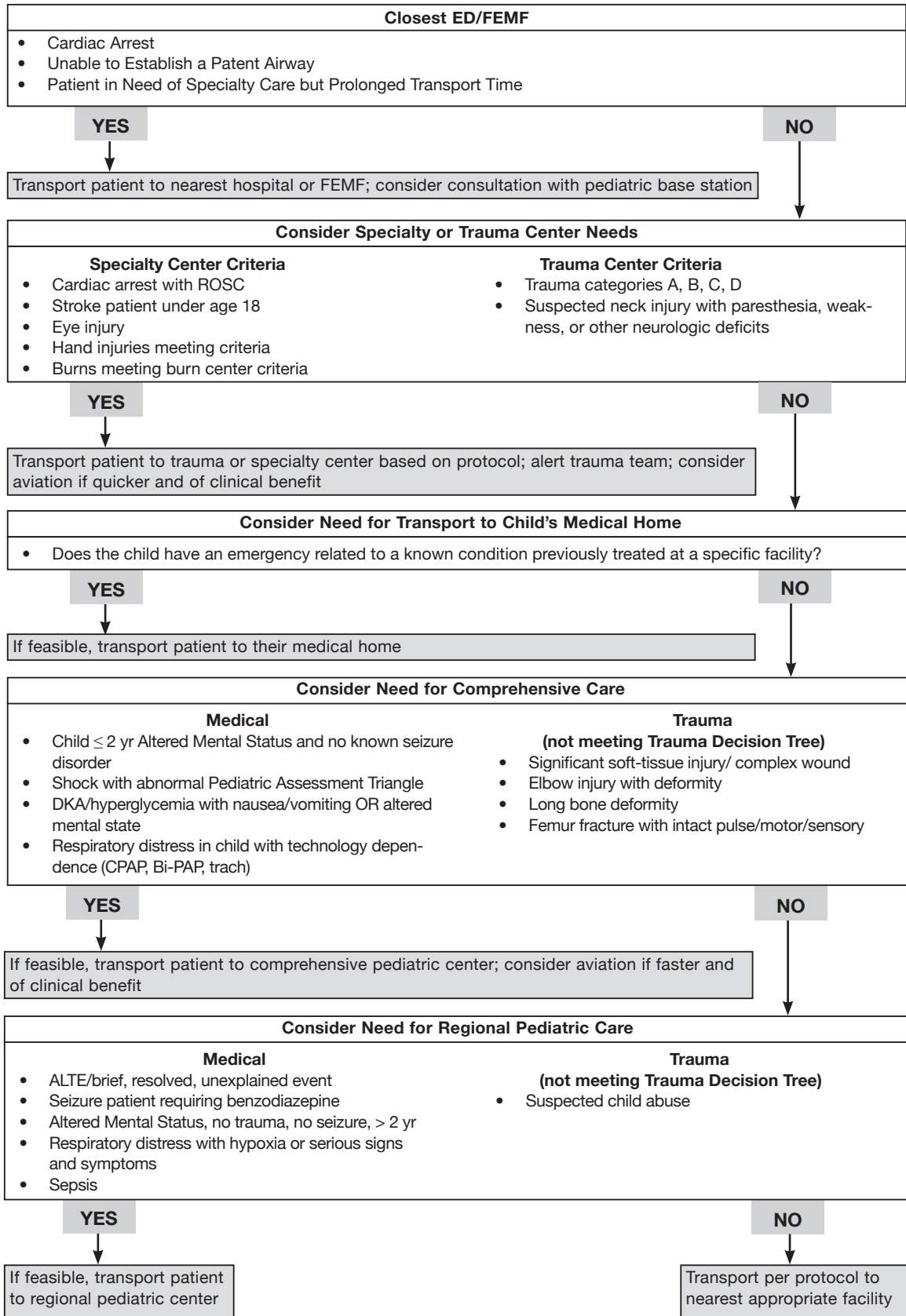


CHILDREN WHO ARE IN CARDIAC ARREST, OR IF A PATENT AIRWAY CANNOT BE ESTABLISHED, MUST BE TRANSPORTED TO THE NEAREST APPROPRIATE HOSPITAL-BASED EMERGENCY DEPARTMENT OR DESIGNATED FREESTANDING EMERGENCY MEDICAL FACILITY.



EMS OPERATIONAL PROGRAM RESEARCH PROTOCOL  
 PEDIATRIC DESTINATION DECISION TREE (PDTree)

**PD Tree**



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**CLINICAL  
TREATMENT  
GUIDELINES**

**FOR**

**WEAPONS OF MASS  
DESTRUCTION**

(Based on 1996 Olympic Protocols)

Revised February 2, 2000

## Guideline Development and Use

Guidelines are systematically developed statements to assist health care providers and patients with decisions about appropriate care/treatment for specific clinical conditions. This supplement was developed by a multidisciplinary panel of health care providers and other experts in consultation with the Department of Health and Human Services.

This supplement is organized to provide a fact sheet on the individual chemical or biological agent, followed by a treatment protocol. The pediatric protocol sections for the chemical agents are located immediately following the chemical agents and before the biological agents. EMS providers may implement these protocols (1) with medical consultation for chemical agent exposure patients and/or (2) in the jurisdictional declared mass casualty incident biological event where antidotes or antibiotics are available.

The guidelines reflect the state of knowledge, current at the time of publication, on effective and appropriate care. Health care providers and patients are encouraged to use the information provided in this clinical practice guideline. The recommendations may not be appropriate for use in all circumstances. Decisions to adopt any particular recommendation must be made by the care provider in light of the available resources and circumstances presented by individual patients.

Richard L. Alcorta, MD, FACEP  
State EMS Medical Director  
Maryland Institute for Emergency Medical Services Systems

## Table of Contents

### Chlorine

Fact Sheet .....	455
Treatment Protocol .....	456

### Hydrocyanic Acid–Hydrogen Cyanide and Cyanogen Chloride

Fact Sheet .....	458
Treatment Protocol .....	459

### Methyl Isocyanate, Methylene Bisphenyl Isocyanate, and Methylene Diisocyanate

Fact Sheet .....	461
Treatment Protocol .....	462

### Mustard (Sulfur Mustard)

Fact Sheet .....	464
Treatment Protocol .....	465

### Nerve Agents (GA, GB, GD, GF, VX)

Fact Sheet .....	467
Treatment Protocol .....	468

### Phosgene–Carbonyl Chloride

Fact Sheet .....	471
Treatment Protocol .....	472

### Medication Dosage Charts

Atropine .....	474
Pralidoxime .....	476
Amyl Nitrite .....	477
Sodium Nitrite .....	477
Sodium Thiosulfate .....	478

## Table of Contents

### **Anthrax**

Fact Sheet .....	479
Treatment Protocol .....	480

### **Botulinum Toxins**

Fact Sheet .....	481
Treatment Protocol .....	482

### **Cholera**

Fact Sheet .....	483
Treatment Protocol .....	484

### **Plague**

Fact Sheet .....	485
Treatment Protocol .....	486

### **Q Fever**

Fact Sheet .....	488
Treatment Protocol .....	489

### **Salmonella**

Fact Sheet .....	490
Treatment Protocol .....	491

### **Staphylococcal Enterotoxin B**

Fact Sheet .....	492
Treatment Protocol .....	493

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Chlorine**

**Military Designation:** None

**Description:** Chlorine is found as an amber liquid or greenish-yellow gas with a very characteristic irritating, pungent odor. Chlorine is severely irritating to the skin, eyes, and respiratory tract. Although generally stored as a liquid, when released, the resulting gas is approximately two times heavier than air.

**Non-military Uses:** Chlorine is used widely in industrial settings in the organic synthesis and manufacture of antifreeze agents, solvents, refrigerants, resins, bleaching agents, and other inorganic chemicals. There is an exceptionally wide use of chlorine in noncommercial and home settings as a cleaning agent, bleaching agent, bacteriostatic, and disinfecting agent. Storage of this substance in a variety of liquid and granular forms is widespread.

**Military Use:** Chlorine was first used by the German military on April 22, 1915 in a cylinder-released gas attack that resulted in an estimated 15,000 Allied wounded and 5000 Allied deaths. Because of its tendency to dissipate rapidly, very large concentrations were required. Chlorine was weaponized in projectiles, mortars, and bombs. There is no current chlorine weaponry.

**Health Effects:** Chlorine exposure causes an immediate severe irritation to the eyes and mucous membranes. The upper airways are first involved with nose, throat, and sinus irritation. The lower airways are irritated with severe cough and chest pain. There may be nausea, vomiting, and fainting. Very high doses may cause excess fluid to develop in the lungs (pulmonary edema). Wheezing respiration is likely to occur in individuals with previous asthma. Bronchitis often occurs, sometimes progressing to pneumonia. Chronic exposures may increase the susceptibility to respiratory infections. High concentrations also irritate the skin, causing burning, itching, and occasional blister formation. There is no animal or human epidemiologic data suggesting that chronic chlorine exposure may cause cancer or the occurrence of adverse developmental effects in the unborn fetus.

**Environmental Fate:** Chlorine is not persistent in surface water, ground water, or soil. Oxidation of environmental organic materials occurs rapidly, reducing its concentration rapidly. Dispersal of chlorine gas is rapid to the atmosphere.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Chlorine**

### **1. General:**

Chlorine is found as a greenish-yellow gas. There is a pungent, acrid, characteristic odor. Sensitivity to the odor is below toxic levels; however, since some sensory adaptation occurs, repeat exposures are more likely to produce toxic effects. Exposures irritate eyes and central (upper) airways within minutes. Low doses produce some cough and choking sensation. Moderate doses also produce a sense of suffocation, hoarseness, and substernal pain. High doses also produce a severe dyspnea, with pulmonary edema, nausea, vomiting, headache, and syncope. Very high doses may produce sudden death without obvious pulmonary lesions—possibly via laryngospasm. All recognized exposures should be referred for direct observation/care.

### **2. Patient Evaluation:**

- a. Victim should be immediately removed from the toxic environment by fully masked personnel. Chemically protective clothing is required for liquid/solution exposures.
- b. Liquid contamination causes eye and skin burns on contact. Contaminated clothing should be removed and properly disposed.

### **3. Treatment:**

- a. Eyes: Liquid exposures should be flushed with copious quantities of water; medical attention should be sought. Gas exposures, if symptomatic, should be flushed with water. Medical attention should be sought if symptomatic.
- b. Skin: Liquid exposures should be flushed with copious quantities of water. Contaminated clothing should be removed and disposed. Gas exposures require no specific therapy unless symptomatic. Intense gas exposure produces burns; wash with water.
- c. Breathing: Evaluate respiration, cyanosis, and bronchospasm.

If apneic: CPR with intubation. Be aware that laryngospasm may be present with intense exposures; hence intubation may be very difficult and tracheostomy could be required. Medical attention should be sought.

If stridorous/hoarse: Consider intubation under direct vision since laryngospasm may be imminent (see above). Medical attention should be sought.

If dyspnea/cough/chest tightness: Consider intubation for impending pulmonary edema. Also consider possible bronchospasm sufficiently severe to have so little air exchange that wheezes are absent. Medical attention should be sought. Codeine-containing demulcents may help. Be wary of sedation.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Chlorine Treatment (continued)**

**Note:** *Wheezing is a less reliable indicator of bronchospasm in infants and children due to the anatomical configuration of their airways. Severe smaller airway constriction with resultant hypoxia may be present. Any apparent infant or child distress should be immediately assessed with oximetry.*

If bronchospasm: Provide aggressive bronchodilation:

**Adult:**

Inhaled albuterol: unit dose q 2 hr.

Steroids: methylprednisolone, load 120 mg, then 60-mg q 6 hr.

Theophylline: load 150 mg, then 30 mg/hr.

**Infants and children (0-12 yr.):**

Inhaled albuterol: 0.15 mg/kg per nebulized dose  
up to 5 mg/20 minutes for first 2 hr.

Steroids: methylprednisolone: 1 mg/kg q 6 hr.

Theophylline: 10-mg/kg/24 hr.

**Elderly:**

Inhaled albuterol: unit dose q 3 hr.

Steroids: methylprednisolone, load 125 mg, then 60-mg q 6 hr.

Theophylline (occasional use): load 100 mg, then 25 mg/hr.

If asymptomatic: Maintain direct observation for at least 1 hour.

If becomes symptomatic, treat as above.

If still asymptomatic, monitor for additional 12 hours since some bronchospasm may appear late.

If hypoxic from bronchospasm: Administer bronchodilators and supplemental oxygen.

If pulmonary edema: Treat as noncardiac pulmonary edema (Adult Respiratory Distress Syndrome or ARDS) (e.g., BiPAP, CPAP, or if intubated, PEEP 5-7 cm). Diuretic therapy risks severe hypotension if intubation is required.

If infection: Inhalational exposures may produce pulmonary infiltrates, fever, and white blood cell elevations leading to an erroneous diagnosis of (presumed bacterial) pneumonia. Prophylactic antibiotics are not indicated. Surveillance bacteriologic cultures are obtained anticipating an approximate 50% risk of nosocomial pneumonia at days 3-6.

If pain: Airway discomfort may benefit from codeine. Be wary of sedation.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Hydrocyanic Acid - Hydrogen Cyanide and Cyanogen Chloride**

**Military Designations:** AC (hydrocyanic acid) and CK (cyanogen chloride)

**Description:** Both of these substances are liquids, but they vaporize (evaporate) at approximately 73°F and 58°F, so they will be in the gaseous form under most temperate conditions. AC has an odor of bitter almonds; CK is pungent. AC vapor is lighter than air, whereas CK gas is heavier than air. Cyanogen chloride is quickly metabolized to cyanide once absorbed into the body, and causes the same biological effects as hydrogen cyanide. In addition, CK is irritating to the eyes, nose, and throat (similar to riot control agents), whereas AC is nonirritating.

**Non-military Uses:** Large amounts of cyanide (most in the form of salts) are produced, transported, and used by U.S. industry annually. Cyanide is used in fumigation, photography, and extraction of metals, electroplating, metal cleaning, tempering of metals, and the synthesis of many compounds. It is released when synthetic fibers and plastics burn.

**Military Uses:** The French and the English used small amounts of cyanide during World War I, but the compound was not effective as a weapon because the amount needed is large (and small munitions were used) and because cyanide, being lighter than air, drifted away from the target. Japan allegedly used cyanide against China before World War II, and Iraq allegedly used cyanide against the Kurds in 1988. The U.S. once had cyanide munitions, but the known ones have been destroyed. However, some of these munitions may have been abandoned at sites around the U.S. Small amounts of cyanogen chloride were incorporated in chemical agent identification sets, which were also abandoned.

**Health Effects:** Cyanide blocks the use of oxygen in cells of the body and thus causes asphyxiation in each cell. The cells of the brain and the heart are most susceptible to an oxygen deficit. High concentrations of vapor may cause a brief increase in rate and depth of breathing (in 15 seconds), seizures (30 seconds), cessation of breathing (3-5 minutes) and of cardiac activity (4-10 minutes), and death. A smaller concentration will cause headache, flushing, light-headedness, and other nonspecific effects. (In addition, CK produces irritation of the eyes, the nose, and the airways.) Antidotes (nitrites and thiosulfate) are very effective if administered in time. A large exposure may result in prolonged neurologic damage, probably because of hypoxia. Chronic ingestion of cyanide-containing foods (e.g., cassava, which is a staple in many parts of Africa) has been associated with thyroid and nerve disturbances. Evidence does not suggest that cyanides are carcinogenic.

**Environmental Fate:** Because of their volatility, these substances are not expected to persist in surface water or soil.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Hydrogen Cyanide and Cyanogen Chloride**

**1. General:**

- a. Patient should be removed from the toxic environment immediately.
- b. These substances are very volatile so there is little need for decontamination if exposure was to vapor alone. If liquid was present, remove patient's clothing and wash liquid off skin.
- c. The effects of vapor from either form of cyanide appear within seconds to a minute. If patient has no or only mild effects when seen 5 to 30 minutes after exposure, he/she will need no treatment.
- d. Severe cyanide poisoning produces metabolic acidosis. If cyanide poisoning is suspected in a patient who does not have moderate or severe acidosis, treatment for cyanide poisoning should not be delayed, but the diagnosis should be reconsidered.

**2. Patient Evaluation:** level of consciousness, respiratory rate, and heart rate.

- a. Exposure to a high concentration: transient hyperpnea, followed by convulsions (30 seconds after exposure), gradual decrease in respiratory rate and depth to apnea (3-5 minutes) and cessation of cardiac activity (5-8 minutes).
- b. Exposure to low concentration: flushing, headache, anxiety, agitation, vertigo, feeling of weakness, nausea, muscular trembling (cyanogen chloride may cause irritation of eyes, nose, and airways). Prolonged exposure may lead to effects listed above.
- c. Odor of bitter almonds may be detected (half of the population cannot smell this); normal pupils (may be dilated in terminal stage); "cherry-red" skin (may not be present); diaphoresis; venules in fundus are same color as arterioles; cyanosis occurs only after circulatory collapse and apnea.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Hydrogen Cyanide and Cyanogen Chloride (continued)**

### **3. Treatment:**

a. For a mild exposure (conscious and breathing): observe; no antidotes; oxygen may be given to adult or pediatric patients in the presence of a patient experiencing the mild symptoms of heart disease.

b. Severe exposure (unconscious, not breathing): should immediately receive 100% oxygen. Cardiac monitoring and evaluation of oxygen saturation should be done when possible. (Saturation will be normal even in cases of severe cyanide exposure until the terminal stage; however, additional oxygen may assist in therapy.) Antidotes should be administered as soon as possible (see below). It is important to note that pulse oximeter results are completely unreliable in the setting of methemoglobinemia, which is induced by amyl nitrite or sodium nitrite therapy.

c. For a severe exposure: Ventilate using bag-valve-mask with one ampule of amyl nitrite (crushed) in bag; after several minutes add another (crushed) ampule; keep adding an ampule every several minutes. This is a temporary measure until IV medications can be given, but it may assist in recovery.

d. Administer 300 mg (10 ml) of sodium nitrite IV over 5 minutes. Flush line. [Children's dose: 0.2-0.3 ml/kg, or 6-9 mg/kg of the 3% solution. No separate recommendation for infants. For elderly, use adult dose unless small and frail.] Be aware: Nitrites produce orthostatic hypertension, but a patient who can stand does not need them.

e. Follow with 12.5 grams (50 ml) of sodium thiosulfate IV. [Children's dose: 0.4 mg/kg, or 1.65 ml/kg of the 25% solution. No separate recommendation for infants. Adult dose should be used for elderly unless they are small and frail. Use care in giving nitrite in a patient with hypertension or heart disease.] (Amyl nitrite, sodium nitrite, and sodium thiosulfate are in the Pasadena (formerly Lilly) Cyanide Antidote Kit, the latter two in ampules of 300 mg/10 ml and 12.5 grams/50 ml.). Use one-half dose in 20 minutes if no improvement. See instructions on top of Antidote Kit box.

f. If patient continues to remain apneic, intubate and continue oxygen through tube with assisted ventilation.

g. Transfer apneic or unconscious patients to medical facility.

h. Patients often recover rapidly unless CNS hypoxia has occurred.

### **4. Laboratory Issues:**

a. Metabolic acidosis is common; should be treated with bicarbonate.

b. Monitor arterial pO<sub>2</sub>; should be normal until near-terminal stage.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Methyl Isocyanate, Methylene Bisphenyl Isocyanate, and Methylene Diisocyanate (MDI)**

**Military Designations or Military Unique Use:** None

**Description:** Methylene Bisphenyl Isocyanate is found as a solid in white to yellow flakes. Various liquid solutions are used for industrial purposes. There is no odor to the solid or the liquid solutions. The vapor is approximately eight times heavier than air. This chemical is a strong irritant to the eyes, mucus membranes, skin and respiratory tract. This chemical is also a very potent respiratory sensitizer.

**Non-military Uses:** Very large quantities of MDI are produced, transported, and used annually in the U.S. Various industrial processes utilize MDI in production and usage of (poly)urethane foams, lacquers, and sealants. MDI is a commonly used precursor in the industrial production of insecticides and laminating materials. Noncommercial uses of polyurethanes such as in isocyanate paints or in cutting of uncured urethanes may also cause exposure. Thermal degradation of these substances may produce MDI as a combustion by-product.

**Health Effects:** MDI as either a solid or liquid solution is a strong irritant to the eyes and the skin, resulting in discomfort and burning sensation. Severe inflammation may occur. Irritation of the respiratory tract results in cough, shortness of breath, and chest pain. Very high concentrations may irritate the respiratory tract sufficiently to cause excess fluid accumulation within the lung, resulting in very severe respiratory distress and pulmonary edema. MDI vapor is a strong sensitizer of the respiratory tract. In some individuals, particularly those with prior history of asthma, repetitive exposures, even to very low doses, may trigger an asthmatic episode. Such sensitized individuals may also experience asthma with subsequent skin or eye exposures. This sensitization may persist indefinitely. Repeated or long-term exposure may result in permanent respiratory problems. Repeated or long-term exposure of the skin may cause a rash. There are no animal or human epidemiologic data that suggest that chronic MDI exposure may cause cancer or the occurrence of adverse developmental effects in the unborn fetus.

**Environmental Fate:** Since the reported vapor pressure of Methyl isocyanate (MIC) is 348 mm Hg at 20°C, MIC is expected to remain almost entirely in vapor phase when released into the atmosphere. MIC is susceptible to hydrolysis and photooxidation in the atmosphere with a half-life of 11 days at an atmospheric concentration of 5.0E+5 hydroxyl radicals/M<sup>3</sup>. In the aquatic media, MIC is rapidly hydrolyzed with half-lives of 20 and 9 minutes at 14° and 25°C, respectively. The products of hydrolysis-N-carboxymethylamine, methylamine, carbon dioxide, and N,N'-dimethylurea are nontoxic. Due to its rapid hydrolysis in aqueous media, MIC is not expected to bioconcentrate or bioaccumulate in the environment. MIC released to soil is hydrolyzed and the degradative process is rapid in the presence of moisture. Hydrolysis minimizes adsorption and volatilization of MIC from the soil, although these conditions are favorable for its mobility. Depending upon the concentration of MIC in soil and prevailing moisture conditions, volatilization from the surface soil may be a significant environmental transport and fate process.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Methyl Isocyanate, Methylene Bisphenyl Isocyanate, and Methylene Diisocyanate (MDI)**

### **1. General:**

MDI is found as a solid, which has a melting point of 37°C. Vapor exposures occur with liquids containing dissolved solid. Gas exposures may occur with high-temperature volatilization. Thermal decomposition produces carbon monoxide and oxides of nitrogen. Sensitivity to this substance (eye, nose irritation) occurs at concentrations five times higher than OSHA limits (0.2 mg/m<sup>3</sup>); hence toxic exposures may go unrecognized.

#### **Exposures lead to:**

Irritant effects: Eyes, mucous membranes, and skin may be irritated, particularly with prolonged, repetitive, or intense exposures. High concentrations may also produce cough, dyspnea, and lethal pulmonary edema.

Sensitizing effects: Respiratory sensitization may occur, particularly in individuals with known asthma, allergies, or recognized isocyanate sensitivity (e.g., TDI).

### **2. Patient Evaluation:**

The victim should be immediately removed from the toxic environment by personnel in chemically protective clothing. Vapor or gas hazards should be anticipated with full (positive pressure) masks. Liquid/solid contamination should be corrected by clothing removal and soap and water decontamination.

### **3. Treatment:**

a. Eyes: There is no specific therapy appropriate. Liquid/solid exposures should be irrigated with copious quantities of water. Subsequently symptomatic individuals should seek medical attention.

b. Skin: There is no specific therapy appropriate. Liquids/solids should be removed with soap and water. Single exposures are unlikely to create rashes unless the individual was previously sensitized. Intense exposure may produce dermatitis and require referral.

c. Ingested: Liquids/solids should be removed by induced vomiting in the conscious victim or by lavage otherwise.

d. Respiratory: Symptoms due to sensitivity may be delayed up to 8 hr after exposure. Respiratory symptoms may appear with skin, ocular, or GI exposure in previously sensitized individual.

If apneic: Initiate CPR. Intubation may be required for pulmonary edema. Consider severe bronchospasm in previously sensitized victim.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Methyl Isocyanate, Methylene Bisphenyl Isocyanate, and Methylene Diisocyanate (MDI) (continued)**

If stridorous/hoarse: Consider intubation under direct vision.

If dyspnea/cough/chest tightness: Consider intubation for impending pulmonary edema. Also consider possible bronchospasm sufficiently severe to have so little air exchange that wheezes are absent. Medical attention should be sought. Codeine-containing demulcents may help. Be wary of sedation.

**Note:** *Wheezing is a less reliable indicator of bronchospasm in infants and children due to the anatomical configuration of their airways. Severe smaller airway constriction with resultant hypoxia may be present. Any apparent infant or child distress should be immediately assessed with oximetry.*

If bronchospasm: Treat as asthma with inhaled albuterol. Bronchospasm may be particularly severe, especially in previously sensitized individuals.

Treat aggressively:

**Adults:**

Inhaled albuterol: unit dose q 2 hr. or continuous neb 15 g/hr.

Steroids: methylprednisolone load 250 mg, then 80-mg q 6 hr.

Theophylline: load 150 mg, then 30-mg/hr.

**Infants and children (0-12 yr.):**

Inhaled albuterol: 0.15 mg/kg per nebulized dose  
up to 5 mg/20 minutes for first 2 hr.

Steroids: methylprednisolone; 1 mg/kg q 6 hr.

Theophylline: 10-mg/kg/24 hr.

**Elderly:**

Inhaled albuterol: unit dose q 3 hr.

Steroids: methylprednisolone load 125 mg, then 60-mg q 6 hr.

Theophylline (occasional use): load 100-mg then 25 mg/hr.

**Upper airway obstruction:** This is very rarely seen and only with intense exposure. Hoarseness and stridor suggest impending laryngospasm: Consider intubation under direct vision.

If pulmonary edema (may rarely occur with intense exposures): Treat as non-cardiac pulmonary edema (Adult Respiratory Distress Syndrome or ARDS see PHOSGENE).

If hypoxia (commonly from bronchospasm, rarely from pulmonary edema): Treat with above bronchodilation and oxygen.

If cough: Codeine-containing demulcents (tissue-soothing agents) may help. Be wary of sedation.

**[Note:** *cough typically indicates inadequately treated bronchospasm.*]

If pain: Airway discomfort from irritant effect may benefit from codeine. Be wary of sedation.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Mustard (Sulfur Mustard)**

**Military Designations:** H; HD; HS

**Description:** Mustard is a "blister agent" that causes cell damage and destruction. It is a colorless to light yellow to dark brown oily liquid with the odor of garlic, onion, or mustard. It does not evaporate readily, and may pose a vapor hazard in warm weather. It is a vapor and liquid hazard to skin and eyes, and a vapor hazard to airways. Its vapor is five times heavier than air.

**Non-military Uses:** Sulfur mustard has been used as a research tool to study DNA damage and repair. A related compound, nitrogen mustard, was the first cancer chemotherapeutic agent, and is still used for some purposes.

**Military Use:** Mustard was used extensively in World War I and was the largest chemical casualty producer in that war. Mustard was used by Iraq against Iran in the 1980s. The U.S. has a variety of munitions filled with sulfur mustard, including projectiles, mortars, and bombs. It is also in chemical agent identification sets (which may be on abandoned sites) and in ton containers.

**Health Effects:** Mustard damages DNA in cells, which leads to cellular damage and death. Mustard penetrates skin and mucous membranes very quickly, and cellular damage begins within minutes. Despite this cellular damage, clinical effects do not begin until hours later; the range is 2 to 24 hours, but usually 4 to 8 hours. The initial effects are in the eyes (itching or burning), the skin (erythema with itching and burning), and airways (epistaxis, hoarseness, sinus pain, cough). After high doses, these may progress to more severe effects in the eyes (corneal damage), skin (blisters), and damage to the lower airways (dyspnea and productive cough). After absorption of a large amount, there may be damage to the gastrointestinal tract (vomiting, diarrhea) and bone marrow (damage to stem cells with cessation of production of white cells, red cells, and platelets). There is no antidote. Epidemiological studies indicate that frequent exposure to mustard over years may cause an increased incidence of cancer of the upper airways. An acute exposure may cause persistent damage to airways (e.g., stenosis) and eyes (keratitis). Animal studies suggest that mustard may have developmental effects.

**Environmental Fate:** Persistence of mustard in soil will depend on the soil type, the amount of mustard, the depth of contamination, and weather conditions. Mustard contamination of surface soil may persist for weeks, and deeper soil may remain contaminated for years. Mustard is relatively insoluble in water; once dissolved, however, it breaks down into less toxic products. Because of its relatively rapid hydrolysis once in solution, mustard is not thought to be transported through the soil by ground water.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Mustard (Sulfur Mustard)**

**1. General:**

a. Mustard causes no immediate effects. The initial clinical effects of mustard (which usually involve the eyes, the skin, and the airways) appear 2 to 24 hours (usually 4 to 8 hours) after exposure to liquid mustard or to mustard vapor. However, liquid or vapor mustard penetrates the skin and mucous membranes and damages cells within minutes of exposure, so decontamination must be done immediately after exposure.

b. The patient should be immediately removed from the toxic environment.

c. If the patient has been exposed to liquid mustard, the clothing should be removed and skin decontaminated with soap and cool water, or thoroughly flushed with water alone. The patient's eyes should be flushed with large amounts of saline. If the patient has been exposed to vapor alone, remove the clothing.

d. If there is a history of definite exposure, the patient should be taken to a medical facility for observation.

**2. Patient Evaluation:** Initial effects (usually 2 to 24 hours after exposure):

a. Eyes: irritation, feeling of grit in eye, redness.

b. Skin: erythema (will progress to blisters 1 to 4 hours later if exposure was large).

c. Respiratory: irritation of nose, voice change, sinus pain, and hacking cough. (Very rarely a patient might inhale an extremely large amount and start to have these effects plus dyspnea within 2 hours. This patient should be intubated, and assisted ventilation with oxygen should be started. This patient should be taken to the nearest pulmonary intensive care unit as quickly as possible).

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

**Mustard (continued)**

**3. Treatment:**

a. There is nothing to do for patients exposed to mustard until effects appear except to decontaminate. Tissue is damaged within minutes, so decontamination must be done immediately.

b. Eyes: Any commercial eye solution may relieve the irritation from a mild exposure. More severe effects: A mydriatic b.i.d. or q.i.d. (depending on the length of action of the drug); a topical antibiotic b.i.d.; Vaseline on lid edges b.i.d.; sunglasses if photophobia is present. Topical steroids within the first 24 hours may only reduce inflammation. Control pain with systemic, not topical, analgesics. Visual loss is usually due to lid edema and blepharospasm, not eye damage.

c. Skin: A soothing lotion (e.g., calamine) for erythema. Leave small blisters intact. Unroof large blisters and irrigate denuded area at least t.i.d. followed by liberal application of topical antibiotic. Watch for infection. Fluid requirements are much less than those for thermal burns; do not overhydrate.

d. Respiratory: Steam inhalation and cough suppressants will generally relieve mild symptoms. A chemical pneumonitis (increased temperature; white blood count; chest x-ray findings) may develop after large exposure: intubation; assisted ventilation with oxygen (and possibly with PEEP or CPAP); bronchodilators; watch sputum at least daily for organisms (no antibiotics until organism is identified).

e. Systemic absorption of a large amount of mustard may cause bone marrow and gastrointestinal tract damage. Watch WBC, Hct daily; mustard damages bone marrow.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Nerve Agents (GA, GB, GD, GF, VX)**

**Military Designations:** GA, GB, GD, GF, and VX

Common Names: Tabun (GA); Sarin (GB); Soman (GD). None for GF and VX.

**Description:** Nerve agents are very toxic organophosphorus compounds that have biological activity similar to that of many insecticides. Their volatility ranges from that of water to that of motor oil; they present a hazard from vapor and liquid. Under temperate conditions, the liquids are clear, colorless, and mostly odorless. They cause biological effects by inhibiting acetylcholinesterase, thereby allowing acetylcholine to accumulate and cause hyperactivity in muscles, glands, and nerves.

**Non-military Use:** There is no non-military use. Nerve agents can be found in some research laboratories and storage facilities, and could pose a risk to human populations if used by terrorists.

**Military Use:** Nerve agents were first synthesized pre-World War II, but were not used in that war. They were used by Iraq in its war with Iran. The U.S. has a large stockpile of GA and VX in weapons; these are being destroyed.

**Health Effects:** Nerve agents are the most toxic chemical agents. Initial effects from small amounts of a nerve agent differ, depending on the route of exposure. After a small vapor exposure, there is the immediate onset of effects in the eyes (small or pinpoint pupils [miosis], redness, eye pain, and dim vision), the nose (rhinorrhea), and airways (some degree of shortness of breath because of bronchoconstriction and secretions). After a small liquid exposure, there may be an asymptomatic interval of up to 18 hours before the onset of sweating and fasciculations at the site of the droplet, which may be followed by nausea, vomiting, and diarrhea. After exposure to a large amount of nerve agent by either route, there is sudden loss of consciousness, convulsions, copious secretions, apnea, and death. There is usually an asymptomatic interval of minutes after liquid exposure before these occur; effects from vapor occur almost immediately. Antidotes (atropine and pralidoxime) are effective if administered before circulation fails. There is no evidence that nerve agents cause cancer or developmental effects.

**Environmental Fate:** GB will react with water to produce toxic vapors. Open-pit burning or burying is prohibited. GB mixes with water and would be mobile in surface and ground water should a release occur; however, because of its rapid hydrolysis, it is not a long-term water contaminant of concern. Most GB spilled will be lost by evaporation; because of this there is no long-term impact on health and environment. VX is moderately persistent in soil, and because it has low water solubility, it could be mobile in surface and ground water systems.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Nerve Agents (GA, GB, GD, GF, VX)**

### **1. General:**

Nerve agents are extremely toxic chemicals that cause effects by inhibiting the enzyme acetylcholinesterase, allowing excess acetylcholine to accumulate. This excess neurotransmitter then produces overstimulation and causes hyperactivity in muscles, glands, and nerves. The nerve agents are GA (tabun), GB (sarin), GD (soman), GF, and VX. Their effects are identical.

Remove the patient from contaminated atmosphere. If exposure was to vapor, remove clothing; if exposure was to liquid, remove clothing and wash skin with soap and water, or thoroughly flush with water alone.

### **2. Patient Evaluation:**

If the patient is conscious, note ventilatory status and ask about nausea. If the patient is unconscious, note ventilatory status and heart rate (heart rate may be high, low, or normal in a nerve agent casualty).

Initial effects differ depending on whether exposure was to vapor or to liquid.

a. Vapor: Effects start within seconds to a minute or two.

(1) Mild to moderate: Miosis (possible redness in eye, eye pain, complaints of dim or blurred vision, nausea), rhinorrhea, excess secretions, dyspnea (mild to severe).

(2) Severe: Loss of consciousness, seizures, apnea, and flaccid paralysis.

b. Liquid: Effects start in minutes (large exposure) to 18 hours (small exposure) after an asymptomatic interval.

(1) Mild to moderate: Sweating and fasciculations at site of exposure; nausea, vomiting, diarrhea; weakness.

(2) Severe: Same as for vapor, but after a 1- to 30-minute asymptomatic interval.

**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.)

(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.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Phosgene — Carbonyl Chloride**

**Military Designation:** CG

**Description:** Phosgene is a highly reactive halogenated compound. It is found as a colorless liquid or colorless or white (if hydrolysis occurs in air) gas. It has an odor of newly mown or moldy hay. It is primarily a vapor hazard at high concentrations to the upper respiratory tract, with severe irritation; and at lower concentrations, to the lower respiratory tract, with pulmonary edema. Phosgene vapors are heavier than air but are not persistent.

**Non-military Uses:** Phosgene is an industrially widely used, extremely important substance for purposes of chemical synthesis. Large quantities are stored and transported within the continental U.S. Materials such as foamed plastics, insecticides, and aniline dyes are products of its use. These substances and many other halogenated hydrocarbons (e.g., carbon tetrachloride, methylene chloride, degreasing agents), if combusted, produce phosgene as a degradation byproduct.

**Military Use:** Phosgene was first used by the Germans as a toxic war gas on December 19, 1915. By some estimates phosgene accounted for 85% of World War I chemical deaths. Phosgene was generally dispersed in combination with other agents (e.g., chlorine) due to its relatively low rate of evaporation from the liquid state.

**Health Effects:** Phosgene gas at high concentrations may cause immediate irritation of the eyes and upper respiratory tract (nose, larynx, and trachea). This effect is thought to be due to breakdown of the gas to hydrochloric acid with water vapor contact. After resolution of this irritation, a symptom-free period may occur. During this period, progressive damage to the walls of the capillaries allows fluids to leak from those vessels and gradually compromise lung function. The individual complains of progressive cough, chest tightness, and shortness of breath. Frothy secretions typical of pulmonary edema occur. This can be so rapid as to cause death if the early symptoms are not recognized and treated. If recovery is not complicated by infection, permanent lung damage is not likely to occur. There are no recognized long-term health risks from repetitive/chronic low-dose exposure. There are no data suggesting adverse effects on the unborn fetus.

**Environmental Fate:** Phosgene is not persistent in surface water, ground water, or soil containing moisture because of its rapid breakdown into carbon dioxide and hydrochloric acid. Phosgene is not persistent in dry soil because of its tendency to evaporate readily.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Phosgene — Carbonyl Chloride**

### **1. General:**

Phosgene may be found as a colorless liquid or a colorless-to-white gas. There is an odor of newly mown or moldy hay. Sensitivity to the odor may degrade, making individuals unaware of toxic inhalation. High-intensity exposure irritates eyes and upper airways within minutes. Lower-dose exposures may produce a lethal pulmonary edema with a characteristic symptom-free or "latent" period up to 48 hours later. Some pulmonary symptoms may appear as late as 72 hours after exposure. All recognized exposures should be referred for direct, in-hospital observation and care.

### **2. Patient Evaluation:**

a. Victim should be immediately removed from the toxic environment by personnel with the appropriate PPE (positive pressure apparatus).

b. Liquid contamination does not require additional protection for rescue personnel insofar as there are minimal topical effects to the skin and no substantial dermal absorption. Contaminated clothing should be removed.

### **3. Treatment:** Maintain at rest at least 6 hours.

a. Eyes: If exposed to liquid phosgene, eyes should be flushed with copious quantities of water. Medical attention should be sought. Eyes exposed to gas phosgene, if symptomatic, should be flushed with water. Medical attention should be sought if symptomatic.

b. Skin: Patients exposed to liquid phosgene should be flushed with copious quantities of water; contaminated clothing should be removed and disposed. Patients exposed to gas phosgene require no specific therapy unless symptomatic.

c. Ingested: Do not induce vomiting. Medical attention should be sought.

d. Respiratory: Evaluate respiration, cyanosis. Oxygen should always be used.

If apneic: Initiate CPR with intubation. Be aware that laryngospasm may be present with intense exposures; hence, intubation may be very difficult and tracheostomy required. Medical attention should be sought.

If stridorous/hoarse: Consider intubation under direct vision since laryngospasm may be imminent (see above). Medical attention should be sought.

If dyspnea/cough/chest tightness: Consider intubation for impending pulmonary edema. Also consider possible bronchospasm sufficiently severe to have so little air exchange that wheezes are absent. Medical attention should be sought. Codeine-containing demulcents may help. Be wary of sedation. Note: cough may presage pulmonary edema.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Phosgene — Carbonyl Chloride (continued)**

**Note:** Wheezing is a less reliable indicator of bronchospasm in infants and children due to the anatomical configuration of the airways. Severe smaller airway constriction with resultant hypoxia may be present. Any apparent infant or child distress should be immediately assessed with oximetry.

If bronchospasm: Individuals with underlying asthma may suffer bronchospasm. Treat as any asthmatic: Inhaled albuterol, parenteral steroids, and theophylline. Watch for hypoxia.

**Adult:**

Inhaled albuterol: unit dose q 2 hr.

Steroids: methylprednisolone, load 120 mg, then 60 mg q 6 hr.

Theophylline: loading dose 5.6 mg/kg, then 30 mg/hr.

**Infants and Children (0-12 yr.):**

Inhaled albuterol: 0.15 mg/kg per nebulized dose  
up to 5 mg/20 minutes for first 2 hr.

Steroids: methylprednisolone: 1 mg/kg q 6 hr.

Theophylline: 10 mg/kg/24 hr.

**Elderly:**

Inhaled albuterol: unit dose q 3 hr.

Steroids: methylprednisolone, load 125 mg, then 60 mg q 6 hr.

Theophylline (occasional use): load 100 mg, then 25 mg/hr.

If asymptomatic: Maintain direct observation for at least 6 hours;

If patient becomes symptomatic treat as above.

If patient is still asymptomatic after 6 hours, lesser observation is needed for an additional 36 hours.

If hypotensive (will occur rapidly with pulmonary edema): Immediate volume replacement should be undertaken. Colloid or crystalloid may be used to maintain adequate tissue perfusion.

If infection: Inhalational exposures may produce pulmonary infiltrates, fever, and white blood cell elevations, leading to an erroneous diagnosis of (presumed bacterial) pneumonia. Prophylactic antibiotics are not indicated. Surveillance bacteriologic cultures are obtained anticipating an approximate 50% risk of nosocomial pneumonia at days 3-6.

If hypoxia: Commonly from pulmonary edema, treat as above; occasionally from bronchospasm, treat as above.

If pain: Airway discomfort may benefit from codeine. Be wary of sedation.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
MEDICATION DOSAGE CHARTS**

**ATROPINE dosage chart at 0.1 mg/ml drug concentration  
(0.02 mg/kg Pediatric, 2 mg adult)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	1 mL
12 months	10 kg (22 lb)	2 mL
3 years	15 kg (33 lb)	3 mL
6 years	20 kg (44 lb)	4 mL
8 years	25 kg (55 lb)	5 mL
10 years	30 kg (66 lb)	6 mL
11 years	35 kg (77 lb)	7 mL
12 years	40 kg (88 lb)	8 mL
13 years	45 kg (99 lb)	9 mL
14 years or more	50 kg (110 lb) or more	20 mL
Adult	50 kg (110 lb) or more	20 mL

**ATROPINE dosage chart at 0.4 mg/ml drug concentration  
(0.02 mg/kg Pediatric, 2 mg adult)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	0.25 mL
12 months	10 kg (22 lb)	0.5 mL
3 years	15 kg (33 lb)	0.75 mL
6 years	20 kg (44 lb)	1 mL
8 years	25 kg (55 lb)	1.25 mL
10 years	30 kg (66 lb)	1.5 mL
11 years	35 kg (77 lb)	1.75 mL
12 years	40 kg (88 lb)	2 mL
13 years	45 kg (99 lb)	2.25 mL
14 years or more	50 kg (110 lb) or more	5 mL
Adult	50 kg (110 lb) or more	5 mL

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
MEDICATION DOSAGE CHARTS**

**ATROPINE dosage chart at 1 mg/ml drug concentration  
(0.02 mg/kg Pediatric, 2 mg adult)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	0.1 mL
12 months	10 kg (22 lb)	0.2 mL
3 years	15 kg (33 lb)	0.3 mL
6 years	20 kg (44 lb)	0.4 mL
8 years	25 kg (55 lb)	0.5 mL
10 years	30 kg (66 lb)	0.6 mL
11 years	35 kg (77 lb)	0.7 mL
12 years	40 kg (88 lb)	0.8 mL
13 years	45 kg (99 lb)	0.9 mL
14 years or more	50 kg (110 lb) or more	2 mL
Adult	50 kg (110 lb) or more	2 mL

**ATROPINE dosage at 2 mg/ml drug concentration  
(0.02 mg/kg Pediatric, 2 mg adult)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	0.05 mL
12 months	10 kg (22 lb)	0.1 mL
3 years	15 kg (33 lb)	0.15 mL
6 years	20 kg (44 lb)	0.2 mL
8 years	25 kg (55 lb)	0.25 mL
10 years	30 kg (66 lb)	0.3 mL
11 years	35 kg (77 lb)	0.35 mL
12 years	40 kg (88 lb)	0.4 mL
13 years	45 kg (99 lb)	0.45 mL
14 years or more	50 kg (110 lb) or more	1 mL
Adult	50 kg (110 lb) or more	1 mL

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
MEDICATION DOSAGE CHARTS**

**PRALIDOXIME (2-PAM, Protopam) dosage chart  
at 50 mg/mL  
(For IV use) – (50 mg/kg Pediatric, 2000 mg Adult)**

Estimated age	Estimated weight	Dose in ML
3 months	5 kg (11 lb)	5 mL = 250 mg
12 months	10 kg (22 lb)	10 mL = 500 mg
3 years	15 kg (33 lb)	15 mL = 750 mg
6 years	20 kg (44 lb)	20 mL = 1000 mg
8 years	25 kg (55 lb)	25 mL = 1250 mg
10 years	30 kg (66 lb)	30 mL = 1500 mg
11 years	35 kg (77 lb)	35 mL = 1750 mg
12 years	40 kg (88 lb)	40 mL = 2000 mg
13 years	45 kg (99 lb)	40 mL
14 years or more	50 kg (110 lb) or more	40 mL
Adult	50 kg (110 lb) or more	40 mL

**PRALIDOXIME (2-PAM, Protopam) dosage chart  
at 300 mg/mL  
(For IM use) – (40 mg/kg Pediatric, 1800 mg Adult)  
(reconstitute by adding 3 ml sterile water to a 1 g vial of pralidoxime)**

Estimated age	Estimated weight	Dose in ML
3 months	5 kg (11 lb)	0.7 mL = 200 mg (One MARK I - if only available means)
12 months	10 kg (22 lb)	1.3 mL = 400 mg (One MARK I - if only available means)
3 years or more	15 kg (33 lb) or more	2 mL = 600 mg = One MARK I
Adult	50 kg (110 lb) or more	6 mL = 1800 mg = Three MARK I

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
MEDICATION DOSAGE CHARTS**

**AMYL NITRITE dosage chart**

For all ages, crush ampule and allow it to be inhaled for up to 3 minutes. If patient is endotracheally intubated, place ampule or some of its contents in the large end of the ET tube where it connects to the bag or ventilator.

If amyl nitrite use is to continue beyond 3 minutes, use a new vial approximately every 3 minutes until the patient recovers or until sodium nitrite can be administered.

Once venous access is established and sodium nitrite is available, administer sodium nitrite and discontinue use of amyl nitrite as soon as possible.

**SODIUM NITRITE dosage chart at 3% (300mg/10 ml)  
(Pediatric 0.3 ml/kg for Hgb 11 g/dL, Adult 10 ml)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	1.5 mL
12 months	10 kg (22 lb)	3 mL
3 years	15 kg (33 lb)	4.5 mL
6 years	20 kg (44 lb)	6 mL
8 years	25 kg (55 lb)	7.5 mL
10 years	30 kg (66 lb)	9 mL
11 years	35 kg (77 lb)	10 mL
12 years	40 kg (88 lb)	10 mL
13 years	45 kg (99 lb)	10 mL
14 years or more	50 kg (110 lb) or more	10 mL
Adult	50 kg (110 lb) or more	10 mL

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
MEDICATION DOSAGE CHARTS**

**SODIUM THIOSULFATE dosage chart at 25% concentration  
(Pediatric 1.65 ml/kg, Adult 50 ml)**

<b>Estimated age</b>	<b>Estimated weight</b>	<b>Dose in ML</b>
3 months	5 kg (11 lb)	8 mL
12 months	10 kg (22 lb)	17 mL
3 years	15 kg (33 lb)	25 mL
6 years	20 kg (44 lb)	33 mL
8 years	25 kg (55 lb)	41 mL
10 years	30 kg (66 lb)	50 mL
11 years	35 kg (77 lb)	50 mL
12 years	40 kg (88 lb)	50 mL
13 years	45 kg (99 lb)	50 mL
14 years or more	50 kg (110 lb) or more	50 mL
Adult	50 kg (110 lb) or more	50 mL

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Anthrax**

**Description of Agent:** Inhalation anthrax is a highly lethal infection caused by inhalation of aerosols of the spore form of the bacteria *Bacillus anthracis*. In naturally occurring cases, anthrax may be spread by entry through skin wounds, causing a localized infection.

**Signs and Symptoms:** Incubation period for inhalation anthrax is 1-6 days. Fever, malaise, fatigue, cough, and mild chest discomfort are followed by severe respiratory distress with dyspnea, diaphoresis, stridor, and cyanosis. Shock and death occur within 24-36 hours of severe symptoms.

In cutaneous anthrax, a papule develops, then vesicles, followed by a black eschar surrounded by moderate to severe edema. The lesions are usually not painful. Without treatment, the disease may progress to septicemia and death, with a case-fatality rate of 20%. With treatment, fatalities are rare.

**Diagnosis:** Physical findings are nonspecific in inhalation cases with initial complaints of malaise, fever, headache, and possibly some substernal chest pain. A widened mediastinum is often seen on x-ray. Anthrax is detectable by Gram stains of the blood and by blood culture late in the course of illness.

**Treatment:** Although usually not effective for inhalation cases after symptoms are present, high-dose antibiotic treatment with penicillin, ciprofloxacin, or doxycycline should be undertaken. Without antibiotic sensitivities, treatment should be started with IV ciprofloxacin (400 mg q 8-12 hr) or IV doxycycline (200 mg initially, followed by 100 mg q 12 hr). Supportive therapy may be necessary.

**Prophylaxis:** There is a licensed vaccine for use in those considered to be at risk of exposure. The vaccine is administered at 0, 2, and 4 weeks for the initial series, followed by boosters at 6, 12, and 18 months and then an annual booster. Oral ciprofloxacin (500 mg po bid) or doxycycline (100 mg po bid) should be given for known or imminent exposure. After confirmed exposure, all unimmunized individuals should have two 0.5 ml doses of the vaccine 2 weeks apart, and those vaccinated with less than three doses prior to exposure should have a single 0.5 ml booster. Anyone vaccinated with the initial three-dose series in the previous 6 months does not need a booster. Everyone exposed should continue antibiotics for 4 weeks. If no vaccine is available, antibiotics should be used beyond 4 weeks and withdrawn under medical supervision.

**Decontamination:** Secretion and lesion precautions should be practiced. Anthrax has not been transmitted by the aerosol route person-to-person. After an invasive procedure or autopsy is performed, the instruments and area used should be thoroughly disinfected with a sporicidal agent (iodine or 0.5% sodium hypochlorite).

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Anthrax**

### **1. General:**

Anthrax is a highly lethal infection spread by inhalation or entry through an opening in the skin. The inhalation route will result in a more rapid and deadly infection. The incubation period for both routes is 1-6 days. Fever, malaise, fatigue, cough, and mild chest discomfort are followed by severe respiratory distress with dyspnea, diaphoresis, stridor, and cyanosis. Shock and death occur within 24-36 hours of severe symptoms.

### **2. Treatment:**

- a. Evaluate the patient for fever, cyanosis, and respiratory distress.
- b. The patient should be given oxygen during transport, as needed.
- c. All patients should receive cardiac monitoring and evaluation of oxygenation saturation via pulse oximeter.
- d. Obtain IV access with lactated Ringer's at KVO rate.
- e. Although usually not effective after severe symptoms are present, high-dose antibiotic treatment with penicillin, ciprofloxacin, or doxycycline should be undertaken. Without antibiotic sensitivities, treatment should be started with IV ciprofloxacin (400 mg q 8-12 hr) or IV doxycycline (200 mg initially, followed by 100 mg q 12 hr). Supportive therapy may be necessary.
- f. Before transporting the patient, check for additional victims.
- g. Transport the patient to the most appropriate medical facility as directed by medical consultation.
- h. Secretion and lesion precautions should be practiced. Anthrax has not been transmitted by the aerosol route person-to-person. After an invasive procedure or autopsy is performed, the instruments and area used should be thoroughly disinfected with a sporicidal agent (iodine or chlorine). Wiping the ambulance interior with a 70% alcohol or other disinfectant is probably unnecessary, but would not be unreasonable. That need not be completed before the next run.
- i. Public health officials may recommend that others who may have been initially exposed take prophylactic antibiotics and immunizations before they show signs of illness. If a registry is established, all emergency personnel should identify themselves and indicate when, where, and to what extent they might have been exposed.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Botulinum Toxins**

**Description of Agent:** Botulinum toxins are poisonous substances produced by a bacterium, *Clostridium Botulinum*. They are usually formed in canned foods and eaten but can be spread by aerosol and inhalation. The toxin blocks acetylcholine release at the neuromuscular junction and in the central and peripheral nervous systems.

**Signs and Symptoms:** Ptosis, generalized weakness, dizziness, dry mouth and throat, blurred vision and diplopia, dysarthria, dysphonia, and dysphagia followed by symmetrical descending flaccid paralysis and development of respiratory failure. Symptoms begin as early as 24-36 hours but may take several days after inhalation of toxin.

**Diagnosis:** Clinical diagnosis. No routine laboratory findings. Biowarfare or terrorist attack should be suspected if numerous collocated casualties have progressive descending bulbar, muscular, and respiratory weakness.

**Treatment:** Intubation and ventilatory assistance for respiratory failure. Tracheostomy may be required. Administration of Botulinum antitoxin as soon as possible--trivalent licensed product made by CDC or heptavalent IND product--may prevent or decrease progression to respiratory failure and hasten recovery. Skin testing must be performed before administration of the antitoxin.

Prophylaxis: Pentavalent toxoid (types A, B, C, D, and E) is available as an IND product for those at high risk of exposure. The dosage schedule is 0, 2, and 12 weeks, with yearly boosters.

**Decontamination:** Hypochlorite and/or soap and water. Toxin is not dermally active and secondary aerosols are not a hazard from patients.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Botulinum Toxins**

### **1. General:**

Botulinum toxin is a poisonous substance produced by a bacterium, *Clostridium Botulinum*. It is usually formed in canned foods and eaten but can be spread by aerosol and inhalation. Onset of symptoms is hours to days after taking the poison into the body, so there is virtually no chance that emergency responders would be endangered by the poison carried by a victim. Symptoms typically include drooping eyelids, blurred or double vision, trouble swallowing, dry mouth, and sore throat, followed by a flaccid (limp) paralysis that begins near the head and moves downward. Death most often results from respiratory failure, so respiratory support is the most important aspect of prehospital care. Symptoms begin as early as 24-36 hours but may take several days after inhalation of toxin.

### **2. Treatment:**

a. Evaluate the patient for paralysis, cyanosis, respiratory distress, and signs of pneumonia superimposed on paralysis.

b. The patient may require artificial respiration during transport.

c. All patients should receive cardiac monitoring and evaluation of oxygenation saturation via pulse oximeter.

d. Patient should be given oxygen during transport, as needed, but mechanical ventilation may be more important than oxygen.

e. IV access is not critical, but will be helpful in the hospital setting, where a specific antitoxin will be administered and where the patient will probably remain for a few days to several weeks. If desired, obtain IV access with lactated Ringer's at KVO rate.

f. Intubation and ventilatory assistance may be necessary for respiratory failure. Tracheostomy may be required. Administration of Botulinum antitoxin — trivalent licensed product made by CDC or heptavalent IND product — may prevent or decrease progression to respiratory failure and hasten recovery. Skin testing must be performed before administration of the antitoxin.

g. Before transporting the patient, check for additional victims.

h. Transport the patient to the most appropriate medical facility as directed by medical consultation.

i. Decontaminate with hypochlorite and/or soap and water. Toxin is not dermally active and secondary aerosols are not a hazard from patients.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Cholera**

**Description of Agent:** Cholera is a bacterial infection causing severe diarrhea and fluid loss. The causal organism, *Vibrio cholerae*, is spread through water or food. IV fluids may be exhausted in a hospital or an isolated community during an epidemic.

**Signs and Symptoms:** The incubation period is 1-5 days. Asymptomatic to severe with sudden onset. Vomiting, abdominal distention, and pain with little or no fever followed rapidly by a profuse, watery diarrhea with a 'rice-water' appearance. Fluid losses may exceed 5 to 10 liters per day. Without treatment, death may result from severe dehydration, hypovolemia, and shock.

**Diagnosis:** Clinical diagnosis. Watery diarrhea and dehydration. Microscopic exam of stool samples reveals few or no red or white cells. The causal organism can be identified in stool by darkfield or phase contrast microscopy and can be grown on a variety of culture media.

**Treatment:** Fluid and electrolyte replacement. This often can be accomplished by the use of oral rehydration salts or diluted Gatorade™. IV fluids are needed if there is severe dehydration. Antibiotics will shorten the duration of diarrhea and thereby decrease fluid loss - tetracycline (500 mg q 6 hr x 3 days) or doxycycline (300 mg once or 100 mg q 12 hr x 3 days). There is widespread tetracycline resistance; therefore, ciprofloxacin (500 mg q 12 hr x 3 days), or erythromycin (500 mg q 6 hr x 3 days) should also be considered.

**Prophylaxis:** A licensed, killed vaccine is available but provides only about 50 percent protection that lasts for no more than 6 months. Vaccination schedule is at 0 and 4 weeks, with a booster every 6 months.

**Decontamination:** Personal contact rarely causes infection; however, enteric precautions and careful hand washing should be employed. Gloves should be used for patient contact and specimen handling. Bactericidal solutions (hypochlorite) would provide adequate decontamination.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Cholera**

### **1. General:**

Cholera is a bacterial infection causing severe diarrhea and fluid loss. The causal organism, *Vibrio cholerae*, is spread through water or food. When growing in the intestines, the organism releases a toxin. The toxin, not the infection itself, is the cause of diarrhea. Fluid loss through watery diarrhea is profound and may exceed 5-10 liters/day. IV fluids may be exhausted in a hospital or an isolated community during an epidemic. Without treatment, death may result from severe dehydration, hypovolemia, and shock.

### **2. Treatment:**

- a. Evaluate the patient for dehydration and shock.
- b. Obtain IV access with a large-bore needle and run lactated Ringer's at a rate sufficient to correct volume loss and replace fluids.
- c. Telemetered EKG may provide information on electrolyte balance.
- d. Protect yourself and others from contact with diarrheal fluids; they are highly infectious.
  - (1) Gloves, aprons, and other protective garments should be worn.
  - (2) Try to contain stools, to minimize contamination of the ambulance. Blanket rolls may be used to create a dike, and plastic or other sheeting may be used to contain fluid within the dike.
  - (3) Change contaminated clothing and wash hands thoroughly.
- e. Before transporting, check for additional victims.
- f. Transport the patient to the most appropriate medical facility as directed by medical consultation.
- g. Fluid and electrolyte replacement should be undertaken and often can be accomplished by the use of oral rehydration salts or dilute Gatorade™. IV fluids are needed with severe dehydration. Antibiotics will shorten the duration of diarrhea and thereby decrease fluid loss — tetracycline (500 mg q 6 hr x 3 days) or doxycycline (300 mg once or 100 mg q 12 hr x 3 days). There is widespread tetracycline resistance; therefore, ciprofloxacin (500 mg q 12 hr x 3 days) or erythromycin (500 mg q 6 hr x 3 days) should also be considered.
- h. Personal contact rarely causes infection; however, enteric precautions and careful hand washing should be employed. Bactericidal solutions (hypochlorite) would provide adequate decontamination. Wash the ambulance interior if necessary and wipe with a 70% alcohol, dilute chlorine bleach, or other disinfectant. If practical, complete the decontamination before the next run.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Plague**

**Description of Agent:** Plague is an infectious disease caused by the bacteria *Yersinia pestis*. In nature, plague is most often spread by fleas that feed on infected rodents, then incidentally bite humans. When spread by that route, it classically causes a local abscess with formation of very large, abscessed, regional lymph nodes called buboes. Plague can also spread by aerosol and inhalation of sputum droplets from a coughing patient. In that manner, a primary pneumonic form develops and progresses rapidly to death without treatment. The plague can also be spread from person to person.

**Signs and Symptoms:** Pneumonic plague: incubation period is 2-3 days. High fever, chills, headache, hemoptysis, and toxemia progress rapidly to dyspnea, stridor, and cyanosis. Death results from respiratory failure, circulatory collapse, and a bleeding diathesis. Bubonic plague: incubation period is 2-10 days. Symptoms are malaise, high fever, and tender lymph nodes (buboes); they may progress spontaneously to the septicemic form, with spread to the CNS, lungs, and elsewhere.

**Diagnosis:** Clinical diagnosis. A presumptive diagnosis can be made by Gram or Wayson stain of lymph node aspirates, sputum, or CSF. Plague can also be cultured.

**Treatment:** Early administration of antibiotics is very effective, but must be started within 24 hours of the onset of symptoms in pneumonic plague. The treatment of choice is streptomycin 30 mg/kg/day IM in 2 divided doses x 10 days. Intravenous doxycycline 200 mg, then 100 mg q 12 hr x 10-14 days is also effective. Chloramphenicol is necessary to treat plague meningitis. Supportive therapy for pneumonic and septicemic forms is required.

**Prophylaxis:** A licensed, killed vaccine is available. An initial dose is needed, followed by a second smaller dose 1-3 months later, and a third 3-6 months later. A booster dose is given at 6, 12, and 18 months and then every 1-2 years. This vaccine does not protect against aerosol exposure. After face-to-face contact with a pneumonic plague patient or after a confirmed or suspected attack with aerosolized plague, doxycycline 100-mg po bid x 7 days or for the duration of exposure, whichever is longer, should be used.

**Decontamination and Isolation:** Secretion and lesion precautions should be observed for patients with bubonic plague. Strict isolation of patients with pneumonic plague is needed. Respiratory isolation with the use of a filtered respirator for those with direct contact with patients, and secretion precautions are necessary until the patient has been on antibiotics for at least 48 hours and there has been a favorable response to treatment. Heat, disinfectants, and exposure to sunlight render the bacteria harmless.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Plague**

### **1. General:**

Plague is an infectious disease caused by a bacterium called *Yersinia pestis* (formerly *Pasteurella pestis*). In nature, plague is most often spread by fleas that feed on infected rodents, then incidentally bite humans. When spread by that route, it classically causes a local abscess with formation of very large, abscessed, regional lymph nodes called buboes (hence the term "bubonic plague"). The incubation period is 2-10 days. Symptoms of malaise, high fever, and tender lymph nodes may progress spontaneously to the septicemic form and spread to the CNS, lungs, and elsewhere. Plague can also spread by aerosol and inhalation of sputum droplets from a coughing patient. In that manner, a primary pneumonic form develops and progresses rapidly to death. Person-to-person spread from a pneumonic plague victim can occur; protective measures are needed to protect against plague as well as other, more common, diseases.

Pneumonic plague: Incubation period is 2-3 days. Symptoms of high fever, chills, headache, hemoptysis, and toxemia may progress rapidly to dyspnea, stridor, and cyanosis. Death results from respiratory failure, circulatory collapse, and a bleeding diathesis.

### **2. Treatment:**

- a. Wear a properly fit-tested mask with a high-efficiency particulate (HEPA) filter, following the guidelines for control of tuberculosis.
- b. If breathing allows, the patient should be masked to stop as many of the cough droplets as possible before they evaporate to form small-diameter droplet nuclei, which are harder to filter out.
- c. Evaluate the patient for fever, cyanosis, and respiratory distress.
- d. The patient should be given oxygen during transport, as needed.
- e. All patients should receive cardiac monitoring and evaluation of oxygenation saturation via pulse oximeter.
- f. Obtain IV access with lactated Ringer's at KVO rate.
- g. The early administration of antibiotics is very effective, but must be started within 24 hours of the onset of symptoms in pneumonic plague. The treatment of choice is streptomycin 30 mg/kg/day IM in 2 divided doses x 10 days. Intravenous doxycycline 200 mg, then 100 mg q 12 hr x 10-14 days is also effective. Chloramphenicol is necessary for plague meningitis. Supportive therapy for pneumonic and septicemic forms is required.
- h. Before transporting the patient, check for additional victims.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

**Plague (continued)**

i. Transport the patient to the most appropriate medical facility as directed by medical consultation.

j. Secretion and lesion precautions should be observed for patients with bubonic plague. Strict isolation of patients with pneumonic plague is needed. Respiratory isolation and secretion precautions are necessary until the patient has been on antibiotics for at least 48 hours and there has been a favorable response to treatment. Heat, disinfectants, and exposure to sunlight render bacteria harmless.

k. Wiping the ambulance interior with a 70% alcohol or other disinfectant must be done if there is gross contamination with secretions or pus; this is a reasonable precaution in all cases. The organisms do not survive well outside a host; therefore, in an emergency with heavy demand on transport resources, decontamination need not be done before the next run unless there is gross contamination.

l. Public health officials usually recommend that others who may have been exposed take prophylactic antibiotics before they show signs of illness. If a registry is established, all emergency personnel should identify themselves and indicate when, where, and to what extent they might have been exposed. Quarantine may be imposed on those who cannot take or who refuse to take prophylactic treatment.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Q Fever**

**Description of Agent:** Q fever is an infectious disease caused by a rickettsial organism, *Coxiella burnetii*. It is usually spread by aerosolized organisms from infected animal products, such as the placenta, but could be made into an aerosol and disseminated as a terrorist weapon. Person-to-person transmission rarely, if ever, occurs. Case fatality rates are usually below 1%.

**Signs and Symptoms:** Fever, chills, sweats, coughs, headache, weakness, and pleuritic chest pain may occur as early as 10 days after exposure. Onset may be sudden or insidious and present as a "fever of unknown origin." Pneumonia is present in some cases, but pulmonary syndromes are usually not prominent. Patients are not generally critically ill, and the illness lasts from 2 days to 2 weeks.

**Diagnosis:** Q fever is not a clinically distinct illness and may resemble a viral illness or other types of atypical pneumonia. The diagnosis is confirmed serologically.

**Treatment:** Q fever is generally a self-limited illness even without treatment. Tetracycline (500 mg q 6 hr) or doxycycline (100 mg q 12 hr) are the treatments of choice and are given orally for 5 to 7 days. Q fever endocarditis (rare) is much more difficult to treat.

**Prophylaxis:** Treatment with tetracycline or doxycycline, starting between the 8th to 12th day postexposure and continued for 5 days, should prevent the onset of symptoms. An inactivated whole cell vaccine (investigation) is effective in eliciting protection against exposure, but severe local reactions to this vaccine may be seen in those who already possess immunity.

**Decontamination:** Patients who are exposed to Q fever by aerosol do not present a risk for secondary contamination or re-aerosolization of the organism. Decontamination is accomplished with soap and water or by the use of weak (0.5 percent) hypochlorite solutions.



**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Q Fever**

### **1. General:**

Q fever is an infectious disease caused by a rickettsial organism. Rickettsia is smaller than bacteria but larger than viruses. They usually live within cells, but have more complete metabolic systems than viruses. The organism that causes Q fever is called *Coxiella burnetii*. The organism is robust and infection occurs via inhalation of organisms. After an incubation period, which may require from 10 days to 3 weeks, the onset of Q fever symptoms may be sudden with chills, a headache behind the eyes, weakness, malaise, and severe sweats; or the onset may be insidious and present as a "fever of unknown origin." Pneumonia is present in some cases, but pulmonary symptoms are usually not prominent. Person-to-person transmission rarely, if ever, occurs. Case fatality rates are usually below 1%.

### **2. Treatment:**

- a. Evaluate patient for dehydration and shock (which would suggest an alternate diagnosis). If effects are mild, it might be practical to send the patient for medical care via private conveyance; hospitalization may not be necessary.
- b. IV fluids are not usually necessary, but if the patient's condition suggests dehydration or the possibility of some other diagnosis, obtain IV access and run lactated Ringer's at a rate sufficient to correct volume loss and replace fluids.
- c. Universal precautions should be practiced with respect to body fluids.
- d. Q fever is generally a self-limited illness even without treatment. Tetracycline (500 mg q 6 hr) and doxycycline (100 mg q 12 hr) are the treatments of choice and are given orally for 5 to 7 days starting between the 8th to 12th day postexposure. Q fever endocarditis (rare) is much more difficult to treat.
- e. Before transporting the patient, check for additional victims.
- f. Transport the patient to the most appropriate medical facility as directed by medical consultation.
- g. Patients who are exposed to Q fever by aerosol do not present a risk for secondary contamination or re-aerosolization of the organism. Decontamination is accomplished with soap and water or by the use of weak (0.5%) hypochlorite solutions. Wash the ambulance interior if necessary and wipe with dilute (0.5%) chlorine bleach or other appropriate disinfectant. Decontamination is not absolutely necessary before the next run unless there has been unusually heavy contamination.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Salmonella**

**Description of Agent:** Several distinct bacteria within the group *Salmonella* cause diarrheal illnesses, sometimes with a septicemia. In 1984, *Salmonella typhimurium*, which causes a diarrheal illness in humans, was used by terrorists in Oregon to contaminate foods in restaurants: 720 people became ill as a result. *Salmonella* illnesses are not rare, and cannot be distinguished on the basis of clinical signs from other causes of diarrhea. The illness would typically be less profound than with cholera. Infants are at the greatest risk of severe illness and death.

**Signs and Symptoms:** Acute onset of headache, abdominal pain, bloody diarrhea, nausea, and sometimes vomiting 6 to 72 hours after exposure to contaminated food; incubation is usually 12-36 hours. Fever is usually present. Diarrhea and anorexia often last several days. Dehydration may be severe, especially in infants.

**Diagnosis:** Fecal Gram stain and culture; serologic tests are not useful. *Salmonella* is a commonly occurring disease in the U.S. with an estimated 5 million annual cases.

**Treatment:** For uncomplicated cases, oral rehydration therapy alone is indicated. IV fluids may be needed with severe dehydration. Antibiotics may prolong the Carrier State, but should be considered with infants, the elderly, or those with underlying illnesses. Ciprofloxacin 500 mg q 12 hr x 3 days is effective.

**Prophylaxis:** No immunization available.

**Decontamination:** Enteric precautions should be practiced. Hypochlorite and/or soap and water is effective. Destroy any remaining contaminated food. Wear gloves for patient contact and specimen handling.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Salmonella**

### **1. General:**

Several distinct bacteria within the group *Salmonella* cause diarrheal illnesses, sometimes with a septicemia (where organisms are also multiplying in the blood and other tissue). In 1984, *Salmonella typhimurium*, which causes a diarrheal illness in humans, was used by terrorists in Oregon to contaminate foods in restaurants: 720 people became ill as a result. *Salmonella* illnesses are not rare, and cannot be distinguished on the basis of clinical signs from other causes of diarrhea. The illness would typically be less profound than with cholera. Infants are at the greatest risk of severe illness and death. Signs and symptoms include the acute onset of headache, abdominal pain, bloody diarrhea, nausea, and sometimes vomiting 6 to 72 hours after exposure to contaminated food; incubation is usually 12-36 hours. Fever is usually present. Diarrhea and anorexia often last several days. Dehydration may be severe, especially in infants.

### **2. Treatment:**

a. Evaluate the patient for dehydration and shock. If the patient has only mild effects, it might be practical to send him/her for medical care via private conveyance; hospitalization may not be necessary.

b. Obtain IV access with a large-bore needle and run lactated Ringer's at a rate sufficient to correct volume loss and replace fluids.

c. Telemetered EKG may provide information on electrolyte balance.

d. Protect yourself and others from contact with diarrheal fluids; they are highly infectious.

(1) Gloves, aprons, and other protective garments should be worn.

(2) Try to contain the patient's stools and to minimize contamination of the ambulance. Blanket rolls may be used to create a dike and plastic or other sheeting may be used to contain fluid within the dike.

(3) Change contaminated clothing and wash hands thoroughly.

e. For uncomplicated cases, oral rehydration therapy alone is indicated. IV fluids may be needed with severe dehydration. Antibiotics may prolong the Carrier State, but should be considered with infants, the elderly, or those with underlying illnesses. Ciprofloxacin 500 mg q 12 hr x 3 days is effective.

f. Before transporting the patient, check for additional victims.

g. Transport the patient to the most appropriate medical facility as directed by medical consultation.

h. Enteric precautions should be practiced. Hypochlorite and/or soap and water is effective. Destroy any remaining contaminated food. Wash the ambulance interior if necessary and wipe with a 70% alcohol, dilute chlorine bleach, or other disinfectant. If practical, complete the decontamination before the next run.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
FACT SHEET**

## **Staphylococcal Enterotoxin B**

**Description of Agent:** Staphylococcus enterotoxin B (SEB) is one of several toxins produced by the bacteria *Staphylococcus aureus*. SEB is a common contributor to staphylococcal food poisoning but can also be disseminated as an aerosol and inhaled.

**Signs and Symptoms:** From 3-12 hours after aerosol exposure, there is the sudden onset of fever, chills, headache, myalgia, and nonproductive cough. Some patients may develop shortness of breath and retrosternal chest pain. The fever may last 2 to 5 days, and the cough may persist for up to 4 weeks. Patients may also present with nausea, vomiting, and diarrhea if they swallow toxin. Higher exposure levels can lead to pulmonary edema, and rarely, death.

**Diagnosis:** Diagnosis is clinical. Patients present with a febrile respiratory syndrome without CXR abnormalities. Large numbers of people presenting with typical symptoms and signs of SEB pulmonary exposure would suggest an intentional attack with this toxin.

**Treatment:** Treatment is limited to supportive care. Artificial ventilation might be needed for very severe cases, and attention to fluid management is important.

**Prophylaxis:** Use of protective mask. There is currently no human vaccine available to prevent SEB intoxication.

**Decontamination:** Hypochlorite (bleach) and/or soap and water. Destroy any food that may have been contaminated.

**WEAPONS OF MASS DESTRUCTION SUPPLEMENT  
TREATMENT PROTOCOL**

## **Staphylococcus Enterotoxin B**

### **1. General:**

Staphylococcus enterotoxin B (SEB) is a substance produced by Staphylococcus aureus. SEB is common contributor to foodborne enteritis outbreaks but can also be disseminated as an aerosol and inhaled. Symptoms usually follow inhalation by 3 to 12 hours and would include sudden onset of fever, headache, chills, pain in the muscles, and a nonproductive cough. Nausea, vomiting, and watery diarrhea may be accompanied by heavy fluid losses and a feeling of profound malaise leading to incapacitation; higher doses can lead to a toxic shock syndrome and death. Reddening of the eyes is common. Overall, the mortality rate from an attack would be lower than that from many other biological agents.

### **2. Treatment:**

- a. Evaluate the patient for dehydration and shock.
- b. Obtain IV access with a large-bore needle and run lactated Ringer's at a rate sufficient to correct volume loss and replace fluids.
- c. Telemetered EKG may provide information on electrolyte balance.
- d. Diarrheal fluids are not dangerous, but you may not know whether you are dealing with SEB or cholera or Salmonellosis. Therefore, treat diarrheal fluids as highly infectious.
  - (1) Don gloves and aprons or other protective garments.
  - (2) Try to contain stools, to minimize contamination of the ambulance. Blanket rolls may be used to create a dike, and plastic or other sheeting may be used to contain fluid within the dike.
  - (3) Change contaminated clothing and wash hands thoroughly.
- e. Treatment is limited to supportive care. Artificial ventilation might be needed for very severe cases, and attention to fluid management is important.
- f. Before transporting the patient, check for additional victims.
- g. Transport the patient to the most appropriate medical facility as directed by medical consultation.
- h. Decontaminate with hypochlorite (bleach) and/or soap and water. Destroy any food that may have been contaminated. Wash the ambulance interior if necessary and wipe with a 70% alcohol, dilute chlorine bleach, or other disinfectant. If practical, complete the decontamination before the next run.

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