

The Maryland

Medical Protocols

for Emergency Medical Services Providers

Effective July 1, 2010

**Maryland Institute for
Emergency Medical Services Systems**



The complete “Maryland Medical Protocols for
Emergency Medical Services Providers” is also avail-
able on the Internet. Check out the MIEMSS website
www.MIEMSS.org.

To All Health Care Providers in the State of Maryland:

Re: 2010 Revisions, updates, and additions to Maryland Medical Protocols for EMS Providers

EMS providers will be able to download the replacement pages from the MIEMSS website at www.miemss.org. They will also be receiving a single copy of the 2010 pocket protocols which will have the core protocol changes for quick reference and review. The EMS Board has approved the following: Protocol Changes, Procedure Protocols, Optional Supplemental Protocol, Pilot Protocols, and Research Protocol for implementation on July 1, 2010. Prior to July 1, 2010 all EMS providers (BLS and ALS) must complete a protocol rollout session that will cover the new material. The major protocol additions, deletions, and changes are listed below, but there are terminologies, dosing, and age adjustments that will be highlighted during the educational roll-out.

Protocol Changes

1. Hyperkalemia - Renal Dialysis/Failure or Crush Syndrome
2. New Medication or Concentration –
 - a. Acetaminophen for pain management
 - b. Lidocaine 4% nasal spray or gel - Nasal Pharyngeal Anesthesia (12 years and greater) for Nasotracheal Intubation with removal of Benzocaine from formulary
3. Emphasizing respiratory support
 - a. “Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer”
4. Modification of EMS/DNR-A
 - a. CPAP is allowed.
 - b. Removal of intubation as a skill for EMS/DNR-A patients in respiratory distress
 - i. The only skill that will not be allowed is nasal or oral intubation.
 - ii. Inappropriate Care for an EMS/DNR Option A - “Maximal (Restorative) Care Before Arrest, Then DNR (1) Nasal or Oral Intubation”
5. GPC – Treatment Section
“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 albuterol 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 re-establish 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. 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.
ALERT: Do not administer oral medications (exception glucose paste) to patients with an altered mental status.”
6. Adjust instruction “(c) - Uterine massage is performed with heel of hand applying firm pressure from the pubis toward the umbilicus only. This massage is continued until bleeding diminishes. RAPID TRANSPORT.”
7. GPC Trauma Communications: (d, e, and f are new)
 5. Trauma Communications
The following information must be communicated to the appropriate Trauma Center and/or Local Hospital:
 - a) Patient's age(s), injuries, ETA;
 - b) Number of victims;
 - c) Detailed description of the incident.
 - d) Provide patient Trauma Decision Tree Category (A-D).
 - e) Provide assigned patient priority (1 to 4).
 - f) Pertinent patient signs and symptoms (e.g. HR, RR, BP, Pulse Ox and GCS)

Procedure Protocols

1. Latex-Free Dual Lumen Tube (e.g. EasyTube®)
2. Helicopter Utilization – Consolidation of current medevac request criteria with the addition of Optimal Landing Zone and Safety Guidance

Optional Supplemental Protocols

1. Neuroprotective Induced Hypothermia (Therapeutic) After Cardiac Arrest - Scene & Interfacility Transfer

Pilot Protocols

1. On-Scene Protocol and Alternative Dispatch Protocol During Declared Public Health Emergency for Pandemic Influenza
2. Video Laryngoscope/Glidescope® Ranger for Orotracheal Intubation
3. Modification of the Vaccination and Testing Protocol in response to the Governor's Executive Order, November 6, 2009 (in effect only as long as the Governor's Executive Order is active)

Research Protocol

1. RAMPART: Study comparing efficacy of IV Lorazepam to IM Midazolam for seizure management in adults.

Remember, it is the responsibility of each provider to review the 2010 material to ensure he/she is familiar with the revisions. If you have any questions regarding the update, please contact the Office of the State EMS Medical Director at 410-706-0880. Thank you for your hard work and dedication.

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State EMS Medical Director, MIEMSS

Robert Bass, M.D., FACEP
Executive Director, MIEMSS

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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-B, CRT-(I), or EMT-P 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-B/CRT-(I)/EMT-P 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-B/CRT-(I)/EMT-P must document the treatment rendered and the reason on-line medical consultation could not be obtained on the Patient Care Report (PCR), the equivalent of the MAIS runsheet, 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.



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 A FIRST 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 FIRST RESPONDER IS JURISDICTIONALLY AUTHORIZED TO USE AN AED AND/OR THE FIRST RESPONDER HAS BEEN EDUCATED AND TRAINED TO PROVIDE OXYGEN AND/OR AED THERAPY.

THE FIRST RESPONDER SHALL DOCUMENT ALL PATIENT CARE.

B. IMPORTANT NUMBERS

- | | | |
|--|-----------|--|
| 1. Commercial Ambulance Licensing and Regulation | Office | (410) 706-8511
(888) 200-5015 |
| | Fax | (410) 706-8552 |
| 2. Critical Incident Stress Management | | (800) 648-3001 |
| 3. Office of Education, Licensure, & Certification | Office | (800) 762-7157 |
| | Fax | (410) 706-2367 |
| 4. Regional Programs | | |
| a) Region I (Allegany & Garrett counties) | Office | (301) 895-5934 |
| | Fax | (301) 895-3618 |
| b) Region II (Washington & Frederick counties) | Office | (301) 791-2366
(301) 416-7249 |
| | Fax | (301) 791-9231 |
| c) Region III (Baltimore City, and Anne Arundel, Baltimore, Carroll, Harford, and Howard counties) | Office | (410) 706-3996 |
| | Fax | (410) 706-8530 |
| d) Region IV (Caroline, Cecil, Dorchester, Kent, Queen Anne's, Somerset, Talbot, Wicomico, and Worcester counties) | Office | (410) 822-1799 |
| | Toll Free | (877) 676-9617 |
| | Fax | (410) 822-0861 |
| e) Region V (Calvert, Charles, Montgomery, Prince George's, and St. Mary's counties) | Office | (301) 474-1485 |
| | Toll Free | (877) 498-5551 |
| | Fax | (301) 513-5941 |
| 5. State EMS Medical Director | Office | (410) 706-0880 |
| | Fax | (410) 706-0853 |
| 6. SYSCOM (Administrative) | | 800-648-3001 |
| 7. EMRC | | |
| a) Consult Line (Regions I-IV) | | (800) 492-3805 |
| b) Consult Line (Region V) | | (877) 840-4245 |

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) Hospice of Baltimore–Gilchrist Center **(410) 512-8200**
 - b) Joseph Richey Hospice–Joseph Richey House **(410) 523-2150**
 - c) Stella Maris Hospice **(410) 560-9695**
 - d) Stella Maris Hospice at Mercy Hospital **(410) 332-9534**

C. HEALTH CARE FACILITY CODES

Code	Health Care Facility Name
345	10th Street Medical Center, Ocean City, MD
346	26th Street Medical Center, Ocean City, MD
379	63rd Street Medical Center, Ocean City, MD
380	75th Street Medical Center, Ocean City, MD
347	93rd Street Medical Center, Ocean City, MD
409	126th Street Medical Center, Ocean City, MD
751	Alfred I. DuPont Hospital for Children (formerly Alfred I. DuPont Institute)
492	Alleghany General Hospital, Alleghany, PA (former facility code 422)
397	Altoona Rehabilitation Hospital
231	Andrew Rader Clinic, VA
221	Anne Arundel Medical Center (Base Station)
421	Anne Arundel Medical Primary Stroke Center
382	Anne Arundel Medical Park
550	Annie M. Warner Hospital
381	Atlantic General Hospital (Base Station)
581	Atlantic General Hospital Primary Stroke Center
590	Baltimore City Public Service Infirmary (former facility code 520)
222	Baltimore Washington Medical Center (Base Station)
422	Baltimore Washington Medical Primary Stroke Center
350	Bayhealth Medical Center, Kent Hospital (formerly Kent General)
359	Bayhealth Medical Center, Milford Hospital (formerly Milford Memorial Hospital)
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
754	Bryn Mawr Rehabilitation Hospital at Maryland General
771	Calvert County Nursing Home Center
266	Calvert Memorial Hospital (Base Station)
466	Calvert Memorial Hospital Primary Stroke Center
554	Carlisle Regional Medical Center, PA
555	Carpenter's Clinic
219	Carroll Hospital Center (Base Station)
755	Central Industrial Medical Center
276	Chambersburg Hospital, PA
284	Charlestown Area Medical Center
241	Chemtrec Chemical Manufacturers Association Chemical Transportation Emergency Center, Washington, DC
296	Chester River Hospital Center (formerly Kent & Queen Anne's Hospital) (Base Station)
243	Chestnut Lodge Hospital
225	Children's Hospital & Center for Reconstructive Surgery - Baltimore, MD

Code	Health Care Facility Name
756	Children's Hospital of Philadelphia, PA
317	Children's National Medical Center, DC (Pediatric Base Station)
818	Children's National Medical Center Neonatal Center - Wash., DC
717	Children's National Medical Center Pediatric Trauma Center - Wash., DC
718	Children's National Medical Center Pediatric Burn Center - Wash., DC
304	Christiana Care Health Systems, Christiana Hospital
299	Christiana Care Health Systems, Wilmington Hospital (formerly Wilmington Hospital)
341	City Hospital, Martinsburg, WV
291	Civista Medical Center (Base Station)
591	Civista Medical Primary Stroke Center
245	Columbia Hospital for Women Medical Center, Washington, DC
383	Columbia Medical Plan
757	Cooper Trauma Center, NJ
248	Crownsville State Hospital
252	Cullen Center
342	DC General Hospital
842	DC General Hospital Neonatal Center
293	Deer's Head State Hospital
556	Delaware Memorial Hospital, DE
256	DeWitt Army Hospital, VA
329	Doctor's Community Hospital (formerly Doctor's Hospital of P.G. Co.) (Base Station)
257	Dominion Hospital, VA
294	Dorchester General Hospital
310	Dover U.S. Air Force Clinic (formerly Dover U.S. Air Force Hospital)
302	DuPont Memorial Hospital
491	Eastern Neurological Rehabilitation Hospital (formerly facility code 421)
331	Eastern Shore State Hospital
557	Elizabethtown Children's Hospital
306	Ellsmere Veteran's Administration Hospital, DE
558	Emmitsburg Hospital
258	Finan Center
279	Fort Dietrick Medical Center
247	Fort Howard Veteran's Administration Hospital
522	Fort Washington Hospital (Base Station)
203	Franklin Square Hospital Center (Base Station)
503	Franklin Square Hospital Primary Stroke Center
239	Frederick Memorial Hospital (Base Station)
253	Freeman Hospital
286	Fulton County Medical Center, PA
322	Garrett County Memorial Hospital (Base Station)
580	Geisinger Medical Center, PA
335	George Washington University Hospital, DC
337	Georgetown University Hospital, DC
737	Georgetown University Hospital Eye Trauma Center, DC
240	Gettysburg Hospital, PA
759	Gladys Spellman Nursing Center
226	Good Samaritan Hospital of Maryland (Base Station)

Code	Health Care Facility Name
526	Good Samaritan Hospital Primary Stroke Center, MD
559	Grant Memorial Hospital
217	Greater Baltimore Medical Center (Base Station)
517	Greater Baltimore Medical Primary Stroke Center
817	Greater Baltimore Medical Center Neonatal Center
261	Greater Northeast Medical Center, DC (see also Northeast Georgetown #313)
316	Greater Southeast Community Hospital, DC
760	The Greenery
348	Groupe Memorial Hospital
263	Gundry Hospital
363	Hadley Memorial Hospital, DC
560	Hagerstown State Hospital
561	Hampshire Memorial Hospital, WV
242	Hanover Hospital, PA
211	Harbor Hospital Center (formerly South Baltimore General Hospital) (Base Station)
511	Harbor Hospital Primary Stroke Center
220	Harford Memorial Hospital (Base Station)
520	Harford Memorial Hospital Primary Stroke Center
562	Harryon State Hospital
399	Health South Chesapeake Rehabilitation Center (formerly Chesapeake Rehabilitation Hospital)
490	Health South Rehabilitation Hospital of Altoona (former facility code 420)
267	Highland State Health Facility Psychiatric Unit
244	Holy Cross Hospital (Base Station)
544	Holy Cross Hospital Primary Stroke Center
450	Hospice of Baltimore - Gilchrist Center - Baltimore, MD
268	Hospital for Sick Children, DC
223	Howard County General Hospital (Base Station)
523	Howard County General Hospital Primary Stroke Center
270	Howard University Hospital, 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
601	Johns Hopkins Bayview Adult Trauma Center
701	Johns Hopkins Bayview Adult Burn Unit
201	Johns Hopkins Bayview Medical Center (Base Station)
501	Johns Hopkins Bayview Medical Primary Stroke Center
801	Johns Hopkins Bayview Neonatal Center
901	Johns Hopkins Bayview Perinatal Center
761	Johns Hopkins Comprehensive Geriatric Center
766	Johns Hopkins Bayview Medical Center Transitional Care Unit
204	Johns Hopkins Hospital (Pediatric & Adult Base Station)

Code	Health Care Facility Name
504	Johns Hopkins Hospital Primary Stroke Center
604	Johns Hopkins Hospital Adult Trauma Center
705	Johns Hopkins Hospital Eye Trauma Center
706	Johns Hopkins Hospital Inpatient Rehabilitation Center
804	Johns Hopkins Hospital Neonatal Intensive Care Unit
704	Johns Hopkins Hospital Pediatric Trauma Center
707	Johns Hopkins Hospital Pediatric Burn Center, Baltimore, MD
904	Johns Hopkins Hospital Perinatal Center
451	Joseph Richey Hospice - Joseph Richey House, Baltimore, MD
274	Kennedy-Krieger Institute (formerly John F. Kennedy Institute for Handicapped Children)
227	Kernan Hospital
277	Keswick Home for the Incurables of Baltimore City
262	Kimbrough Army Hospital
563	Kings Daughters Hospital, WV
259	Kirk Army Hospital
403	Lancaster General Hospital, PA
564	Lancaster Osteopathic Hospital, PA
352	Laurel Regional Hospital (formerly Greater Laurel Beltsville Hospital)
773	Laurel Regional Hospital–Rehabilitation
565	Leesburg Hospital, VA
278	Levindale Hebrew Geriatric Center & Hospital
209	Liberty Medical Center (formerly Provident Hospital)
205	Liberty Medical Center Psychiatric Center (formerly Lutheran Hospital)
255	Lincoln Memorial Hospital
354	Malcolm Grow U.S. Air Force Medical Center
280	Mary Washington Hospital, VA
206	Maryland General Hospital (Base Station)
506	Maryland General Hospital Primary Stroke Center
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 Veteran's Administration Hospital, VA
398	Mechanicsburg Rehabilitation Hospital
774	Medlink, DC
404	Memorial Hospital, PA
567	Memorial Osteopathic Hospital, PA
597	The Memorial Hospital at Easton, MD, Inc. Primary Stroke Center
207	Mercy Medical Center, Baltimore, MD (Base Station)
507	Mercy Medical Primary Stroke Center - Baltimore, MD
807	Mercy Medical Center, Neonatal Center - Baltimore, MD
907	Mercy Medical Center, Perinatal Center - Baltimore, MD
271	Monongalia General Hospital, WV
228	Montebello Center - Baltimore, MD
264	Montgomery General Hospital (Base Station)

Code	Health Care Facility Name
464	Montgomery General Hospital Primary Stroke Center
292	Mount Washington Pediatric Hospital
400	Myersdale Medical Center, PA
351	Nanticoke Memorial Hospital
295	National Capital Poison Center, Washington, DC
334	National Hospital for Orthopedics & Rehabilitation, VA
308	National Institute of Mental Health
356	National Institutes of Health Clinical Center
355	National Naval Medical Center
307	Newark Emergency Center, Newark, DE
568	Newark Hospital, NJ
762	Newmedico Rehabilitation
753	Northampton-Accomac Memorial Hospital
313	Northeast Georgetown Medical Center (see also Greater Northeast # 261)
315	Northern Virginia Doctor's Hospital, VA
218	Northwest Hospital Center (Base Station)
309	NRH Regional Rehabilitation @ Irving Street, Washington, DC (formerly National Rehabilitation Hospital)
408	Peninsula Regional Medical Center (Base Station)
454	Peninsula Regional Medical Center, Transitional Care Unit
508	Peninsula Regional Medical Primary Stroke Center
608	Peninsula Regional Medical Center, Trauma Center
419	Penn State Children's Hospital, Hershey, PA
301	Penn State Milton Hershey Medical Center, PA
318	Perkins State Hospital
357	Perry Point Veteran's Administration Hospital
569	Pittsburgh Institute for Rehabilitation
362	Pocomoke City Medical Center
361	Pocomoke Family Health Center
338	Police & Fire Clinic, Washington, DC
325	Potomac Hospital, VA
401	Potomac Valley Hospital, WV
232	Prince George's Hospital Center (Base Station)
632	Prince George's Hospital Center Adult Trauma Center
832	Prince George's Hospital Center Neonatal Center
344	Prince William Hospital, VA
288	Providence Hospital, DC
378	Psychiatric Institute of DC
364	Psychiatric Institute of Montgomery County
634	R Adams Cowley Shock Trauma Center - Adult Trauma Center (Base Station)
734	R Adams Cowley Shock Trauma Center - Hyperbaric Unit
735	R Adams Cowley Shock Trauma Center - Neurotrauma Unit
570	Reading Medical Center
571	Riverside Hospital, DE
311	Riverside Hospital, VA
365	Rosewood Center
461	Ruby Hospital Morgantown, WV

Code	Health Care Facility Name
572	Sacred Heart Hospital, PA
573	Saint Agnes Burn Center, PA (formerly listed as a Delaware facility)
212	Saint Agnes Hospital (Base Station)
512	Saint Agnes Hospital Primary Stroke Center
812	Saint Agnes Hospital Neonatal Center
912	Saint Agnes Hospital Perinatal Center
366	Saint Elizabeth's Hospital, Washington, DC
303	Saint Francis Hospital, WV
460	Saint Francis Hospital, Wilmington, DE
213	Saint Joseph Hospital, MD (Base Station)
513	Saint Joseph Hospital Primary Stroke Center
405	Saint Joseph Hospital, PA
367	Saint Luke Institute
333	Saint Mary's Hospital (Base Station)
533	Saint Mary's Hospital Primary Stroke Center
455	Salisbury Genesis Center
265	Shady Grove Adventist Hospital (Base Station)
465	Shady Grove Adventist Hospital Primary Stroke Center
368	Sheppard & Enoch Pratt Hospital
294	Shore Health Systems, Dorchester General Hospital (formerly listed as Dorchester General Hospital) (Base Station)
297	Shore Health Systems, Easton Memorial Hospital (formerly listed as Easton Memorial Hospital) (Base Station)
324	Sibley Memorial Hospital, Washington, D.C.
750	Sinai Head Injury Rehabilitation Hospital
210	Sinai Hospital of Baltimore (Base Station)
510	Sinai Hospital of Baltimore Primary Stroke Center
610	Sinai Hospital of Baltimore Adult Trauma Center
810	Sinai Hospital of Baltimore Neonatal Center
910	Sinai Hospital of Baltimore Perinatal Center
770	Sinai Rehabilitation Hospital
772	Solomon's Nursing Home Center
360	Southern Chester County Medical Center, PA
343	Southern Maryland Hospital Center (Base Station)
543	Southern Maryland Hospital Primary Stroke Center
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, MD
453	Stella Maris Hospice at Mercy Medical Center - Baltimore, MD
249	Suburban Hospital Association (Base Station)
549	Suburban Hospital Association Primary Stroke Center
649	Suburban Hospital Association Adult Trauma Center
763	Suburban Hospital, Inc., Skilled Nursing Facility
371	Tawes-Bland Bryant Nursing Center
574	Taylor Hospital, WV

Code	Health Care Facility Name
312	Taylor Manor Hospital
372	TB Clinic
373	Tidewater Memorial Hospital, VA
254	University Specialty Hospital - formerly Deaton Hospital & Medical Center of Christ Lutheran Church
224	Upper Chesapeake Health System
374	U.S. Naval Medical Clinic, Annapolis
576	U.S. Public Health Hospital, MD
375	U.S. Soldier's and Airmen's Home, DC
298	Union Hospital of Cecil County (Base Station)
214	Union Memorial Hospital (Base Station)
514	Union Memorial Hospital Primary Stroke Center
714	Union Memorial Hospital, Curtis Hand Center
215	University of Maryland Medical System (Base Station)
515	University of Maryland Medical System Primary Stroke Center
815	University of Maryland Medical System Neonatal Center
915	University of Maryland Medical System Perinatal Center
575	University of Pennsylvania Hospital
551	University of Pittsburgh Medical Center Bedford Memorial, PA
224	Upper Chesapeake Health System (formerly Fallston General Hospital) (Base Station)
524	Upper Chesapeake Health System Primary Stroke Center
407	Upper Shore Mental Health Center
246	Veteran's Administration Hospital - Baltimore, MD
577	Veteran's Administration Hospital - Wilmington, DE
376	Veteran's Administration Medical Center, DC
275	Veterans Affairs Medical Center, Martinsburg, VA (formerly Martinsburg V.A. Hospital and Newton T. Baker Hospital)
233	Virginia Hospital Center, VA
238	Walter P. Carter Center
250	Walter Reed Army Medical Center, DC
377	Walter Reed Hospital Annex
282	War Memorial Hospital, Berkeley Springs, WV
552	War Memorial Hospital, Berkeley Springs, WV (formerly Berkeley Springs Hospital, WV)
328	Washington Adventist Hospital (Base Station)
289	Washington County Health System, MD (Base Station)
589	Washington County Health System Primary Stroke Center
689	Washington County Health System, Adult Trauma Center
789	Washington County Health System, Comprehensive Inpatient Rehabilitation Services, MD
456	Washington County Health System, Psychiatric Unit
764	Washington County Health System, Skilled Nursing Facility, MD
327	Washington Hospital Center, DC
728	Washington Hospital Center, DC, Adult Trauma Center
727	Washington Hospital Center, DC, Burn Center
269	Waynesboro Hospital, Waynesboro, PA

Code	Health Care Facility Name
323	West Virginia University Hospital, WV
290	Western Maryland Center, MD
395	Western Maryland Regional Medical Center (Base Station) (NEW '10)
495	Western Maryland Regional Medical Center, Primary Stroke Center (NEW '10)
695	Western Maryland Regional Medical Center, Trauma Center (NEW '10)
776	Western Maryland Regional Medical Center, Psychiatric Unit (NEW '10)
402	Western Pennsylvania University Hospital, PA
283	Winchester Medical Center
578	Woodrow Wilson Rehabilitation Center, VA
579	Yale - New Haven Hospital
272	York Hospital, PA
765	York Rehabilitation Hospital, PA
888	Other Facility

D. MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS

Trauma Centers

Primary Adult Resource Center

- R Adams Cowley Shock Trauma Center, University of Maryland Medical System, Baltimore

Level I Trauma Center

- Johns Hopkins Hospital Adult Trauma Center, Baltimore

Level II Trauma Centers

- Johns Hopkins Bayview Medical Center, Baltimore
- Prince George's Hospital Center, Cheverly
- Sinai Hospital of Baltimore
- Suburban Hospital, Bethesda

Level III Trauma Centers

- Western Maryland Regional Medical Center
- Peninsula Regional Medical Center, Salisbury
- Washington County Hospital, Hagerstown

Specialty Referral Centers

Eye Trauma

- Wilmer Eye Institute's Eye Emergency Service/Johns Hopkins Hospital, Baltimore

Hand/Extremity Trauma

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

Hyperbaric Medicine

- Hyperbaric Medicine Center/R Adams Cowley Shock Trauma Center/ University of Maryland Medical System, Baltimore

Neurotrauma (Head and Spinal Cord Injuries)

- Neurotrauma Center/R Adams Cowley Shock Trauma Center/ University of Maryland Medical System, Baltimore

Pediatric Trauma

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

Burns

- Baltimore Regional Burn Center/ Johns Hopkins Bayview Medical Center, Baltimore
- Burn Center/ 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 Hospital Center, Baltimore
- Greater Baltimore Medical Center, Towson
- Holy Cross Hospital, Silver Spring
- Howard County General Hospital
- Johns Hopkins Bayview Medical Center, Baltimore
- Johns Hopkins Hospital, Baltimore
- Mercy Medical Center, Baltimore
- Prince George's Hospital Center, Cheverly
- St. Agnes Health Care, Baltimore
- St. Joseph Medical Center, Baltimore
- Shady Grove Adventist Hospital, Gaithersburg
- Sinai Hospital of Baltimore
- University of Maryland Medical System, Baltimore

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 & ALS) SHOULD CHECK ALL PEDIATRIC SECTIONS FOR NECESSARY CARE.



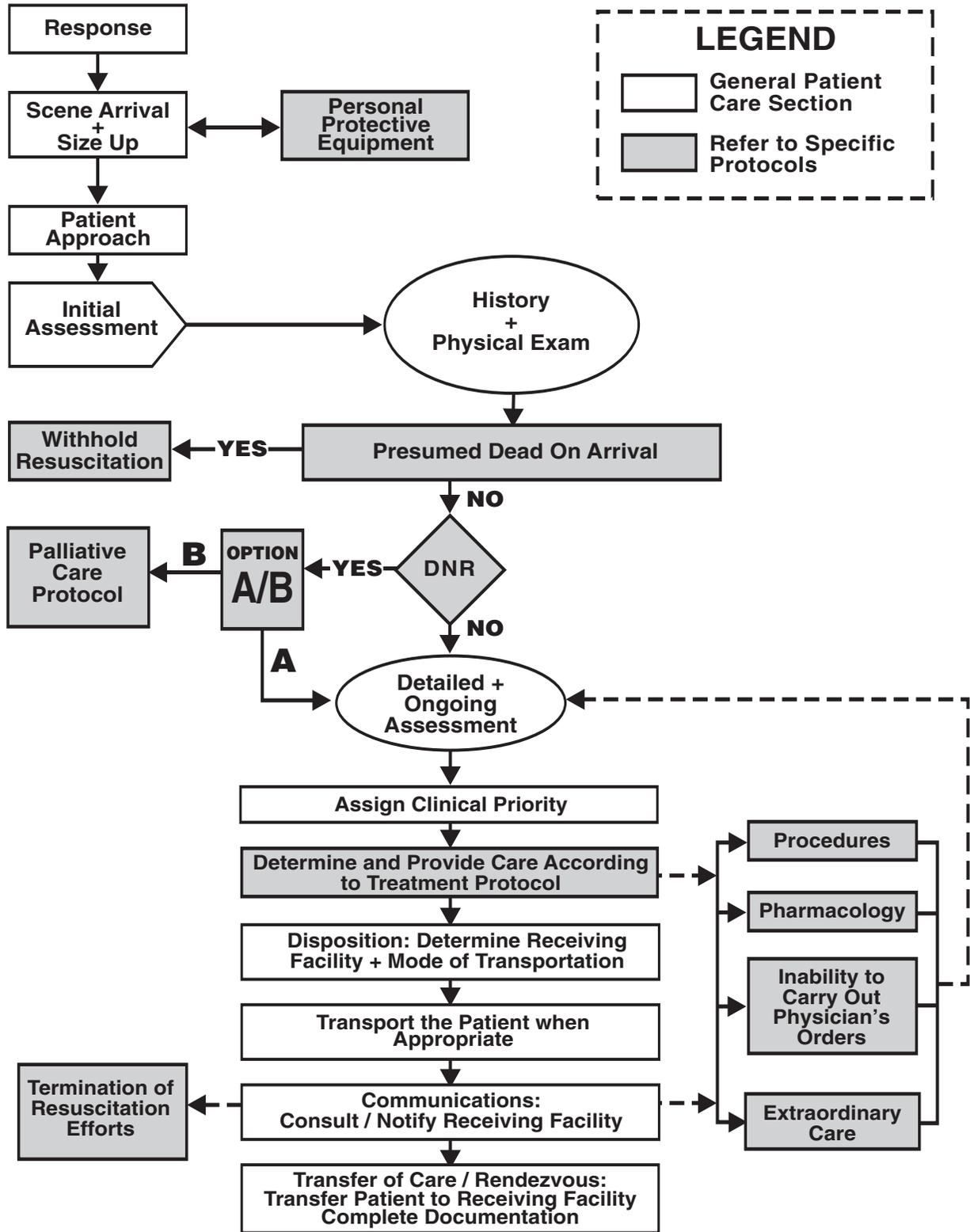
5. Caution/Warning/Alert



or Italics

6. Indicates EMT-Paramedic only

F. PROTOCOL USAGE FLOW DIAGRAM



G. PROTOCOL VARIATION PROCEDURE (NEW '10): 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:
 - i) Local EMS jurisdiction,
 - ii) Program Medical Director,
 - iii) MIEMSS Compliance Office, and
 - iv) 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.

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H. INABILITY TO CARRY OUT PHYSICIAN ORDER (NEW '10): 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 (MAIS, E-MAIS, etc.) 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 the MIEMSS Regional EMS Administrator being notified at the discretion of the Regional Medical Director, and a copy to the State EMS Medical Director.
 - b) Shall within **14 days** of the written notification of the incident, initiate a QA investigation under the authority of the Medical Review Committee.
 - c) Shall 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 and a copy to the State EMS Medical Director.
 - b) Shall within **14 days** of the written notification of the incident, initiate a QA investigation under the authority of the Medical Review Committee.
 - c) Shall 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.

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I. PHYSICIAN ORDERS FOR EXTRAORDINARY CARE NOT COVERED BY MARYLAND PROTOCOL: To maintain the life of a specific patient, it may be necessary, in rare instances, for the physician providing on-line medical consultation, as part of the EMS consultation system, to direct a prehospital provider in rendering care that is not explicitly listed within the Treatment Protocols.

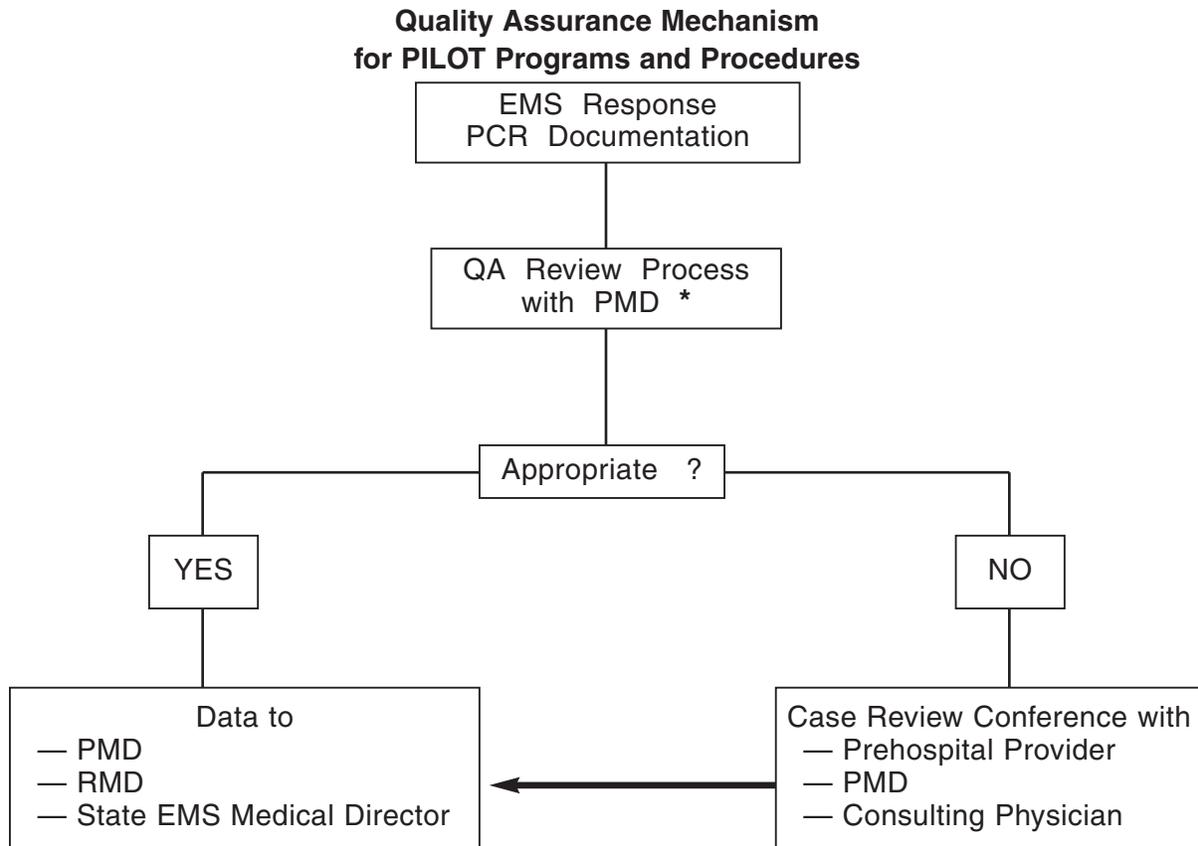
1. **ALL** of the following criteria **MUST** be present for prehospital providers to proceed with an order under this section:
 - a) During the consultation, both the consulting physician and the provider must acknowledge and agree that the patient's condition and extraordinary care are not addressed 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, based on the instructions given by the consulting physician, of correctly performing the care directed 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 his/her 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, he/she shall proceed with the "Inability to Carry Out a Physician's 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. The extraordinary care protocol is intended to address the potential moral/ethical dilemma which may arise in unanticipated or unforeseen situations not specifically addressed within protocols. The 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.

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 Regional Medical Director and the State EMS Medical Director.

2. If a variance or questions arise 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 Regional Medical Director and the State EMS Medical Director.



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

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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

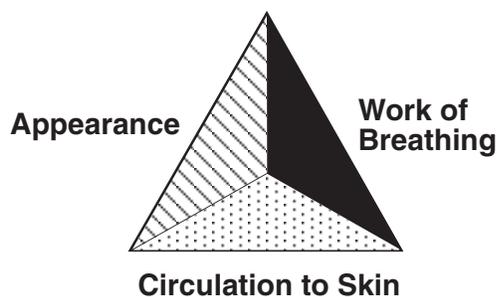
1. Determine the Mechanism of Injury (MOI)/Nature of Illness (NOI).
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures.

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 MEDICAL FACILITY**. ONCE THE PATIENT PRESENTS TO THE HOSPITAL **OR DESIGNATED FREESTANDING MEDICAL FACILITY** FOR TREATMENT OF AN EMERGENCY CONDITION, TREATMENT AND TRANSFER DECISIONS ARE THE RESPONSIBILITY OF THE HOSPITAL UNDER APPLICABLE LAW. THE PROVIDER SHOULD STAND BY TO BE AVAILABLE FOR AND ASSIST WITH TRANSFER OF THE PATIENT IF THE HOSPITAL DETERMINES SUCH A TRANSFER IS APPROPRIATE.

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

3. Breathing

- a) Determine if breathing is adequate.
 - (1) If patient's ventilations are not adequate, provide assistance with 100% oxygen using Bag-Valve-Mask (BVM). (The use of a manually activated positive pressure oxygen delivery device is allowed when a BVM is not available.)
 - (2) Consider pulse oximetry, if available.

Percent O ₂ Saturation	Ranges	General Patient Care
95–100%	Normal	Give Oxygen as necessary
91–94%	Mild Hypoxia	Give Oxygen as necessary
86–90%	Moderate Hypoxia	Give 100% Oxygen Assisting Ventilations (NEW '10)
≤ 85%	Severe Hypoxia	Give 100% Oxygen Assist Ventilations if necessary If indicated, Intubate
<i>False SPO₂ readings may occur in the following patients:</i> Hypothermic, Hypoperfusion (Shock), Carbon Monoxide Poisoning, Hemoglobin Abnormality, Anemic, and Vasoconstriction.		

- b) Hyperventilate the head-injured patient as follows:
 - Adult 20 breaths per minute
 - Child 30 breaths per minute
 - Infant 35 breaths per minute
 - (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis
 - (2) Who is manifesting a rapidly decreasing GCS **or**,

- (3) With on-line medical consultation.
- c) Administer oxygen as appropriate.
 - (1) Administer oxygen at 12-15 lpm NRB mask to all priority 1 patients (including COPD).
 - (2) Administer oxygen at 12-15 lpm NRB to all priority 2 patients (including COPD) experiencing cardiovascular, respiratory, or neurological compromise.
 - (3) Administer oxygen at 2-6 lpm by nasal cannula or 6-15 lpm mask delivery device to ALL other priority 2 patients and priority 3 patients with no history of COPD.
 - (4) Priority 3 patients, with a history of COPD or patients with chronic conditions, should receive their prescribed home dosage of oxygen. If patients are not on home oxygen, they should receive oxygen at 2-6 lpm nasal cannula or 6 lpm mask delivery device, if indicated.



NEVER WITHHOLD OXYGEN FROM A PATIENT IN RESPIRATORY DISTRESS!

DEVICE	FLOW RATE	CONCENTRATION
Nasal Cannula	2-6 lpm	24-44% (NEW '10)
Venturi Mask	Variable	24-50%
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
 - a) Assess pulse.
 - (1) Patients less than 1 year of age:
 - (a) If pulse is absent, begin CPR and use manual defibrillator.
 - (b) If patient is symptomatic with poor perfusion (unresponsive or only responds to painful stimuli) and pulse is less than 60 bpm:
 - (i) Ventilate for 30 seconds.
 - (ii) If after 30 seconds, the pulse is less than 60 bpm, begin CPR.
 - (c) If pulse greater than 60 bpm, continue assessment.
 - (2) Patients 1 year of age or greater but who have not reached their 12th birthday:
 - (a) If pulse is absent, use AED/manual defibrillator or begin CPR.
 - (b) If patient is symptomatic with poor perfusion (unresponsive or responds only to painful stimuli) and pulse is less than 60 bpm (NEW '10):

- (i) Ventilate for 30 seconds.
- (ii) If after 30 seconds, the pulse is less than 60 bpm, begin CPR.
- (c) If pulse greater than 60 bpm, continue assessment.
- (3) Patients 12 year of age or older:
 - (a) If pulse is absent, use AED/manual defibrillator or begin CPR.
 - (b) If pulse is present, continue assessment.
- 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) Cervical Spine Immobilization
 - (1) The provider shall determine the appropriate device for use in spinal immobilizing the patient. Infant or child car seats may NOT be used as a spine immobilization device for the pediatric patient.
 - (2) If patient presents with a traumatic mechanism which could cause cervical spine injury and meets ANY of the following criteria, complete Spinal Immobilization (C-spine and back maintaining neutral alignment and padding when appropriate) should occur.
 - (a) History of Loss of Consciousness (LOC) or Unconscious?
 - (b) Disoriented or altered LOC?
 - (c) Suspected use of Drugs or Alcohol?
 - (d) Midline Cervical Tenderness or Pain?
 - (e) Focal Neurologic Deficit?
 - (f) Has a painful distracting injury that could mask cervical pain or injury?
 - (g) Child less than 8 years of age
 - (3) If NO to all of the above, transport as appropriate.



IF PATIENT IS UNABLE TO COMMUNICATE OR APPROPRIATELY RESPOND TO THE ABOVE QUESTIONS, PERFORM A COMPLETE SPINAL IMMOBILIZATION.

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.

HISTORY AND PHYSICAL EXAMINATION

TRAUMA PATIENT

MEDICAL PATIENT

Significant MOI	Non-Significant MOI	Unresponsive Patient	Responsive Patient
<p>Rapid Trauma Assessment</p> <p>D Head</p> <p>C Crepitation</p> <p>A Chest</p> <p>P Crepitation</p> <p>B Respiration</p> <p>T Paradoxical Motion</p> <p>L Breath Sounds</p> <p>S 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 SAMPLE History</p> <p>Signs & Symptoms</p> <p>A Allergies</p> <p>M Medications</p> <p>P Pertinent History</p> <p>Last Oral Intake</p> <p>Events Prior</p>	<p>Determine Chief Complaint</p> <p>D Perform Focused Examination of the Injured Site and Areas</p> <p>C Compatible with Given MOI</p> <p>A</p> <p>P</p> <p>B</p> <p>T</p> <p>L</p> <p>S</p> <p>Baseline Vital Signs</p> <p>Obtain SAMPLE History</p> <p>Signs & Symptoms</p> <p>A Allergies</p> <p>M Medications</p> <p>P Pertinent History</p> <p>Last Oral Intake</p> <p>Events Prior</p>	<p>Rapid Physical Examination</p> <p>D Head</p> <p>C Neck</p> <p>A JVD</p> <p>P Medical Alert Device</p> <p>B Chest</p> <p>T Breath Sounds</p> <p>L Abdomen</p> <p>S 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>O Onset</p> <p>P Provocation</p> <p>Q Quality</p> <p>R Radiation</p> <p>S Severity</p> <p>T Time</p> <p>Obtain SAMPLE History</p>	<p>Obtain History of Episode</p> <p>O Onset</p> <p>P Provocation</p> <p>Q Quality</p> <p>R Radiation</p> <p>S Severity</p> <p>T Time</p> <p>Baseline Vital Signs</p> <p>Obtain SAMPLE History</p> <p>Signs & Symptoms</p> <p>A Allergies</p> <p>M Medications</p> <p>P Pertinent History</p> <p>Last Oral Intake</p> <p>Events Prior</p> <p>Focused Physical Exam</p> <p>DCAPBTLs</p> <p>Check areas suggested by MOI and SAMPLE.</p>

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

DETAILED AND ONGOING ASSESSMENTS

DETAILED EXAMINATION

ONGOING ASSESSMENT

<p>D HEAD Scalp & Cranium Crepitation Eyes Discoloration Equality Foreign Bodies Blood in Anterior Chamber Ears & Nose Fluid Drainage or Bleeding Discoloration Mouth Teeth & Foreign Bodies Swelling or Lacerations Breath Odor Discoloration</p> <p>N NECK Jugular Vein Distention Trachea Position Crepitation</p> <p>C CHEST Paradoxical Motion Breath Sounds Crepitation</p> <p>A ABDOMEN Rigidity Distention</p> <p>P PELVIS/GU Pain on Motion</p> <p>E EXTREMITIES Pulse, Motor, Sensory Capillary Refill</p> <p>S POSTERIOR</p>
--

MEDICAL PATIENT	TRAUMA PATIENT
<p>REPEAT INITIAL ASSESSMENT</p> <p>Reassess AVPU Reassess Airway Monitor Breathing Reassess Circulation Monitor Skin Confirm Clinical Priority</p> <p>REPEAT & RECORD VITAL SIGNS</p> <p>REPEAT FOCUSED ASSESSMENT Especially Chief Complaint or Injuries</p> <p>CHECK ALL INTERVENTIONS</p>	<p>REPEAT INITIAL ASSESSMENT</p> <p>Reassess AVPU Reassess Airway Monitor Breathing Reassess Circulation Monitor Skin Confirm Clinical Priority</p> <p>REPEAT & RECORD VITAL SIGNS</p> <p>REPEAT RAPID TRAUMA ASSESSMENT</p> <p>CHECK ALL INTERVENTIONS</p>
<p>Assure Oxygen Adequacy Check Bleeding Check Interventions Check for Trending Stable Pt.- Every 15 Min. Unstable Pt.- Recommend Every 5 Min.</p>	<p>Assure Oxygen Adequacy Check Bleeding Check Neck Stabilization Check Interventions Check for Trending Stable Pt.- Every 15 Min. Unstable Pt.- Recommend Every 5 Min.</p>

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

E. HISTORY AND PHYSICAL EXAMINATION/ASSESSMENT

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

F. TREATMENT PROTOCOLS

1. Refer to **ALL** appropriate protocols.
2. Patients who have had an impaled electric conductive device used on them will be transported to the nearest appropriate facility without dart removal (Exception Tactical EMS).
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 albuterol 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 re-establish 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. 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. **(NEW '10)**



DO NOT ADMINISTER ORAL MEDICATIONS (EXCEPT GLUCOSE PASTE) TO PATIENTS WITH AN ALTERED MENTAL STATUS. **(NEW '10)**



4. For pediatric patients:
 - a) Pediatric section of the treatment protocol will be used for children who have **not** reached their 15th birthday (trauma and medical), except as otherwise stated in the treatment protocol. **(NEW '10)**
 - 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.
 - d) Destination consideration:

For those patients who are 15 years of age or older who receive specialized care at a pediatric facility, consider medical consultation with a pediatric base station for patient destination.
 - e) Infants and children must be properly restrained prior to and during transport.
 - f) When appropriate, family members should remain with pediatric patients.

G. COMMUNICATIONS

1. All Priority 1 patients require on-line medical consultation.
2. All Priority 2 patients who have persistent symptoms or need further therapeutic intervention(s) require on-line medical consultation.
3. 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.

4. 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).
5. Trauma Communications (**NEW '10**)
The following information must be communicated to the appropriate Trauma Center and/or Local Hospital:
 - a) Patient's age(s), injuries, ETA;
 - b) Number of victims;
 - c) Detailed description of the incident.
 - d) Provide patient Trauma Decision Tree Category (A-D).
 - e) Provide assigned patient priority (1 to 4).
 - f) Pertinent patient signs and symptoms (e.g. HR, RR, BP, Pulse Ox and GCS)
6. 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.
7. 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 EMSC/SYSCOM are being recorded.

H. REASSESSMENT

1. Reassess unstable patients frequently (recommended every 5 minutes).
2. Reassess stable patients at a minimum of every 15 minutes.

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 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.
 - c) Stable priority 3 or 4 patients who do not need a time critical intervention may also be transported to the local emergency department or freestanding medical facility.
2. Mode of transport (air, land, water, etc.)
 - 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 "C" OR "D", RECEIVING TRAUMA CENTER MEDICAL CONSULTATION 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 classes "C" and "D".
- d) Refer to the trauma decision tree when considering use of aeromedical transport. Provide SYSCOM with the patient's Category (A, B, C, or D).
- 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 trauma 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 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 144-147

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 for each incident/patient as per local jurisdictional and State requirements.

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.

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 either the patient, parent, or caregiver must be documented.
 - (3) Document the condition of the environment and other residents present.

ABUSE/NEGLECT (Continued)

- (4) Document the time the police/welfare agency was notified and the name of the person notified.
 - (5) Document 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 patient from further injury.
- (3) Consider cause of seizure activity.

b) When seizure activity has stopped:

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



c) Initiate IV LR KVO.

d) Use glucometer and treat accordingly.

- e)  Consider midazolam (Paramedic may perform without consult for patients with active seizures.)
0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg
(Reduce by 50% for patients 69 years or older)
If IV unavailable, 5 mg IM may be administered
Additional doses up to a maximum total dose 10 mg require medical consultation for all providers
If patient is in status, consider IO administration of midazolam
If suspected severe nerve agent exposure, providers may administer midazolam 5 mg IM or diazepam (CANA) without medical consultation.



IF PATIENT IS PREGNANT, CONTINUE WITH SEIZURE PROTOCOL AND USE MIDAZOLAM. MEDICAL CONSULTATION REQUIRED FOR PREGNANT PATIENTS WHO MAY REQUIRE LARGER DOSES OF MIDAZOLAM TO CONTROL SEIZURES. **(NEW '10)**

ALTERED MENTAL STATUS: SEIZURES (Continued)



- f) If the patient is still seizing:
 - (1) DO NOT RESTRAIN.
 - (2) Protect from further injury.
 - (3) Consider underlying cause of seizure.
- g) 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. **(NEW '10)**



-
- h) Initiate IV/IO.
 - i) Use glucometer and treat accordingly.
 - j) Administer fluid bolus, if appropriate
20 mL/kg of LR IV/IO



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

- k) The paramedic may assist patients with the administration of their prescribed benzodiazepine.
- l)  Consider midazolam for seizures lasting greater than 10 minutes (Paramedic may perform without consult for patients with active seizures.)
 - 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes
 - Maximum total dose 5 mg
 - If IV unavailable, administer 0.2 mg/kg IM
 - Maximum single dose 5 mg
 - Additional doses up to a maximum total dose 5 mg require medical consultation for all providers.
 - If patient is in status, consider IO administration of midazolam.
 - If suspected severe nerve agent exposure, providers may administer midazolam as above or diazepam (CANA) without medical consultation.

4. Continue General Patient Care.

C. ALTERED MENTAL STATUS: UNRESPONSIVE PERSON

1. Initiate General Patient Care.
2. Presentation
Patients may exhibit confusion, focal motor sensory deficit, unusual behavior, unresponsiveness to verbal or painful stimulus.



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



3. Treatment
 - a) Obtain pulse oximetry, if available.
 - b) Administer glucose paste (10-15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes. **(NEW '10)**



-
- c) Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrates to a systolic pressure of 100 mm Hg.
 - d) Consider obtaining blood sample using closed system.
 - e) **If patient has constricted pupils and respiratory depression or is unresponsive and the provider strongly suspects a narcotic overdose,**
Administer naloxone
0.4 - 2 mg SLOW IVP/IO/IM/Intranasal (If delivery device is available)
Titrates to adequate respiratory effort.
 - f) Use glucometer and treat accordingly.
 - g)  Consider an additional dose of naloxone.
 - h)  Consider additional fluid administration
Maximum 2,000 mL without medical consultation.

ALTERED MENTAL STATUS: UNRESPONSIVE PERSON (Continued)



- i) Obtain pulse oximetry if available.
- j) Administer glucose paste (10-15 grams) between the gum and cheek. Consider single additional dose of glucose paste if not improved after 10 minutes. **(NEW '10)**



-
- k) Initiate IV/IO KVO.
 - (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 (0-28 days), children with congenital heart disease, chronic lung disease, or chronic renal failure.

- (2) Consider obtaining blood sample using closed system.
- l) Use glucometer and treat accordingly.
- m) **If patient has constricted pupils and respiratory depression or is unresponsive and the provider strongly suspects a narcotic overdose,**
Administer naloxone
0.1 mg/kg SLOW IVP/IO/IM/Intranasal (If delivery device is available)
Maximum dose 0.4-2 mg

- n)  Consider repeating naloxone.
- o)  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 initiating an IV/IO of LR KVO.



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 WHICH 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 his/her best interest.
 - (5) **R**ecovery or referral - leave patient in care of responsible person or professional, or transport to appropriate facility.

BEHAVIORAL EMERGENCIES (Continued)



-
- d) Initiate IV LR KVO, if appropriate.
 - e) Consider Chemical Restraint
4. Continue General Patient Care.

F. CARDIAC EMERGENCIES: CARDIAC GUIDELINES



1. The following algorithmic and standard formatted sections pertain to cardiac emergencies. Several guidelines apply to all algorithms when assessing and treating cardiac patients. These guidelines are:
 - a) When the patient's condition changes, indicating the transition to a new treatment algorithm, the new treatment shall take into account prior therapy (e.g., previously administered medications).
 - b) As BLS/ALS guidelines indicate, definitive airway control is preferable, and if this can be achieved, along with other initial interventions, then the earlier the better. However, defibrillation is more important initially if the patient can be ventilated without intubation.
 - c) Cardiac Arrest Modifications:
 - (1) For **witnessed** cardiac arrest by EMS provider, immediately start CPR and apply AED or manual defibrillator as soon as possible; shock if indicated.

The goal is to defibrillate as soon after stopping CPR as possible (ideally for manual defibrillator in less than 5 seconds).
After single shock, immediately restart CPR (do not perform pulse or ECG rhythm check) for 5 cycles, then assess for pulse and rhythm and apply single shock if indicated. Repeat this sequence of single shocks and 5 cycles of CPR.



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

- (2) For all **unwitnessed** cardiac arrest without CPR in progress, EMS should first perform 5 cycles of CPR, then apply AED or manual defibrillator while performing CPR. Then perform as in c) (1) above.

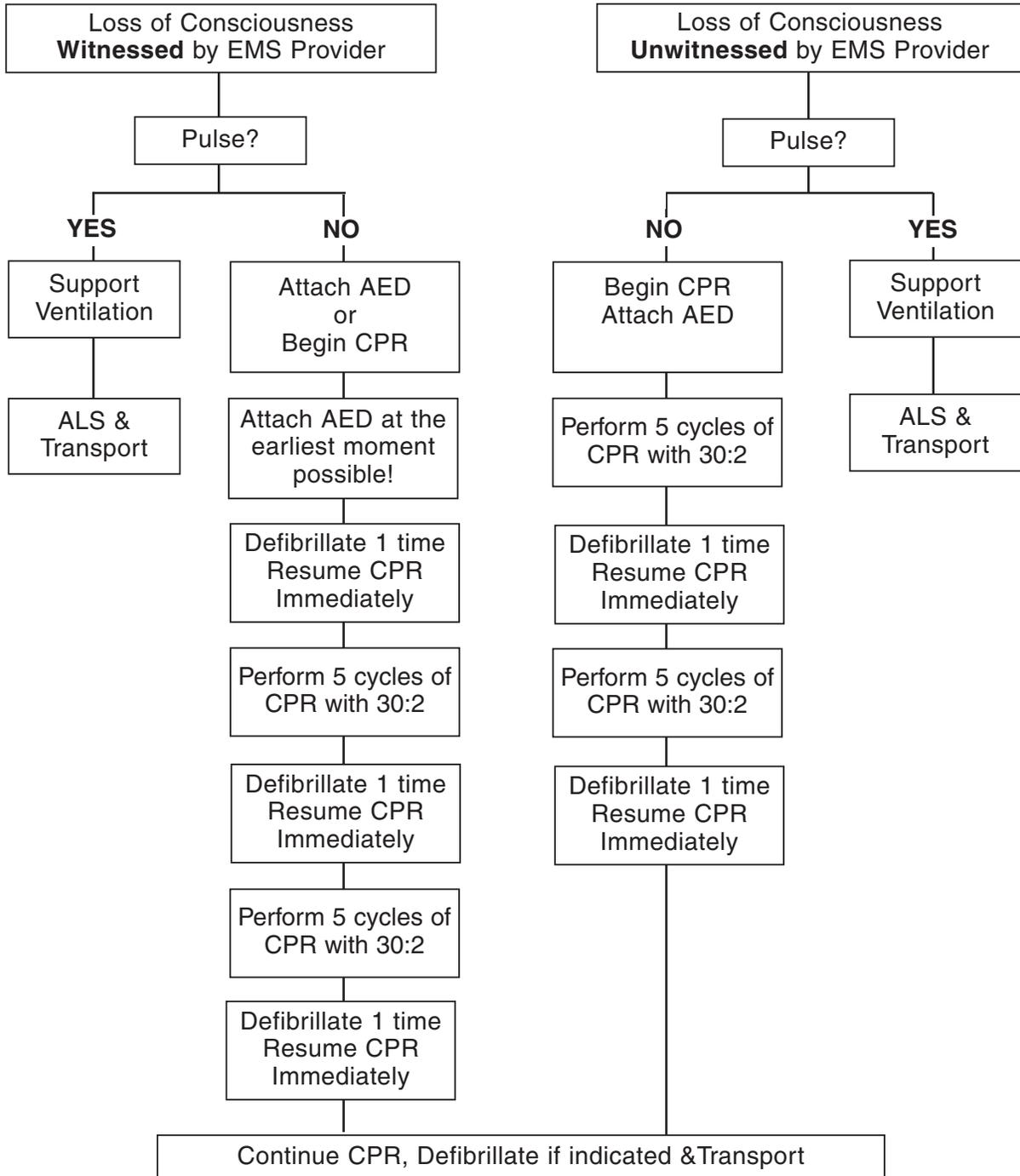


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- d) If unable to initiate an IV or perform endotracheal intubation within 5 minutes, continue with appropriate care and transport the patient as soon as possible to the appropriate hospital. Further attempts to initiate IV therapy or endotracheal intubation should be accomplished while en route to the receiving hospital.
 - e) Only in the pediatric or neonatal arrest situation, naloxone, atropine, epinephrine, and lidocaine 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, atropine, and lidocaine and ten times the IV dose for epinephrine (1:1,000). All ET medications shall be diluted in 5 mL of Lactated Ringer's for pediatric patients.



2.

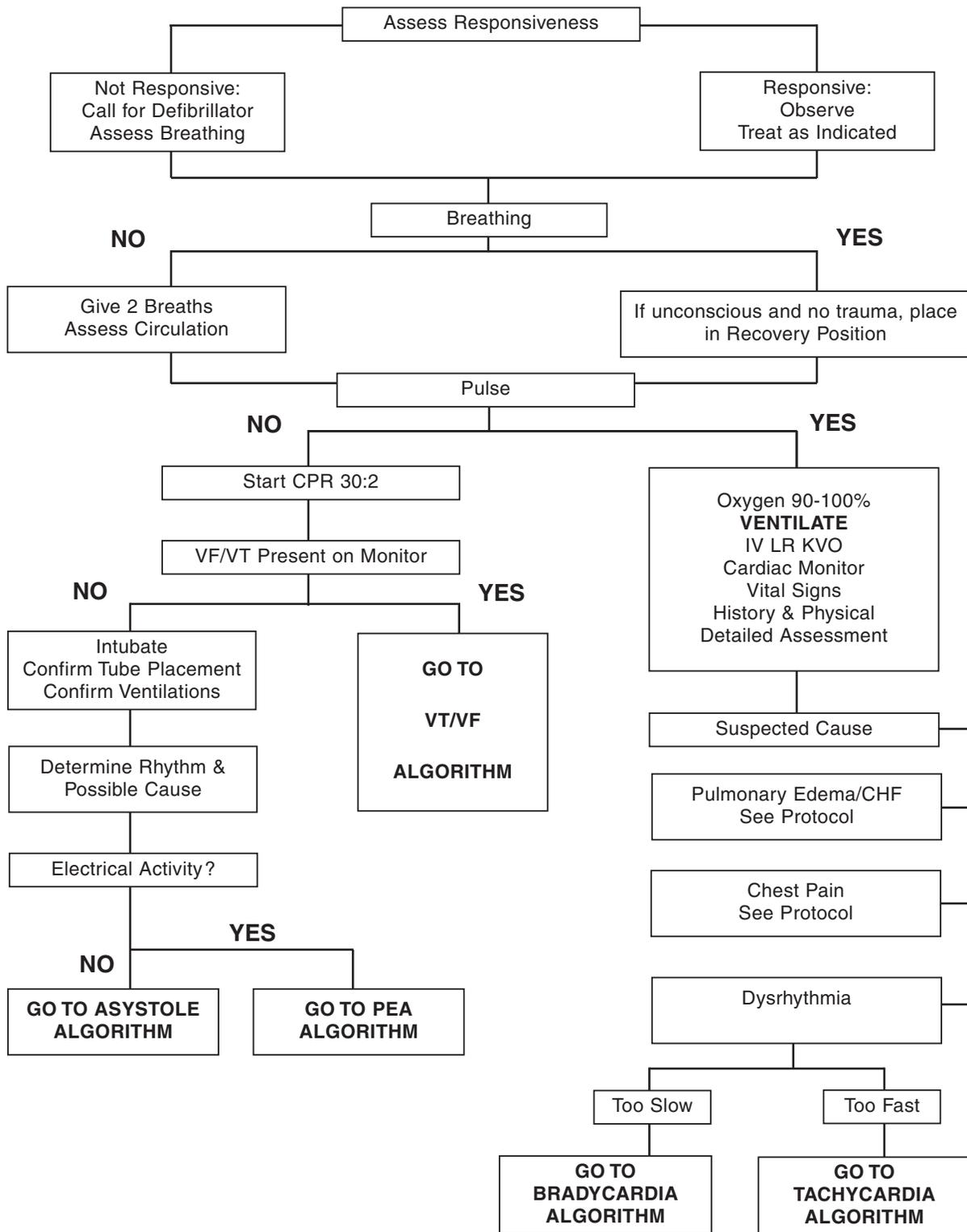
UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR BLS





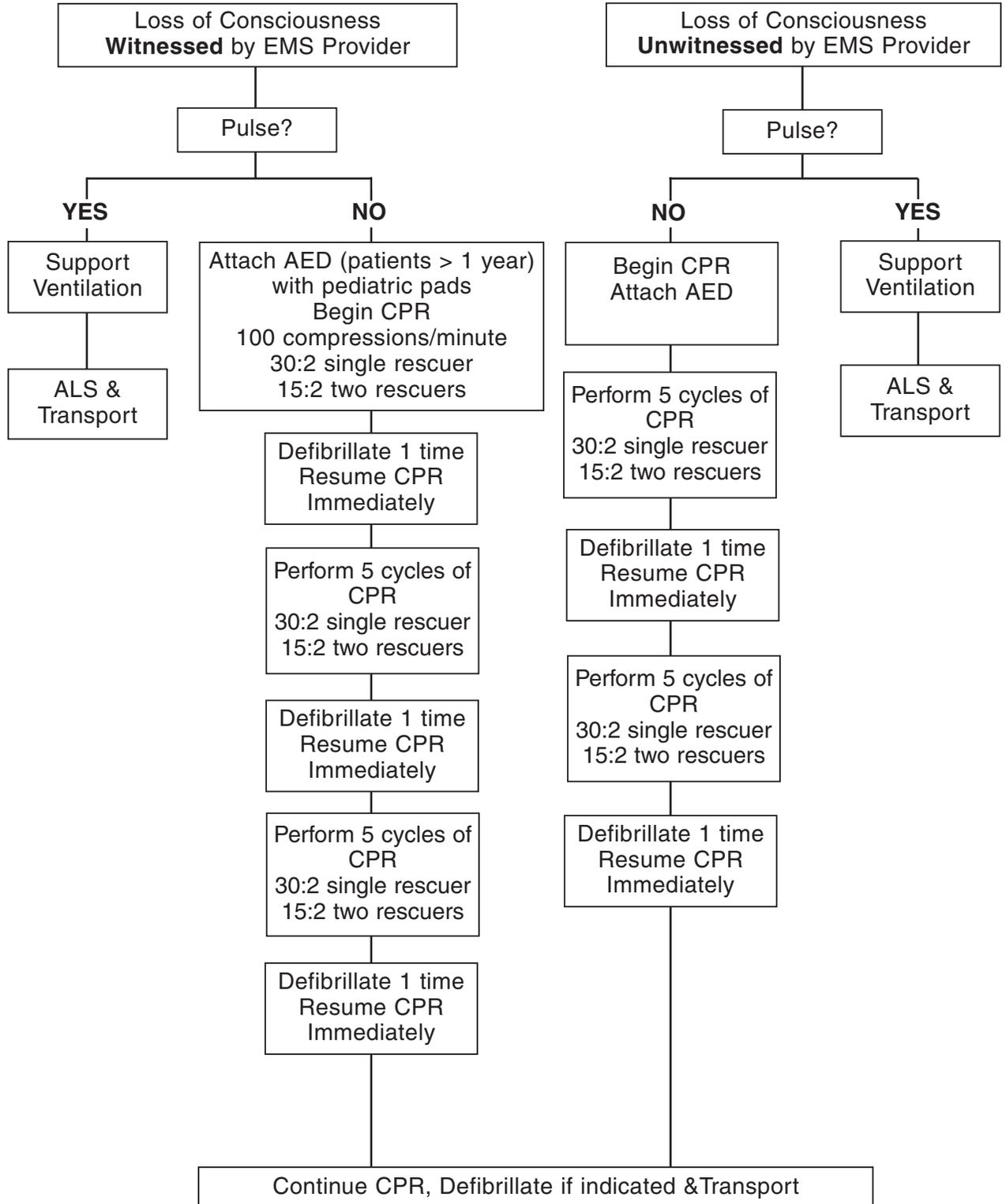
3.

UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR ALS



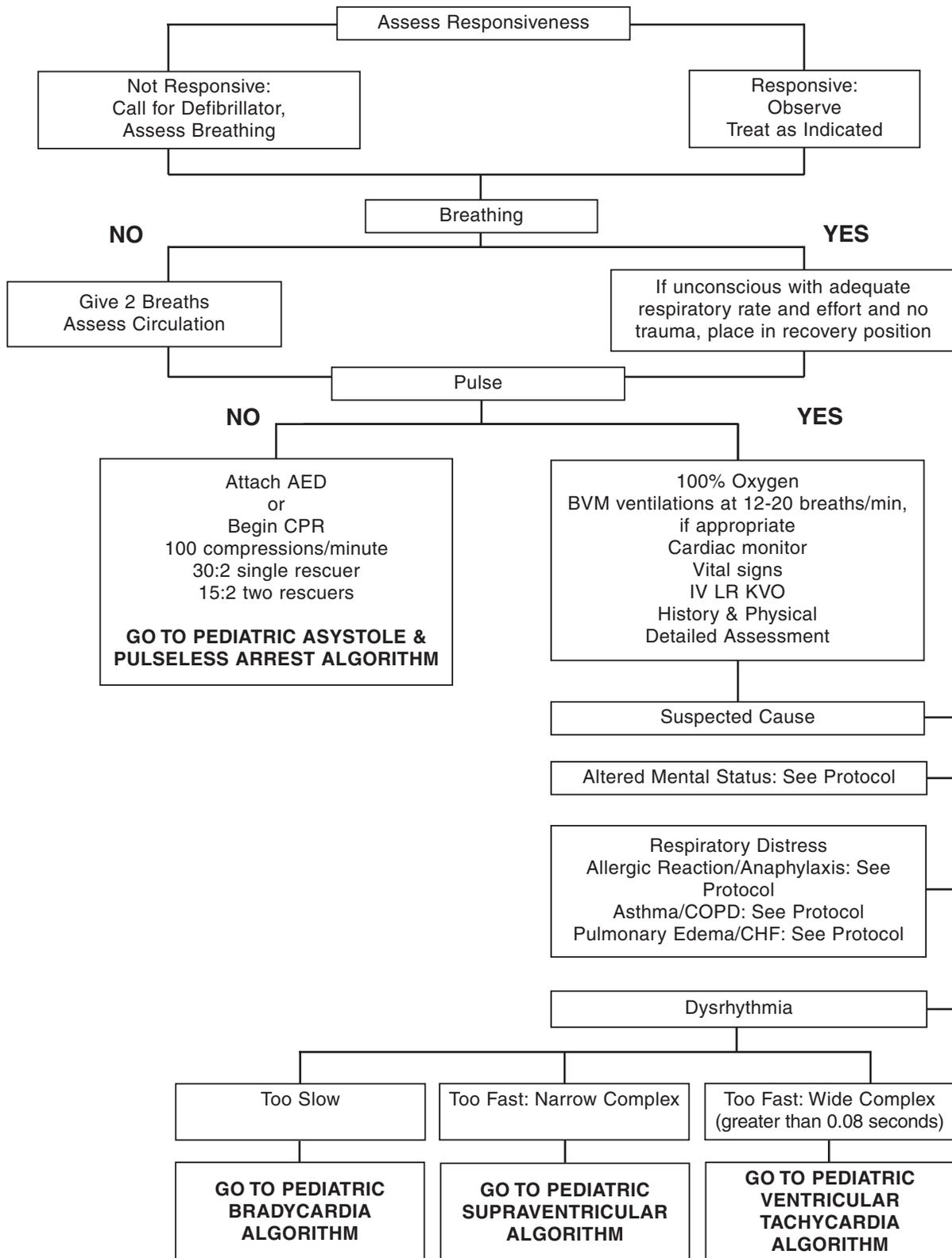


4. **UNIVERSAL ALGORITHM FOR PEDIATRIC (LESS THAN 12 YEARS OF AGE)
EMERGENCY CARDIAC CARE FOR BLS**
(If newborn, refer to Newly Born Protocol)





5. **UNIVERSAL ALGORITHM FOR PEDIATRIC (LESS THAN 12 YEARS OF AGE)
EMERGENCY CARDIAC CARE FOR ALS**
(If newborn, 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) Constantly monitor airway and reassess vital signs every 5 minutes.



d) Initiate IV LR KVO.

e) If patient is hemodynamically unstable: Initiate Transcutaneous Pacing. (CRT-(I) & EMT-P only)

f) If transcutaneous pacing 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/minute.

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

(1) Consider/Prepare for Transcutaneous Pacing. (CRT-(I) & EMT-P only)

(2) If patient develops discomfort with TCP
Consider morphine 1-2 mg/min IVP. (Paramedic may perform without consult.)

OR

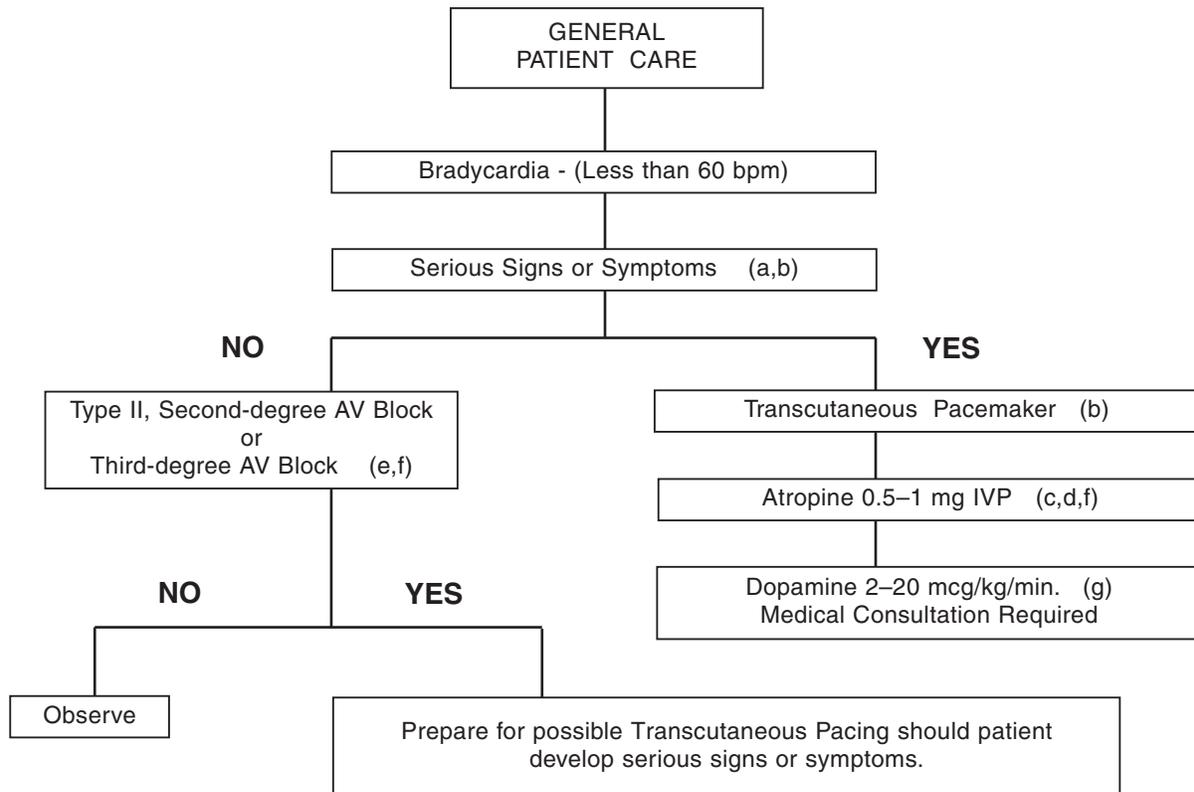
Consider midazolam 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg. (Reduce by 50% for patients 69 years or older.)

i) Refer to appropriate algorithm.



4.

ADULT BRADYCARDIA ALGORITHM

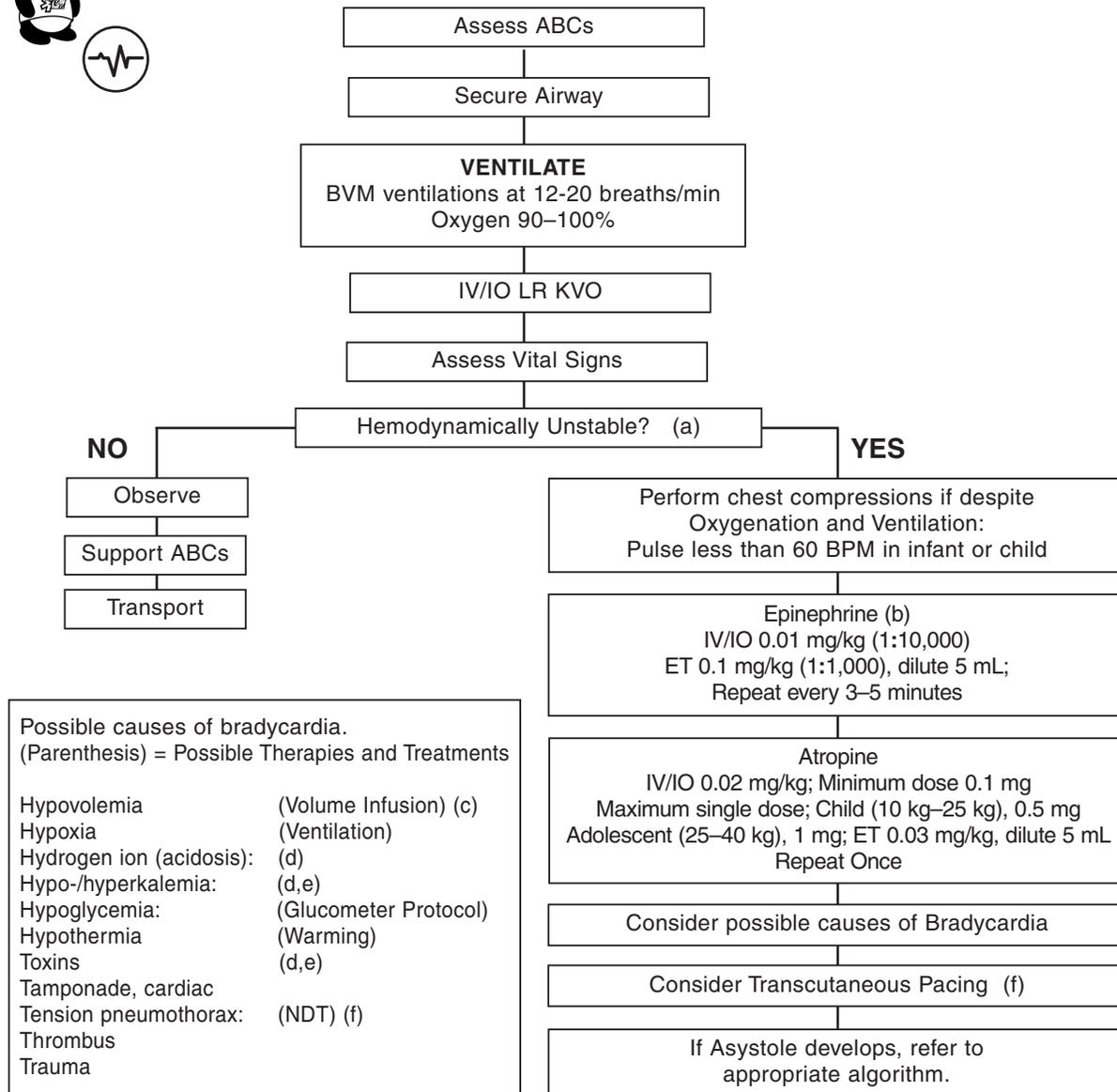


- (a) - Serious signs and symptoms must be related to the slow rate. Signs and symptoms may include chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, CHF, and/or AMI.
- (b) - Do not delay TCP (CRT-I) & EMT-P only) while awaiting IV or atropine to take effect if the patient is symptomatic, or if patient is provider-witnessed asystole.
- (c) - Denervated transplanted hearts will not respond to atropine. Go at once to TCP. (CRT-I) & EMT-P only).
- (d) - Atropine shall be given in repeat doses in 3-5 minute intervals up to a total of 0.04 mg/kg. Medical consultation required. Consider shorter intervals in severe clinical conditions. Atropine shall be used with caution 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 lidocaine.
- (f) - In the presence of Mobitz II and third-degree AV block, medical consultation is required for atropine administration.
- (g) - Requires medical consultation for administration of dopamine. Adults: titrate to systolic BP 100 mm Hg or medical consultation directed BP. IV infusion pump is preferred.



5.

PEDIATRIC BRADYCARDIA ALGORITHM



(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 (0-28 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, 1mEq/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.

(f) - Transcutaneous Pacing available for CRT-(I) & EMT-P only. **(NEW '10)**

Pacer Age-Related Rates (NEW '10) (f)

Start pacemaker at age appropriate heart rate:
 Infant (less than 1 year): 120 beats per minute
 Child (1 through 11 years): 100 beats per minute
 Adult (12 years and greater): 80 beats per minute

H. CARDIAC EMERGENCIES: CARDIAC ARREST

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



EARLY DEFIBRILLATION IS A PRIORITY IN WITNESSED ARREST. FOR PATIENTS IN UNWITNESSED ARREST 5 CYCLES OF CPR SHOULD BE COMPLETED PRIOR TO DEFIBRILLATION.



3. Treatment
 - a) Perform CPR.
 - b) Utilize AED as appropriate.
 - c) Transport
 - (1) If no shock indicated, transport immediately.
 - (2) If shock indicated, defibrillate and transport ASAP.



-
- d) Identify rhythm and treat according to appropriate algorithm.



- e) Perform CPR.
- f) Utilize AED as appropriate.



DO NOT USE AED FOR PATIENTS WHO ARE LESS THAN 1 YEAR OF AGE. USE ONLY PEDIATRIC AED FOR PATIENTS 1 TO 8 YEARS OF AGE.

- g) Transport
 - (1) If no shock indicated, transport immediately.
 - (2) If shock indicated, defibrillate and transport ASAP.

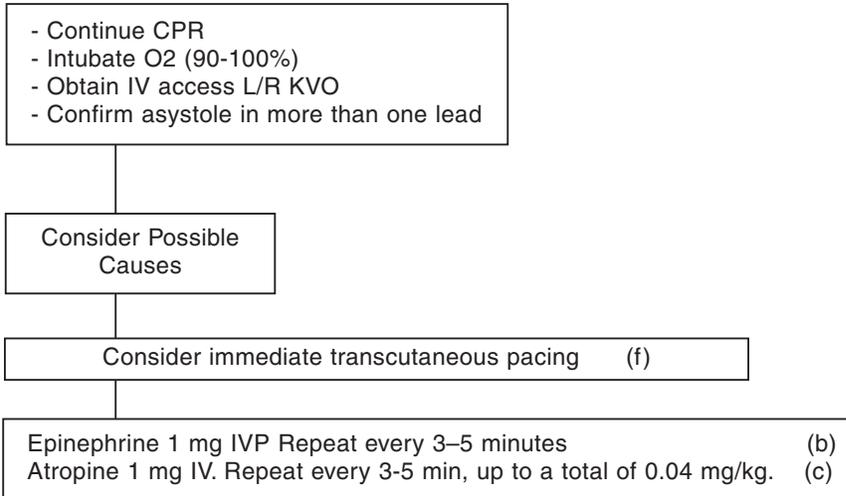


-
- h) Identify rhythm and treat according to appropriate algorithm.



4.

ADULT ASYSTOLE ALGORITHM

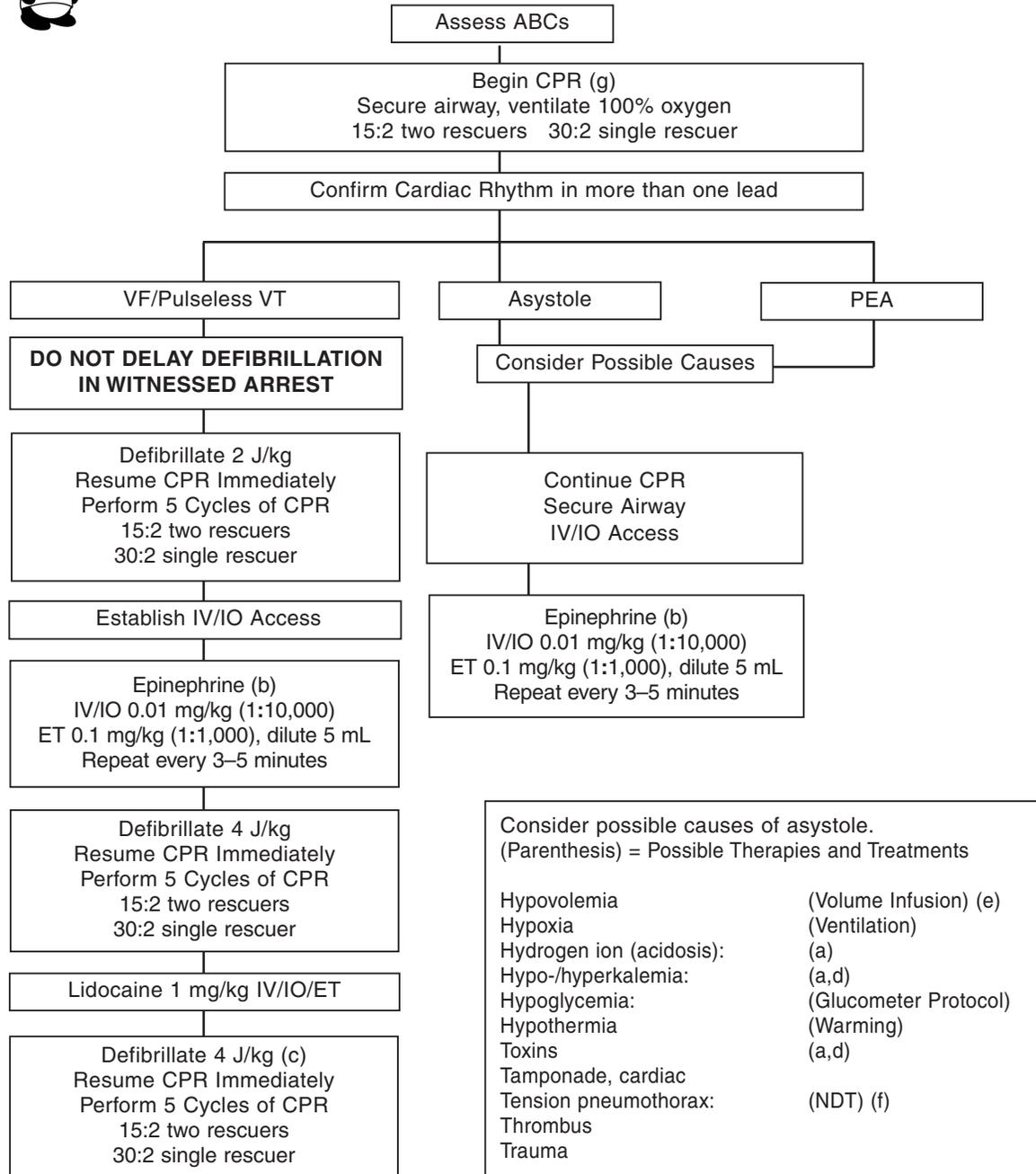


Consider possible causes of asystole. (Parenthesis) = Possible Therapies and Treatments	
Hypovolemia	(Volume Infusion) (e)
Cardiac Tamponade	(Volume Infusion) (e)
Tension Pneumothorax	(Needle Decompression Thorocostomy–NDT) (g)
Massive Pulmonary Embolism	
Massive AMI	
Drug Overdose	(a,d)
Hypoxia	(Ventilation)
Hypothermia	(Warming)
Acidosis	(a)
Hyperkalemia	(a,d)

- (a) - Sodium bicarbonate 1 mEq/kg, with medical consultation. See sodium bicarbonate.
- (b) - The recommended dose for epinephrine is 1 mg IVP every 3-5 minutes.
- (c) - Shorter atropine dosing intervals are acceptable, possibly helpful in asystolic arrest.
- (d) - Calcium Chloride, 0.5-1 gram IVP, with medical consultation. See calcium chloride.
- (e) - Volume infusion is 20 mL/kg.
- (f) - Do not delay TCP if patient is provider-witnessed asystole. (CRT-I) & EMT-P only)
- (g) - NDT for CRT-I) and EMT-P only.



5. PEDIATRIC ASYSTOLE & PULSELESS ARREST ALGORITHM



- (a) - Sodium bicarbonate, 1 mEq/kg, with medical consultation. See sodium bicarbonate.
- (b) - Neonates (0-28 days), epinephrine ET 0.03 mg/kg (1:10,000) dilute with 1 mL.
- (c) - Alternate: lidocaine, defibrillate, then epinephrine, defibrillate.
- (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) - NDT for CRT-(I) and EMT-P only.
- (g) - For patients in unwitnessed cardiac arrest 5 cycles of CPR should be completed prior to defibrillation.

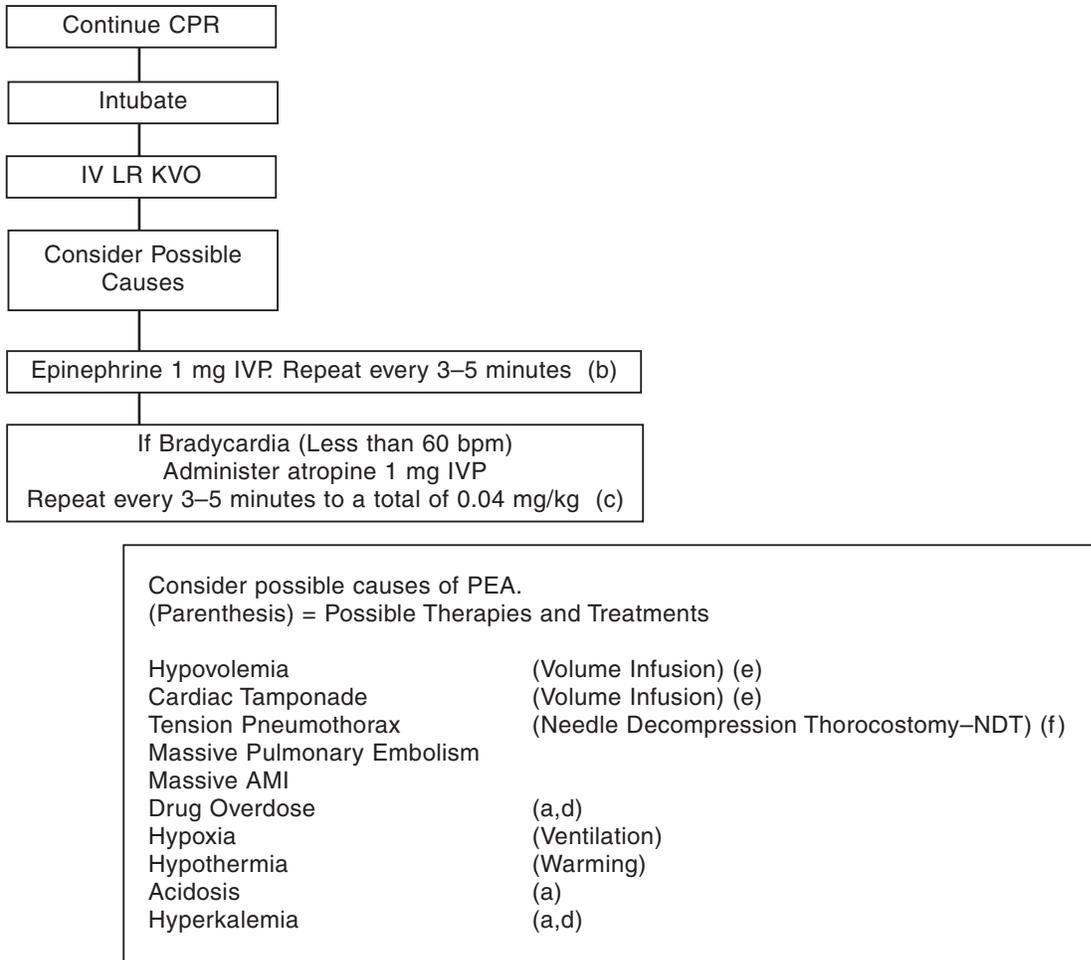


6.

PULSELESS ELECTRICAL ACTIVITY (PEA) ALGORITHM

Includes:

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

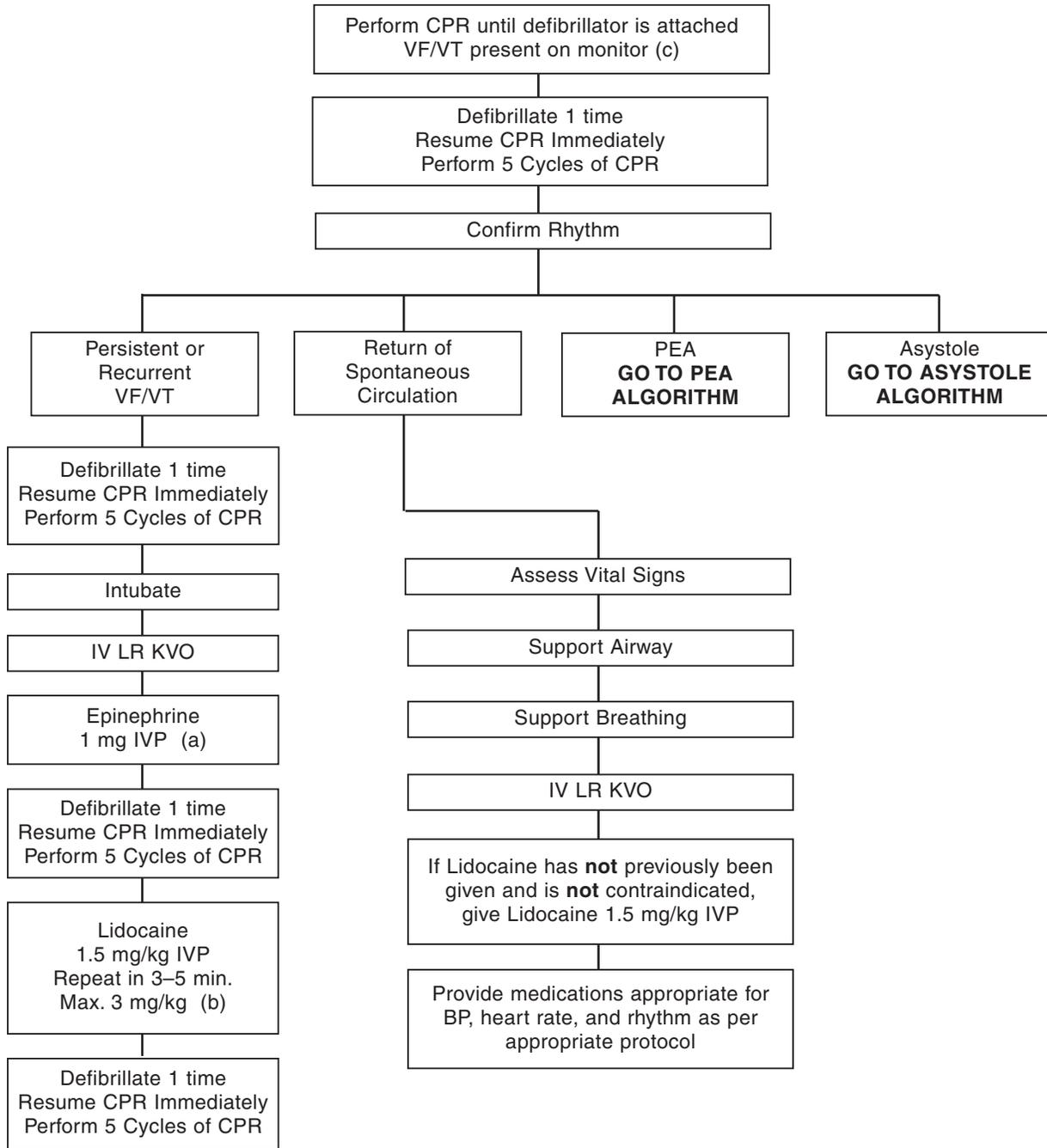


- (a) - Sodium bicarbonate 1 mEq/kg, with medical consultation. See sodium bicarbonate.
- (b) - Administer epinephrine 1 mg IVP every 3-5 minutes.
- (c) - Shorter atropine dosing intervals are acceptable, possibly helpful in asystolic arrest.
- (d) - Calcium Chloride, 0.5-1 gram IVP, with medical consultation. See calcium chloride.
- (e) - Volume infusion is 20 mL/kg.
- (f) - NDT for CRT-(I) and EMT-P only.



7.

VENTRICULAR FIBRILLATION PULSELESS VENTRICULAR TACHYCARDIA



(a) - The recommended dose of epinephrine is 1 mg IVP every 3-5 minutes.

(b) - Sodium bicarbonate 1 mEq/kg, if medical consult directed. See sodium bicarbonate.

(c) - For patients in unwitnessed cardiac arrest 5 cycles of CPR should be completed prior to defibrillation.

I. 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 CHEST, EPIGASTRIC, ARM, OR JAW PAIN OR DISCOMFORT AND MAY BE ASSOCIATED WITH DIAPHORESIS, NAUSEA, SHORTNESS OF BREATH OR DIFFICULTY BREATHING.

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 mm Hg, and pulse is greater than 60 bpm. Maximum three doses total (patient and EMT-B assisted).
- c) Assess and treat for shock if indicated.
- d) Constantly monitor airway and reassess vital signs every 5 minutes.



NITROGLYCERIN IS CONTRAINDICATED FOR ANY PATIENT HAVING TAKEN MEDICATION FOR ERECTILE DYSFUNCTION (eg, 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 mm Hg AFTER ADMINISTRATION OF NITROGLYCERIN, OBTAIN MEDICAL CONSULTATION BEFORE FURTHER ADMINISTRATION.

- e)  Additional doses of nitroglycerin require medical consultation.



-
- f) Initiate IV LR KVO.
 - g) Shall perform a 12 lead ECG for patients with ACS. (If trained, providers may perform a 15 lead ECG.)
 - h) 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 mm Hg, and pulse is greater than 60 bpm, to a maximum dose of 1.2 mg.

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

- i) 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.
- j) If IV cannot be established, nitroglycerin may be administered with medical consultation.
- k) Identify rhythm and treat according to appropriate algorithm.
- l)  Administer additional doses of nitroglycerin.
- m)  Consider morphine sulfate.
2-10 mg slow IV/IM/IO
Administer 1-2 mg/min
- n) Consider aspirin 324 mg or 325 mg chewed, if acute myocardial infarction is suspected.



CONSULT A PEDIATRIC BASE STATION FOR CHILDREN (WHO HAVE NOT REACHED THEIR 15TH BIRTHDAY) WITH CHEST PAIN WITH ASSOCIATED DYSRHYTHMIAS, CARDIAC DISEASE, OR BLUNT CHEST TRAUMA.

- 4. Continue General Patient Care.

J. CARDIAC EMERGENCIES: HYPERKALEMIA (RENAL DIALYSIS/FAILURE OR CRUSH SYNDROME) (NEW '10)

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 (**NEW '10**)
 - (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) Constantly monitor airway and reassess vital signs every 5 minutes.



-
- e) Initiate IV LR KVO.
 - f) Initiate Bradycardia protocol.
 - g)  Consider calcium chloride 0.5-1 grams slow IVP over 3-5 minutes. Maximum dose 1 gram or 10 mL.
 - h)  Consider sodium bicarbonate 50 mEq IV over 5 minutes. (**NEW '10**)
 - i)  Consider/ administer albuterol (high dose) via nebulizer 20 mg (if available) (**NEW '10**)



FLUSH IV WITH 5 ML OF LACTATED RINGER'S BETWEEN CALCIUM AND SODIUM BICARBONATE ADMINISTRATION (**NEW '10**)

- j) Crush syndrome or patients with functional kidneys by history
 Consider/ administer sodium bicarbonate 50 mEq SLOW IV over 5 minutes and then initiate drip of sodium bicarbonate 100 mEq in 1000 mL to run over 30-60 minutes. (Reserve for patient suspected of crush syndrome or patients with functional kidneys by history.) (**NEW '10**)

CARDIAC EMERGENCIES: HYPERKALEMIA (Continued)



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



-
- n) Initiate IV LR KVO.
 - o) Initiate Bradycardia protocol.
 - p)  Administer calcium chloride 20 mg/kg (0.2 mL/kg) slow IVP/IO (50 mg/min)
Maximum dose 1 gram or 10 mL.
 - q)  Consider/administer 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.**(NEW '10)**



FLUSH IV WITH 5 ML OF LACTATED RINGER'S BETWEEN CALCIUM AND BICARBONATE ADMINISTRATION. **(NEW '10)**

- r) Crush syndrome or patients with functional kidneys by history
 -  Consider/administer 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.)
(NEW '10)

4. Continue General Patient Care.

J-1. 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 which 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) Constantly 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) Initiate IV LR KVO.
- 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 lidocaine per protocol as appropriate).



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) Consider morphine sulfate. (Paramedics may administer without consultation.)
Rate of administration 1-2 mg/min
OR
 - (2) Midazolam 0.1 mg/kg (2-5 mg) slow IVP/IM/IO (Paramedics may administer without consultation.)
IM administration requires all providers to obtain consultation.
- j) Transport to the closest appropriate facility.
- k) Continue general patient care.



Consult a pediatric base station for children (who have not reached their 15th birthday) with an ICD device delivering shock therapy or malfunctioning.

- l)  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) Morphine sulfate 0.1 mg/kg IV/IO/IM
OR
 - (2) Midazolam 0.1 mg/kg slow IV/IO over 1-2 minutes. Maximum single IV/IO dose 2 mg. Maximum total dose 5 mg. 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.
- m) Transport to the closest appropriate facility.
- n) Continue general patient care.

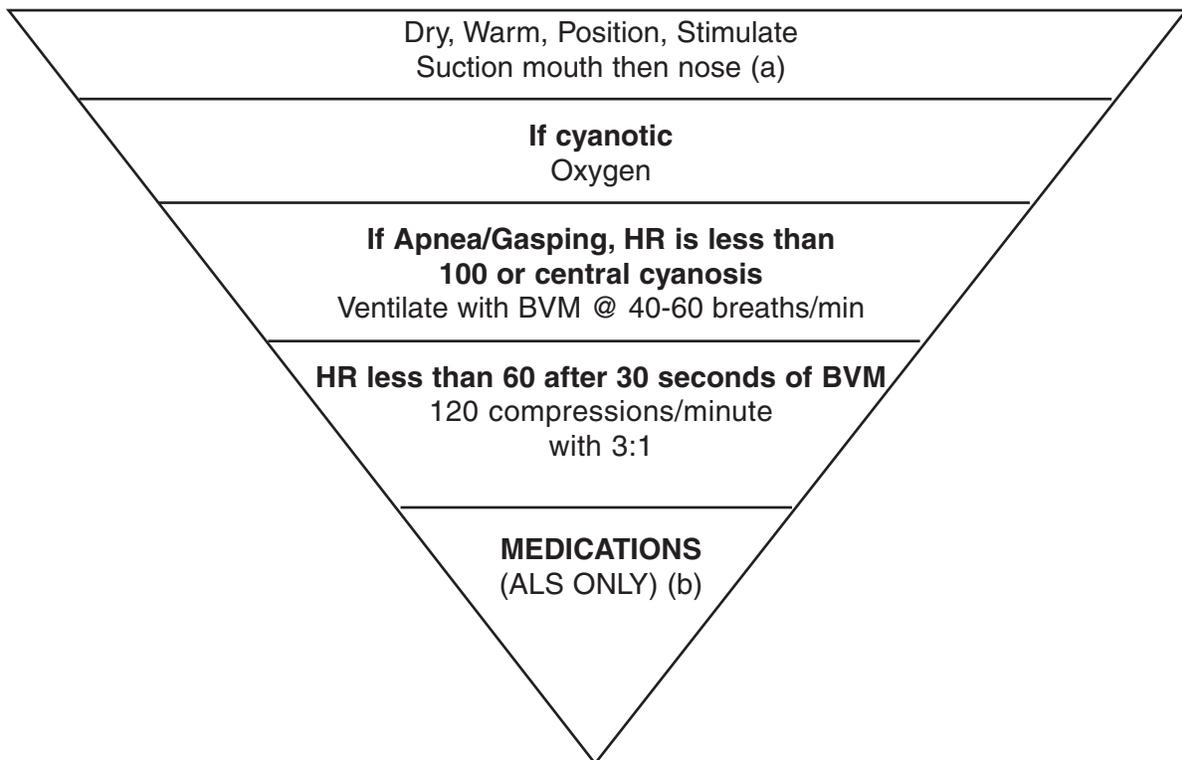
K. NEWLY BORN PROTOCOL



1. Initiate General Patient Care.
2. Presentation

This protocol applies to the infant who has just been delivered.

UNIVERSAL ALGORITHM FOR THE NEWLY BORN FOR BLS



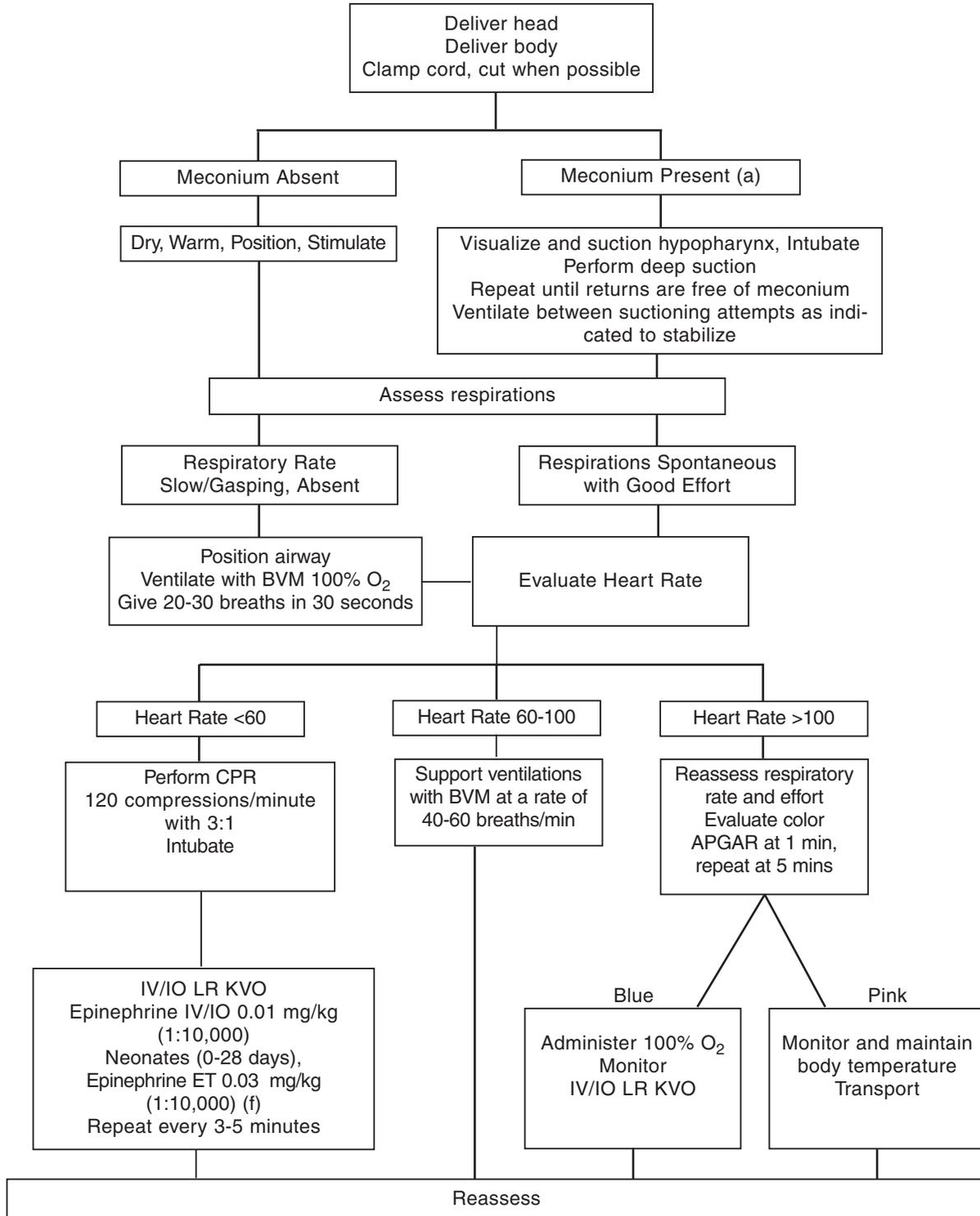
(a) - If meconium present, multiple suction attempts should be made.

(b) - Identify rhythm and treat according to appropriate algorithm.



3.

UNIVERSAL ALGORITHM FOR NEWLY BORN FOR ALS



NEWLY BORN PROTOCOL (Continued)

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

Respiratory depression	(b,c)
Hypoglycemia	(d)
Hypothermia	(Warming)
Hypovolemia	Volume Infusion (e)

- (a) - Deep tracheal suctioning before many spontaneous respirations have occurred is only indicated when the newborn is not vigorous after delivery.
- (b) - Premature infants less than 32 weeks gestation will likely require ongoing BVM ventilations due to immature lungs.
- (c) - Naloxone 0.1 mg/kg ET/IV/IO.
- (d) - D10W 5 -10 mL/kg IV/IO (D10W is prepared by mixing one part of D50W with four parts LR).
- (e) - Volume infusion is 10 mL/kg.
- (f) - Neonates (0-28 days), epinephrine ET 0.03 mg/kg (1:10,000) dilute with 1 mL.

L. CARDIAC EMERGENCIES: PREMATURE VENTRICULAR CONTRACTIONS (PVCs)

1. Initiate General Patient Care.
2. Presentation
Irregular heart beat of ventricular origin.
3. Treatment indications:
 - a) PVCs in the presence of cardiac symptoms that are:
 - (1) Near the "T" wave.
 - (2) Multifocal (different shape)
 - (3) Sequential or closely coupled or
 - b) Runs of Ventricular Tachycardia (5 or more consecutive beats) or ventricular tachycardia with a pulse or
 - c) Once successful electrical conversion from ventricular tachycardia or ventricular fibrillation to a supraventricular rhythm



- d) Place patient in position of comfort.
- e) Assess and treat for shock, if indicated.
- f) Constantly monitor airway and reassess vital signs every 5 minutes.



-
- g) Initiate IV LR KVO.
 - h) Patients meeting the above criteria:
 - (1) Initial Dose: lidocaine 1-1.5 mg/kg IVP
 - (2) Follow-up Doses: lidocaine 0.5-0.75 mg/kg IVP every 5-10 minutes
 - (3) Maximum dose: 3 mg/kg IVP



MAY BE MODIFIED BY MEDICAL CONSULTATION.

- i)  Medical consultation must be obtained for treatment of asymptomatic patients.

4. Continue General Patient Care.

M. 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 AND MAY BE ASSOCIATED WITH DIAPHORESIS, NAUSEA, SHORTNESS OF BREATH OR DIFFICULTY BREATHING. **(NEW '10)**

Inclusion Criteria:

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

- a) 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

- b) 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)

OR

- c) **New Left Bundle Branch Block:** If patient has in his/her possession a previous ECG with narrow QRS to demonstrate that the wide complex is a new change



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.

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 I 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 Intervention Center by ground as long as the transport time is not more than 30 minutes greater than transport to the nearest ED. **(NEW '10)**
 - d) When indicated and based on the EMS provider's report, the Base Station physician at the receiving Cardiac Intervention Center will activate its Cardiac Intervention Team. **(NEW '10)**

CARDIAC EMERGENCIES: ST ELEVATION MYOCARDIAL INFARCTION [STEMI] (Continued)

- e) The receiving Emergency Department physician will determine if the patient can bypass the Emergency Department and go directly to the cardiac catheterization lab to meet the cardiac interventional team.
- f) If patient does not have ECG ST elevations greater than 1mm in two contiguous leads, the patient shall be transported to the closest appropriate facility.
- g) Patient who presents with inferior wall MI (perform right side V4r to rule out right ventricular involvement- if ST elevation present in V4r withhold nitrates), clear lung sounds, and hypotension (90 systolic) (40% of inferior wall MI have right ventricular infarction) should be given a fluid bolus of 250-500 mL of Lactated Ringer's. For additional bolus, perform medical consult. **(NEW '10)**



CONSULT A PEDIATRIC BASE STATION FOR CHILDREN WHO HAVE **NOT** REACHED THEIR 15TH BIRTHDAY WITH ST ELEVATIONS.

N. 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 PRESUMED DEAD ON ARRIVAL 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 PRESUMED DEAD ON ARRIVAL PROTOCOL).

4. Continue General Patient Care.

O. 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) Constantly monitor airway and reassess vital signs every 5 minutes.



-
- d) Initiate IV LR KVO.
 - 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) Constantly monitor airway and reassess vital signs every 5 minutes.



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

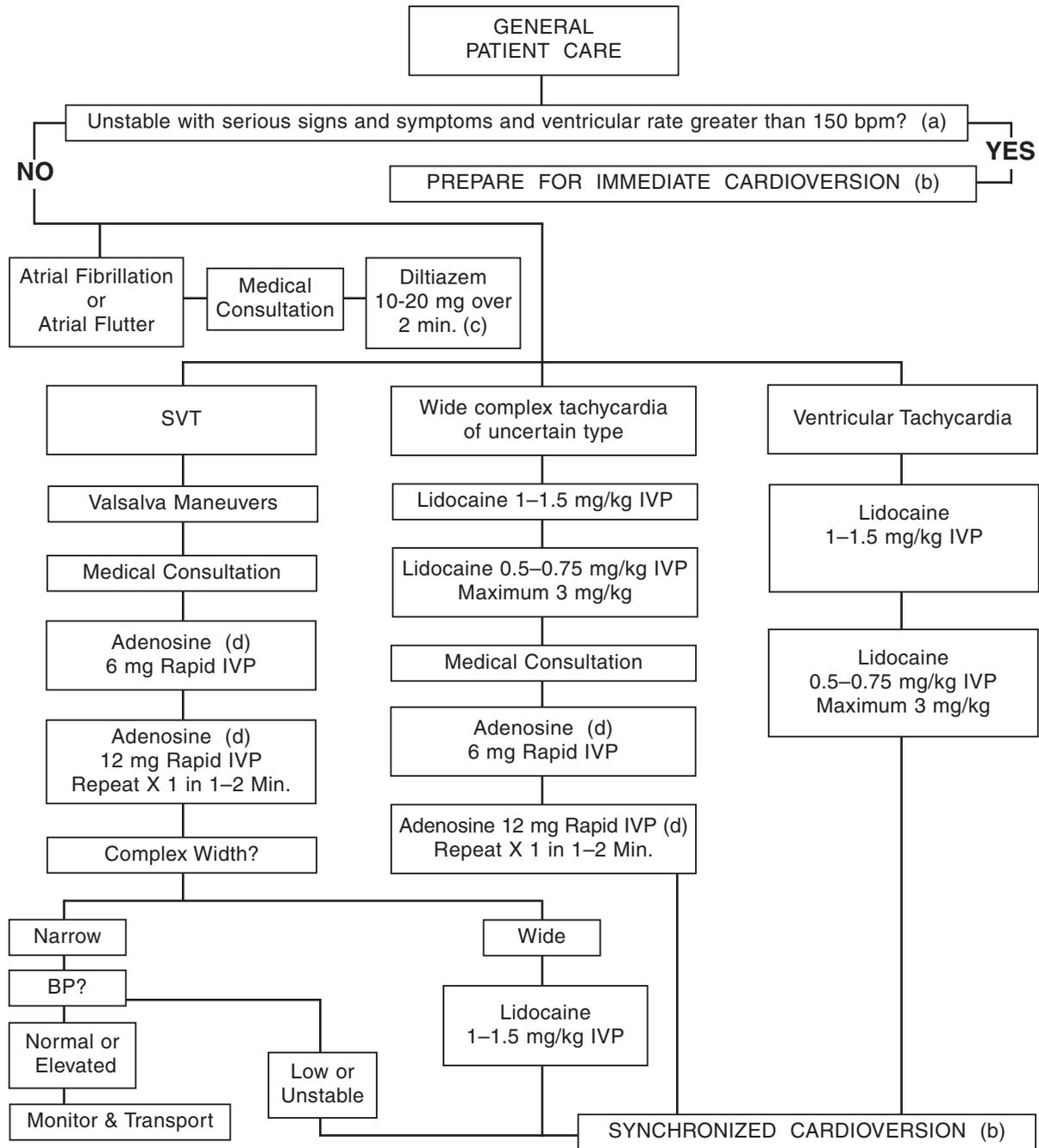
CARDIAC EMERGENCIES: TACHYCARDIA (Continued)

- 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

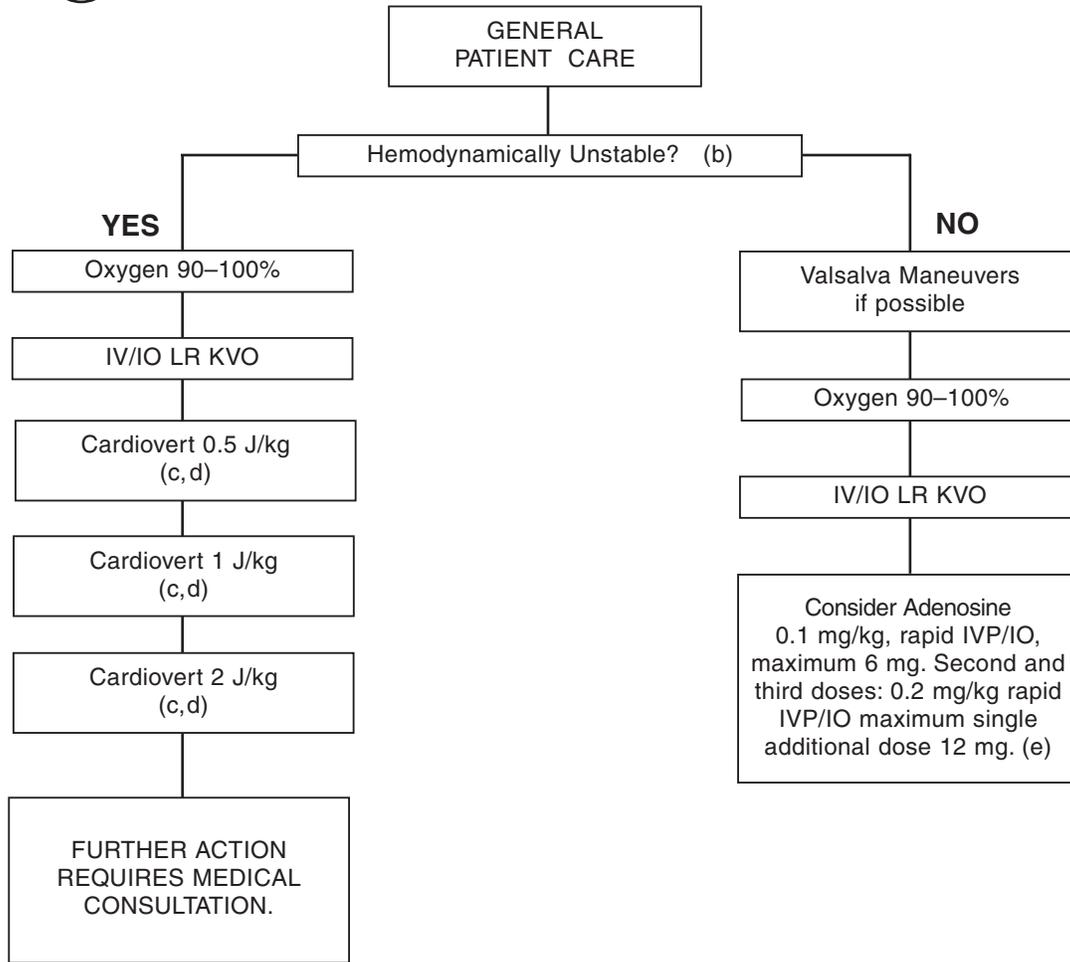


- (a) - Unstable condition must be related to the tachycardia. Signs and symptoms may include chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, CHF, and/or AMI.
- (b) - Consider sedation (midazolam with medical consultation). However, overall patient status, including BP, may affect ability to administer sedative.
- (c) - Consider calcium chloride 250 mg IVP for hypotension induced by diltiazem. Medical consultation required. If rate does not slow in 15 minutes, administer a second dose of diltiazem (15-25 mg over 2 minutes.) Medical consultation required.
- (d) - Be prepared for up to 40 seconds of asystole. Adenosine available for CRT-(I) & EMT-P only. (Paramedic may administer without consult.)



6.

PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA ALGORITHM (a)



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

(b) - 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), 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.

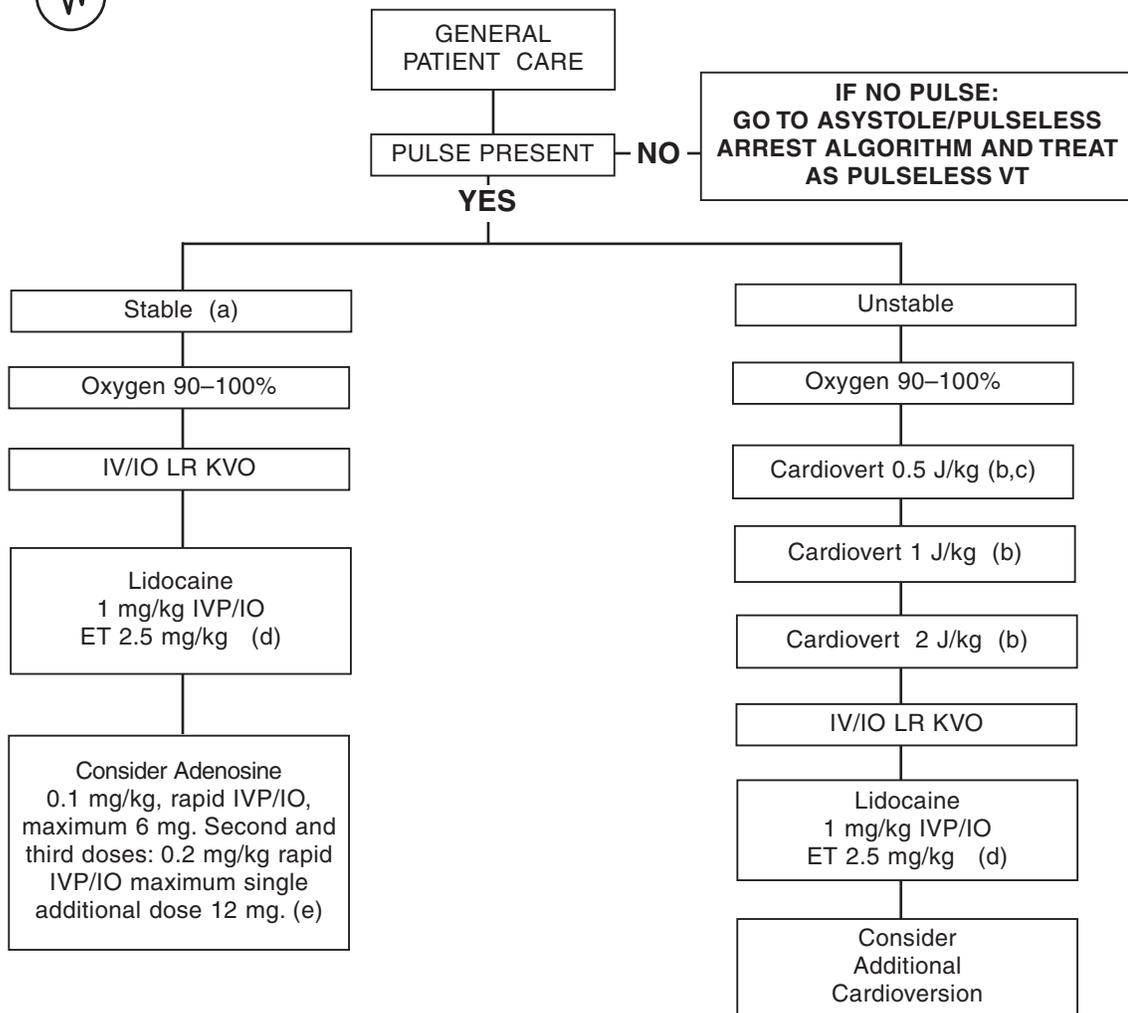
(d) - Consider sedation (midazolam with medical consultation). However, overall patient status, including BP, may affect ability to administer sedative.

(e) - Be prepared for up to 40 seconds of asystole. Adenosine available for CRT-(I) & EMT-P only. (Paramedic may administer without consult.)



7.

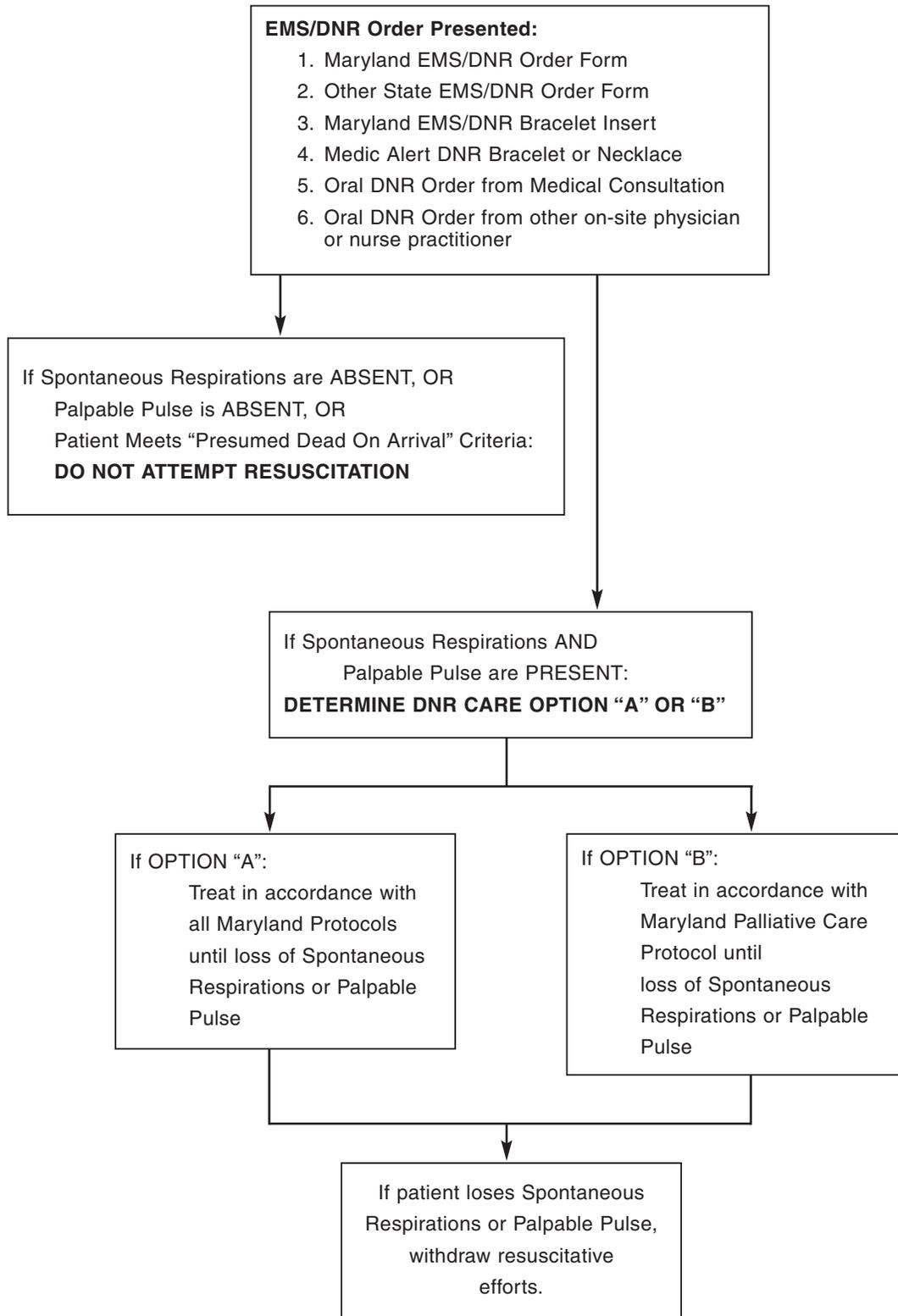
PEDIATRIC VENTRICULAR TACHYCARDIA ALGORITHM



- (a) - If patient decompensates, move directly to unstable path and cardioversion
- (b) - Cardioversion. If calculated joules setting is lower than cardioversion device is able to deliver, use the lowest joules setting possible or obtain medical consultation.
- (c) - Consider sedation (midazolam with medical consultation). However, overall patient status, including BP, may affect ability to administer sedative.
- (d) - Lidocaine administration: 1 mg/kg IV/IO bolus, followed by 0.5 mg/kg at 8-minute intervals until a maximum dose of 3 mg/kg has been administered or rhythm conversion has occurred. A paper tracing must be obtained prior to each administration. ET Dose is 2-2.5 times the above dose.
- (e) - Be prepared for up to 40 seconds of asystole. Adenosine available for CRT-(I) & EMT-P only. (Paramedic may administer without consult.)

P. EMS DNR Flowchart Effective 07/01/98

(Reference DNR Appendix in this document for a thorough explanation.)



Q. 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) Initiate IV LR KVO, if appropriate.
 - f)  Consider morphine sulfate (Paramedic may perform without consult.)
2-10 mg slow IV/IM/IO
Administer 1-2 mg/min.

PEDIATRIC SECTION ON NEXT PAGE

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) Consider IV/IO LR KVO.
 - l)  Consider Morphine Sulfate
0.1 mg/kg slow IV/IM/IO
Administer 1-2 mg/min
Maximum dose 5 mg

4. Continue General Patient Care.

R. 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)
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** re-warm patient within a warm environment.
 - d) If available, administer warmed oxygen.



ADMINISTER SHOCK(S) WITH THE AED IF INDICATED.

- e)  For further AED shocks, obtain medical consultation.

ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (Continued)



-
- f) Monitor EKG closely.
 - g) Initiate IV LR KVO, 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.

S. 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) Initiate IV LR KVO.

4. Continue General Patient Care.

T. 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. (See Section IV, Personal Protective Equipment.)

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) Initiate IV LR KVO 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.

ENVIRONMENTAL EMERGENCIES: HAZARDOUS MATERIALS (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.

U. ENVIRONMENTAL EMERGENCIES: HEAT-RELATED EMERGENCIES

1. Initiate General Patient Care.
2. Presentation
 - a) **Heat Cramps:** Moist, cool skin temperature, cramps, normal to slightly elevated temperature
 - b) **Heat Exhaustion:** Moist, cool skin, cramp 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 if available.
- d) If **heat stroke**, aggressively cool patient and place patient in semi-fowler's position.



-
- e) Initiate fluid therapy (20 mL/kg bolus).
Titrate to a systolic pressure of 100 mm Hg.

4. Continue General Patient Care.

V. 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) Initiate IV LR KVO.

d) Identify rhythm and treat according to appropriate algorithm.



e) Protect from and/or treat for hypothermia.



f) Initiate IV/IO LR KVO.

g) Identify rhythm and treat according to appropriate algorithm.

4. Continue General Patient Care.

W. 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) Initiate fluid therapy (20 mL/kg bolus).
Titrate to a systolic pressure of 100 mm Hg.

4. Continue General Patient Care.

X. HYPERBARIC THERAPY PROTOCOL

1. Initiate General Patient Care.
2. Presentation
 - a) Patients involved in a closed space fire and/or explosion incident with exposure to products of combustion or toxic gas inhalation are more likely to have carbon monoxide toxicity.
 - b) Patients with a recent history of scuba diving exhibiting signs of decompression complications.
3. INDICATIONS FOR REFERRAL TO A HYPERBARIC MEDICINE SPECIALTY CENTER
 - a) Patients presenting with altered mental status or nausea with vomiting, seizures, loss of consciousness or marked dyspnea in the face of suspected carbon monoxide or toxic inhalation with or without minor burns should be considered for transport to the hyperbaric specialty center. Patients in closed space incidents are more likely to manifest these symptoms.
 - b) Patients experiencing pain, paralysis, respiratory distress, altered mental status with a history of scuba diving in the last 48 hours.



4. CONTRAINDICATIONS FOR REFERRAL TO A HYPERBARIC MEDICINE SPECIALTY CENTER
 - a) Patients who meet the criteria for referral to a burn center.
 - b) Patients with injuries that meet the criteria for a trauma center.



PATIENTS WITH BURNS AND TRAUMA SHOULD BE REFERRED TO THE NEAREST APPROPRIATE TRAUMA CENTER, NOT A BURN CENTER.

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 15TH BIRTHDAY SHOULD BE TRANSPORTED TO A PEDIATRIC TRAUMA CENTER.



5. Treatment
 - a) Remove patient from toxic environment or eliminate source of toxic gas.
 - b) Administer as high a concentration of oxygen as possible.

HYPERBARIC THERAPY PROTOCOL (Continued)



c) Initiate IV LR

- (1) If hypoperfusion exists, initiate IV LR fluid therapy 20 mL/kg bolus in unburned area, if possible.
Titrate to a systolic pressure of 100 mm Hg.
- (2)  Obtain medical consultation to initiate an IV in an area of burn, if unable to obtain an IV in unburned area.
- (3)  Consider additional fluid administration (Max 2,000 cc without medical consultation)



d) Initiate IV/IO LR.

- (1) If age-related vital signs and patient's condition indicates hypoperfusion, administer initial fluid challenge of 20 mL/kg LR IV/IO in unburned area, if possible. If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg LR IV/IO.
- (2)  Obtain medical consultation to initiate an IV in an area of burn, if unable to obtain an IV in unburned area.

6. Transportation

a) Priority I Patients (immediate threat to life)

- (1) Consider air transportation if the patient will **ARRIVE** at the appropriate receiving facility more quickly than could be accomplished by ground transportation.
- (2) The provider should consider all of the following:
 - (a) Time for helicopter response
 - (b) Patient turnover (loading time)
 - (c) Flight time to appropriate facility
 - (d) Weather conditions

b) Priority II Patients (no immediate threat to life)

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

7. Continue General Patient Care.

X1. Nausea and Vomiting (CRT-I and EMT-P)

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 and approved with medical consultation (e.g., penetrating eye injury, high risk for aspiration, side effects of narcotic administration).



3. Treatment

a) Place patient either in position of comfort or in left lateral position if not prevented by spinal immobilization or packaging.



b) Consider initiating IV LR KVO or with 20 mL/kg fluid challenge if indicated

c) Administer Ondansetron

Adult: 4 mg slow IV over 2-5 minutes or 4 mg IM;

May repeat once with medical consultation.



Preventative administration of an anti-nausea/anti-emetic



d) Consider initiating IV LR KVO.

e) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge of 20 mL/kg LR IV/IO.

f)  Administer Ondansetron:

For patients who weigh less than 40 kg: 0.1 mg/kg slow IV over 2-5 minutes,

For patients who weigh 40 kg or greater: 4 mg slow IV over 2-5 minutes

OR

If no IV: 0.1 mg/kg IM (with max single dose of 4 mg);

May repeat once with medical consultation.



Preventative administration of an anti-nausea/anti-emetic

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Y. 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) Initiate IV LR KVO.

(1) If lungs are clear, initiate fluid therapy (20 mL/kg bolus).
Titrate to a systolic pressure of 100 mm Hg.

(2) If rales are present, infuse up to 250 mL, titrate to a systolic pressure of 100 mm Hg. 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

PEDIATRIC SECTION ON NEXT PAGE

NON-TRAUMATIC SHOCK: HYPOPERFUSION (Continued)



- e) The pediatric patient may present hemodynamically unstable or with hypoperfusion evidenced by altered mental status, delayed capillary refill greater than 2 seconds, pallor, peripheral cyanosis, hypotension. Hypotension 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), less than $[70 + (2 \times \text{years}) = \text{systolic BP}]$ for patients greater than 1 year of age.



- f) Continue General Patient Care.



-
- g) Initiate IV/IO LR.

If age-related vital signs and patient's condition indicates 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 (0-28 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.

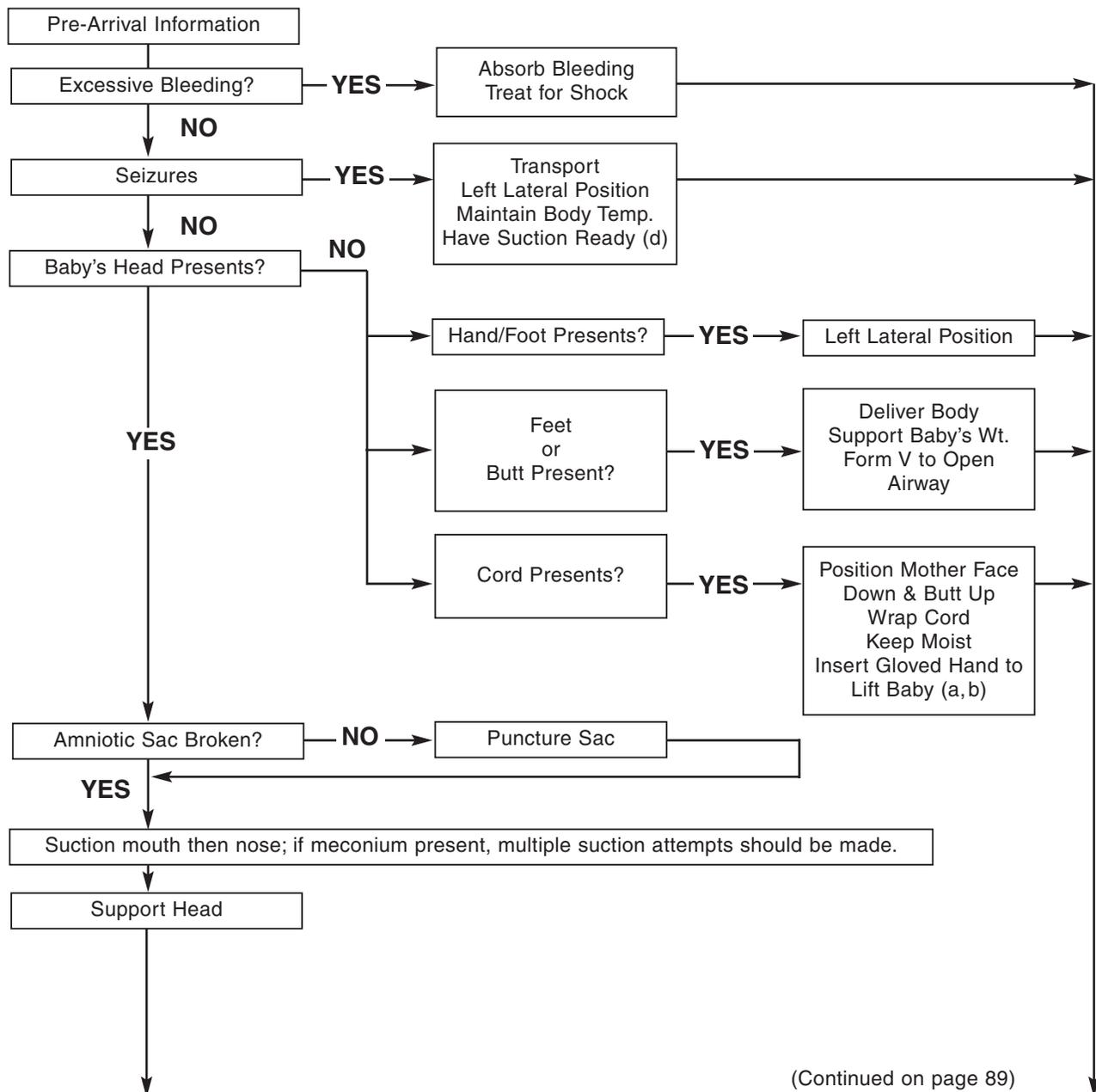
Z. OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES: CHILDBIRTH ALGORITHM

1. Initiate General Patient Care.

2. Presentation

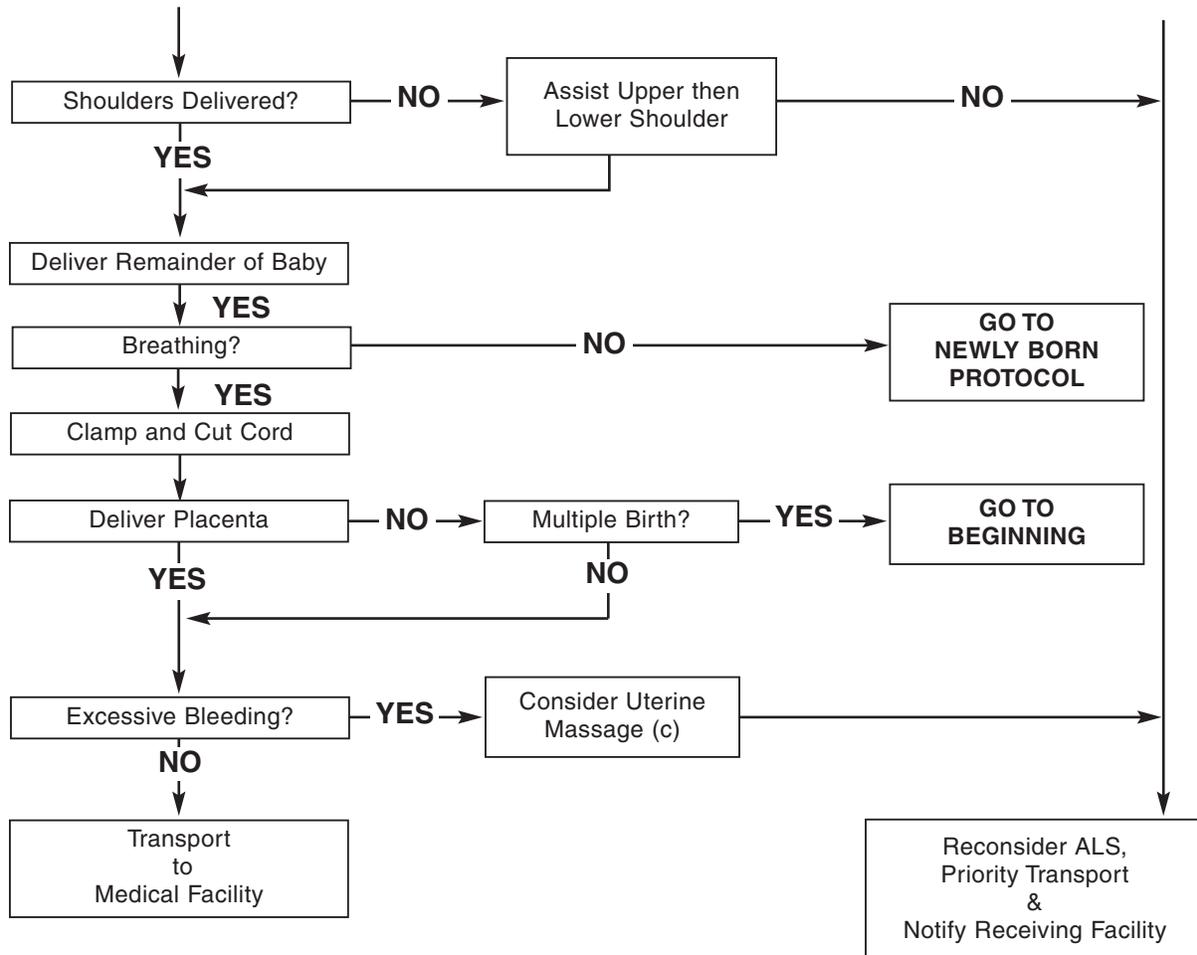
Patient presents pregnant, with contractions and/or pain, accompanied by bleeding or discharge, crowning during contraction, the feeling of an impending bowel movement, and/or a rock-hard abdomen.

3. Treatment



(Continued on page 89)

OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES (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. **(NEW '10)**

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

4. Continue General Patient Care.

AA. FUTURE PROTOCOL DEVELOPMENT

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BB. 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) Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mm Hg.
 - f)  Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation
4. Continue General Patient Care.

CC. 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.
(See Section IV, Personal Protective Equipment.)
- b) Identify agent and mechanism of exposure.
- c) Decontaminate as appropriate.



d) Initiate IV LR KVO in a clean area, if medication administration is anticipated.

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

f)  Consider antidote to specific agent if available.

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



h) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.
(See Section IV, Personal Protective Equipment.)

i) Identify agent and mechanism of exposure.

j) Decontaminate as appropriate.

OVERDOSE/POISONING: ABSORPTION (Continued)



k) Initiate IV/IO LR KVO in a clean area, if medication administration is anticipated.

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

m)  Consider antidote to specific agent if available.

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

4. Continue General Patient Care.

DD. 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) Initiate IV LR KVO in a clean area, if medication administration is anticipated.

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

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

f)  If **beta blocker** overdose, consider glucagon
1 mg every 5 minutes IVP
Maximum dose 3 mg

g)  If **calcium channel blocker** overdose, consider calcium chloride;
0.5 - 1 gram slow IVP (50 mg/min)



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

OVERDOSE/POISONING: INGESTION (Continued)

- h)  If **organophosphate poisoning**, consider atropine
2-4 mg IVP or IM every 5-10 minutes
- i)  If **tricyclic** overdose, consider sodium bicarbonate
1 mEq/kg IVP Bolus initially with 0.5 mEq/kg at 10 minute intervals
- j)  Consider antidote to specific agent if available.
- k)  Consider antibiotic specific to agent in mass casualty incident, if available.



- l) Identify substance and amount ingested.



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



-
- n) Initiate IV/IO LR KVO in a clean area, if medication administration is anticipated.
 - o)  Consider activated charcoal **without** Sorbitol 1 gram/kg PO.
 - p)  If **dystonic, extrapyramidal, or mild allergic reaction**, consider diphenhydramine 1 mg/kg IVP/IO or IM
Maximum single dose 25 mg
 - q)  If **beta-blocker** overdose, consider glucagon
1 mg IVP (25-40 kg);
0.5 mg IVP (less than 25 kg);
every 5 minutes as necessary
Maximum dose 3 mg
 - r)  If **calcium channel blocker** overdose, consider calcium chloride
20 mg/kg (0.2 mL/kg) slow IVP/IO (50 mg/mL)
Maximum dose 1 gram or 10 mL



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

OVERDOSE/POISONING: INGESTION (Continued)

- s)  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
- t)  If **tricyclic** overdose, consider sodium bicarbonate
1 mEq/kg diluted 1:1 slow IVP/IO
- u)  Consider antidote to specific agent if available.
- v)  Consider antibiotic specific to agent in mass casualty incident, if available.

4. Continue General Patient Care.

EE. 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!

PATIENTS PRESENTING WITH ALTERED MENTAL STATUS OR NAUSEA WITH VOMITING, SEIZURES, LOSS OF CONSCIOUSNESS OR MARKED DYSPNEA IN THE FACE OF SUSPECTED CARBON MONOXIDE OR TOXIC INHALATION WITH OR WITHOUT MINOR BURNS SHOULD BE CONSIDERED FOR TRANSPORT TO THE HYPERBARIC SPECIALTY CENTER. PATIENTS IN CLOSED SPACE INCIDENTS ARE MORE LIKELY TO MANIFEST THESE SYMPTOMS.



3. Treatment

- a) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.
(See Personal Protective Equipment.)
- b) Identify agent and mechanism of exposure.
- c) Decontaminate as appropriate.



-
- d) Consider obtaining blood sample using closed system, if indicated.
 - e) Initiate IV LR KVO in a clean area, if medication administration is anticipated.
 - 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.

OVERDOSE/POISONING: INHALATION (Continued)



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



-
- l) Initiate IV/IO LR KVO in a clean area, if medication administration is anticipated.
 - 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.

FF. 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) Place distal and proximal constricting band (allowing arterial flow) for poisonous snakebite to an 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 auto-injector or patient's prescribed albuterol.



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) Initiate IV LR fluid therapy 20 mL/kg bolus in uninjured extremity. Titrate to a systolic pressure of 100 mm Hg.
 - g) If narcotic overdose is suspected, administer naloxone 0.4-2 mg slow IVP
 - h)  Consider antidote to specific agent if available.
 - i)  Consider antibiotic specific to agent in mass casualty incident, if available.

OVERDOSE/POISONING: INJECTION (Continued)



- j) Identify markings (insects, bites, needlestick, etc.).
- k) Place distal and proximal constricting bands (allowing arterial flow) for a poisonous snakebite to an extremity.
- l) 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 albuterol.



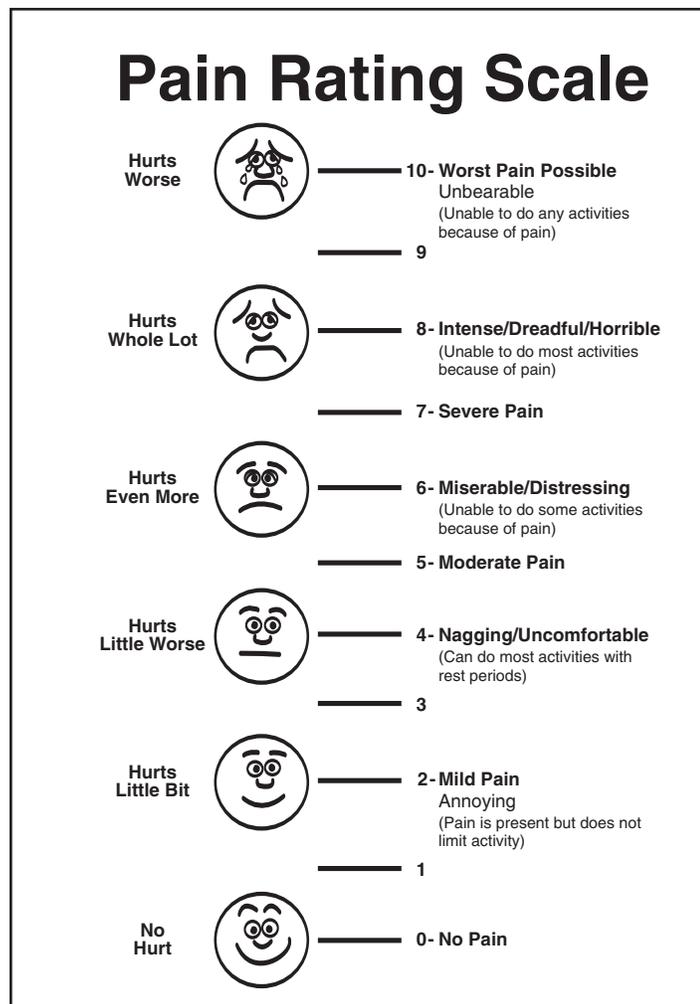
-
- m) Initiate IV LR fluid therapy 20 mL/kg bolus in uninjured extremity. Titrate to a systolic pressure of 100 mm Hg
 - n) If narcotic overdose is suspected, administer naloxone 0.1 mg/kg slow IVP/IO. Maximum dose 0.4-2 mg. ET dose 0.2-0.25 mg/kg.
 - o)  If **organophosphate poisoning**, consider atropine 0.02 mg/kg IV/IO or IM every 5-10 minutes
 - p)  Consider antidote to specific agent if available.
 - q)  Consider antibiotic specific to agent in mass casualty incident, if available.

4. Continue General Patient Care.

GG. PAIN MANAGEMENT (NEW '10)



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. Use of certain drugs for analgesia (reduction of pain) may also interfere with diagnostic procedures in the emergency department, and their use in such circumstances must be judicious, with medical control consulted when necessary.
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.



PAIN MANAGEMENT (Continued)



- b) Allow patient to remain in position of comfort unless contraindicated.
- c) Monitor airway and vital 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 3 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:
 - (1) Less than 3 years of age: Not indicated
 - (2) 3-5 years: Unit dose 160 mg/5 mL
 - (3) 6-9 years: Unit dose 325 mg/10.15 mL
 - (4) 10 years & above: Administer TWO Unit doses of 325 mg/10.15 mL each for total of 650 mg/20.3 mL
 - (a) Obtain on-line medical direction for appropriate dosing for patients who are significantly underweight or overweight.



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 HIS/HER PAIN AND APPROPRIATE DEFINITIVE TREATMENT.



-
- e) Moderate to severe pain
 - (1) Indications for pain management
 - (a) Acute myocardial infarction
 - (b) Burns
 - (c) Isolated injuries requiring pain relief such as suspected fractures or dislocations
 - (d) Acute sickle cell pain crisis
 - (e) Abdominal pain with consult
 - (f) EMS/DNR Palliative Care Protocol (Option A or B)

PAIN MANAGEMENT (Continued)

- (2) Contraindications for pain management with morphine
 - (a) Head injury
 - (b) Hypotension
 - (c) Sensitivity to morphine, codeine, or percodan
 - (d) Allergy to morphine
- (3) Administer morphine intravenously or intramuscularly



Adult:

- (1) AMI: Administer 2-5 mg slow IVP followed by 1 mg every 5 minutes to a maximum of 10 mg or until pain is relieved
- (2) Isolated injury (including burns, frostbite, eye trauma): Administer 2-10 mg slow IVP at 1-2 mg/min increments to 10 mg or until pain is relieved (Paramedic may perform without consult). For doses above 10 mg, contact medical direction

OR

- (3) May also be administered IM dose 5-15 mg based on patient weight.



0.1mg/kg IVP/IO/IM (slow 1-2 mg/min).
Maximum dose of 5 mg.

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

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HH. RESPIRATORY DISTRESS: ALLERGIC REACTION/ANAPHYLAXIS

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 mild wheezing
 - (3) **SEVERE:** Diffuse wheezing, pharyngeal swelling, dyspnea, hypoperfusion, abnormal skin color, stridor, and/or loss of peripheral pulses.



3. Treatment
 - a) Assist the 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 patient's prescribed albuterol.
 - b) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.
 - c)  Consider additional doses of Epinephrine auto-injector or prescribed albuterol.



-
- d) Moderate to Severe Distress
 - (1) Administer epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg
May repeat every 5 minutes for total of 3 doses for severe reactions
Additional doses of epinephrine require medical consultation.
 - (2) Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mm Hg.
 - (3) Administer diphenhydramine
50 mg slow IVP or IM (**NEW '10**)
Additional doses of diphenhydramine require medical consultation.
 - (4) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer. (**NEW '10**)
 - (5) Administer a combination of albuterol/Atrovent via nebulizer
albuterol 2.5 mg and Atrovent 500 mcg.
 - (6) If further treatments are indicated, an additional albuterol-only nebulizer may be given.

RESPIRATORY DISTRESS: ALLERGIC REACTION/ANAPHYLAXIS (Continued)

- e)  For anaphylactic shock only (hypotension or severe airway/respiratory distress), consider epinephrine 1:10,000 (concentration is 0.1 mg per mL) with medical consultation 0.01 mg/kg slow IVP (give 1 mL increments)
Maximum dose 1 mg
- f)  Mild Allergic Reaction
- (1) Consider diphenhydramine
25 mg slow IVP or IM
OR
Consider epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg
- (2) Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation
- g) 
 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 patient's prescribed albuterol.
- h) Albuterol inhaler (2 puffs) may be repeated once within 30 minutes.
- i)  Consider additional doses of Epinephrine auto-injector or albuterol.
-
-  j) Moderate to Severe Distress
- (1) Administer epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg
May repeat every 5 minutes for total of 3 doses for severe reactions
Additional doses of epinephrine require medical consultation.
- (2) Initiate IV/IO.



RESPIRATORY DISTRESS: ALLERGIC REACTION /ANAPHYLAXIS (Continued)

- (3) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge 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.
 - (4) Administer diphenhydramine
1 mg/kg slow IVP/IO or IM
Maximum single dose 50 mg **(NEW '10)**
Additional doses of diphenhydramine require medical consultation.
 - (5) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer. **(NEW '10)**
 - (6) Administer 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.
 - (7) If further treatments are indicated, an additional albuterol-only nebulizer may be given.
- k)  For anaphylactic shock only (hypotension or severe airway/respiratory distress), consider epinephrine 1:10,000 (concentration is 0.1 mg per mL) with medical consultation 0.01 mg/kg slow IVP/IO (give 1 mL increments)
Maximum dose 1 mg
- l)  Mild Allergic Reaction
Consider diphenhydramine
1 mg/kg slow IVP or IM
Maximum single dose 25 mg
OR
Consider epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg

4. Continue General Patient Care.

II. 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 the patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed albuterol or prescribed Epinephrine auto-injector.

b)  Use of the EMS services Epinephrine auto-injector requires medical consultation.

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

d)  Consider additional doses of patient's prescribed albuterol or Epinephrine auto-injector.



e) Initiate IV LR KVO (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, CPAP, or BVM while receiving medication via nebulizer. **(NEW '10)**

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 continuous positive airway pressure (CPAP) if patients continue to deteriorate in spite of above nebulized treatments. Continue inline nebulizations. **(NEW '10)**

j) Consider the administration of epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg
May repeat every 5 minutes for a total of 3 doses for severe reactions.
OR

k) Consider the administration of terbutaline
0.25 mg IM

RESPIRATORY DISTRESS: ASTHMA/COPD (Continued)



- l)  Consider additional doses of epinephrine, albuterol, or terbutaline.



- m) 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 auto-injector or patient's prescribed albuterol.



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

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

- o)  Consider additional doses of patient's prescribed albuterol or Epinephrine auto-injector.



- p) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer. **(NEW '10)**

- q) Administer 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.

- r) 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.

- s) Administer epinephrine 1:1,000
0.01 mg/kg IM
Maximum single dose 0.5 mg
May repeat every 5 minutes for a total of 3 doses for severe reactions.

- t)  Consider additional doses of albuterol or epinephrine.

- u) Consider initiating an IV/IO of LR KVO.

4. Continue General Patient Care.

JJ. RESPIRATORY DISTRESS: CROUP



1. Initiate General Patient Care.
2. Presentation
Pediatric Respiratory Distress with Stridor (Suspected Croup) "Barking Cough and Audible Stridor"

Severe "Priority 1" –Patient is unable to speak or cry, has a decreased level of consciousness, bradycardia or tachycardia, and hypertension or hypotension.

Moderate "Priority 2" –Slow onset of respiratory distress with barking cough, fever, and audible stridor.



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) Initiate IV/IO LR KVO. **Do not withhold nebulized epinephrine if IV is not easily obtainable. Establish IV/IO access after appropriate airway management has been done.**

RESPIRATORY DISTRESS: CROUP (Continued)



- d) For children who have not reached their 15th birthday without known cardiac disease and are having respiratory distress with audible stridor believed to be caused by croup, administer 3 mL of normal saline via nebulizer for 3-5 minutes. (Note: if inhaled normal saline decreases the patient's level of distress symptoms, continue this therapy en route to the appropriate receiving facility.) **(NEW '10)**

- e)  If no change in patient's condition, then administer 2.5 mL of epinephrine 1:1,000 via nebulizer. For priority one patients, a second dose of 2.5 mL may be administered with medical consultation.

AND

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

- g) 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.

KK. 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. Using the factors listed above can help identify CHF/APE. Factors most associated with a short of breath patient having CHF include: **a history of CHF**, exam features **of jugular venous distension and ECG evidence of Atrial Fibrillation**. The patient with CHF also typically may have a history of **cardiac disease** (Coronary Artery Disease or MI) and/or **hypertension**. Hypertension is usually poorly controlled. 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)** (an attack of severe shortness of breath while sleeping that causes the patient to have to sit-up or stand to breathe) are symptoms associated with CHF/APE. Blood pressure is frequently elevated, usually greater than 160/100 but not uncommonly greater than 180/120.

COPD patients, by comparison, usually have histories of respiratory illness but not of cardiac disease. They are commonly on respiratory medicines (inhalers) but not on cardiac medicines. COPD patients usually do not have orthopnea or PND and their blood pressures are typically not elevated.

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 mm Hg.

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

- (1) **Asymptomatic – dyspnea on exertion but no symptoms at rest**
- (2) **Mild – mild dyspnea at rest, despite O₂ treatment. Able to speak in full sentences.**
- (3) **Moderate – moderate dyspnea. O₂ saturation less than 93% on oxygen. Systolic BP usually greater than 150. Unable to speak in full sentences. Normal mental status.**
- (4) **Severe – severe dyspnea, respiratory failure, hypoxia (O₂ saturation less than 90% on oxygen), diaphoresis, Systolic BP commonly greater than 180. One word sentences, altered consciousness.**



3. Treatment – 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 (after load). The most effective and safe medication for these goals is nitroglycerin (NTG). When Captopril (an Angiotensin Converting Enzyme Inhibitor (ACEI) is administered along with NTG the benefit is in addition to the benefit realized with nitroglycerin.



- 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; administer 3 doses of NTG while setting up, acclimatizing the patient and applying CPAP).



PERFORM 12-LEAD ECG (IF AVAILABLE) AND IN THE FACE OF INFERIOR WALL WITH POSTERIOR WALL EXTENSION MI, CONSIDER LOWERING THE SECOND DOSING OF NTG.

- d) If patient **has** a prescription or previous history of nitroglycerin use, administer nitroglycerin per dosing below. May be repeated if symptoms persist, and BP is greater than 90 mm Hg, and pulse is greater than 60 bpm, to a maximum dose of 4 mg. If BP drops below 90 mm Hg, treat with medical fluid bolus(es) [initial bolus 250 – 500 cc; may repeat x 1].
- e) 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 below.
- f) Initiate IV LR KVO.
- g) If IV cannot be established, nitroglycerin may be administered with medical consultation.

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

- h) Identify rhythm and treat according to appropriate algorithm.
- i) Nitroglycerin
- (1) **Asymptomatic (dyspnea on exertion, not at rest)** – apply oxygen per GPC to maintain O₂ saturation greater than 93%
 - (2) **Mild symptoms (mild dyspnea at rest, despite O₂ treatment; able to speak full sentences)** – administer low dose NTG 0.4 mg SL at 3 – 5 minute intervals.
 - (3) **Moderate symptoms (moderate dyspnea; O₂ saturation less than 93% on O₂; unable to speak full sentences; normal mental status; SBP will generally be greater than 150 mm Hg) –High Dose NTG (Assess BP before each administration.)**

High Dose NTG (Assess BP before each administration)

CPAP nitroglycerin dose (Dose at 3-5 minute intervals.)

- (i) give 1 dose of 0.4 mg NTG (Preparing CPAP and apply as soon as possible) **(NEW '10)**
- (ii) give 1 dose of 0.8 mg NTG and apply nitropaste **(NEW '10)**
- (iii) give 1 dose of 0.8 mg NTG **(NEW '10)**
- (iv) complete dose=2.0 mg
- (v) Then follow with captopril (SBP is equal to or greater than 110)



ONCE CPAP IS IN PLACE, THE PREFERRED THERAPY IS CPAP OVER SUBLINGUAL NTG AND CAPTOPRIL. **(NEW '10)**

CPAP Not Tolerated - nitroglycerin dose

(Dose at 3-5 minute intervals.)

- (i) give 1 dose of 0.4 mg NTG
 - (ii) give 1 dose of 0.8 mg NTG
 - (iii) give 1 dose of 0.8 mg NTG
 - (iv) give 1 dose of 0.8 mg NTG
 - (v) give 1 dose of 0.8 mg NTG
 - (vi) give 1 dose of 0.8 mg NTG
 - (vii) complete dose = 4.4 mg
 - (viii) Then follow with captopril (SBP is equal to or greater than 110); and apply Nitroglycerin paste.
- (4) **Severe symptoms (O₂ saturation less than 90% [hypoxia]; one word sentences, altered sensorium, diaphoresis; SBP will generally be greater than 180 mm Hg) –**
Treat as in i)(3) above.
- j) Consider additional nitroglycerin
low or high dose based upon symptoms of shortness of breath (rating scale) and blood pressure (goal: reduce Mean Arterial Pressure by 15 – 20%)

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

- (1) Administer captopril 25 mg SL for moderate and severe symptoms so long as SBP is equal to or greater than 110 after nitroglycerin administration.
- (2) Nitroglycerin paste – for patients with moderate or severe symptoms and SBP greater than 110, administer NTG paste 1 inch topically following at least 3 doses of NTG SL (0.4, 0.8 & 0.8).
- (3) Re-evaluate the patient's subjective trouble breathing with using the 0 to 10 scale, vital signs.

k)  Consider furosemide 0.5 - 1 mg/kg slow IVP.



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

l)  Consider dopamine 2-20 mcg/kg/min.
Titrate to systolic BP 100 mm Hg or medical consultation directed BP.
IV infusion pump preferred.



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

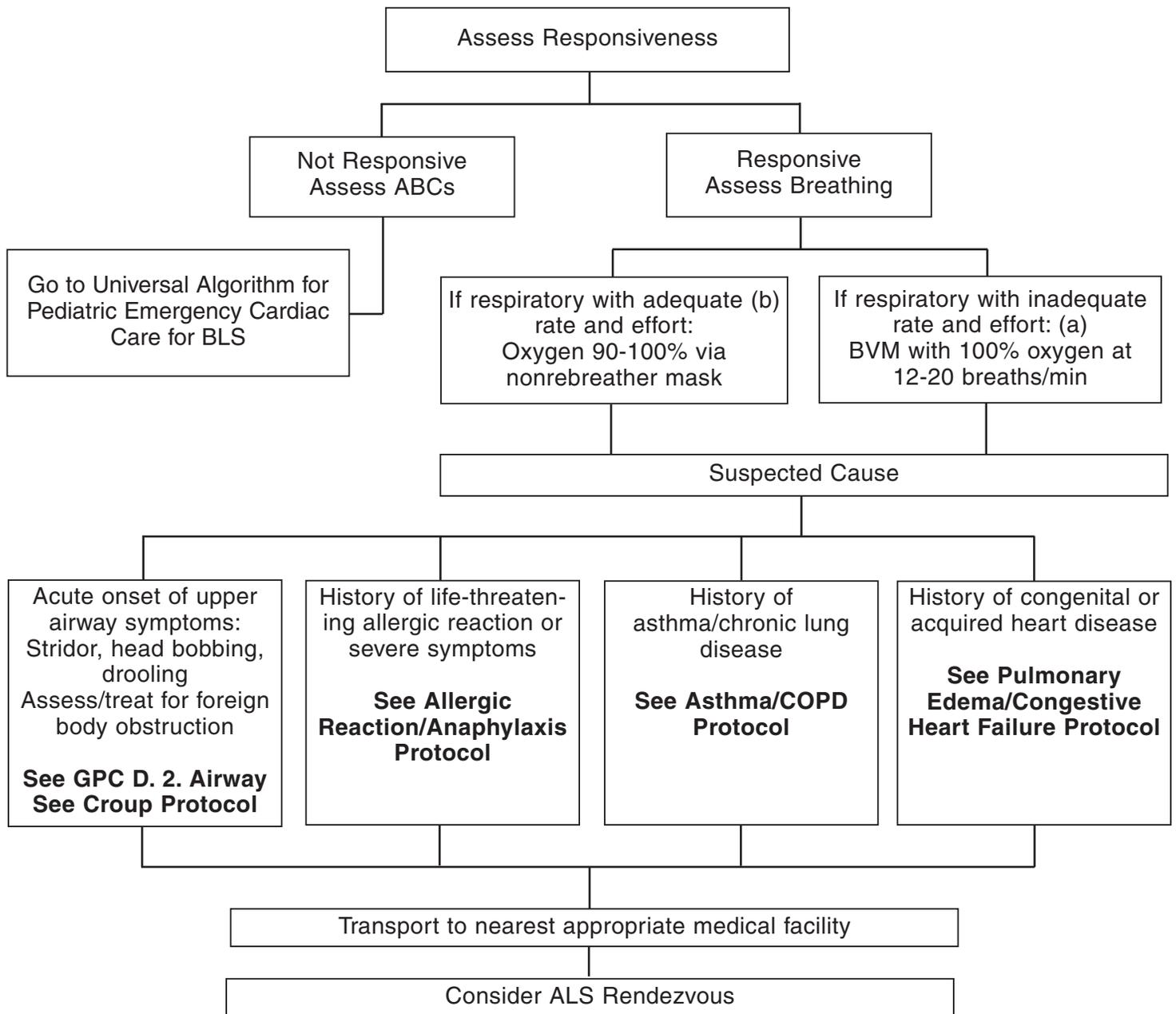
- m) Position patient in semi-Fowler's position.
- n) Initiate IV LR KVO.
- o) Identify rhythm and treat according to appropriate algorithm.
- p) Patients with moderate to severe respiratory distress may require high flow oxygen via non-rebreather mask, CPAP, or BVM while receiving medication via nebulizer. **(NEW '10)**
- q)  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
- r)  Consider furosemide:
1 mg/kg slow IVP/IO **(NEW '10)**
- s)  Consider morphine:
0.1 mg/kg slow IVP/IO/IM (1-2 mg/min)
Maximum dose 5 mg
- t)  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



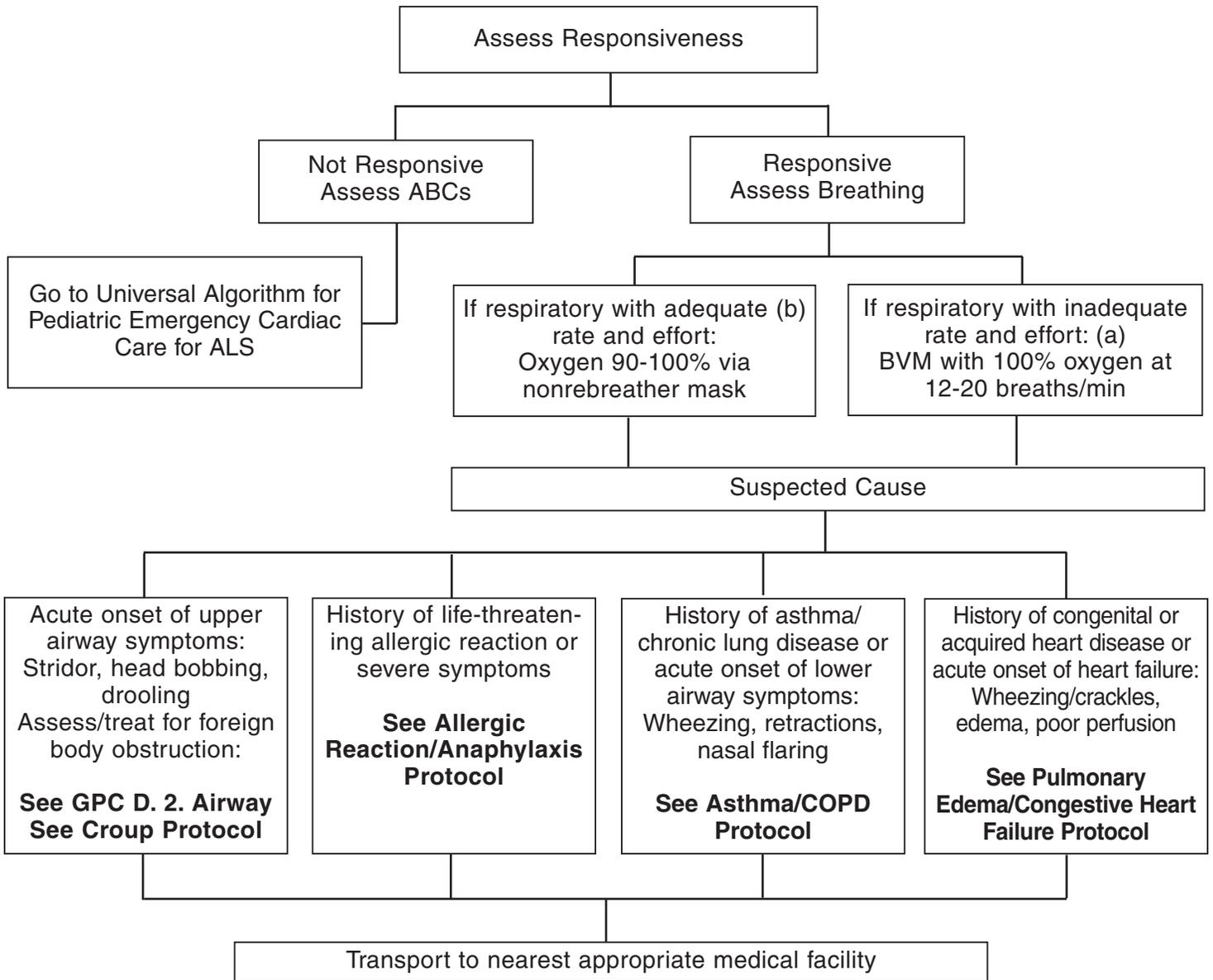
(a) Inadequate RR: Infant less than 20, Child less than 16, Adolescent less than 12.
Inadequate effort: Poor chest rise, shallow respirations/poor air movement, cyanosis, severe retractions, paradoxical breathing.

(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, Child less than 16, Adolescent less than 12.
 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.

LL. 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



3. Treatment

- Administer oxygen at 2-6 liters via nasal cannula (unless hypoxic or in respiratory distress).
- Position patient lying flat or slightly elevated.
- Complete the Fibrinolytic Therapy Checklist for Ischemic Stroke.
- If the patient is a candidate for fibrinolytic therapy AND can be delivered to the hospital **within 2 hours** of sign/symptom onset, transport the patient to the closest Designated Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital.



CONSULT WITH NEAREST DESIGNATED STROKE CENTER AS SOON AS POSSIBLE TO ALLOW HOSPITAL PREPARATION.

STROKE TREATMENTS ARE TIME SENSITIVE.



- Use Glucometer and treat if glucose less than 70 mg/dl.
- Initiate an IV LR KVO.
-  If the patient is hypotensive, obtain medical consultation.
- Consider obtaining blood sample using closed system.
- Do not treat hypertension in the field.

STROKE: NEUROLOGICAL EMERGENCIES (Continued)



STROKES ARE UNCOMMON IN CHILDREN. WHEN THEY OCCUR, IT IS LIKELY THAT THE CHILD WILL HAVE SICKLE CELL DISEASE. TRY TO DETERMINE WHICH PEDIATRIC SPECIALTY CENTER FOLLOWS THE CHILD AND INFORM LOCAL BASE STATION AND THE PEDIATRIC BASE STATION.



- j) Administer oxygen at 2-6 liters via nasal cannula (unless hypoxic or in respiratory distress).
- k) Position patient lying flat or slightly elevated.



- l) If a child presents with a SUSPECTED Stroke (e.g. sickle cell patient), consult with the nearest pediatric base station and local base station.



-
- m) Use Glucometer and treat accordingly.
(See Section IV, Glucometer Protocol.)
 - n) Initiate an IV LR KVO.
 - o) If the patient is hypotensive, obtain medical consultation.
 - p) Consider obtaining blood sample using closed system.
 - q) Do not treat hypertension in the field.

4. Continue General Patient Care.

Fibrinolytic Therapy Checklist for Ischemic Stroke

All of the "YES" boxes and **all** of the "NO" boxes must be checked before a patient should be transported to a "Designated Stroke Center".

INCLUSION CRITERIA

(All of the "YES" boxes must be checked)

YES

- 15 years of age or older
- Signs and symptoms of stroke with neurologic deficit (abnormal Cincinnati Stroke Scale)
- Patient can be delivered to a Stroke Center within 2 hours of sign/symptom onset

EXCLUSION CRITERIA

(All of the "NO" boxes must be checked)

NO

- Active internal bleeding (eg, gastrointestinal bleeding or urinary bleeding within the last 21 days)
- Known bleeding disorder
- Within 3 months of intracranial surgery, serious head trauma, or previous stroke
- Within 14 days of major surgery or serious trauma
- History of intracranial hemorrhage
- Witnessed seizure at stroke onset
- History of cancer of the brain

MM. TRAUMA PROTOCOL: BURNS

1. Initiate General Patient Care.
2. Presentation
 - a) 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.
 - b) Indications for Referral to a Burn Center
 - (1) Second and third degree burns
 - (a) Burns greater than 10% body surface area (BSA) in patients under 10 or over 50 years of age
 - (b) Burns greater than 20% body surface area (BSA) in any patient
 - (c) Burns of the face, hands, feet, or perineum
 - (2) Electrical burns, including lightning or contact with high voltage (200 volts or greater)
 - (3) Chemical burns
 - (4) Suspected inhalation injury when carbon monoxide is not suspected. (Assess airway for direct thermal injury as noted by singed nasal hairs, facial burns, and soot in mouth.) Patients with suspected inhalation injury may need emergent airway management.
 - (5) Circumferential burns



PATIENTS WITH BURNS AND TRAUMA SHOULD BE REFERRED TO THE NEAREST APPROPRIATE TRAUMA CENTER, NOT A BURN CENTER.

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

PATIENTS PRESENTING WITH ALTERED MENTAL STATUS OR NAUSEA WITH VOMITING, SEIZURES, LOSS OF CONSCIOUSNESS OR MARKED DYSPNEA IN THE FACE OF SUSPECTED CARBON MONOXIDE OR TOXIC INHALATION WITH OR WITHOUT MINOR BURNS SHOULD BE CONSIDERED FOR TRANSPORT TO THE HYPERBARIC SPECIALTY CENTER. PATIENTS IN CLOSED SPACE INCIDENTS ARE MORE LIKELY TO MANIFEST THESE SYMPTOMS.

3. Treatment
 - a) Eliminate source of burn.
 - b) Determine percent of body surface area (BSA) and depth.
 - c) Treat associated trauma.
 - d) Dress wounds appropriately:
 - (1) Dry, sterile dressings
 - (2) Moist dressings for burns less than 9% BSA



TRAUMA PROTOCOL: BURNS (Continued)



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.



e) Initiate IV LR fluid therapy 20 mL/kg bolus in unburned area, if possible. Titrate to a systolic pressure of 100 mm Hg.

f)  Obtain medical consultation to initiate an IV in an area of burn, if unable to obtain an IV in unburned area.

g)  Consider morphine sulfate. (Paramedic may administer without consult.)
2-10 mg slow IV/IM/IO
Administer 1-2 mg/min



h)  Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation



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

j)  Obtain medical consultation to initiate an IV in an area of burn, if unable to obtain an IV in unburned area.

k)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO.

l)  Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

4. Continue General Patient Care.

NN. 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):** Stabilize and immobilize the patient's head and spine; apply cold packs if the eyeball is NOT injured.
- c) **Lacerations/injuries to the eyeball or globe:** Shield affected eyeball and dress other eye to reduce movement; protect loss of fluids; immobilize the patient's head and spine and elevate the head of the backboard to decrease intraocular pressure.
- d) **Impaled objects:** Stabilize object; shield affected eyeball; and dress other eye to reduce movement.



-
- e) Initiate IV LR KVO.
 - f)  Consider morphine sulfate. (Paramedic may administer without consult.)
2-10 mg slow IV/IM/IO
Administer 1-2 mg/min



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):** Stabilize and immobilize the patient's head and spine; apply cold packs if the eyeball is NOT injured.
- i) **Lacerations/injuries to the eyeball or globe:** Shield affected eyeball and dress other eye to reduce movement; protect loss of fluids; immobilize the patient's head and spine and elevate the head of the backboard to decrease intraocular pressure.
- j) **Impaled objects:** Stabilize object; shield affected eyeball; and dress other eye to reduce movement.



-
- k) Initiate IV/IO LR KVO.
 - l)  Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

4. Continue General Patient Care.

OO.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 (eg 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 15th 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
 - (1) Patients with toe amputation (partial or complete)

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) Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mm Hg.
- c)  Consider morphine sulfate. (Paramedic may administer without consult).
2-10 mg slow IV/IM/IO
Administer 1-2 mg/min
- d)  Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation



-
- e) Initiate IV/IO LR.
- f) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge 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.
- g)  Third and subsequent fluid boluses at 20 mL/kg LR IV/IO.
- h)  Consider morphine sulfate
0.1 mg/kg slow IV/IO/IM
Administer 1-2 mg/min
Maximum dose 5 mg

4. Continue General Patient Care.

PP. 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 15TH BIRTHDAY, SHOULD BE TRANSPORTED TO A PEDIATRIC TRAUMA CENTER.



3. Treatment

- a) Maintain spine stabilization.
- b) Control bleeding and immobilize patient, if indicated.
- c) Hyperventilate the head-injured patient as follows:
Adult 20 breaths per minute
Child 30 breaths per minute
Infant 35 breaths per minute
 - (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis
 - (2) Who is manifesting a rapidly decreasing GCS **or**,
 - (3) With on-line medical consultation.
- d) Consider pelvic stabilization technique if indicated



-
- e) Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mm Hg.
 - f)  Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation

TRAUMA PROTOCOL: MULTIPLE/SEVERE TRAUMA (Continued)



- g) Maintain appropriate spine stabilization.
- h) Control bleeding and immobilize patient, if indicated.
- i) Hyperventilate the head-injured patient as follows:
 - Adult 20 breaths per minute
 - Child 30 breaths per minute
 - Infant 35 breaths per minute
 - (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis
 - (2) Who is manifesting a rapidly decreasing GCS **or**,
 - (3) With on-line medical consultation.



-
- j) Initiate IV/IO.
 - k) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge 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.
 - l)  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

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

Glasgow Coma Score

Total (3-15)

QQ. TRAUMA PROTOCOL: SEXUAL ASSAULT

1. Initiate General Patient Care.
2. Presentation
Patient may present with no overt evidence of trauma, or may present with bruising, bleeding, or associated physical and/or emotional trauma.



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.



3. Treatment
 - a) Patient may feel more comfortable talking to someone of the same sex.
 - b) Maintain non-judgmental, but caring attitude.
 - c) Preserve crime scene and clothing articles, if practical.
 - d) Maintain strict confidentiality.
 - e) Do not perform a genital examination.
 - f) Dress wounds (do not attempt to clean).
 - g) Discourage any self-treatment (shower, washing, changing clothes).
 - h) Treat injuries according to presentation.
4. Continue General Patient Care.

RR. TRAUMA PROTOCOL: SPINAL CORD INJURY

1. Initiate General Patient Care.
2. Presentation

Patients may exhibit any of the following: paralysis below the site of injury, loss of motor or neurological function and/or neurogenic shock.
Associated injuries will also include pain.
3. Treatment
 - a) Indications for Referral to a Specialty Spinal Center:
 - (1) Signs and symptoms of new paraplegia or quadriplegia in the presence of trauma **and**
 - (2) Patent airway **and**
 - (3) Hemodynamically stable **and**
 - (4) Patients who are 15 years of age or older should be transported to the Adult Spinal Specialty Center.
 - b)  Consult with nearest Trauma Center and, when possible, the Adult Spinal Specialty Center.
 - c)  **Protect Airway!**
 - d) Immobilize and protect entire spine.

 - e)  Initiate IV LR fluid therapy 20 mL/kg bolus.
Titrate to a systolic pressure of 100 mm Hg.
 - f)  Consider additional fluid administration
Maximum dose 2,000 mL without medical consultation

PEDIATRIC SECTION ON NEXT PAGE

TRAUMA PROTOCOL: SPINAL CORD INJURY (Continued)



- g) Spinal Injury Indications for Referral to a Pediatric Trauma Center:
- (1) Signs and symptoms of new paraplegia or quadriplegia in the presence of trauma **and**
 - (2) Patent airway **and**
 - (3) Hemodynamically stable **and**
 - (4) Children who have **not** reached their 15th birthday should be transported to a Pediatric Trauma Center.
- (5)  Consult with nearest Trauma Center and, when possible, the Pediatric Trauma Center.



- h) **Protect Airway!**
- i) Maintain appropriate spine stabilization.



-
- j) Initiate IV/IO LR.
- k) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge 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.
- l)  Third and subsequent fluid bolus at 20 mL/kg LR IV/IO.

4. Continue General Patient Care.

SS. TRAUMA PROTOCOL: TRAUMA ARREST

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) Protect cervical spine.
- c) CPR
- d) Consider AED if arrest is believed to be medical in nature and the patient meets the criteria.



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



-
- e) Initiate IV 20 mL/kg.
Titrate to systolic pressure of 100 mm Hg.
 - f) Identify rhythm and refer to appropriate algorithm.
 - g) 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 catheters are placed **do not remove.**

TRAUMA PROTOCOL: TRAUMA ARREST (Continued)



- h) Rapid assessment and extrication
- i) Protect cervical spine.
- j) CPR
- k) 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!



-
- l) Initiate IV/IO LR.
 - m) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge 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) 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 catheters are placed **do not remove**.

4. Continue General Patient Care.

TT. TRAUMA DECISION TREE

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

Category A

<input type="checkbox"/> GCS less than or equal to 8 or Systolic BP less than 90 (Adult) less than 60 (Peds) or Respiratory rate less than 10 or greater than 29		
<input type="checkbox"/> Flail chest	<input type="checkbox"/> Pelvic fracture	<input type="checkbox"/> Penetrating injuries to head, neck, or torso
<input type="checkbox"/> Rapidly declining GCS	<input type="checkbox"/> Paralysis (spine)	<input type="checkbox"/> Open or depressed skull fracture
<input type="checkbox"/> 2 or more proximal long-bone fractures		

YES

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

NO

Assess for other injuries.

Category B

<input type="checkbox"/> GCS 9 - 14	<input type="checkbox"/> Crushed, degloved, or mangled extremity
<input type="checkbox"/> Paralysis or vascular compromise of limb	<input type="checkbox"/> Penetrating injuries to extremities proximal to elbow or knee
<input type="checkbox"/> Amputation proximal to wrist or ankle	<input type="checkbox"/> Combination trauma with burns

YES

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

NO

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

Category C

<input type="checkbox"/> High Risk Auto Crash		
<ul style="list-style-type: none"> • Intrusion greater than 12 in. occupant site; greater than 18 in. any site • Ejection (partial or complete) from vehicle • Death in same passenger compartment • Vehicle telemetry data consistent with high risk of injury 	<ul style="list-style-type: none"> • Rollover without restraint • Auto v. pedestrian/bicyclist thrown, run over, or with significant (20 mph) impact • Motorcycle crash greater than 20 mph 	
<input type="checkbox"/> Falls greater than 3 times patient's height	<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 II GPC I). **(Effective 10/14/08)**

NO

Evaluate for other considerations.

Category D

<input type="checkbox"/> Age less than 5 or greater than 55	<input type="checkbox"/> Burns without trauma mechanism go to burn center
<input type="checkbox"/> Patient with bleeding disorder or patient on anticoagulants	<input type="checkbox"/> Pregnancy greater than 20 weeks
<input type="checkbox"/> Dialysis patient	<input type="checkbox"/> EMS provider judgment

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 II GPC I). **(Effective 10/14/08)**

NO

Transport according to protocol.

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IV. APPENDICES

A. GLOSSARY

AED: Automated External Defibrillation.

Alternative Airway Device: An airway adjunct other than an endotracheal tube that may include dual lumen airways (e.g. EasyTube®) or the laryngeal tube airway device (e.g. King LTS-D®) **(NEW '10)**

AMI: Acute Myocardial Infarction.

APGAR score: An acronym and method of scoring to determine the condition of a newborn (see APGAR chart on page 149).

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. 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).

Basic: Emergency Medical Technician-Basic.

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.

COPD: Chronic Obstructive Pulmonary Disease (i.e., 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. **(NEW '10)**

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

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

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.

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 with an awake and alert person and 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 & 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.

EMS: Emergency Medical Services.

EMT-B: Emergency Medical Technician - Basic.

EMT-P: Emergency Medical Technician - Paramedic.

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.

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 with an awake and alert person and 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.

Fluid Challenge: The administration of fluid dose usually over thirty to sixty minutes to a patient that is dehydrated and has low urine output.

FR: First Responder.

GCS: Glasgow Coma Scale. A tool to evaluate injury and illness severity.

Gm: Gram. The symbol for a metric unit of mass and weight equal to 1000 milligrams.

Hemodynamically Stable: When a patient’s vital signs (including pulse oximeter or ECG 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 ECG if available), active bleeding, or there are signs of distress (skin conditions or capillary refill are abnormal).

HTN: Hypertension.

Hypoxia: Too little oxygen in the cells.

IM: Intramuscular injection.

IV: Intravenous line or administration of medication through IV.

IVP: Intravenous push.

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 1000 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. **(NEW '10)**

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: 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.

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

mL: Milliliter. The symbol for a metric measure of volume.

MOI: Mechanism of Injury.

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 birth through the first 28 days of life.

Newly Born (also called newborn): A term that describes an infant during the first few hours after birth.

NOI: Nature of Illness.

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

NRB: Non-rebreather mask.

NTG: Nitroglycerin.

Nurse Practitioner: A nurse practitioner is 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-Line Medical Direction: Is the 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 receiving hospital with valuable information on the patient. This exchange can take place on-scene, over a telecommunications device, or in the hospital setting.

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 which is not consistent with the protocols shall only be rendered by the on-scene physician who shall 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 which 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.

PDOA: Presumed dead on arrival.

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.

PPE: Personal Protective Equipment.

Provider: Includes EMT-Basic, CRT-(I), and EMT-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.

SAFER: **S**tabilize, **A**ssess and acknowledge, **F**acilitate, **E**ncourage, and **R**ecovery OR Referral.

SAMPLE: Used to aid in obtaining pertinent patient history. S = Symptoms and signs patient is exhibiting, A = patient Allergies, M = patient Medications (prescription & 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.

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 EMTs may be called upon to respond (for example: ill and/or injured patients, hazardous materials incidents, fires, mass casualty incidents, etc.)

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. **(NEW '10)**

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 that 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.

VT: Ventricular Tachycardia.

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

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

PROCEDURE	EMT-B	CRT-(I)	EMT-P
ADMINISTRATION OF MEDICATIONS			
Oral, Sublingual, IM (auto-injector)	SO	SO	SO
SC, IM, IV, Rectal, Nebulizer, Intranasal	-	SO	SO
Intraosseous	-	SO	SO
Intradermal PPD (Public Safety Personnel only)	-	-	OSP
AIRWAY MANAGEMENT			
Alternative Airway Device (e.g. EasyTube®) (NEW '10)	-	SO	SO
Carbon Dioxide Detector (ALS required)	SO	SO	SO
Capnograph (not required)	-	SO	SO
CPAP	-	SO	SO
Cricothyroidotomy	-	-	PP
Direct Laryngoscopy	-	SO	SO
Gastric Tube (BLS "Burp," ALS insert)	-	SO	SO
Impedance Threshold Device (ITD)	OSP	OSP	OSP
Laryngeal Tube Airway (King LTS-D)	-	OSP	OSP
Nasotracheal Intubation	-	-	SO
Oropharyngeal/Nasopharyngeal Airway	SO	SO	SO
Orotacheal Intubation	-	SO	SO
Needle Decompression Thoracostomy (NDT)	-	SO/MC	SO/MC
Pulse Oximeter (ALS required)	SO	SO	SO
Suction	SO	SO	SO
Ventilator	-	-	OSP
CHEMICAL RESTRAINT	-	-	MC
ELECTROCARDIOGRAM			
Standard Limb Leads	-	SO	SO
12 Lead	PP	SO	SO
ELECTRICAL THERAPY			
Automated External Defibrillator	SO	SO	SO
Cardioversion	-	SO	SO
Defibrillation	-	SO	SO
Transcutaneous Cardiac Pacing	-	SO	SO
GLUCOMETER	OSP	SO	SO
INTRAVENOUS THERAPY			
External Jugular Access & Maintenance	-	SO	SO
Intraosseous Infusion & Maintenance	-	SO	SO
Peripheral IV Access/Saline Lock/Blood Drawn	OSP	SO	SO
Peripheral IV Maintenance	SO	SO	SO
SKELETAL STABILIZATION/IMMOBILIZATION	SO	SO	SO
SOFT TISSUE INJURY & BLEEDING MANAGEMENT	SO	SO	SO
VASOVAGAL MANEUVER			
Valsalva maneuver	-	SO	SO

SO Standing Order

OSP Optional Supplemental Program

MC

Medical Consultation Required

PP

Pilot Program

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

DEVICE	EMT-B	CRT-(I)	EMT-P
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
PICC —peripherally inserted central catheter or CVA —central venous access line, capped only.	SO	SO	SO
PICC —peripherally inserted central catheter or CVA —central venous access line, subclavian/femoral or internal jugular may be monitored if fluid/medication being administered meets protocol. The ALS provider may access the line in a life-threatening emergency.	-	SO	SO
Intraventricular/Intracranial Monitor	-	-	-
Left Ventricular Assist Device (LVAD) Scene (BLS & ALS)	SO	SO	SO
Left Ventricular Assist Device (LVAD) Interfacility	-	-	-
Nasogastric and Orogastric tubes (Existing, Non-infusing or Capped)	SO	SO	SO
Nephrostomy Tubes	SO	SO	SO
Peak Expiratory Flow Meter	-	SO	SO
Pelvic Binder Device	PP	PP	PP
Portable Outpatient Fixed Medication Pump/PCA Pump	SO	SO	SO
Peritoneal Dialysis (Non-active, Capped)	SO	SO	SO
Physical Restraint	SO	SO	SO
Sengstaken-Blakemore tube	-	-	-
Suprapubic catheter	SO	SO	SO
Surgical drains	SO	SO	SO
Swan-Ganz	-	-	-
Tracheostomy (Existing)	SO	SO	SO
Transtracheal O ₂ (Out Patient/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

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

MEDICATIONS	EMT-B	CRT-(I)	EMT-P
Activated Charcoal (Without Sorbitol)	MC	MC	MC
Adenosine	–	MC	SO
Albuterol Unit Dose Inhaler (Patient's Prescribed)	SO/MC	SO/MC	SO/MC
Albuterol Sulfate Nebulizer	–	SO/MC	SO/MC
Aspirin	–	SO	SO
Atropine Sulfate	–	SO/MC	SO/MC
Atrovent	–	SO	SO
Calcium Chloride (10% Solution)	–	MC	MC
Captopril (Capoten)	–	SO	SO
Dextrose 50%	–	SO	SO
Diazepam	–	MC	SO/MC
Diltiazem	–	MC	MC
Diphenhydramine Hydrochloride	–	SO/MC	SO/MC
Dopamine Hydrochloride	–	MC	MC
Epinephrine Auto-Injector	SO/MC	SO	SO
Epinephrine Nebulizer	–	MC	MC
Epinephrine 1:10,000/1:1,000	–	SO	SO
Etomidate (Amidate)	–	–	PP
Furosemide	–	MC	MC
Glucagon	–	SO/MC	SO/MC
Glycoprotein IIb/IIIa	–	–	OSP
Haldol	–	–	MC
Hemophilia Blood Factor (VIII or IX)	–	SO	SO
Heparin (Inter-facility transport only)	–	–	OSP
Lidocaine	–	SO	SO
MARK I/Duodote (Atropine & 2 PAM)	OSP	OSP	OSP
Midazolam (Versed)	–	MC	SO/MC
Morphine Sulfate	–	MC	SO/MC
Morphine Sulfate (Infusion)	–	–	MC
Naloxone (IV and intranasal)	–	SO	SO
Nitroglycerin Paste	–	SO	SO
Nitroglycerin (tablet /spray) (Patient's Prescribed)	SO	SO	SO
Nitroglycerin (tablet/spray)	–	SO	SO
Ondansetron	–	SO/MC	SO/MC
Oral Glucose	SO	SO	SO
Oxygen	SO	SO	SO
Purified Protein Derivative (Public Safety Personnel only)	–	–	OSP
Saline (Nebulized)	–	SO	SO

SO Standing Order
OSP Optional Supplemental Program

MC Medical Consultation Required
PP Pilot Program

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

MEDICATIONS	EMT-B	CRT-(I)	EMT-P
Sodium Bicarbonate	–	MC	MC
Sodium Bicarbonate (Infusion) (NEW '10)	–	MC	MC
Succinylcholine (Anectine)	–	–	PP
Terbutaline Sulfate	–	SO	SO
Vaccines (Hepatitis and Influenza) (Public Safety Personnel only)	–	–	OSP
Vecuronium (Norcuron)	–	–	PP

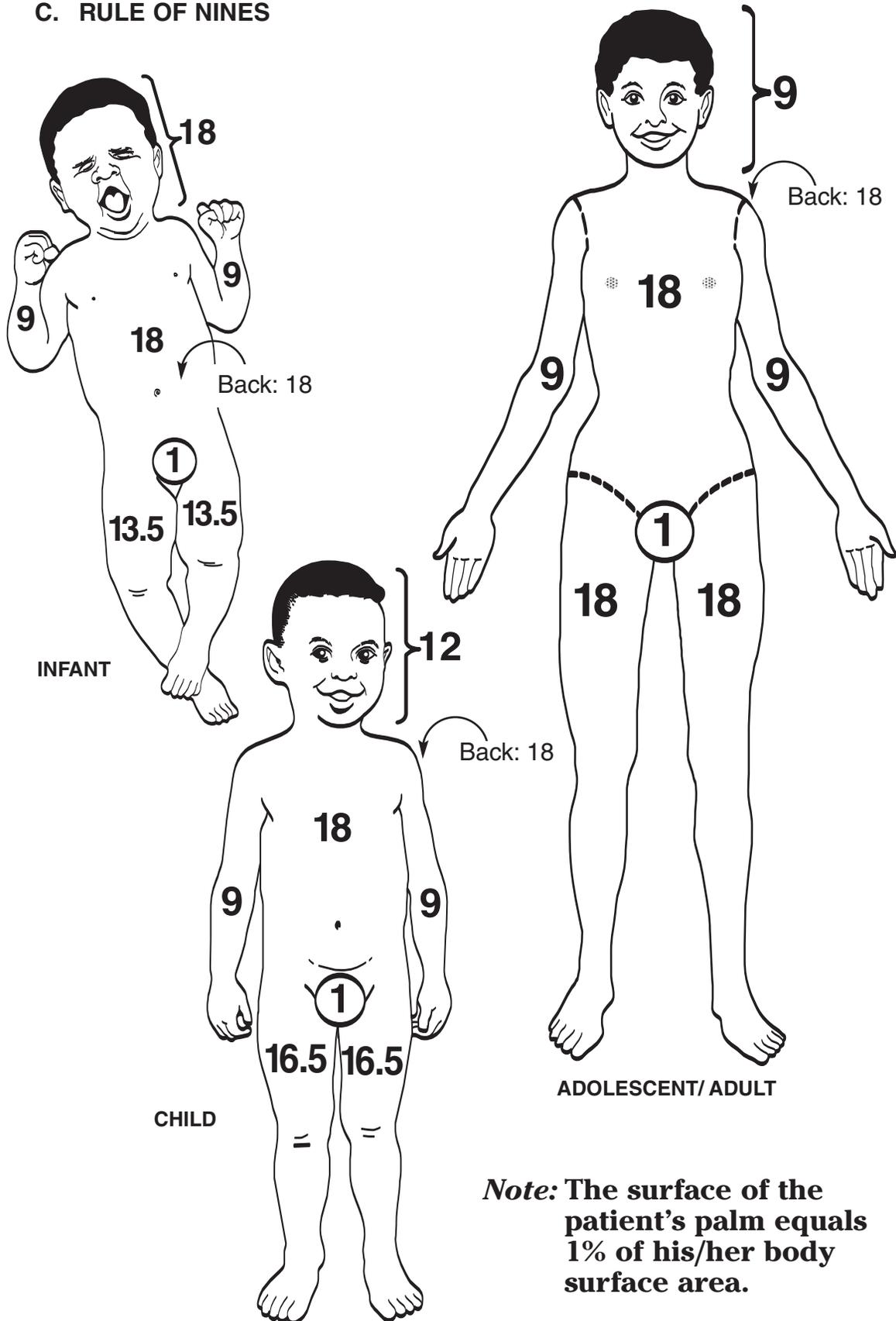
SO Standing Order

OSP Optional Supplemental Program

MC Medical Consultation Required

PP Pilot Program

C. RULE OF NINES



D. NORMAL VITAL SIGNS AND APGAR CHART

Normal Vital Signs

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

APGAR Chart

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

**Nasal or Oral Suction Catheter Stimulus*

E. EMS/DNR



THE FOLLOWING SECTION IS ABSTRACTED FROM THE ORIGINAL MARYLAND EMERGENCY MEDICAL SERVICES DO NOT RESUSCITATE PROGRAM 2ND REVISION (07/01/98). THE PAGE (pg.) AND THE CHAPTER (ch.) NUMBER HAVE BEEN APPENDED TO THE FOLLOWING CHAPTER TITLES FOR EASY REFERENCE. BECAUSE THIS ABSTRACT IS CONDENSED FROM THE ORIGINAL DOCUMENT, SOME CHAPTER NUMBERS OR LETTERS WERE INTENTIONALLY LEFT OUT. PLEASE REFER TO THE ORIGINAL MARYLAND EMS/DNR DOCUMENT FOR FURTHER INFORMATION.

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

1. PREFACE As of 7/1/98, EMS/DNR Order forms, bracelets, and necklaces will recognize two patient options for care prior to arrest: (pg. 15 ch. A)
 - a) **Option A** (ALS)—Maximal (Restorative) Care Before Arrest, Then DNR, **or**
 - b) **Option B** (BLS)—Limited (Palliative) Care Only Before Arrest, Then DNR

2. VALID EMS/DNR BRACELET WITH INSERT or AUTHORIZED METAL EMBLEM HAS THE SAME EFFECT AS THE FORM. (pg. 17 ch. D)
 - a) Typically only one EMS/DNR device is needed to initiate the EMS/DNR protocol.
 - b) EMS providers should only request a second instrument (i.e., a bracelet when a form has already been presented) if there is reason to question the validity of the first produced notification device.

3. RECIPROCITY (pg. 19 ch. E)
 - a) A standardized EMS/DNR Order from another state may be honored.
 - b) Treat out-of-state EMS/DNR Orders as Option “B” EMS/DNR patients.
 - c) See chart in “EMS/DNR Program” booklet for how other states will treat Maryland devices.

4. ORAL EMS/DNR ORDERS (pg. 19 ch. G)
 - a) EMS providers may follow an oral EMS/DNR Order directly from a Maryland- licensed physician (MD or DO) or nurse practitioner that 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 (i.e. radio or telephone consult that is routed through a public service access point [PSAP] for audio recording).**

5. ACCEPTABLE AND UNACCEPTABLE EMS/DNR ORDERS (pg. 19 ch. H)
 - a) The following **are** acceptable for implementing the EMS/DNR protocol:
 - (1) Original Maryland EMS/DNR Order Form

EMS/DNR (Continued)

- (2) Copy of the Maryland EMS/DNR Order Form
 - (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
- b) The following **are not** acceptable for implementing the EMS/DNR protocol:
- (1) Advance directives without an EMS/DNR Order
 - (2) Facility specific DNR orders
 - (3) Notes in medical records
 - (4) Prescription pad orders
 - (5) DNR stickers
 - (6) An oral request from someone other than a physician or nurse practitioner
 - (7) An oral order from an attending physician or nurse practitioner who is not on site
 - (8) Any other device or instrument not listed above as acceptable.
6. VALIDITY OF EARLIER VERSIONS OF EMS/DNR ORDERS (pg. 22 ch. K)
- a) Older versions of EMS/DNR Orders — i.e. initial version (1995 and first revision, 4/1/96) — **continue to be valid and need not be updated** unless the patient or authorized decision maker wishes to take advantage of new features available in the newer forms.
 - b) EMS providers should treat older versions of EMS/DNR order (pre 7/1/98) as “Option B (BLS) - Limited (Palliative) Care Only Before Arrest, Then DNR.”
7. REVOCATION OF AN EMS/DNR ORDER (pg. 24 ch. M)
- a) An EMS/DNR Order may be revoked at any time by:
 - (1) Physical cancellation or destruction of all EMS/DNR Order devices; or
 - (2) An oral statement by the patient made directly to emergency medical services personnel requesting only palliative care or resuscitation. If the patient revokes an EMS/DNR order orally, the EMS/DNR Order notification devices do not need to be destroyed. EMS providers should document thoroughly 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.

EMS/DNR (Continued)

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

EMS/DNR (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 which 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 (pg. 29 ch. T)

a) DISPATCH

- (1) Option B EMS/DNR patients (7/98 version) or patients with older version EMS/DNR orders (pg. 22 ch K) 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 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 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.

EMS/DNR (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 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 contact on-line medical direction to consult regarding “physician-directed termination of unsuccessful non-traumatic resuscitation in the field.”
- (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 he/she revokes 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 or B) arrests, withhold or withdraw further resuscitation and provide support to the family and caregivers. Consider notifying appropriate personnel.

d) MAXIMAL (RESTORATIVE) CARE PROTOCOL

- (1) When Option A - “Maximal (Restorative) Care Before Arrest, Then DNR” is selected on an EMS/DNR Order, 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. The only skill that will not be allowed is nasal or oral intubation. **(NEW '10)**
- (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 Lasix for pulmonary edema, dextrose for diabetic emergencies, and epinephrine for anaphylactic reactions in patients who, upon arrest, are not to be resuscitated.

EMS/DNR (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, no CPR, no cardiac pacing, no defibrillation, withdrawal of active ventilatory assistance upon cardiac arrest, and withholding or withdrawal of drug therapy (i.e., chemical resuscitation).
- e) Inappropriate care for an EMS/DNR Option A - "Maximal (Restorative) Care Before Arrest, Then DNR"
 - (1) Nasal or oral intubation (**NEW '10**)



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 AND THE AVAILABILITY OF AN ALS UNIT, AND ITS ABILITY TO ARRIVE OR RENDEZVOUS IN A MEDICALLY APPROPRIATE PERIOD OF TIME.

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

EMS/DNR (Continued)

- (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, morphine 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 when directed by online physician for morphine administration for pain control as in 1 (d) (iii))
- (c) EMS-Initiated Medications (except oxygen and morphine administration for pain control as in 1 (d) (iii))
- (d) CPR
- (e) Intubation (alternative airway device, endotracheal, nasotracheal, or gastric tube) (**NEW '10**)
- (f) Active ventilatory assistance, unless on an outpatient ventilator (pg. 32 ch. 5)

g) TRANSPORT

- (1) Upon request of the patient, family, or caregivers and in lieu of transport to a hospital-based emergency department, EMS providers may transport Option B EMS/DNR patients who require transportation for pain control or symptom management or respite care to a specified inpatient hospice facility.
- (2) A current list of those facilities is available from the MIEMSS Program Development Office (410) 706-4367 (4DNR). The receiving status of a particular facility can be ascertained from EMRC (24 hours a day) by EMS radio, EMSTEL, or red phone, or by calling 1 (800) 492-3805.

EMS/DNR (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, 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 (see pg. 20 ch H2 and the “EMS/DNR Order Retrieval Strategies” on pg. 58 of the EMS/DNR program booklet).
- 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 and attach it to the official copy of the call runsheet that is kept by the EMS service. **Having a copy of the EMS/DNR Order can significantly reduce documentation requirements.** Encourage sending facilities to provide you with a copy of the EMS/DNR order, in addition to an original of the order, with the patient’s transfer documents.

EMS/DNR (Continued)

- (2) If the EMS/DNR protocol is initiated:
 - (a) On the 7/94 MAIS runsheet, until the supply of those runsheets is exhausted, complete the "Hospice" dot in the "Conditions" section under "Assessment." On the 7/95 and subsequent MAIS runsheets, complete the DNR dot. On runsheets shipping 7/1/98 you will be able to select DNR-A or DNR-B to match the patient care options on the 7/1/98 revision of the EMS/DNR Orders;
 - (b) Document, in the narrative section:
 - (i) Who gave you the EMS/DNR Order (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 was found;
 - (c) 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 or nurse practitioner signing the order;
 - (d) Document the time the EMS/DNR protocol was initiated;
 - (e) Document any care rendered;
 - (f) If the patient arrests while under your care, document the time the patient lost spontaneous respirations or palpable pulse, if able to determine, and
 - (g) 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, etc.);
 - (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 or nurse practitioner signing the order; and
 - (ii) Who gave you the EMS/DNR or where the EMS/DNR Order was found.
- (4) Transfer any EMS/DNR Order 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. **DO NOT RETAIN** an original EMS/DNR Order.

EMS/DNR (Continued)

- (5) If a copy of the EMS/DNR Order is available to EMS providers, it shall be attached to the official copy of the call runsheet 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 (see pg.16 ch. C of the EMS/DNR Program booklet).

j) PATIENT DISPOSITION IF NOT TRANSPORTED

If the EMS/DNR Protocol is implemented and the patient is not transported because the patient arrested at the response site, EMS personnel shall:

- (1) Follow local operational procedures for handling deceased patients (**see "How to Best Tell the Worst News" on pp.105-106 of the EMS/DNR program booklet**);
- (2) Do **not** remove an EMS/DNR vinyl bracelet or metal emblem (bracelet or necklace) from the deceased patient;
- (3) Law enforcement personnel or a representative of the medical examiner's office needs to be notified only in the case of sudden or unanticipated death which 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.

F. PRESUMED DEAD ON ARRIVAL (PDOA)

**NOTE: IF ANY DOUBT EXISTS, INITIATE RESUSCITATION
AND TRANSPORT.**

1. PURPOSE

This protocol is designed to assist the provider with the presumption of death in the prehospital setting.

2. INDICATIONS

Presumption of death in the field (without initiation of resuscitation) should be considered only in the following instances:

- a) Decapitation
- b) Decomposition
- c) Rigor mortis
- d) Pulseless, apneic patient in multiple casualty situation where system resources are required for stabilization of living patients
- e) Pulseless, apneic patient with 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)

3. CONTRAINDICATIONS

- a) Certain special circumstances may result in exception to this protocol.
- b) Obtain medical direction at time of the occurrence when:
 - (1) Patient is too large to extricate.
 - (2) Significant physical environmental barriers exist.

4. PRECAUTIONS

- a) Death cannot be judged in the hypothermic patient, who may be asystolic, apneic, and stiff but still survive. Transport for rewarming in all instances.
- b) All children who do not meet criteria above should be transported to the Emergency Department. **DO NOT SPECULATE OR PREDICT THE OUTCOME (GOOD OR BAD) TO THE RELATIVES!** The grief of pediatric death is best managed at the hospital; moreover, the possibility of child abuse can best be evaluated there.
- c) Do not attempt to guess future outcomes based on the appearance of the patient (e.g., shotgun blast to face of suicide victim). Failure to act because of mistaken notions of outcome will result in a self-fulfilling prophecy.
- d) Do not allow attempted suicide to prejudice the decision to resuscitate. Despite the seriousness of the event, psychiatric patient(s) may, after therapy, resume the desire to live. It is inappropriate to agree with the patient that death would be preferable, and therefore fail to act.

PRESUMED DEAD ON ARRIVAL (PDOA) (Continued)

- e) Do not delay action to find out facts about patient's history. If summoned, one must respond. If the patient has a chronic disease (for instance, cancer), the time to educate relatives as to the inevitability of death (if indeed that is appropriate) is at the hospital, not in the field.

5. SPECIAL CONSIDERATIONS

- a) Be careful to avoid discussion of the mechanism of death in the presence of relatives. In early grief, it is easy to misinterpret even well meaning expressions of concern. Moreover, because a patient is doing well in the field does not mean that survival is assured. Misguided optimism in the field will make grieving more difficult.
- b) Rescue personnel, like Emergency Department personnel, must have the ability to discuss their own grief over problem cases with one another and their advisers. Moreover, they must come to terms with their mission, what can be accomplished in the field (not every life can be saved), and the importance of having resolved ethical issues before taking care of individual problems. Critical Incident Stress Management is a valuable EMS resource.
- c) When you, as an EMS responder, are summoned, you should assume that you are summoned for life-saving skills, and initiate resuscitation. In these days when we are becoming more concerned with the right to die with dignity, do not allow premature judgment to delay or withhold life-saving skills. Despite much press to the contrary, BLS and even ALS measures are extremely unlikely to "bring back" an otherwise unsalvageable person.

G. PHYSICIAN-DIRECTED TERMINATION OF UNSUCCESSFUL, NON-TRAUMATIC FIELD RESUSCITATION

1. PURPOSE

This protocol may, under medical consultation, be used after unsuccessful, non-traumatic field resuscitation.

2. INDICATIONS

- a) Patient must be 18 years of age or older,
- b) Patient must be in asystole,
- c) Patient must be pulseless and apneic for at least 30 minutes,
- d) Patient must have had resuscitation attempts based on the full algorithm for the appropriate rhythm, and
- e) Patient must have no return of spontaneous circulation for more than 2 minutes during the resuscitation.

3. CONTRAINDICATIONS

- a) Patients who are exhibiting any neurological activity such as spontaneous respiration, eye opening, or motor response
- b) Patients under 18 years old
- c) Patients with suspected hypothermia

4. PROCEDURE

- a)  Follow appropriate ALS algorithms and obtain medical consultation.
- b) Request that the consulting physician authorize termination of resuscitation.
- c) If approved, discontinue resuscitation and follow local jurisdictional policies.

5. SPECIAL RURAL CONSIDERATIONS

- a)  In rare circumstances, such as rural areas, it may be appropriate for BLS providers to discontinue resuscitation. This must be approved by medical consultation and can be considered when:
 - (1) The patient has been pulseless and apneic for more than 30 minutes and
 - (2) The AED recommends “no shock advised” on three separate occasions.
- b) When this protocol is used, the provider will mark the “exceptional call” block on the PCR. The jurisdictional EMS program and Jurisdictional Medical Director will be notified immediately. Within 7 days, the Jurisdictional Medical Director will conduct a case review of the incident and document/provide this review for the MIEMSS Regional/EMS Administrator and regional medical director.

G1. 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) Completion of 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, and 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 floated through 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 by 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

Official Use Only

Date received by OMD: _____

Review Date: _____ Approved / Denied

Protocol Review Committee hearing date: _____ Approved / Denied

G2. 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 *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*

G3. 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

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: _____



H. 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 an EMTP 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 EMT-P) 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 (ie 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 10mL syringe or larger, draw up TWO 5mL flushes with NS/RL
NOTE: 10mL syringes are used because they have lower pressure when flushing fluids than smaller volume syringes (1mL, 3mL, or 5mL). 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 (i.e. ChloraPrep®)*, using a circular motion.

- (7) Use latex-safe sterile 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 5mL 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 5mL 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-TUNNELLED LINES

TUNNELED LINES (ie Hickman®, Groshong®, Broviac®, Cook®)

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

NON-TUNNELLED LINES: PICC and MLC (i.e. Cook®, Neo-PICC®)

A PICC (Peripherally inserted central catheter) line is a thin catheter which 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: 10mL syringes are used because they have lower pressure when flushing fluids than smaller volume syringes (1 mL, 3 mL, or 5mL). 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 that 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 2Fr 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 2Fr 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 ventilation (BVM) 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 less than 12
 - (c) Child less than 16
 - (d) Infant/Toddler 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 **(NEW '10)**
- (3) Symptomatic Bradycardia
 - (a) Adult Heart rate less than 60
 - (b) Child Heart rate less than 80
 - (c) Infant Heart rate less than 100
- (4) Cardiac arrest
- (5) Altered mental status
Glasgow coma scale 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
4 – 10 years	Pediatric
10 – 14 years	Small adult
Adult	Adult

g) SUGGESTED SIZES FOR RESUSCITATION BAGS

Age/Weight	Bag Size
Newborn to 3 months	Neonatal 450-500 mL
Child less than 30 kg	Pediatric 750 mL
Child 30 kg or greater (NEW '10)	Adult 1000-1200 mL
Adult	Adult 1000-1200 mL

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The protocol for Combitube has been removed. Combitube is no longer an approved airway device. **(NEW '10)**

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



CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

1. INDICATIONS

- a) 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) Patients who are 15 years of age or older.

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 does not improve or continues to deteriorate despite CPAP administration

3. PROCEDURE

- a) Assure patent airway.
- b) Administer 100% O₂ via appropriate delivery system.
- c) Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO₂) reading, and cardiac rhythm.
- d) Apply CPAP device per manufacturer's instructions.
- e) Continuously reassess the patient.
- f) Monitor continuous pulse oximetry.
- g) Monitor continuous ETCO₂ monitoring with nasal prongs (if available).
- h) Follow the appropriate set of standing orders for continued treatment.
- i) 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. JUSTIFICATION

- a) The use of CPAP has long been recognized as an effective treatment for patients suffering from exacerbation of congestive heart failure and COPD. CPAP has recently shown promise in the out-of-hospital setting as well, by demonstrating favorable results in the treatment of acute congestive heart failure.
- b) The use of CPAP for the treatment of patients who might otherwise receive endotracheal intubation holds several benefits:
 - (1) CPAP is a less invasive procedure with a lesser risk of infection.
 - (2) CPAP eliminates the necessity of weaning a patient off an ET tube and ventilator.
 - (3) CPAP eliminates the necessity of sedating or paralyzing an alert patient by ALS or the emergency department staff in order to perform laryngoscopy.
 - (4) CPAP allows the alert patient to have a continued dialogue with his/her caregivers. This allows for the exchange of additional medical history. It also allows for the patient to be involved in the decision-making process for his/her care.

5. SPECIFIC METHODS

Maryland will be using a full facemask, with the approval of the Jurisdictional Medical Director. CPAP will be initiated for the treatment of pulmonary edema and asthma/COPD.

**3A. AIRWAY MANAGEMENT: LATEX FREE DUAL LUMEN TUBE (E.G. EASYTUBE®)
(NEW '10)**



1. INDICATION

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).

2. CONTRAINDICATIONS

- (1) Responsive patients with an intact gag reflex
- (2) Patients under 35.5 inches (90 cm)
- (3) Known esophageal disease or ingestion of caustic substances

3. PROCEDURE

- (1) Inspect all components of the EasyTube® for damage.
- (2) Select appropriate size EasyTube®
 - (a) EasyTube® 28 Fr (Small): Patients 35-51 inches (90-130 cm) in height
 - (b) EasyTube® 41 Fr (Large): Patients over 51 inches (130 cm) in height
- (3) Test cuffs and lubricate with water soluble jelly.
- (4) Maintain cervical immobilization (if indicated) and lift tongue and jaw upward with one hand.
- (5) Insert EasyTube® to the indicated depth; **DO NOT FORCE.**
- (6) Inflate cuffs.
- (7) Ventilate through primary tube #1 and evaluate lung ventilation (breath sounds, gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
- (8) If lung ventilation is absent, immediately ventilate through secondary tube (#2) and re-evaluate (breath sounds, gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
- (9) If no lung ventilation, then deflate the cuff #1, withdraw EasyTube® 2-3 cm, re-inflate cuff, and reevaluate ventilation through tube #1 (as in #7 and #8 of this section).
- (10) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired end tidal carbon dioxide level.
- (11) If unable to achieve adequate ventilation using EasyTube®, remove device, reinsert, and attempt again. If unable to ventilate, re-attempt bag valve mask ventilation, consider obstructed airway maneuvers (if not yet performed), and refer to cricothyroidotomy protocol.

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4. 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 (i.e., 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.



EMT-P ONLY

5. 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 12 years of age (**NEW '10**)

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 pre-existing 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. **(NEW '10)**
- (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) End tidal CO₂ 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 (i.e. pupillary response, skin color, etc.)
- (3)  Nasal intubation may require facilitation with sedation. When hypovolemia is unlikely, morphine or midazolam, or a combination of both may be given by direct medical consultation to achieve mild sedation.



CRT-(I) & EMT-P ONLY

6. AIRWAY MANAGEMENT: NEEDLE DECOMPRESSION THORACOSTOMY (NDT)

a) PURPOSE

Needle Decompression Thoracostomy is a procedure of introducing a needle/catheter (with 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 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 evidence of reaccumulation, catheter occlusion, or dislocation is evident.



7. 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 EMT-P. 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.



8. 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) INDICATION

- (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 pre-existing 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) End Tidal CO₂ detection device. At a minimum, utilize colorimetric devices (required for all intubated patients). **(NEW '10)**
 - (f) The esophageal detection device
 - (g) Documentation of tube depth at the lip
 - (h) Other clinical signs of improved perfusion and ventilation (i.e. 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 THE 16 PLUS CHILD'S AGE DIVIDED BY FOUR [$(16 + \text{YEAR}) / 4 = \text{TUBE SIZE}$].

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. **(NEW '10)**

9. AIRWAY MANAGEMENT: TRACHEOSTOMY CHANGE



a) PURPOSE

Changing a tracheostomy tube may be required to re-establish 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 O₂ 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 re-insert 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. **(NEW '10)**



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. **(NEW '10)**

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. **(NEW '10)**
 - (b) Carefully cut the tracheostomy ties.

- (c) Remove the tracheostomy tube, outward and backward towards the chest.
 - (d) Lubricate the new tracheostomy tube with Surgilube or saline/water.
 - (e) Insert new tracheostomy tube into stoma, inward and downward towards the lungs.
- NOTE: STOP IF YOU MEET RESISTANCE** (see (7) next page).
- (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). **(NEW '10)**
 - (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) Re-oxygenate 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 Surgilube or saline/water.
 - (e) Proceed with (6) f-g-h above.
 - (f) If you meet resistance, reassess the patient. Re-oxygenate 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). **(NEW '10)**
 - (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.



10. 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
- (5) Increased hypoxia/respiratory distress
- (6) 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) Re-oxygenate and re-evaluate patient.
- (10) Repeat suction procedure as needed (for thick secretions instill 3-5 cc sterile saline/water prior to repeat suctioning).



11. ELECTRICAL THERAPY: AUTOMATED EXTERNAL DEFIBRILLATION (AED)

a) INDICATIONS

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

Infant less than 1 year	Not indicated
Infant 1 year - Child 8 years	Pediatric AED or AED with pediatric capability only
Child 8 years of age or greater	Adult AED

b) CONTRAINDICATIONS

- (1) Infant less than 1 year of age (estimate based upon information available to individual operating AED).
- (2) Patient exhibiting signs of life.



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 assessing the patient or charging.
- (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. If unwitnessed arrest without CPR in progress, EMS should perform 5 cycles of CPR then apply AED.
- (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) Record the name of the ALS provider and ALS unit number to whom you gave the AED medical direction module.
- (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) Document the number of analysis and shocks delivered, times of assessments and treatments, and the patient's response to shocks/CPR.



12. ELECTRICAL THERAPY: CARIOVERSION

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 FOR TREATMENT

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 fibrillation/flutter:
 - (i) Initial 50 J
 - (ii) Subsequent 100 J, 200 J, 300 J, 360 J
 - (b) 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)  Administer midazolam 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg.



(Reduce by 50% for patients 69 years or older)
(3)  Administer midazolam 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment to a maximum total dose of 5 mg. **(NEW '10)**



13. 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 FOR TREATMENT

- (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)

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.



CRT-(I) & EMT-P ONLY

14. 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. (ECG 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 mm Hg 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.
- (5) Patients who experience provider-witnessed cardiopulmonary arrest and who present with asystole, or patients whose ECG converts to asystole while the ECG is being monitored.
- (6) Prompt application of the transcutaneous cardiac pacemaker is appropriate prior to the administration of epinephrine and atropine when a patient converts to asystole as a primary rhythm during ECG monitoring by a CRT-(I) or EMT-P.



- (7)  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 11 years): 100 beats per minute **(NEW '10)**
Adult (12 years and greater): 80 beats per minute

Start milliamperes (m.a.) as low as possible and gradually increase m.a. until palpable pulse 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 mild to moderate discomfort.

If patient is conscious and has adequate blood pressure consider:



Morphine 1-2 mg/min IVP (Paramedic may administer without consult).

OR

Midazolam 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg

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



Administer midazolam 0.1 mg/kg in 2 mg increments slow IV push over one to two minutes per increment to a maximum total dose of 5 mg. **(NEW '10)**

- (2) Musculoskeletal twitching in upper torso may occur during pacing.

f) PRECAUTIONS

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

15. FUTURE PROTOCOL DEVELOPMENT

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CRT-(I) & EMT-P ONLY

**16. 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 EMT-P 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.

17. 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.

c) TREATMENT

(1) ADULT

- (a) If blood glucose is less than 70 mg/dl, administer 25 grams 50% dextrose IVP.
- (b) If unable to initiate an IV and blood glucose is less than 70 mg/dl, administer glucagon 1 mg IM (if over 25 kg) or 0.5 mg IM (if less than 25 kg).
- (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.

- (d)  If blood glucose is less than 40 mg/dl, obtain medical consultation for authorization to administer a second dose of D50W.



(2) PEDIATRIC

- (a) **Patient 2 months of age or less** - If blood glucose is less than 30 mg/dl, administer 5–10 mL/kg of 10% dextrose IV/IO (D10W is prepared by mixing one part of D50W with four parts LR).
- (b) **Patient greater than 2 months but less than 2 years of age** - If blood glucose is less than 70 mg/dl, administer 2-4 mL/kg of 25% dextrose IV/IO; (D25W is prepared by mixing D50W with an equal volume of LR).
- (c) **Patient 2 years of age or greater** - If blood glucose is less than 70 mg/dl, administer 1–2 mL/kg of 50% dextrose IV/IO. Maximum dose 25 grams.

- (d) 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.
- (e)  If blood glucose is less than 40 mg/dl, obtain medical consultation for authorization to administer second dose of D25W or D10W.



CRT-(I) & EMT-P ONLY

18. INTRAOSSEOUS INFUSION (IO)

a) PURPOSE

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

b) INDICATIONS

Patients in which the following conditions are present:

- (a) Cardiac arrest, **OR**
- (b) Profound hypovolemia, **OR**
- (c) 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**
- (d) 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:

- (a) Sites for manual placement of IO needle:
 - (i) Patients 6 years of age or less, use the proximal tibial site: locate the preferred site 1-3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia.
 - (ii) 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.
- (b) Sites for mechanical placement of IO needle:
 - (i) Patients 3-39 kg, use a pediatric needle (15 ga, 15 mm length) in the proximal tibial site as in manual placement above.
 - (ii) Patients 40 kg and greater, use an adult needle (15 ga, 25 mm length) in the proximal tibial site as in manual placement above.
 - (iii) Patients 40 kg and greater where the adult needle is not long enough (less than 5 mm of the needle is visible when the tip of the needle touches the bone), use the distal tibial site as in manual placement above or longer adult needle (15 ga, 35 mm length).
 - (iv) Patients 40 kg and greater where a lower extremity site is not available, use the proximal humerus site: adduct the humerus, position the elbow posteriorly to the back of the stretcher or floor, and place the patient's hand on his/her

abdomen near the umbilicus. Go two finger breaths below the tip of the acromium to locate the tuberosity. Insert at 90 degree angle to lateral surface of the tuberosity.



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



- (2) 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 pediatric patients equal to or greater than 40 kg, administer 20-40 mg of 2% (only 1-2 mL preservative free/cardiac) Lidocaine IO.
 - (c) Medical consultation required for pediatric patients under 40 kg.

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
- (5) Cellulitis at the intended site of the procedure
- (6) Patient with known bone disorder
- (7) Prior knee or shoulder joint replacement

e) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

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

f) PRECAUTIONS

- (1) 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.



19. INTRAVENOUS MAINTENANCE THERAPY FOR EMT-B

a) Provider-controlled IV solutions

(1) The EMT-Basic 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 (i.e., heparin-locked) peripheral or central line, and

(d) No other ALS interventions are required.

(2) IV fluids

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

(a) Lactated Ringer's 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 milliequivalents (mEq)/liter **OR**

(e) Total Parenteral Nutrition (TPN)



IF IV FLUIDS OR TPN 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-Basic 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-B PROVIDER ATTEMPT TO MAKE ANY ADJUSTMENTS TO IV INFUSION PUMPS, NOR SHOULD THE EMT-B 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-B 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-B shall discontinue the IV as soon as possible.



THE EMT-BASIC IS AUTHORIZED TO DISCONTINUE PERIPHERAL LIMB VEIN IV'S 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

20. MEDEVAC UTILIZATION (NEW '10)

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 A, B, C*, D*
- (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 launch the helicopter.

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

- (1) Priority I 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 II 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 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 911 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 911 center Medevac request process:

- (1) Decision made to request Medevac based on indication and principles above (if 911 center has enough information from phone interrogation of call, and trauma indications meet Trauma Decision Tree Category A or B, the 911 center operator does not have to wait for EMS provider to arrive on scene to make Medevac request)
- (2) If indicated, consultation 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 911 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: Medevac, Search & Rescue, Airborne Law Enforcement
3	Jurisdictional Incident Number & 911 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

HELICOPTER SAFETY

OPTIMAL LANDING ZONE (LZ) SETUP

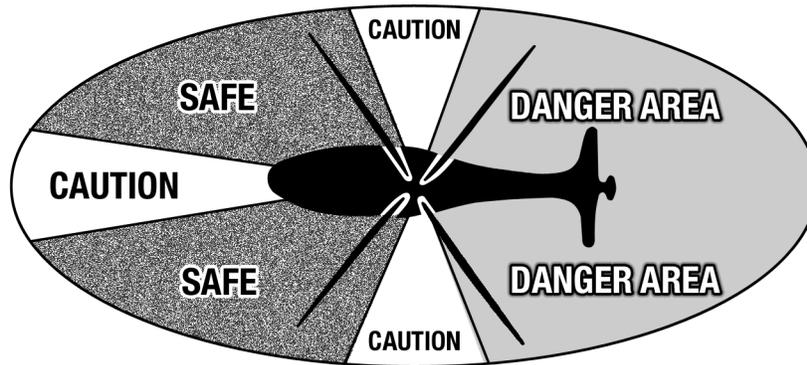
- **100 x 100 foot area close to the incident scene and free from obstructions is the best selection.**
(In mass casualty incident, increase to 165 x 165 foot area if possible to allow for large aircraft.)
- ✓ The landing zone should be a flat surface that is firm, free of overhead obstructions, and free of any debris that can blow up into the rotor system. The maximum allowable slope is 10 degrees.
- ✓ 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.
- ✓ 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.
- ✓ 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, causing extended periods of rotor wash.

ADDITIONAL LANDING ZONE TIPS

- ✓ 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.
- ✓ 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.
- ✓ All traffic must be stopped in both directions of the roadway, even on multi-lane highways or interstates. Do not allow traffic to use the roadway until after the aircraft has departed. Traffic should be stopped at least 200 feet in both directions from the landing zone.
- ✓ 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.

- ✓ 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.)
- ✓ The pilot is the final authority when selecting an LZ. On some occasions, the pilot 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, etc.).

APPROACHING THE AIRCRAFT



Personnel should only approach MSP aircraft under the following conditions:

- ✓ Hearing and eye protection shall be utilized at all times when approaching the aircraft.
- ✓ Only when accompanied by an MSP flight crew member to the aircraft.
 - Response personnel are usually limited to four when loading patients. The Trooper/Flight Paramedic will provide additional guidance prior to these personnel approaching the aircraft.
- ✓ 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!

- ✓ Only approach the aircraft from the Safe Zone (see diagram).
 - 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!

- 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.

- Personnel shall not wear hats and loose clothing when approaching the aircraft. Do not lift anything above shoulder height (e.g. IV bags).
- ✓ 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.
- ✓ 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.
- ✓ 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.

MISCELLANEOUS SAFETY TIPS

Aircraft Doors

- ✓ Personnel should not attempt to open or close any aircraft doors. If a person is in the aircraft, he/she 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.

Vehicles

- ✓ No vehicles or personnel shall be permitted within 200 feet of the aircraft.
- ✓ 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.

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

a) PURPOSE

IV access is an invasive skill reserved for ALS providers and “Program Approved Option” EMT-Bs 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-B 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 challenge or medication, the saline lock is converted to an IV of LR.
- (4) All ALS providers (CRT-(I) & EMT-P) 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 (CRT-(I) & EMT-P) may access lower extremity IV sites. The CRT-(I) & EMT-P 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.

c) CONTRAINDICATIONS

See treatment protocols.

d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

See IV Maintenance Therapy for EMT-B.

e) PRECAUTIONS

All sharps must be properly disposed of in an appropriate container.

22. PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment (PPE) or dermal protective ensembles are used in combination with respirators to protect first responders from vapor, solid, or liquid chemical agent environments. The OSHA levels of protection are defined in Title 29 of the Code of Federal Regulations, Part 1910.120. (29 CFR 1910.120)

- a) Level A: An SCBA or supplied-air with escape cylinder, in combination with a fully encapsulating chemical protective suit, capable of maintaining a positive air pressure inside the suit. Level A ensembles include both outer and inner chemical-resistant gloves, chemical-resistant steel-toed boots, and two-way radio communications. Additional items, such as long underwear or coveralls, may also be included. This ensemble is required for the highest level of protection for skin, eyes, and the respiratory system.
- b) Level B: Same respiratory protection as Level A, along with hooded chemical-resistant clothing, outer and inner chemical-resistant gloves, chemical-resistant steel-toed boots, and other optional items, such as face shields, hard hats, boot covers, and coveralls. OSHA Level B does not include a positive-pressure suit. Level B PPE is used when the type and atmospheric concentrations of substances have been identified and require a high level of respiratory protection, but a lesser level of skin protection.
- c) Level C: Full face piece or half face piece air-purifying respirators with hooded, chemical-resistant clothing, inner and outer chemical-resistant gloves, and chemical-resistant boots. Level C PPE should be used when the atmospheric contaminants have been identified, concentrations measured, and an air-purifying respirator is appropriate and available to remove the contaminants of interest.
- d) Level D: A work uniform affording minimal protection, used for nuisance contamination only.

23. 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 PRE-EXISTING CONDITIONS, SUCH AS OSTEOPOROSIS OR CONTRACTURE, IN A NEUTRAL POSITION.

PATIENTS ARE NOT TO BE RESTRAINED IN A PRONE, HOBbled, OR HOG-TIED POSITION. WHENEVER POSSIBLE, ALL PATIENTS THAT 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.)

1. Place patient face up or on his/her side, if at all possible.
2. 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 AND WITH HANDS ANTERIOR AND SECURED TO STRETCHER.

3. If necessary, utilize cervical-spine precautions to control violent head or body movements.

4. Place padding under patient's head. Pad any other area needed to prevent the patient from further harming him or herself or restricting circulation.
 5. 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.

- (a) Prepare airway equipment, including suction, BVM, and intubation equipment
- (b) Adults
 - (1) 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 15-69 years of age:**
 - (i) Haloperidol 5 mg IM/IV **and**
 - (ii) Midazolam 5 mg IM/IV
 - b. **Patient greater than 69 years of age:**
 - (i) Haloperidol 2.5 mg IM/IV **and**
 - (ii) Midazolam 2.5 mg IM/IV
 - (2) Repeat doses may be given with medical direction.
- (c) Pediatric
 - (1) Administer haloperidol only.
 - a. **Less than 6 years of age is contraindicated.**
 - b. **6-11 years of age**
 - (i) Haloperidol 0.05 mg/kg IM/IV
 - (ii) Max dose 2.5 mg
 - c. **12-14 years of age**
 - (i) Haloperidol 2.5-5 mg IM/IV
 - (2) Repeat doses may be given with medical direction.
- (d) Start IV LR KVO, if possible.
- (e) Use Glucometer and treat accordingly.
- (f) Monitor vital signs, ECG, and pulse oximetry.
- (g) Be prepared to treat hypotension with fluid challenge.



- (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.

I. BLS PHARMACOLOGY



1. ACETAMINOPHEN (NEW '10)

a) Indications

Patients ages 3 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

e) Preparations Use Unit Dose Only

(DO NOT USE MULTIDOSE BOTTLE)

- (1) Unit dose 160 mg/5 mL
- (2) Unit dose 325 mg/10.15 mL

f) Dosage

- (1) Less than 3 years of age: Not indicated
- (2) 3-5 years: Unit dose 160 mg/5 mL
- (3) 6-9 years: Unit dose 325 mg/10.15 mL
- (4) 10 years & above: Administer TWO Unit doses of 325 mg/10.15 mL each for total of 650 mg/20.3 mL
- (5) Obtain on-line medical direction for appropriate dosing for patients who are significantly underweight or overweight.



2. ACTIVATED CHARCOAL (WITHOUT SORBITOL)

a) Indications

Poisoning by mouth

b) Adverse Effects

May indirectly induce vomiting and cause nausea

c) Precautions

Does not absorb 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

f) 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.

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3. **ALBUTEROL (PROVENTIL, VENTOLIN)**

(Patient Prescribed, Patient Assisted)

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 his/her 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. 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)
- (1) Adult: 0.3 mg
 - (2) Pediatric: 0.15 mg



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

f) Dosage

- (1) **Patients 3 years of age or greater:**
Adult Auto-injector: 0.3 mg IM
- (2) **Patients less than 3 years of age:**
Pediatric Auto-injector: 0.15 mg IM
- (3)  Additional doses may be administered with medical consultation.



5. 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 12
- (5) Any patient having taken medication for erectile dysfunction (eg, 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 pains persists
 - (b) Maximum of three doses (a combination of patient-administered and EMT-B-administered) of nitroglycerin
- (2) Pediatric: Not Indicated (nitroglycerin contraindicated for children under age 12)
- (3)  Additional doses may be administered with medical consultation.



6. 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. **(NEW '10)**
- (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. **(NEW '10)**



7. OXYGEN

a) Indications

All medical and trauma patients

b) Adverse Effects

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

c) 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-rebreather face masks must be supplied with a minimum 12 lpm.

d) Contraindications

None

e) Dosage

- (1) Adult: Administer 12–15 lpm with NRB mask or 2–6 lpm via nasal cannula, unless otherwise directed.
- (2) Pediatric: Administer 12–15 lpm via NRB mask or 2–6 lpm via nasal cannula, unless otherwise directed.

DEVICE	FLOW RATE	CONCENTRATION
Nasal Cannula	2-6 lpm	24-44%
Venturi Mask	Variable	24-50%
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%

J. ALS PHARMACOLOGY



1. ACETAMINOPHEN (NEW '10)

a) Indications

Patients ages 3 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) Administration of acetaminophen or acetaminophen containing medications within the previous four hours



MANY COMMON COLD PREPARATIONS CONTAIN ACETAMINOPHEN.

- (2) Inability to swallow or take medications by mouth
- (3) Respiratory distress
- (4) Persistent vomiting
- (5) Known or suspected liver disease (including patients suspected of current alcohol ingestion)
- (6) Allergy to acetaminophen

e) Preparations Use Unit Dose Only

(DO NOT USE MULTIDOSE BOTTLE)

- (1) Unit dose 160 mg/5 mL
- (2) Unit dose 325 mg/10.15 mL

f) Dosage

- (1) Less than 3 years of age: Not indicated
- (2) 3-5 years: Unit dose 160 mg/5 mL
- (3) 6-9 years: Unit dose 325 mg/10.15 mL
- (4) 10 years & above: Administer TWO Unit doses of 325 mg/10.15 mL each for total of 650 mg/20.3 mL
- (5) Obtain on-line medical direction for appropriate dosing for patients who are significantly underweight or overweight.

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2. ACTIVATED CHARCOAL (WITHOUT SORBITOL)

- a) **Pharmacology**
Variable drug or toxin absorption when ingested
- b) **Pharmacokinetics**
Absorbs 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)**

(CRT-I) & EMT-P only)

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 to 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 medical consultation and caution.

d) **Contraindications**

Known hypersensitivity

e) **Adverse Effects**

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

f) **Precautions**

- (1) Effects antagonized by theophylline
- (2) Effects enhanced by dipyridimole (persantine), digitalis, calcium channel blockers, and benzodiazepines such that the dose of adenosine must be reduced for patients on these medications
- (3) Be prepared for up to 40 seconds of asystole

g) **Dosage (Paramedic May Administer Without Consult)**

- (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 to 2 minutes
- (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) Little effect on blood pressure
- (4) Little 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 to 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 (**NEW '10**)

d) Contraindications

Known hypersensitivity

e) Adverse Effects

Tachycardia, palpitations, peripheral vasodilation, tremors, and 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 (NEW '10)

- (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) **Ages less than two years:** 1.25 mg by nebulized aerosol

Hyperkalemia (NEW '10)

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



5. 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



6. ATROPINE SULFATE

a) Pharmacology

- (1) Parasympatholytic (vagolytic action)
- (2) Anticholinergic (accelerates the heart rate)
- (3) May restore cardiac rhythm in asystole

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) Asystole, idioventricular rhythm
- (3) Organophosphate poisoning
- (4) 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:

- (a) Asystole: Administer 1 mg IVP repeated every 3-5 minutes to a total of 0.04 mg/kg; maximum dose not to exceed 3 mg
- (b) Bradycardia: Administer 0.5-1 mg IVP repeated every 3-5 minutes to a total dose of 0.04 mg/kg

(2) Pediatric:

- (a) Bradycardia: Administer 0.02 mg/kg IV/IO; minimum dose 0.1 mg; maximum single dose Child (10 kg-25 kg), 0.5 mg; Adolescent (25-40 kg), 1 mg; ET 0.03 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 in WMD Protocols.



7. ATROVENT (Ipratropium)
(CRT-I) & EMT-P only)

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 elderly patients.
- (2) May worsen the condition of glaucoma if it gets into the eyes. Having the patient close his/her 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

- (1) 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. **Ages 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
-

The Benzocaine protocol formerly on page 219 has been removed.
Benzocaine is no longer an approved medication. **(NEW '10)**



8. 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.

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

- (1) Adult: Administer 0.5 -1 gram slow IVP over 3-5 minutes
Maximum dose 1 gram or 10 mL.
Administer 250 mg slow IVP for hypotension following diltiazem administration.
- (2) Pediatric: Administer 20 mg/kg (0.2 mL/kg) slow IVP/IO (50 mg/min)
Maximum dose 1 gram or 10 mL.



9. CAPTOPRIL (Capoten)
(CRT-(I) & EMT-P only)

a) Pharmacology

- (1) Inhibits angiotensin converting enzyme, which converts angiotensin I to angiotensin II
- (2) Reduces after load on the heart

b) Pharmacokinetics

- (1) Vasodilatation begins within 5 to 15 minutes after sublingual administration
- (2) Peak effect occurs in 30-120 minutes
- (3) Duration of action is usually 3-4 hours

c) Indications

- (1) Respiratory distress from Pulmonary Edema or Congestive Heart Failure

d) Contraindications

- (1) Known hypersensitivity
- (2) Known history of angioedema

e) Adverse Effects

- (1) Angioedema, hyperkalemia, renal impairment, cough, rash

f) Precautions

- (1) Not for use with pregnant females

g) Dosage

- (1) Adult: 25 mg sub-lingual for moderate and severe symptoms so long as systolic blood pressure is equal to or greater than 110 after nitroglycerin administration
- (2) Pediatric: Not indicated



10. DEXTROSE 50%

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 pre-existing hyperglycemia
- (2) Tissue necrosis if extravasation occurs

g) Dosage

- (1) Adult: Administer 25 grams in 50 mL IV (1 ampule of 50% solution)
- (2) Pediatric:
 - (a) If less than 2 months of age - Administer 5–10 mL/kg D10W IV/IO (D10W is prepared by mixing one part of D50W with four parts LR).
 - (b) If greater than 2 months but less than 2 years of age - Administer 2-4 mL/kg of 25% dextrose IV/IO; (D25W is prepared by mixing D50W with an equal volume of Lactated Ringer's).
 - (c) If greater than 2 years of age - Administer D50W 1–2 mL/kg IV/IO. Maximum dose 25 grams.



11. DIAZEPAM (VALIUM) (for Chempack or Mark I Optional Protocol)

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 to 90 minutes.

c) Indications

- (1) Sustained and/or recurrent seizures due only to nerve agent or organophosphate 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 consultation NOT required for above indication)

- (1) Adult: Administer 10 mg IM. **(NEW '10)**
- (2) Pediatric: greater than 30 kg/66 lbs: Administer 10 mg or 0.1 mg/kg IM, maximum of 10 mg. **(NEW '10)**



12. DILTIAZEM (Cardizem)
(CRT-I) & EMT-P only)

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 mm Hg, second or third degree heart block, hypersensitivity to the drug
- (2) Patients less than 12 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 12 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: Consider calcium chloride 250 mg SLOW IVP with medical consultation and IV fluid challenge with lactated Ringer's; evaluate legs.
- (3) Bradycardia: Consider atropine (0.5 to 1 mg); if necessary, consider pacing.



13. DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

a) Pharmacology

Antihistamine

b) Pharmacokinetics

- (1) Effect begins within 15 minutes of IV dose.
- (2) Peak effect 1 to 4 hours
- (3) Metabolized by the liver
- (4) The half-life ranges from 2 to 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
Maximum single dose 25 mg
- (3)  Medical consultation required for administration in mild allergic reaction or anytime doses are greater than 25 mg.



14. 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 **ug/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) Pheochromocytoma (adrenal tumor which causes excessive release of epinephrine and norepinephrine)
- (2) Pre-existing tachydysrhythmias
- (3) 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**



15. 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 a reduction with bronchodilation by relaxing smooth muscles in the bronchial tree (bronchial dilation)

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 which result in reduction of mucosal and submucosal edema. It also has bronchodilator properties which 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)

d) Contraindications

- (1) Hypertension
- (2) Pre-existing 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 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 Lactated Ringer's; 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 Lactated Ringer's
- (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 Lactated Ringer's solution; 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 Lactated Ringer's

(3) Allergic Reaction/Anaphylactic Shock/Asthma

- (a) FOR ANAPHYLACTIC SHOCK ONLY

Consider Epinephrine 1:10,000 (0.1 mg/mL) with medical consultation; 0.01 mg/kg slow IVP/IO; maximum dose 1 mg (1 mL increments) Additional doses of Epinephrine require medical consultation.

- (b) Adult Epinephrine: 1:1,000
0.01 mg/kg IM;
maximum single dose 0.5 mg
- (c) Pediatric Epinephrine: 1:1,000
0.01 mg/kg IM;
maximum single dose: 0.5 mg

(4) Croup

- (a) Adult: not indicated

- (b) Pediatric

- (i) Administer 2.5 mL of Epinephrine 1:1,000 via nebulizer
- (ii) If patient does not improve, administer a second dose of 2.5 mL of Epinephrine 1:1,000 via nebulizer



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



16. FUROSEMIDE (LASIX)

a) Pharmacology

- (1) Potent diuretic
- (2) Inhibits renal sodium reabsorption
- (3) Vasodilation, especially of the pulmonary veins

b) Pharmacokinetics

- (1) Onset of vasodilation is 5 minutes after IV dose.
- (2) Onset of diuretic effects after IV dose is 10 minutes.

c) Indications

Acute pulmonary edema, CHF, edema related to kidney or liver disease

d) Contraindications

- (1) Known hypersensitivity
- (2) Known allergy to sulfonamides
- (3) Dehydrated patients
- (4) Pregnancy
- (5) Patients exhibiting signs and symptoms of electrolyte imbalance (primarily hypokalemia)

e) Adverse Effects

- (1) Dehydration
- (2) Decreased circulatory blood volume
- (3) Decreased cardiac output
- (4) Loss of electrolytes, specifically magnesium and potassium
- (5) Transient hypotension due to decreased cardiac output
- (6) Transient vasoconstriction in patients with chronic heart failure

f) Precautions

The administration of furosemide may cause or aggravate the following conditions:

- (1) Dehydration
- (2) Hypovolemia
- (3) Hypotension
- (4) Hyperosmolality
- (5) Hypokalemia

g) Dosage

- (1) Adult: Administer 0.5-1mg/kg slow IVP
- (2) Pediatric: Administer 1 mg/kg slow IVP/IO; maximum dose of 50mg



17. GLUCAGON (CRT-(I) & EMT-P only)

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) Unconscious patients who are highly suspected of being hypoglycemic where IV access is unobtainable
- (2) Unconscious combative patients where IV access is unobtainable due to venous collapse or altered mental status

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
 - (b) Pediatric:
 - (i) 1 mg IM (25-40 kg); maximum total dose 3 mg
 - (ii) 0.5 mg IM (less than 25 kg); maximum total dose 3 mg
- (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 (25-40 kg); maximum total dose 3 mg
 - (ii) 0.5 mg IVP (less than 25 kg); maximum total dose 3 mg



18. HALOPERIDOL (HALDOL) (NEW '09)
(EMT-P Only)

a) Pharmacology

- (1) An effective anxiolytic agent. Very effective in the management of aggressive and violent patients.
- (2) Also has antiemetic 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. This is a joint paramedic–base station physician decision that relies heavily on paramedic judgment.

d) Contraindication

- (1) Children under 6 years of age
- (2) Parkinson's disease
- (3) CNS depression
- (4) Acute CNS injury

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 (medical consult required).
- (2) Hypotension and tachycardia are common (20-25%) but usually self-limiting side effects. Fluid challenge 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 15-69 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 6 years of age:**
Contraindicated
 - b. **Child 6-11 years of age:**
0.05 mg/kg IM or IV, max of 2.5 mg
 - c. **Patient 12-14 years of age:**
2.5 - 5 mg IM or IV



19. LACTATED RINGER'S

a) Pharmacology

- (1) Isotonic crystalloid solution
- (2) Lactated Ringer's contains:

(a) Sodium (Na ⁺)	130 mEq/liter
(b) Potassium (K ⁺)	4 mEq/liter
(c) Calcium (Ca ⁺⁺)	3 mEq/liter
(d) Chloride (Cl ⁻)	109 mEq/liter
(e) Lactate	28 mEq/liter

b) Pharmacokinetics

Lactated Ringer's is a water and electrolyte replacement.

c) Indications

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

d) Contraindications

Fluid overload states

e) Adverse Effects

Rare in therapeutic doses

f) Precautions

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

g) Dosage

- (1)  Maximum dose 2,000 mL without medical consultation
- (2) Adult:
 - (a) KVO
 - (b) Initiate IV LR fluid therapy (20 mL/kg bolus).
 - (c) Titrate to a systolic pressure of 100 mm Hg.
- (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 **(NEW '10)**
 - (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



20. LIDOCAINE (XYLOCAINE)

a) Pharmacology

- (1) Suppresses ventricular ectopy
- (2) Elevates VT and VF threshold
- (3) 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) Prevent recurrence of ventricular fibrillation/tachycardia after defibrillation and conversion to supraventricular rhythm
- (2) Ventricular tachycardia (VT)
- (3) Ventricular fibrillation (VF)
- (4) Reduce or eradicate ventricular ectopy, especially closely coupled, multifocal, or short bursts of five or more PVCs in succession
- (5) Decrease intracranial pressure with Rapid Sequence Intubation
- (6) Nasal tracheal intubation

d) Contraindications

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

e) Adverse Effects

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



f) Precautions

- (1) Reduce the dosage in patients with decreased cardiac output, liver dysfunction, and the elderly (age over 70)
- (2) Bolus doses should be administered over a 1-minute period, except in ventricular fibrillation/ventricular tachycardia, when they are administered IVP.

g) Dosage

- (1) Adult with pulse: Administer 1 -1.5 mg/kg IVP/IO bolus followed by 0.5-0.75 mg/kg every 8-10 minutes as needed, up to 3 mg/kg.
- (2) Adult without pulse: Administer 1.5 mg/kg IVP/IO bolus initially followed by additional 1.5 mg/kg IVP bolus in 3-5 minutes to maximum of 3 mg/kg.
- (3) Pediatric with pulse: Administer 1 mg/kg initial bolus and 0.5 mg/kg IVP/IO bolus every 8-10 minutes, as needed, to maximum of 3 mg/kg.
ET dose: 2-2.5 times the above dose
- (4) Pediatric without pulse: Administer 1 mg/kg initial bolus IVP/IO bolus followed by 1 mg/kg IVP boluses in 3-5 minutes to a maximum of 3 mg/kg.
ET dose: 2-2.5 times the above dose
- (5) Adult with an IO infusion: To prevent or treat pain during an IO infusion in adult patients (40 kilograms or greater), administer 20-40 mg (1-2 mL) of 2% (preservative free) lidocaine IO. **(NEW '10)**
- (6) Pediatric with an IO infusion: To prevent or treat pain during an IO infusion in pediatric patients (39 kilograms or less), consult a pediatric base station. **(NEW '10)**
- (7) Nasal Pharyngeal Anesthesia (age 12 years and greater)
Draw up 4 mL of lidocaine 4% (40 mg/mL) and using mucosal atomization device, administer 2 mL per nares. The patient IV, gel, and intranasal dosing should not exceed 3 mg/kg. **(NEW '10)**

h) Inter-Facility 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 Inter-Facility Transport.)



21. MIDAZOLAM (VERSED)(Non-RSI) (CRT-I and EMT-P)

a) Pharmacology

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

b) Pharmacokinetics

- (1) A short-acting benzodiazepine with strong hypnotic, anticonvulsant activity and amnestic properties
- (2) Onset of action is extremely rapid following IV administration approximately 1^{1/2} minutes and for IM approximately 15 minutes.
- (3) Duration of effect 1-4 hours with half life of 1^{1/2} 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 (for RSI jurisdictions)
- (8) Chemical Restraint

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 narcotics 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 may perform without consult for patients with active seizures.)

All Indications in c) above except for Bucking Endotracheal Intubated patient and Chemical Restraint

- (1) Adult: (Reduce the below IV/IO/IM by 50% for patients 69 years or older.)

0.1mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg
If IV unavailable, 5 mg IM may be administered

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

For seizures lasting greater than 10 minutes (status), consider IO administration of midazolam.

If suspected severe nerve agent exposure, providers may administer midazolam 5 mg IM without medical consultation.

- (2) Pediatric:
0.1mg/kg in 2 mg increments. Slow IV push over one to two minutes per increment to a maximum total dose of 5 mg
If IV unavailable, 0.2 mg/kg IM
Maximum total dose 5 mg **(NEW '10)**

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.

If suspected severe nerve agent exposure, providers may administer midazolam as above without medical consultation.

Chemical Restraint

Adult: 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

Pediatric: Not indicated

Bucking Endotracheal Intubated patient (RSI PILOT ONLY)

- (1) Adult: Administer 0.05 mg/kg (2-5 mg) slow IVP over 1-2 minutes, while maintaining BP systolic greater than 80 mmHg. STOP ONCE BUCKING HAS RESOLVED AND VENTILATION IS RELAXED
Additional doses require medical consultation.



- (2) Pediatric: Administer 0.05 mg/kg slow IVP over 1-2 minutes, while maintaining BP systolic greater 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.



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



22. MORPHINE SULPHATE

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) Acute myocardial infarction
- (2) Burns
- (3) Isolated injuries requiring pain relief
- (4) Sedative for transcutaneous pacing

d) Contraindications

- (1) Head injury
- (2) Multiple trauma
- (3) COPD with compromised respiratory effort
- (4) Hypotension
- (5) Sensitivity to morphine, codeine, or percodan

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 (pin-point)
- (6) Increased cerebral blood flow



f) Precautions

- (1) Narcan reverses all effects.
- (2) Administration masks pain, making hospital diagnosis difficult.
- (3) Should be administered slowly and titrated to effect.
- (4) Vital signs should be monitored frequently.
- (5) Hypotension is a greater possibility in volume-depleted patients.



Dosage

- (1) Adult:
 - (a) AMI: Administer 2-5 mg slow IVP, followed by 1 mg every 5 minutes to a maximum of 10 mg or until pain is relieved
 - (b) Isolated injury (including burns, frostbite, eye trauma): Administer 2-10 mg slow IVP at 1-2 mg/min increments to 10 mg or until pain is relieved (Paramedic may perform without consult.) For doses above 10 mg, requires medical consultation.
 - (c) May also be administered IM dose 5-15 mg based on patient weight
 - (d) Pacing: Administer 1-2 mg/min IVP. (Paramedic may perform without consult.)
- (2) Pediatric: 0.1 mg/kg slow IVP/IO/IM (1-2 mg/min)
Maximum dose 5 mg.



23. 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.
- (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 narcotics

c) Indications

To reverse respiratory and central nervous system depression induced by opiates

d) Contraindications

Not clinically significant

e) Adverse Effects

Not clinically significant

f) Precautions

- (1) Naloxone may induce opiate 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

- (1) Adult: Administer 0.4-2 mg IVP/IM/Intranasal (if delivery device is available); repeat as necessary to maintain respiratory activity.
- (2) Pediatric: Administer 0.1 mg/kg IVP/IM/Intranasal (if delivery device is available) , up to maximum initial dose of 2 mg; may be repeated as necessary to maintain respiratory activity.
ET dose: 0.2 - 0.25 mg/kg
- (3)  Greater than 2 mg IV may be administered with medical consultation



24. 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 12
- (3) Any patient having taken medication for erectile dysfunction (eg, 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, and dizziness, decreased level of consciousness

f) Precautions

May cause hypotension

g) Dosage

- (1) Adult
 - (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, and BP is greater than 90 mm Hg, 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) High Dose NTG (Assess BP before each administration)

CPAP Nitroglycerin Dose (Dose at 3-5 minute intervals.)

- (i) give 1 dose of 0.4 mg NTG (Preparing CPAP)
- (i) give 1 dose of 0.8 mg NTG (Patient education CPAP)
- (iii) give 1 dose of 0.8 mg NTG (CPAP acclimatized patient)
- (iv) complete dose=2.0 mg
- (v) Then follow with captopril (SBP is equal to or greater than 110); then attach CPAP; and then apply nitroglycerin paste.

CPAP Not Tolerated - Nitroglycerin Dose

(Dose at 3-5 minute intervals.)

- (i) give 1 dose of 0.4 mg NTG
- (ii) give 1 dose of 0.8 mg NTG
- (iii) give 1 dose of 0.8 mg NTG
- (iv) give 1 dose of 0.8 mg NTG
- (v) give 1 dose of 0.8 mg NTG
- (vi) give 1 dose of 0.8 mg NTG
- (vii) complete dose = 4.4 mg
- (viii) Then follow with captopril (SBP is equal to or greater than 110); administer albuterol (medical consult if there is cardiac history); and apply Nitroglycerin paste.

(3) Pediatric: Not indicated

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25. NITROGLYCERIN PASTE (Nitro-Bid Ointment)

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 12
- (3) Any patient having taken medication for erectile dysfunction (eg, 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 constantly.

g) Dosage

- (1) Adult: Generally 1/2 to 1 inch (1.25 to 2.50 centimeters) of the Nitro-Bid Ointment is applied. Measuring applicators are supplied.
- (2) Pediatric: Not indicated



**25A. Ondansetron (Zofran) (NEW '09)
(CRT-I and EMT-P)**

a) Pharmacology

- (1) A selective blocking agent of the serotonin 5-HT₃ receptor type.

b) Pharmacokinetics

- (1) Anti-nausea and anti-emetic with onset of action within 5-15 minutes IV and 30 minutes IM.

c) Indications

- (1) Control of nausea and 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 narcotic administration)

d) Contraindications

- (1) Known hypersensitivity to Ondansetron.

e) Adverse Effects

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

f) Precautions

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

g) Dosage

- (1) Adult: 4 mg slow IV over 2-5 minutes OR
4 mg IM;



May repeat once with medical consultation.
Preventative administration of an anti-nausea/anti-emetic

- (2)  Pediatric:
For patients who weigh 40 kg or less: 0.1 mg/kg slow IV over 2-5 minutes,
For patients who weigh more than 40 kg: 4 mg slow IV over 2-5 minutes

OR

If no IV: 0.1 mg/kg IM (with max single dose of 4 mg);



May repeat once with medical consultation.
Preventative administration of an anti-nausea/anti-emetic

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26. 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 to 20 minutes.

c) Indications

- (1) Acute chest pain
- (2) Suspected hypoxemia of any etiology
- (3) Cardiopulmonary arrest
- (4) Trauma
- (5) 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 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, unless otherwise directed.
- (2) Pediatric: Administer 12-15 lpm via NRB mask or 2-6 lpm via nasal cannula, unless otherwise directed.



27. SALINE NEBULIZED

- a) **Pharmacology**
Increases moisture content in the airways.
- b) **Pharmacokinetics**
Nebulized saline droplets penetrate to the area of inflammation and provide cool moisture to the mucosa.
- c) **Indications**
Suspected croup
- d) **Contraindications**
History of airway hyperresponsiveness
- e) **Adverse Effects**
 - (1) Wheezing or bronchospasm
 - (2) Patient discomfort
- f) **Precautions**
 - (1) The extent of patient monitoring should be determined on the basis of the stability and severity of the patient's condition.
 - (2) Monitor the patient for:
 - (a) Dyspnea
 - (b) Restlessness
 - (c) Respiratory rate
 - (d) Respiratory pattern
 - (e) Accessory muscle use
- g) **Dosage**
 - (1) Adult: Not indicated
 - (2) Pediatric:
 - (a) Administer 3 mL of saline by nebulizer.
 - (b) May be repeated with medical direction.



28. 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

d) Contraindications

Pre-existing 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. **(NEW '10)**

Hyperkalemia (**NEW '10**)

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



FLUSH IV WITH 5 ML OF LACTATED RINGER'S BETWEEN CALCIUM AND BICARBONATE ADMINISTRATION (**NEW '10**)

Adult:



Consider/ Administer sodium bicarbonate 50 mEq SLOW over 5 minutes and then initiate drip of sodium bicarbonate 100 mEq in 1000 mL LR to run over 30-60 minutes

Pediatric:



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



29. TERBUTALINE SULFATE

a) Pharmacology

- (1) Stimulates beta 2 receptors located in the smooth muscle of bronchioles
- (2) Causes relaxation of bronchospasm
- (3) In patients over 44 years of age, with severe respiratory impairment, does not exert cardiovascular side effects seen with epinephrine

b) Pharmacokinetics

Relieves bronchospasm in acute and chronic airway disease with minimal cardiovascular effect

c) Indications

- (1) Bronchial asthma
- (2) Reversible airway obstruction associated with bronchitis or emphysema

d) Contraindications

- (1) Hypertension
- (2) Tachycardia due to digitalis intoxication
- (3) Pediatric under 12 years of age

e) Adverse Effects

- (1) Tachycardia
- (2) Palpitations
- (3) Nervousness
- (4) Tremors
- (5) Dizziness
- (6) Nausea
- (7) Vomiting

f) Precautions

- (1) Administer cautiously to patients with history of diabetes, seizures, or cardiac history
- (2) Monitor ECG

g) Dosage

- (1) Adult: 0.25 mg IM
- (2) Pediatric: Not indicated

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K. LIDOCAINE INFUSION FOR INTER-FACILITY TRANSPORT



1. PURPOSE

A CRT-(I) or Paramedic who is performing an inter-facility transport may utilize this protocol. During inter-facility 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.

2. INDICATIONS

The lidocaine infusion must have been started by the hospital staff prior to an inter-hospital transfer. IV lidocaine infusions may NOT be started by the prehospital provider in the prehospital setting.

3. CONTRAINDICATIONS

Patients who are clinically unstable, including but not limited to, unstable vital signs and blood pressure, current arrhythmia, and active chest pain



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 transport record or transport note, including the concentration of the medication and the infusion rate.
- 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 lidocaine 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 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.

L. MORPHINE SULFATE INFUSION FOR INTER-FACILITY TRANSPORT



1. PURPOSE

A Paramedic who is performing an inter-facility transport may utilize this protocol. During inter-facility transports, a Paramedic may monitor a patient on a continuous morphine sulfate infusion as long as the following criteria have been met.

2. INDICATIONS

The morphine sulfate infusion must have been started by the hospital staff prior to an inter-hospital transfer. Morphine infusions may NOT be started by the prehospital provider in the prehospital setting.

3. CONTRAINDICATIONS

Patients who are clinically unstable, including but not limited to, unstable vital signs and blood pressure

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, including the infusion rate.
- 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 morphine 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 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.

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**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

M. 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) *Age less than 12 (NEW '10)*
- (3) *History of malignant hyperthermia*

c) Preparation

- (1) *Pre-oxygenate with 90-100% oxygen.*
- (2) *Monitor oxygen saturation with pulse oxymetry and ECG.*
- (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 (NEW '10)*
 - (e) *Capnograph*

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

d) RSI Procedure

- (1) *Etomidate: Administer 0.3 mg/kg IVP over 30-60 seconds
If the provider suspects hypovolemia, administer half the usual initial dose (0.15 mg/kg) IVP over 30-60 seconds. May repeat 0.15 mg/kg IVP in 2-3 minutes if inadequate sedation*

OR

- Midazolam: Administer 0.05 mg/kg (2-5 mg) IVP over 1-2 minutes
(a) Hold for BP less than 80 (NEW '10)*
- (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 (60-150 mg) rapid IVP*
- (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 0.5 mg/kg IVP (20-50 mg).*

e) Successful Endotracheal Tube Placement

- (1) *Release cricoid pressure and secure ET.*
- (2) *Ventilate to end tidal carbon dioxide 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 "Unable to Ventilate" below.*
- (3) *Re-attempt oral ET intubation.*
- (4) *If unsuccessful, resume BVM ventilation for 30 seconds.*
- (5) *Insert an approved alternative airway device (refer to alternative airway device protocol). (NEW '10)*
- (6) *Attach capnograph and ventilate to desired end tidal carbon dioxide 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. (NEW '10)*

g) If Unable to Ventilate

Insert an approved alternative airway device (refer to alternative airway device protocol). (NEW '10)

- h) If still unable to ventilate using an approved alternative airway device, remove and perform cricothyroidotomy (refer to Cricothyroidotomy Protocol). (NEW '10)**

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

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 (NEW '10)

b) Contraindication

Unsecured airway

c) Procedure

- (1) *Midazolam up to 0.05 mg/kg (2-5 mg) IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic greater than 80 mmHg*

OR

Etomidate: 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.

- (2) *If ventilatory difficulty is thought to be the result of pain response, Morphine may be used in addition to, or instead of, Midazolam: Morphine 0.05 mg/kg (2-5 mg) IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic greater than 80 mmHg. May be repeated x1 in 5 minutes if required*
- (3) *If significant resistance to ventilation continues, the EMT-P may administer*
- (a) *Vecuronium 0.05 mg/kg (2-5 mg) IVP*



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 END TIDAL CO₂ MONITORING. VECURONIUM MAY ONLY BE USED IF CONTINUOUS, BREATH TO BREATH, ETCO₂ MONITORING CAN BE PROVIDED.

- (b) *Dose may be repeated in 4-6 minutes if necessary.*
- (4) *Continue to monitor oxygen saturation and ventilate to desired end tidal carbon dioxide.*
- (5)  *Obtain on-line medical direction if further problems present.*

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

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The pilot protocol for Combitube has been removed. Combitube is no longer an approved airway device. **(NEW '10)**

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

4. 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) (NEW '10)*
- (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 end tidal 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.*

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-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. (NEW '10)

- (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
EMT-Paramedic only**

5. 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

A verification of all RSI skills and review of RSI principles of safety will be performed on a quarterly basis. In two of the quarters, this will be accomplished via direct observation in the Operating Room. In a third quarter, the medical director during a full EMT-P skills evaluation will perform this. 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.

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:
- (2) Immediate notification of your jurisdictional RSI supervisor for all RSI attempts
- (3) Medical Director evaluation of all RSI attempts within 12 hours

d) Maintenance of detailed RSI database

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

**N. PEDIATRIC RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
(For children less than 12 years of age) (NEW '10)**



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
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c) Preparation

- (1) Pre-oxygenate with 90-100% oxygen.
- (2) Monitor oxygen saturation with pulse oximetry and ECG.
- (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. **(NEW '10)**
 - (b) Bag Valve Mask (BVM) with manometer. (Manometer may be part of the BVM or separate.) **(NEW '10)**
 - (c) Suction
 - (d) RSI kit
 - (i) Prepare medications
 - (ii) Alternative airway device, Cricothyroidotomy equipment **(NEW '10)**
 - (e) Capnograph

d) RSI Procedure

- (1) Etomidate: Administer 0.3 mg/kg IVP over 30-60 seconds
If the provider suspects hypovolemia, administer half the usual initial dose (0.15 mg/kg) IVP over 30-60 seconds. May repeat 0.15 mg/kg IVP in 2-3 minutes if sedation is inadequate. **(NEW '10)**

OR

Midazolam: Administer 0.05 mg/kg (2-5 mg) IVP over 1-2 minutes

- (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. **(NEW '10)**
- (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 age (or if age unknown and using ET tube smaller than 6.0), pretreat patient with Atropine 0.02 mg/kg IVP (minimum dose of 0.1 mg).
- (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 0.5 mg/kg IVP.

e) Successful Endotracheal Tube Placement

- (1) Release cricoid pressure and secure ET.
- (2) Ventilate to end tidal carbon dioxide 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.

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
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f) Unsuccessful Endotracheal Tube Placement

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

g) If Unable to Ventilate

If unable to ventilate, verify appropriate oropharyngeal airway placement and reposition BVM for optimal mask seal. If still unable to ventilate, refer to needle cricothyroidotomy protocol.

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

a) Indication

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

b) Contraindication

Unsecured airway

c) Procedure

- (1) *Midazolam up to 0.05 mg/kg IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic: greater 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.*

OR

Etomidate: 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.

- (2) *If ventilatory difficulty is thought to be the result of pain response, Morphine may be used in addition to, or instead of, Midazolam/Etomidate:
Morphine 0.05 mg/kg IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic: greater 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.
May be repeated x1 in 5 minutes if required.*

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
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- (3) *If significant resistance to ventilation continues, the EMT-P may administer*
 - (a) *Vecuronium 0.05 mg/kg (2-5 mg) IVP (May not be used for patients with needle cricothyroidotomy because of inability to monitor breath to breath $ETCO_2$).*



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. VECURONIUM MAY ONLY BE USED IF CONTINUOUS, BREATH TO BREATH, $ETCO_2$ MONITORING CAN BE PROVIDED.

- (b) *Dose may be repeated in 4-6 minutes if necessary.*
- (4) *Continue to monitor oxygen saturation and ventilate to desired end tidal carbon dioxide.*
- (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) (NEW '10)**

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 (NEW '10)

- (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.*

**PILOT PROGRAM
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- (6) *Monitor oxygen saturation and end tidal 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. **(NEW '10)**

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.*
- (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

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.

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:*

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

- (2) *Immediate notification to jurisdictional RSI supervisor for all RSI attempts*
- (3) *Medical Director evaluation of all RSI attempts within 12 hours*

**d) Maintenance of detailed RSI database
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 narcotics 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

- (1) **Adult:**
*Administer 0.3 mg/kg IVP over 30 to 60 seconds.
If the provider suspects hypovolemia, the initial dose will be 0.15 mg/kg IVP over 30-60 seconds. May repeat 10 mg for adult IVP after succinylcholine effects resolve and patient is bucking or combative. May repeat 10 mg for adult IVP every 15 minutes to a total of three doses. Additional doses require medical consultation.*
- (2) **Pediatric:**
*Administer 0.3 mg/kg IVP over 30 to 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
EMT-Paramedic only**

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 narcotics and alcohol

g) Dosage

- (1) *Adult:
Administer 0.05 mg/kg (2-5 mg) slow IVP over 1-2 minutes, while maintaining BP systolic greater than 80 mmHg.*
- (2) *Pediatric:
Administer 0.05 mg/kg slow IVP over 1-2 minutes, while maintaining BP systolic greater 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.*



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
EMT-Paramedic only**

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 (60-150 mg) rapid IVP.

If relaxation is inadequate after 2-3 minutes, a repeat dose of 0.5 mg/kg (20-50 mg) rapid IVP may be given.

(2) *Pediatric:*

Administer 1.5 mg/kg rapid IVP.

If relaxation is inadequate after 2-3 minutes, a repeat dose of 0.5 mg/kg rapid IVP may be given.

**PILOT PROGRAM
RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE
EMT-Paramedic only**

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 (2-5 mg) IVP.*
- (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.*

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

N1. Patient Initiated Refusal of EMS

1. *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.)

2. *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?"*

3. *Each patient's assessment shall include:*
 - a. *visual assessment - injuries, responsiveness, level of consciousness, orientation, respiratory distress, gait*
 - b. *primary survey - airway, breathing, circulation, and disability*
 - c. *vital signs - pulse, blood pressure, respiratory rate and effort, pulse oximeter when available.*
 - d. *secondary survey - directed by the chief complaint*
 - i. *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.*
 - ii. *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 affected body regions (chest, abdomen, pelvis, extremities).*
 - e. *Capability to make medical decisions (complete questions 1 through 4 on the Patient Initiated Refusal of EMS Form):*
 - i. *Disorientation to person, place, time, situation*
 - ii. *Evidence of altered level of consciousness resulting from head trauma, medical illness, intoxication, or other cause*
 - iii. *Evidence of impaired judgment from alcohol or drug ingestion*
 - iv. *Language communication barriers were removed by assuring "language line" translation when indicated.*

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

4. *Following the assessment, complete items 5 - 9 on the Patient Initiated Refusal of EMS Form, noting the presence of conditions which may place the patient at higher risk of hidden illness/injury or of worse potential outcome.*

Management

- a. *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:*
 - i. *Medical capacity to make decisions - the ability to understand and discuss and understanding of the nature and consequences of the medical care decision.*
 - ii. *Adult
(eighteen years of age or greater)*
 - iii. *A patient that has been evaluated by EMS providers as having 'no' answers to questions 1, 2, 3, 4a or 4b shall be considered to be medically capable to make decisions regarding his/her care.*
 - iv. *Patients with 'no' answers to questions 1, 2, 3, 4a, 4b but one or more yes answers to questions 5-8 (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 his/her condition and accept transportation.*
 - v. *If the EMS provider is unsure whether the patient has adequate ability to make medical decisions, he/she should seek medical consultation.*
 - vi. *At any time the EMS provider identifies patient conditions that the patient should be transported to a hospital, and the patient is refusing transport, then the provider should consult medical direction.*
- b. *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 to the closest appropriate medical facility for further evaluation:*
 - i. *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.*

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

- ii. Attempted suicide, danger to self or others or verbalizing suicidal intent.*
 - iii. Acting in an irrational manner, to the extent that a reasonable person would believe that the medical capacity to make decisions is impaired.*
 - iv. Severe illness or injury to the extent that a reasonable and medically capable person would seek further medical care.*
 - v. On an Emergency Petition.*
- c. 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.*

5. Base 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 hospital consultation:

- a. The provider is unsure if the patient is medically capable to refuse transport.*
- b. The provider disagrees with the patient's decision to 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*
- c. The patient was involved in any mechanism included in the Trauma Decision Tree of the Maryland Medical Protocols which would recommend transportation to a Trauma Center.*

Patients who do not meet the criteria above but have one or more positive answers to questions 5 through 10 on the Patient Initiated Refusal of EMS Form may have a higher risk of illness. In these situations providers should consider consultation with the Base Hospital physician.

6. Documentation

- a. Complete the Patient Initiated Refusal of EMS Form, Section One, documenting the patient's medical decision-making capability and any "At-Risk" criteria.*
- b. Complete Section Two, which documents provider assessment and actions.*
- c. Following patient counseling and Base Hospital consultation, when indicated, complete Section Three, the Initial Disposition, Interventions, and Final Disposition.*

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

- d. Have the patient and witness sign the refusal statement as determined by your jurisdiction.*
- e. 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.)*
- f. Submit copies of the Patient Initiated Refusal of EMS Form and the documentation form to the EMS Supervisor.*

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

Section One:

When encountering a patient that 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 (1-3,4a or b) or high risk criteria (5-8):

<i>Medical Capacity</i>	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. Head Injury?	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	4. 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
<i>At Risk Criteria</i>	5. Age greater than 65?	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	6. Pulse greater than 110 or less than 60?	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	7. Systolic BP greater than 200 or less than 90?	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	8. Respirations greater than 30 or less than 12?	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	9. Serious chief complaint (chest pain, SOB, syncope)	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	10. Significant MOI or high suspicion if injury	_____	<input type="checkbox"/> yes <input type="checkbox"/> no
	11. Is it your impression the patient requires hospital evaluation?		<input type="checkbox"/> yes <input type="checkbox"/> no

If yes, transport

If yes, consult

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 XXXX County Fire and Rescue but refuse (check all that apply):

Examination Treatment Transport

Patient Name: _____ Phone: _____

Patient Address: _____

Signature: _____ Witness: _____

Patient Guardian

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

**PILOT PROGRAM
PATIENT INITIATED REFUSAL OF EMS**

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

Interventions:

- Attempt to convince patient
 Attempt to convince family member
 Contact Medical Direction
 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

Section Four: (MUST COMPLETE)

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

Jurisdiction _____ Incident: _____ Date: _____
Unit #: _____ Provider Name/EID: _____ Time: _____

**PILOT PROGRAM
EMT-B ACQUISITION OF 12-LEAD ELECTROCARDIOGRAPHY**

N2. EMT-B 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-B to acquire and transmit a 12-lead (15-lead if trained to perform) electrocardiography (ECG) 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) 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

**PILOT PROGRAM
EMT-B 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.

4. CONTRAINDICATIONS

Acquisition of a 12-lead ECG should not take precedence over required life-saving measures (i.e. CPR, assisting respirations, clearing or maintaining a patient's airway, checking blood glucose, extrication, or removal of a patient from a dangerous scene).

5. PROCEDURE

- a) Initiate General Patient Care.
- b) Initiate Cardiac Emergencies: Chest Pain Protocol.
- c) Position patient (i) (ii).
- d) Place chest and limb leads (iii) (iv).
- e) Turn on monitor.
- f) Set patient age and a patient identifier.
- g) Acquire 12-lead (v).
- h) Consult with receiving facility.
- i) Transmit 12-lead (vi).
- j) Continue patient care.
 - (i) 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 his/her dignity during the procedure.
 - (ii) If unable to place patient in the recumbent position, include this information in your hospital consult and note it on your EMAIS report or in your written narrative of your patient care report.

**PILOT PROGRAM
EMT-B ACQUISITION OF 12-LEAD ELECTROCARDIOGRAPHY**

- (iii) Remove electrodes from a sealed package immediately before use. Using previously unpacked electrodes or electrodes with expired date codes may impair ECG signal quality.
- (iv) When placing electrodes on female patients, always place the leads V3-V6 under the breast rather than on the breast.
- (v) Acquisition of a 12-lead ECG should take no more than 5 minutes.
- (vi) Transmission of the 12-lead ECG 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 ECG.

6. INDIVIDUAL EMT-B APPROVAL FOR PARTICIPATION

- a) The EMT-B 12-Lead ECG Program is open to all Maryland EMT-Bs 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-B will participate in an annual refresher training program.

8. REVIEW OF EACH CALL

- a) Providers will submit copies of each 12-lead ECG and EMAIS report to their jurisdictional Quality Review Committee.
- b) The Quality Review Committee will review all 12-lead transmissions on a quarterly basis and submit a report to the Jurisdictional and Regional Medical Directors.

**PILOT PROGRAM
PELVIC STABILIZATION BINDER DEVICE FOR
SUSPECTED PELVIC FRACTURE PROCEDURE**

N3. Pelvic Stabilization Binder Device

All levels of EMS providers if appropriately trained in the device

1. INDICATIONS

All of the following blunt trauma patients with physical findings indicative of pelvic fracture should have an application of a Pelvic Stabilization Binder Device.

- 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

Children who have not reached their 15th birthday

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) The patient should be placed in a supine position prior to application of the pelvic stabilization binder device.
- d) Place pelvic binder around the patient, centered at the level of the greater trochanter.
- e) 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.
- f) Ensure patient has been undressed and provides adequate exposure.
- h) Tighten the binder as directed by the manufacturer's instructions for the specific stabilization binder.
- i) Once pelvic stabilization binder device is applied, do not remove until directed to do so by physician.

**PILOT PROGRAM
PELVIC STABILIZATION/ BINDER TECHNIQUE 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.
Assessment 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.

**PILOT PROGRAM
ON-SCENE PROTOCOL AND ALTERNATIVE DISPATCH PROTOCOL DURING
DECLARED PUBLIC HEALTH EMERGENCIES FOR PANDEMIC INFLUENZA (NEW '10)**

N4. 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 pre-hospital 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 and 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 (NEW '10)**

Table 1. Assess Patient's Vital Signs				
	Critical Adult Vital Signs	Critical Pediatric Vital Signs	Normal Adult Vital Signs	Normal Pediatric Vital Signs
	Transport to ED		Consider Alternate Care	
Pulse/Perfusion	Equal or Greater than 130	CRT greater than 2 seconds	Less than 130	CRT less than or equal to 2 seconds
RR/Distress	Equal or Greater than 30	Greater than 45 or increased work of breathing Neonate: Less than 30 Infant: Less than 20 Child: Less than 15	Less than 30	Unlabored breathing or Neonate: 30-45 Infant: 20-45 Child: 15-45
Systolic BP	Less than 90	Neonates: Less than 60 Infants: Less than 70 Children under 10 years of age: Less than 70 + (2 x years)	Equal or Greater than 90	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)
Pulse Ox	Less than 92 on room air	Less than 92 on room air	Equal or Greater than 92	Equal or Greater than 92
AVPU	Pain or Unresponsive	Pain or Unresponsive	Alert or Verbal	Alert or Verbal
Lung sounds	Rales/ Wheezing	Rales/ Wheezing	Clear	Clear

Table 2. Case Definition Signs and Symptoms for FLU	
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 (NEW '10)**

Maximize the Use of Limited Resources Alternative Dispatch Protocols				
Dispatch Priority Level (match vendor or call center based dispatch protocol/tiered algorithm)	Response (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
Classification 1 (*Echo) 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
Classification 2 (*Delta) 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> - If available Closest Ambulance available (ALS or BLS)
Classification 3 (*Charlie) 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
Classification 4 (*Bravo) 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 Alternate Care Site
Classification 5 (*Alpha) BLS Treatment	BLS Ambulance	Alternate Care Referral	Alternate Care Referral	Alternate Care Referral
Classification 6 (*Omega) 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 LARYNGOSCOPE/GLIDESCOPE
RANGER FOR OROTRACHEAL INTUBATION (NEW '10)**

N5. Airway Management: Video Laryngoscopy/Glidescope Ranger 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.

2. INDICATION

Video laryngoscopy and oro-tracheal intubation is indicated for patients who are 18 years or older.

- 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

Patients less than 18 years of age.

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/RESEARCH PROTOCOL
RAMPART: The Rapid Anticonvulsant Medication
Prior to Arrival Trial (NEW '10)**

**N6. RAMPART: The Rapid Anticonvulsant Medication
Prior to Arrival Trial**

PROTOCOL

RAMPART - A double-blind randomized clinical trial of the efficacy of IM midazolam (10 mg) versus IV lorazepam (4 mg) in the prehospital treatment of status epilepticus by paramedics.

1. INDICATIONS

The benefits of emergent treatment and termination of Status Epilepticus likely result from minimizing the consequences of impaired ventilation, pulmonary aspiration, hemodynamic instability, or metabolic derangements associated with prolonged convulsions. Rapid termination of seizures may also prevent kindling effects demonstrated in animal models in which seizures become more refractory to subsequent treatment as the duration of seizure increases.

2. PATIENT INCLUSION CRITERIA

Patients must be convulsing at the time of treatment to be enrolled.

- a) Destination is a study participating hospital
- b) Paramedics or reliable witnesses verify continuous or repeated convulsive seizure activity of more than 5 minutes.

OR

Patient does not regain consciousness (operationally defined as meaningful speech or obeying commands) between seizures.

- c) Patient is still seizing on paramedic arrival.

OR

Patient isn't seizing, but is unresponsive on paramedic arrival and has a qualifying generalized seizure without regaining consciousness (as above).

3. PATIENT EXCLUSION CRITERIA

- a) Patient is not 18 years of age or older.
- b) Major trauma as the precipitant of the seizure.
- c) Hypoglycemia (glucose less than 60 mg/dl).
- d) Known allergy to midazolam or lorazepam.
- e) Cardiac Arrest or Heart Rate (HR) < 40 beats per minute.
- f) Medical Alert tag marked with "RAMPART declined."
- g) Prior treatment of this seizure with diazepam autoinjector as part of another study.
- h) Known pregnancy.
- i) Prisoners.

4. PROCEDURE: INITIAL INCLUSION

- a) Evaluate patient for unconsciousness or active seizure.
- b) If the patient is unconscious, ask bystander/family if the patient had a seizure.

PILOT/RESEARCH PROTOCOL
RAMPART: The Rapid Anticonvulsant Medication
Prior to Arrival Trial (NEW '10)

5. PROCEDURE: ASSESSMENT FOR EXCLUSION FROM STUDY

- a) **Check pulse.** Pulse must be palpable with rate equal to or greater than 40 beats per minute. Exclude patients in whom seizure is the presenting symptom of cardiac arrest or hemodynamic collapse.
- b) **RAPID ASSESSMENT:**
 - (i) Patient is wearing medical alert ID for allergy or sensitivity to midazolam or lorazepam or the statement “RAMPART” declined, do not enroll in this study.
 - (ii) Patient is a female of child-bearing-age; look at abdomen (rise in umbilicus = 20 weeks) to assess for possible pregnancy. Ask family if present. Do not enroll if this patient is suspected or known to be pregnant.
 - (iii) Check glucose level; if glucose is below 60, treat per protocol. Do not enroll in this study.

6. STUDY STEPS

- a) Open RAMPART study box; say out loud for the voice recorder, **“patient is seizing and all study criteria are met.”**
- b) Give IM medication; say out loud **“IM med given”** and state time.
- c) Start IV; say out loud **“IV access obtained.”**
- d) Administer IV med; say out loud **“IV med given”** and state time.
- e) Say out loud **“patient no longer seizing”** if patient stops convulsing.
- f) Continue standard of care with monitoring and charting of vital signs every 5 minutes or per local protocol – include pulse, BP, respiratory rate, cardiac rhythm, pulse oximetry, and airway management (nasal/oral airway, O₂, ET, etc.) if needed.
- g) If patient is still seizing 10 minutes after last dose, refer to your local protocol for use of additional “rescue medication.”
If rescue medication is given, say out loud **“rescue medication given.”**
- h) When you arrive at the ED, say out loud “arrival at ED” and say out loud whether “patient is seizing” or **“patient is not seizing.”**

5. UPON ARRIVAL AT ED

- a) Contact on-call study personnel.
- b) Initiate RAMPART case replacement.

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OPTIONAL SUPPLEMENTAL PROGRAM
CYANIDE POISONING PROTOCOL

V. JURISDICTIONAL OPTIONAL PROTOCOLS



O. 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 (i.e. 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:

1. Markedly altered level of consciousness
2. Seizure
3. Respiratory depression or respiratory arrest or
4. 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 SPINAL IMMOBILIZATION, 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. BLS 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.

**OPTIONAL SUPPLEMENTAL PROGRAM
CYANIDE POISONING PROTOCOL**

CYANIDE POISONING (CONTINUED)



4. ALS Treatment:
 - 1) Initiate IV LR KVO.
 - 2) Use Glucometer and treat patient accordingly.
 - 3) 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:
 - a) Collect a pre-treatment blood sample in the appropriate tube for Lactate and Cyanide levels.
 - b) ADULT: Administer Hydroxocobalamin. Initial dose is 5 g administered over 15 minutes slow IV. Each 2.5 g vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10 - 15 mL/minute. An additional 5 g dose may be administered with medical consultation.
 - c) PEDIATRIC: Administer Hydroxocobalamin 70 mg/kg (reconstitute concentration is 25 mg/mL). Each 2.5 g 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.
 - d) 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).
 - e) If patient history is suggestive of CO inhalation, consider transport to hyperbaric medicine treatment facility.



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 (EG PULSE OXYMETER, 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 SINCE THIS MAY CAUSE CRYSTALLINE PRECIPITATION.

5. 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:

1. Markedly altered level of consciousness
2. Seizure
3. Respiratory depression or respiratory arrest or
4. 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 min 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

- (1) 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 (pulse oxymeter, and CO level) will be interfered with by the color change and are not reliable for patient assessment.
- (2) Rash
- (3) Increased blood pressure
- (4) Nausea
- (5) Headache
- (6) Decreased white cell count
- (7) Injection site reactions
- (8) Allergic reactions have been observed.

6. Precautions

- (1) Notify hospital of administration of hydroxocobalamin and do not administer sodium thiosulfate through the same IV as this may cause crystalline precipitation.
- (2) Administer slowly over 15 minutes.
- (3) Watch for administration sight reactions.
- (4) 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

- (1) Collect a pre-treatment blood sample in the appropriate tube to assess cyanide level.
- (2) ADULT: Administer hydroxocobalamin. Initial dose is 5 g administered over 15 minutes slow IV. (Each 2.5 g vial of hydroxocobalamin for injection is to be reconstituted with 100 mL of LR and administered at 10 - 15 mL/minute.) An additional 5 g dose may be administered with medical consultation.
- (3) PEDIATRIC: Administer hydroxocobalamin 70 mg/kg (reconstitute concentration is 25 mg/mL). Each 2.5 g 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.
- (4) 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 INTER-FACILITY TRANSPORTS
EMT-Paramedic only**



P. GLYCOPROTEIN IIB/IIIA ANTAGONIST INFUSIONS
(EMT-Paramedic only)

1. PURPOSE

During inter-facility 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 inter-hospital 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, current arrhythmia, and active chest pain*
- 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 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 INTER-FACILITY TRANSPORTS
EMT-Paramedic only**



GLYCOPROTEIN IIb/IIIa ANTAGONIST
(EMT-Paramedic only)

1. Pharmacology

Platelet glycoprotein antagonist. This agent reversibly prevents fibrinogen, 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 PCI (percutaneous coronary intervention).

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, 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 which 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
HEPARIN INFUSION FOR INTER-FACILITY TRANSPORT
EMT-Paramedic only**



Q. HEPARIN INFUSION FOR INTER-FACILITY TRANSPORT
(EMT-Paramedic only)

1. PURPOSE

During inter-facility 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 inter-facility transfer. IV heparin infusions may NOT be started by the prehospital provider in the prehospital setting.

3. CONTRAINDICATIONS (NEW '10)

- 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 training of the ALS providers on the operation of 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 INTER-FACILITY TRANSPORT
EMT-Paramedic only**



HEPARIN

(EMT-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 - 1½ 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 1500 units per hour.*
- b) *Pediatric: Not indicated. (NEW '10)*

**OPTIONAL SUPPLEMENTAL PROGRAM
IMPEDANCE THRESHOLD DEVICE (ITD)
ALL PROVIDER LEVELS**



Q1. IMPEDANCE THRESHOLD DEVICE (ITD) (single use device)

1. PURPOSE

While CPR is being performed, the impedance threshold device prevents air from entering the chest during chest recoil, thereby increasing negative pressure. This enhanced vacuum pulls more blood back to the heart, doubling blood flow during CPR. Studies have shown that this mechanism increases cardiac output, blood pressure, and survival rates.

2. INDICATIONS

The impedance threshold device is indicated for patients 12 years of age and greater with cardiac arrest.

3. CONTRAINDICATIONS

- a) Children less than 12 years of age
- b) Patients with a pulse



4. PROCEDURE

- a) Use with a facemask.
 - (1) Connect ITD to facemask.
 - (2) Open airway. Establish and maintain tight face seal with mask throughout chest compressions; a head strap or 2-handed technique is recommended.
 - (3) Connect ventilation source to ITD.
 - (4) Perform CPR at the recommended compression to ventilation ratio.
- b) Use with an ET Tube.
 - (1) Confirm ET tube placement and firmly secure ET tube as there is additional weight.
 - (2) Connect ITD to ET tube.
 - (3) Connect ventilation source to ITD.
 - (4) Perform continuous chest compressions at recommended rate.
 - (5) Remove clear tab and turn on timing assist lights. Ventilate asynchronously at timing light flash rate of 10/min.
 - (6) Place exhaled CO₂ detector between ITD and ventilation source.

**OPTIONAL SUPPLEMENTAL PROGRAM
IMPEDANCE THRESHOLD DEVICE (ITD)**



ONCE THE PATIENT HAS A RETURN OF SPONTANEOUS CIRCULATION (A PULSE) THE ITD MUST BE REMOVED. THE SAME ITD MAY BE PLACED BACK INTO THE VENTILATION CIRCUIT IF THE PATIENT GOES BACK INTO CARDIAC ARREST REQUIRING ADDITIONAL CPR.

5. SPECIAL CONSIDERATIONS

Remove secretions from the ITD by shaking or blowing out with the ventilation source.

**OPTIONAL SUPPLEMENTAL PROGRAM
AIRWAY MANAGEMENT
ALS ONLY**



Q2. AIRWAY MANAGEMENT: Laryngeal Tube Airway Device (King LTS-D™)

1. PURPOSE

To provide an alternative to the Combitube (latex) or Easy Tube (latex free); it is a latex-free means of ventilating patients who cannot be intubated via direct laryngoscopy.

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

- (1) Responsive patients with an intact gag reflex
- (2) Patients under 4 ft (2 and 2.5 LT not to be used) **(NEW '10)**
- (3) Known esophageal disease or ingestion of caustic substances

4. 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.

5. PROCEDURE

- (1) Inspect all components of the LTS-D for visible damage.
- (2) Select appropriate size LTS-D airway:
 - (a) Size 3: Patients 4-5 ft tall (BVM connector tip is yellow) **(NEW '10)**
 - (b) Size 4: Patients 5-6 ft tall (BVM connector tip is red)
 - (c) Size 5: Patients greater than 6 ft tall (BVM connector tip is purple)
- (3) Test cuffs by injecting the maximum volume of air (by size) and lubricate with water soluble jelly.
 - (a) Size 3: 60mL Air
 - (b) Size 4: 80mL Air
 - (c) Size 5: 90mL Air

**OPTIONAL SUPPLEMENTAL PROGRAM
AIRWAY MANAGEMENT**

- (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 to the indicated depth until the proximal cuff is slightly visible in the posterior pharynx under the base of the tongue; **DO NOT USE EXCESSIVE FORCE.**
- (6) With the free hand, hold the mouth open and make sure that the tongue is not folded back during insertion of the LTS-D airway.
- (7) Inflate cuff. When the airway is properly seated, the patient's teeth should be located within the black lines on the lumen of the LTS-D airway.
- (8) Ventilate and evaluate lung ventilation (breath sounds, absence of gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
- (9) If no lung ventilation, then deflate the cuff, withdraw LTS-D airway 2 cm at a time, re-inflate cuff, and reevaluate ventilation.
- (10) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired end tidal carbon dioxide level.
- (11) If unable to achieve adequate ventilation using LTS-D airway, remove device, reinsert, and attempt again. If unable to ventilate, re-attempt bag valve mask ventilation and consider obstructed airway maneuvers.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I KITS**

R. MARK I Kits Atropine and 2-PAM Auto-Injectors

1. Initiate General Patient Care.

2. General Information

- a) Nerve agents are a group of highly toxic chemicals that may potentially 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 and 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 of time. 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.

3. Presentation

- a) 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 for symptoms and signs. NOTE: This mnemonic is used for all

Nerve Agents			
Signs & Symptoms of Chemical Agents			
		<u>Vapor Exposure</u>	<u>Liquid Exposure</u>
Mild	P - Pinpointing pupils	x	Not Seen
	S - Salivation	x	Not Seen
	L - Lacrimation (tearing)	x	Not Seen
Severe	U - Urination	x	x
	D - Defecation	x	x
	G - Gastrointestinal; pain/gas	x	x
	E - Emesis (vomiting)	x	x
	M - Muscle twitching	x	x
	C - Convulsions	x	x

From SBCCOM's EMS Technician Course and Toxic Chemical Training Course for Medical Support Personnel.

**OPTIONAL SUPPLEMENTAL PROGRAM
ADMINISTRATION OF MARK I KITS**

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) EMS providers must know the following MILD, MODERATE, and SEVERE signs and symptoms of nerve agent poisoning. When providers recognize most or all of the symptoms listed below they must IMMEDIATELY receive treatment (first aid or buddy aid).
 - (1) MILD poisoning (self-aid). Casualties with mild symptoms may experience most or all of the following:
 - (a) Unexplained runny nose
 - (b) Unexplained sudden headache
 - (c) Sudden drooling
 - (d) Difficulty in seeing (dimness of vision, constricted pupil)
 - (e) Tightness in the chest or difficulty in breathing
 - (f) Wheezing and coughing
 - (g) Localized sweating and muscular twitching in the area of the contaminated skin
 - (h) Stomach cramps
 - (i) Nausea without vomiting
 - (2) MODERATE effects would be the above, but also include more severe effects such as diarrhea, moderate to severe difficulty breathing, and some skeletal-muscular twitching /fasciculations. The progression of symptoms from mild to moderate indicates either inadequate treatment or continuing exposure to the nerve agent.
 - (3) SEVERE symptoms. Providers with severe symptoms will not be able to treat themselves and must receive prompt buddy aid and medical treatment. Casualties with severe symptoms may experience most or all of the MILD symptoms plus most or all of the following:
 - (a) Impaired thinking
 - (b) Increasing wheezing and increased difficulty breathing
 - (c) Severe pinpoint pupils
 - (d) Red eyes with tearing
 - (e) Vomiting
 - (f) Severe muscular twitching and general weakness
 - (g) Involuntary defecation
 - (h) Convulsions
 - (i) Unconsciousness
 - (j) Respiratory Failure
 - (k) Bradycardia

4. Prevention of Poisoning

- a) 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

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I KITS**

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.

- b) When the masked casualty is severely poisoned after exposure to vapor and liquid, he/she 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.
- c) 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.
- d) 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.

5. Treatment

- a) The ABC priorities of prehospital treatment require modification to AABCs standing for “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) Certified First Responder or EMT-B 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 midazolam 5 mg or 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.
- c) Dosage scheme for Mark I auto-injector administration
 - (1) Vapor (small exposure)
 - (a) Symptoms may include pinpoint pupils, runny nose, and/or mild shortness of breath.
 - (b) Onset of symptoms: within seconds
 - (c) If only symptoms are pinpoint pupils and/or runny nose, DO NOT TREAT; otherwise, treatment should begin with one dose of the Mark I antidote kit initially. This dosage may be repeated in 10 minutes if the patient remains symptomatic.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARK I KITS**

- (2) Liquid (small exposure)
 - (a) Symptoms may include sweating, twitching, vomiting, weakness
 - (b) Onset: minutes to hours
 - (c) Treatment should begin with one dose of Mark I antidote kit initially. The dosage may be repeated in 10 minutes if the patient remains symptomatic.
- (3) Vapor or liquid (moderate exposure)
 - (a) Symptoms may include more severe respiratory distress, muscular weakness, and/or vomiting and diarrhea.
 - (b) Treatment should begin with 2 doses of Mark I antidote kit initially. The dose of 2 mg of atropine may be repeated in 10 minutes if the patient remains symptomatic.
- (4) Vapor or liquid (large exposure)
 - (a) Symptoms may include copious secretions, unconsciousness, convulsions, and/or apnea.
 - (b) Onset: seconds to hours
 - (c) Treatment should begin with 3 doses of Mark I antidote kit initially. The dose of 2 mg of atropine may be repeated until symptoms decrease or cease.
- d) Monitoring effectiveness of treatment
 - (1) Mark I antidote treatment is initiated when symptoms are present in a WMD potential nerve agent setting.
 - (2) Evidence of response to treatment includes improvement in initial symptoms and **drying of secretions**. If neither occurs after initial Mark I administration, then administer additional atropine until these endpoints are reached. In this setting the pulse will generally be above 90 beats per minute (bpm) as an additional sign of atropinization. Pupillary constriction (pinpoint/miosis) usually occurs from direct exposure, will not respond to systemic atropine, and should not be used as a sign of the effect of treatment.
 - (3) The duration of effect of each 2 mg Atropine Auto-Injector is approximately 5 to 15 minutes. If secretions return and the pulse drops below 90 bpm, then additional atropine treatment should be given.
- e) Advanced Life Support care should be initiated once the patient is adequately decontaminated.
 - (1) Once an IV is established, a patient may be treated with Atropine 2–4 mg IVP or IM every 5–10 minutes for symptoms listed above. Treatment should be titrated to the endpoints listed above.
 - (2) If 2-PAM has not previously been administered, 1–2 grams may be administered IM.
 - (3) Seizures should be treated with midazolam as indicated in protocol. If only diazepam (CANA) available administer 10 mg IM.
 - (4) Severe nerve agent exposure: The midazolam 5 mg or 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.

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EMT-PARAMEDIC ONLY**

S. SPECIALTY CARE PARAMEDIC

(EMT-Paramedic only)

*The Scope of Practice for the Specialty Care Paramedic (SCP) is defined by a floor and a ceiling of care. The entry level for this program is Maryland Licensed EMT-Paramedic. The floor of this Specialty Care Paramedic is the existing Maryland Medical Protocols for EMS Providers (MMPEMSP), including the Optional Supplemental protocols: CPAP, Glycoprotein IIB/IIIA Antagonist, Heparin, Scene/Chronic Ventilator, and Mark I. (The Pilot programs and the Optional Supplemental protocols the **'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 SCP based on the written interfacility transfer orders of the sending, Medical Director of the Commercial Specialty Care Service (without manipulation of the MMPEMSP), or receiving physician without having to request online base station medical consultation.*

The ceiling for the Specialty Care Paramedic is defined by the medications and procedures that are defined as "Team" or are not listed within the tables below. Those medications or skills that are listed as "Team" require familiarization by the SCP but are the responsibility of the transport nurse or physician composing the patient care team.

If the medication or procedure are listed within the scope of practice for the Specialty Care Paramedic, this means that it is for both adult and pediatric patients.

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 911 response.

Classification of Drugs and Procedures

S	Solo – Paramedic 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-B driver to complete the specialty care transport.)
T	Team - Means with a transport nurse or physician onboard – SCP needs familiarity with the medication or procedure but SCP may not perform or administer.

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Medication - Procedure			
A. Medications		Solo (S)	Team with Nurse (T)
1.	Sedatives		
	a. Etomidate (amidate)		T
	b. Lorazepam (ativan)	S	
	c. Midazolam (versed)	S	
	d. Propofol (diprivan)		T
2.	Analgesics		
	a. Fentanyl (sublimaze)	S	
	b. Hydromorphone (dilaudid)		T
	c. Meperidine (demerol)		T
	d. Non- narcotic analgesics (eg Ketorolac)	S	
3.	Paralytics		
	a. All types		T
4.	Antihypertensives		
	a. All types		T
5.	Volume Expanders		
	a. Albumin	S	
	b. Blood products		T
	c. Dextran	S	
	d. Hespan	S	
	e. Plasmanate	S	
6.	Vasopressors		
	a. Dobutamine (dobutrex)		T
	b. Epinephrine – drip		T
	c. Norepinephrine (levaphed)		T
	d. Phenylephrine		T
7.	Bronchodilators		
	a. Metaproterenol (alupent)	S	
	b. Theophylline – IV		T
	c. Terbutaline (brethine) - Inhaled	S	
	d. L- Albuterol (inhaled)	S	
8.	Anti-Anginals		
	a. Atenolol (tenormin)		T
	b. Metoprolol (lopressor)		T
	c. Nitroglycerin (tridil) – IV	S (adults only)	
	d. Propranolol (inaleral)		T

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Medication - Procedure (Continued)			
A. Medications (Continued)		Solo (S)	Team with Nurse (T)
9.	Fibrinolytics/ Thrombolytics		
a.	All types		T
10.	Anti-Coagulants /Anti-Platelets		
a.	All Types	S (adults only) (NEW '10)	
11.	Anti-Emetic		
a.	All types anti-emetic	S	
12.	Antibiotics		
a.	All types of antibiotics	S	
13.	Miscellaneous		
a.	Flumazenil AD (romazicon)		T
b.	Insulin – IV		T
c.	Insulin in TPN	S	
d.	Mannitol (osmitrol)		T
e.	Mg Sulfate (added to mixed drip– eg, with vitamins)	S	
f.	Potassium Chloride (only maintenance infusions; Not bolusing)	S	
g.	Steroids – IV (not initiated)	S	
h.	Total Parenteral Nutrition (TPN)	S	
i.	Tocolytics (including Mag Sulfate)		T
j.	Uterine stimulants (eg, oxytocin)		T
14	Anti-Arrhythmic		
a.	Amiodarone		T
b.	Bretylium (bretylol)		T
c.	Digoxin (lanoxin)		T
d.	Esmolol (brevibloc)		T
e.	Metoprolol (lopressor)		T
f.	Procainamide (pronestyl)		T
g.	Quinidine Sulfate & Gluconate		T
15.	Anti-Convulsants (also see sedatives)		
a.	Barbiturates		T
b.	Phenytoin (dilantin) / Fosphenytoin	S	
c.	Other non-benzodiazepine anti-convulsants		T

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Medication - Procedure (Continued)			
B. Invasive Procedures		Solo (S)	Team with Nurse (T)
1. Chest Escharotomies			T
2. Chest Tubes Insertion			T
3. Chest Tube or Surgical Drain with or without vacuum system		S	
4. Laryngeal Mask Airway (LMA)		S (adult only)	
5. Needle Cricothyroidotomy		S	
6. Rapid Sequence Intubation			T
7. Surgical Cricothyroidotomy		S	
8. Tracheostomy Care and Replacement (fresh)		S	
9. Urinary catheter insertion		S	
C. Non-Invasive Procedures			
1. IV Pumps		S	
2. Ostomy care		S	
D. System Monitoring			
1. Arterial Line / Cardiac Sheath			T
2. CVP line (monitor but not performing measures)		S	
3. Intracranial Pressure Monitor/ Line			T
4. Swan-Ganz			T
E. Specialized Equipment			
1. Automatic Internal Cardiac Defibrillator (AICD)		S	
2. Acute Ventilated Inter-Facility Patient – Transport Service's Ventilator (Except as in E6)		S	
3. Internal Pacer with external control			T
4. Intra-Aortic Balloon Pump			T
5. Peritoneal Dialysis Systems		S	
6. Specialty Ventilator (eg, Pediatric or when hospital ventilator must accompany patient)			T
7. Transport Isolette /Incubator			T
8. Ventricular Assist Devices		S	

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

T. TACTICAL EMS

A. INTRODUCTION

1. Scope & Applicability
 - a) These protocols are intended for use during high-risk, large-scale, and extended law enforcement or homeland security operations.
 - b) 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.
 - c) 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, Inter-Facility, Pilot/Optional, and WMD sections.
 - d) 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.
 - e) 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.
 - f) Tactical EMS Providers at the BLS 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.
 - g) 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.
 - h) Once the patient is removed from the law enforcement perimeter of operation, the TEMS protocol will end, the Maryland Medical Protocol for EMS providers will be implemented, and the transition of care will be made to the local EMS agency.
 - i) An exception may be made when the Tactical EMS Provider's specialized training is needed to manage a specific illness/injury.
 - (1) 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 Protocol for EMS providers.
 - (2) 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.
 - (3) If they cannot reach a Tactical Physician, they should contact the local EMS Base Station for on-line medical consultation.

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2. Definition of Tactical Environment
The Tactical Environment is defined as:
 - a) 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.
 - b) 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.
 - c) 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.

3. Demonstration of Need
 - a) Jurisdictions that seek approval for a Tactical EMS Program shall submit a demonstration-of-need letter outlining the necessity for the program.
 - b) The letter shall be submitted to the Executive Director of the Maryland Institute for Emergency Medical Services Systems for approval and include the following:
 - (1) Name of organization and scope of the Tactical EMS Team
 - (2) Name and qualifications of the Tactical Medical Director and other Tactical Physicians
 - (3) Name and qualifications of the Tactical EMS Coordinator and other Tactical EMS Providers

4. Sponsoring Law Enforcement Agency Requirements
 - a) Sponsoring Law Enforcement Agencies shall be responsible for:
 - (1) Completing background investigations appropriate for medical providers working in and around law enforcement operations
 - (2) 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
 - (3) Providing written documentation to MIEMSS that addresses the medical liability and personal injury considerations of the Tactical EMS Providers/Physician(s)

5. Tactical EMS Provider/Tactical Physician Minimum Training Requirements:
 - a) The Tactical EMS Provider shall be a Maryland licensed/certified BLS or ALS provider, and have successfully completed a nationally recognized (CONTOMS/IFHP [COunter-Narcotic Tactical Operation Medical Support / Integrated Force Health Provider] Program or equivalent) Tactical Provider course that includes instruction and training in:

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- (1) Team wellness and health management, including preventive medicine
 - (2) Providing care under fire/basic weapons safety
 - (3) Officer rescue
 - (4) Planning medical operations and medical intelligence
 - (5) Response to the Active Shooter
 - (6) Orientation to specialized medical gear personal protective equipment used in tactical medical operations
 - (7) Remote medical assessment ("medicine across the barricade")
 - (8) Response and management of WMD events, including field-expedient decontamination ("hasty decon") procedures
 - (9) Operational security, light and sound discipline, helicopter operations, pyrotechnic and other chemical agents, as utilized by law enforcement teams
 - (10) Less-than-lethal weaponry, the injuries they may cause, and any specific interventions required
- b) The Tactical EMS Provider shall have responsibilities for part or all of these protocols, as summarized as follows, based upon either BLS (EMT-Basic) or ALS (EMT-Intermediate or EMT-Paramedic) level certification.

INTERVENTION	BLS	ALS	MAIS
Provision of access to medications: Ibuprofen, Naproxen, Fexofenadine, Fexofenadine+Pseudoephedrine, Pseudoephedrine, Oxymetazoline nasal spray, Mylanta, Cimetidine, Omeprazole, Clove oil, Acetaminophen, Caffeine	✓	✓	✓
Administration of medications in Protocol, not listed above		✓	✓
Cyanoacrylate tissue adhesive (Dermabond)	✓	✓	✓
Field expedient wound closure (Stapling)		✓	✓
ELECTRIC CONDUCTIVE WEAPON dart removal		✓	✓

- c) The Tactical EMS Provider shall document each patient contact utilizing MAIS or EMAIS. The documentation must be consistent with current MIEMSS regulations for interventions, as summarized in the above table. All TEMS implementations will be reviewed.
- d) 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

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completed a nationally recognized (CONTOMS / IFHP or equivalent) tactical medical director's course that includes instruction and training in the following topics:

- (1) History of/need for Tactical EMS provision
- (2) Administrative/Command concerns and responsibilities
- (3) Care under fire
- (4) Special equipment/hazards in the Tactical environment
- (5) Forensic examination
- (6) Medicine "across the barricade"
- (7) Medical threat assessment

6. Quality Assurance

- a) Individual Tactical EMS providers must be Approved for TEMS Pilot Participation by the TEMS Medical Director.

Successful completion of small group training of the following:

- (1) Classroom lecture
- (2) Mannequin instruction
- (3) Must demonstrate proficiency through skills testing and written test

- b) Ongoing Demonstration of Proficiency

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.

- 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 addition of (2) and (3) below:
- (2) Upon completion of the Tactical Incident, notification of any implementation of the TEMS protocol will be made to your jurisdictional TEMS supervisor.
- (3) Medical Director will evaluate all TEMS interventions within 48 hours of resolution of the Tactical Incident.

- d) The TEMS program will maintain a detailed TEMS database and will provide an annual report to the State EMS Medical Director.

B. GENERAL PROTOCOLS

1. Medical Direction

- a) Tactical EMS Providers may provide medical care using Tactical Medical Protocols only under the medical direction of a Tactical Physician.
- b) Immediately available telephone or radio contact during an operation shall be considered a reasonable substitute for in-person supervision of the Tactical EMS Providers.
- c) In the absence of medical direction by a Tactical Physician, jurisdictional trained and designated Tactical EMS Providers should defer to their usual EMS protocols.

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2. Operational Command
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.

C. SPECIAL CONSIDERATIONS FOR TACTICAL EMS

1. 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.
2. Prescription and Over the Counter (OTC) medications may be used for the treatment [or "symptomatic relief"] of constitutional symptoms as required to 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 him/her (as will be delineated under "Additional Medications for Tactical EMS," to follow). At the BLS 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.
3. 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.

D. SPECIFIC PROCEDURES

1. Cyanoacrylate tissue adhesive (Dermabond).
 - a) Purpose: To limit blood loss, pain, and risk of secondary contamination/injury to a minor open wound.
 - b) Indications
 - (1) Clean wounds
 - (2) Minor bleeding wounds difficult to control with other interventions
 - (3) Wounds in personnel who must remain operational
 - c) Contraindications
 - (1) Grossly contaminated wounds

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- (2) Greater than two hours since infliction of wound
 - (3) Macerated/crushed surrounding tissue
 - (4) Wounds near the eyes
 - d) Potential adverse effects/Complications
 - (1) This is not intended to constitute definitive wound closure—however, if properly cleaned prior to procedure, may be reviewed by physician without further intervention.
 - (2) Transient local pain at application site may be reported.
 - e) Precautions
 - (1) Ask regarding previous reaction/exposure to agent.
 - (2) Advise patient of requirement for further evaluation by physician.
2. “Field expedient” wound closure (stapling)
- a) Purpose: To limit blood loss and risk of secondary contamination injury to an open wound.
 - b) Indications
 - (1) Clean wounds
 - (2) Delay in transportation to definitive care will be or is anticipated to be several hours
 - (3) Bleeding wounds difficult to control with other interventions
 - (4) Wounds in personnel who must remain operational
 - c) Contraindications
 - (1) Grossly contaminated wounds
 - (2) Greater than six hours since infliction of wound
 - (3) Macerated/crushed surrounding tissue
 - (4) Situations with less than two hours anticipated time to transportation to definitive care
 - (5) Facial wounds
 - d) Potential adverse effects/Complications
 - (1) This is **not** intended to constitute definitive wound closure—this will minimize the potential for increased infection risk and increased retained foreign body risk.
 - e) Precautions
 - (1) Ask regarding local anesthetic allergies.
 - (2) Advise patient of requirement for further evaluation by physician.
3. Impaled electric conductive weapon dart removal
- a) ANY electric conductive weapon dart impalement to the head, neck, hands, feet, or genitalia must be stabilized in place and evaluated by a physician.
 - b) 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 a) above, and is not fully embedded up to the hub in tissue.
 - c) All patients receiving electric conductive weapon intervention will need to be transported to the Emergency Department for assessment.

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SUPPLEMENTAL FORMULARY FOR TACTICAL EMS

Tactical EMS providers may administer the following medications to support and maintain Tactical personnel in the operation environment.

1. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)
 1. Ibuprofen (Motrin/Advil)
 2. Naproxen (Aleve/Naprosyn)
 3. Ketorolac (Toradol) (injectable)
2. Antihistamines / Decongestants
 1. Fexofenadine (Allegra)
 2. Fexofenadine + Pseudoephedrine (Allegra-D)
 3. Pseudoephedrine (Sudafed)
 4. Oxymetazoline nasal spray (Afrin)
3. Gastrointestinal
 1. Liquid Antacid (Mylanta or other equivalent liquid antacid)
 2. Cimetidine (Tagamet—or other equivalent H2 blocker)
 3. Omeprazole (Prilosec—or other equivalent Proton Pump Inhibitor)
 4. Loperamide (Immodium)
 5. Metoclopramide (Reglan) (injectable)
 6. Dimenhydrinate (Dramamine), Meclizine (Antivert) [for motion sickness]
 7. 5-HT₃ Antagonist (Zofran/Ondansetron, Kytril/Granisetron, Anzemet/Dolasetron—or other equivalent 5-HT₃ antagonist) (become non-operational member if given)
4. Ophthalmologicals
 1. Proparacaine or Tetracaine (Alcaine) ophthalmic
 2. Fluorescein stain (and Blue light)
5. Antimicrobials (agent specific training)
 1. Beta-lactams or Cefazolin (Ancef) (IV) [for trauma applications when transport delayed]
 2. Quinolones (Following exposure or prophylaxis)
6. Steroids
 1. Prednisone (PO or IV)
 2. Dexamethasone (Decadron) (PO or IV)
7. Clove oil (for topical dental analgesia)
8. Analgesics / Anesthetics
 1. Tramadol (Ultram) (PO)
 2. Acetaminophen (Tylenol)
 3. Lidocaine (IM/SQ for stapling as temporizing measure only, alternate dosing regimen)
9. Nitroglycerin (alternate dosing regimen – Just taking out consulting requirement [not for hypertension])
10. Performance aids
 1. Zaleplon (Sonata) (sleeper)
 2. Modafinil (Provigil)

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- 3. Caffeine (No-Doz)
- 11. Volume Expanders
 - 1. Hydroxyethyl starch (Hespan)
 - 2. 3% NaCl
- 12. Wound Management
 - 1. Cyanoacrylate tissue adhesive (Dermabond)
 - 2. Powdered hemostatic agent or impregnated dressing (Quik-Clot / equivalent)



OPERATIONAL: THE MEDICATION MAY BE GIVEN TO A LAW ENFORCEMENT MEMBER WHO MAY CONTINUE TO PERFORM HIS/HER ASSIGNED DUTIES.

NON-OPERATIONAL: ONCE THE MEDICATION HAS BEEN ADMINISTERED, THE LAW ENFORCEMENT MEMBER IS REMOVED FROM HIS/HER ASSIGNED DUTIES SINCE THE MEDICATION OR THE ASSOCIATED MEDICAL/TRAUMATIC COMPLAINT MAY IMPAIR HIS/HER ABILITY TO PERFORM CRITICAL LAW ENFORCEMENT TASKS AND DUTIES.

1. Non-Steroidal Anti-Inflammatory Drugs

IBUPROFEN (Motrin/Advil)

AVAILABILITY..... Tablet: 200mg (OTC) and 100mg/5mL suspension
ACTION..... Non-steroidal anti-inflammatory pain medication
INDICATIONS..... Mild to moderate pain
CONTRAINDICATIONS..... Known hypersensitivity; renal insufficiency (not failure); PUD/GERD/GI bleed history
PRECAUTIONS..... Do not use with other NSAIDs; caution with concomitant steroid use. aL CB (D in 3rd trimester) ^{a+}
OPERATIONAL STATUS?..... **Operational**
SIDE EFFECTS..... GI upset / nausea; GI bleeding risk
INTERACTIONS.....
DOSAGE..... 400-600mg / 4 to 6 hours or 600-800mg / 6 to 8 hours

NAPROXEN (Aleve/Naprosyn)

AVAILABILITY..... Tablet: 220 / 375 / 500mg
ACTION..... Non-steroidal anti-inflammatory pain medication
INDICATIONS..... Mild to moderate pain
CONTRAINDICATIONS..... Known hypersensitivity; renal insufficiency (not failure); PUD/GERD/GI bleed history
PRECAUTIONS..... Do not use with other NSAIDs; caution with concomitant steroid use. aL CB (D in 3rd trimester) ^{a+}
OPERATIONAL STATUS?..... **Operational**
SIDE EFFECTS..... GI upset / nausea; GI bleeding risk
INTERACTIONS.....
DOSAGE..... 220-500mg / 12 hours

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KETOROLAC (Toradol) (Injectable)

AVAILABILITY.....	30mg/mL IV/IM
ACTION.....	Non-steroidal anti-inflammatory pain medication
INDICATIONS.....	Mild to moderate pain
CONTRAINDICATIONS.....	Known hypersensitivity; renal insufficiency (not failure); PUD/GERD/GI bleed history
PRECAUTIONS.....	Do not use with other NSAIDs; caution with concomitant steroid use. aPlasma CC (D 3rd trimester) ^{a?}
OPERATIONAL STATUS?.....	Operational
SIDE EFFECTS.....	GI upset / nausea; GI bleeding risk
INTERACTIONS.....	
DOSAGE.....	30mg IM/IV every 6 to 8 hours

2. Antihistamines / Decongestants

FEXOFENADINE (Allegra)

AVAILABILITY.....	Tablet: 60mg
ACTION.....	Non-sedating antihistamine
INDICATIONS.....	Allergic symptoms
CONTRAINDICATIONS.....	Known hypersensitivity
PRECAUTIONS.....	Hypertension history; aLK CC ^{a+}
OPERATIONAL STATUS?.....	Operational
SIDE EFFECTS.....	
INTERACTIONS.....	
DOSAGE.....	60mg / once or twice daily

FEXOFENADINE & PSEUDOEPHEDRINE (Allegra-D)

AVAILABILITY.....	Tablet
ACTION.....	Non-sedating antihistamine with decongestant
INDICATIONS.....	Allergy symptoms with nasal congestion / symptoms
CONTRAINDICATIONS.....	Known hypersensitivity
PRECAUTIONS.....	Hypertension history; aL CC ^{a+} (C-psdphd but used)
OPERATIONAL STATUS?.....	Operational
SIDE EFFECTS.....	
INTERACTIONS.....	
DOSAGE.....	One tablet once or twice daily

PSEUDOEPHEDRINE (Sudafed)

AVAILABILITY.....	Tablet: 30mg; 60mg (OTC)
ACTION.....	Decongestant
INDICATIONS.....	Nasal congestion; rhinorrhea
CONTRAINDICATIONS.....	Known hypersensitivity; hypertension
PRECAUTIONS.....	
OPERATIONAL STATUS?.....	Operational
SIDE EFFECTS.....	Insomnia
INTERACTIONS.....	
DOSAGE.....	30mg to 60mg every 4 to 6 hours, as needed

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OXYMETAZOLINE (Afrin)

AVAILABILITY.....Nasal spray 0.05%
ACTION.....Nasal vasoconstriction; decongestant
INDICATIONS.....Rhinorrhea; sinus congestion and pain
CONTRAINDICATIONS.....Known hypersensitivity
PRECAUTIONS.....aL CC ^{a?}
OPERATIONAL STATUS?.....**Operational**
SIDE EFFECTS.....Nose bleed (minor) possible, often used in
treatment of nosebleed
INTERACTIONS.....
DOSAGE.....Two sprays per nostril two to three times per day

3. Gastrointestinal

LIQUID ANTACID (Mylanta/Maalox)

AVAILABILITY.....Liquid (OTC)
ACTION.....Antacid
INDICATIONS.....GI upset; GERD; PUD; Gastritis; Esophagitis
CONTRAINDICATIONS.....Known hypersensitivity
PRECAUTIONS.....Some medications require acidic pH and should
not be taken at same time with this medication:
aK C+ (? 1st trimester) ^{a?}
OPERATIONAL STATUS?.....**Operational**
SIDE EFFECTS.....
INTERACTIONS.....Loose stools possible
DOSAGE.....15-45mL every 4 to 8 hours

CIMETIDINE (Tagamet)

AVAILABILITY.....200, 300, 400mg tablet; 300mg IV/IM
ACTION.....Proton pump inhibitor
INDICATIONS.....PUD; GERD; Esophagitis; Gastritis
CONTRAINDICATIONS.....Known hypersensitivity; concomitant H-2 blocker use
PRECAUTIONS.....aL CC ^{a?}
OPERATIONAL STATUS?.....**Operational**
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....300mg IV/IM/PO every 6-8 hours; 400mg twice daily

OMPERAZOLE (Prilosec)

AVAILABILITY.....Capsule: 20mg, 40mg (OTC)
ACTION.....Proton pump inhibitor
INDICATIONS.....PUD; GERD; Esophagitis; Gastritis
CONTRAINDICATIONS.....Known hypersensitivity; concomitant H-2 blocker use
PRECAUTIONS.....aL CC ^{a?}
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....40mg once daily

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

ONDANSETRON / 5-HT₃ Antagonist (Zofran)

AVAILABILITY.....IM/IV injectable; tablets
ACTION..... Anti-emetic; anti-motion sickness
INDICATIONS.....Nausea / vomiting
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS.....aK CB ^{a?}
OPERATIONAL STATUS?.....NON-OPERATIONAL
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE..... Per MD/DO

4. Ophthalmologicals

PROPARACAINE /Tetracaine (Alcaine)

AVAILABILITY..... Ocular anesthetic solution
ACTION..... Topical anesthetic
INDICATIONS.....To facilitate eye exam; relieve eye pain; per
MD/DO
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS.....Insure eye protection from foreign objects after exam
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....
INTERACTIONS.....Eye pain
DOSAGE..... 1-2 drops per eye; per MD/DO

FLUORESCEIN (and Blue light)

AVAILABILITY..... Single application strips
ACTION.....Dye to facilitate eye exam
INDICATIONS.....Suspected eye injury (foreign body / corneal abrasion)
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... N/A
OPERATIONAL STATUS?..... Operational
SIDE EFFECTS.....N/A
INTERACTIONS.....N/A
DOSAGE..... One drop per eye

5. Antimicrobials (agent specific training)

Quinolones (Following exposure or prophylaxis)

CIPROFLOXACIN (Cipro)

AVAILABILITY..... Tablet:250/500/750mg; 400mg IVPB; 250 or 500/5 susp
ACTION..... 2nd generation Quinolone antimicrobial agent
INDICATIONS..... Per MD/DO—infectious exposures
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... aLK CC (teratogenicity unlikely) ^{a?+}
OPERATIONAL STATUS?..... Operational
SIDE EFFECTS.....GI upset; nausea/vomiting; diarrhea; yeast infection
INTERACTIONS.....
DOSAGE..... Per MD/DO

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

Betalactam eg: Aminocillins, Cephalosporins, Carbapenems, Monobactams

CEFAZOLIN (Ancef)

AVAILABILITY.....0.5-1.5 gram IM/IV
ACTION..... 1st generation Cephalosporin antimicrobial agent
INDICATIONS.....Per MD/DO—infectious exposures / trauma
CONTRAINDICATIONS.....Known hypersensitivity to PCN or Cephalosporins
PRECAUTIONS..... aK CB ^{a+}
OPERATIONAL STATUS?..... NON-OPERATIONAL
SIDE EFFECTS..... GI upset; nausea/vomiting; diarrhea; yeast infection
INTERACTIONS.....
DOSAGE.....Per MD/DO

6. Steroids

PREDNISONE

AVAILABILITY.....PO or IV; Tablet: 1; 5; 10; 20; 50mg and 5mg/mL or 5mg/5mL sol.
ACTION..... Corticosteroid; anti-inflammatory
INDICATIONS.....Allergic reaction; auto-immune condition; per MD/DO
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... PUD/GERD/GI bleed history; aL CC ^{a+}
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....GI upset / nausea
INTERACTIONS.....
DOSAGE.....40mg to 60mg once daily; per MD/DO

DEXAMETHASONE (Decadron)

AVAILABILITY.....PO or IV/IM; tablets
ACTION..... Corticosteroid; anti-inflammatory
INDICATIONS.....Allergic reaction; auto-immune condition; per MD/DO
CONTRAINDICATIONS.....Known hypersensitivity
PRECAUTIONS..... PUD/GERD/GI bleed history; aL CC ^{a-}
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....GI upset / nausea
INTERACTIONS.....
DOSAGE.....10mg once daily; per MD/DO

7. Clove Oil

CLOVE OIL

AVAILABILITY.....Topical Liquid (OTC)
ACTION..... Topical (dental) anesthetic
INDICATIONS.....Dental pain / injury
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... Penetrating / open intra-oral wounds
OPERATIONAL STATUS?..... Operational

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....Topical application to site of dental pain

8. Analgesics

TRAMADOL (Ultram)

AVAILABILITY..... PO Tablet: 50 and 100mg
ACTION.....Pain medication
INDICATIONS.....Moderate to moderately severe pain
CONTRAINDICATIONS.....Known hypersensitivity; seizure disorder; SSRI / TCA /
MAOI use; renal or hepatic insufficiency (adjust dose)
PRECAUTIONS..... Caution with concomitant narcotic use. aLiver CC ^a?
OPERATIONAL STATUS?.....Operational (if no side effects reported)
SIDE EFFECTS.....Potentially dizziness / nausea
INTERACTIONS..... Antidepressants; antipsychotics; Warfarin; Digoxin;
Tegretol; Quinidine
DOSAGE..... 50 to 100mg every 4 to 6 hours; 400mg/day maximum

ACETAMINOPHEN (Tylenol)

AVAILABILITY..... Tablet: 325 and 500mg
ACTION.....Pain medication
INDICATIONS.....Mild to moderate pain
CONTRAINDICATIONS.....Known hypersensitivity; liver disease; PUD/GERD/GI
bleed history
PRECAUTIONS..... aL CB ^a+
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....GI upset
INTERACTIONS.....
DOSAGE.....650-1000mg / 4 to 6 hours

LIDOCAINE (For stapling as temporizing measure only)

AVAILABILITY..... IM or SQ Injectable 1% solution
ACTION.....Local anesthetic
INDICATIONS.....Infiltration anesthesia
CONTRAINDICATIONS.....Known hypersensitivity
PRECAUTIONS.....a C ^a
OPERATIONAL STATUS?..... Operational
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....5mg/kg maximum

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

9. Nitroglycerin

NITROGLYCERIN

AVAILABILITY.....	1:150 grain (=0.4mg) sublingual tablet
ACTION.....	Vasodilator; antihypertensive
INDICATIONS.....	Chest pain suspicious for cardiac origin; pulmonary edema
CONTRAINDICATIONS.....	Known hypersensitivity; hypotension (SBP <90mmHg); erectile dysfunction drugs (eg Sildenafil [Viagra]) used within 48 hours
PRECAUTIONS.....	Obtain IV access prior to administration, if possible; aL CC ^a ? (mother's needs paramount)
OPERATIONAL STATUS?.....	NON-OPERATIONAL
SIDE EFFECTS.....	Headache (transient); hypotension
INTERACTIONS.....	Erectile dysfunction drugs (eg Sildenafil [Viagra]) may cause lethal hypotension
DOSAGE.....	0.4mg sublingual every 3 to 5 minutes for chest pain until improvement of pain or desired BP; discuss utilization of Morphine for chest pain with MD/DO versus continued NTG and frequency

10. Performance Affecting

ZALEPLON (Sonata) (sleeper)

AVAILABILITY.....	Capsule: 10mg
ACTION.....	Anxiolytic / hypnotic; shortest t-1/2 of agents available
INDICATIONS.....	Facilitate rest during non-operational periods in prolonged deployment / transportation; minimum 4-hour block required for usage (6 hours preferred)
CONTRAINDICATIONS.....	Known hypersensitivity; insecure location; lack of assured 4-hour non-operational period
PRECAUTIONS.....	May not drive / operate machinery / use weapons minimum 4 hours post-administration aL CC ^a -
OPERATIONAL STATUS?.....	NON-OPERATIONAL (x 4 hours after administration)
SIDE EFFECTS.....	Sedation
INTERACTIONS.....	Alcohol / other sedatives potentiate effect
DOSAGE.....	10-20mg with assured 4-hour non-operational block, as approved by MD/DO

MODAFINIL (Provigil)

AVAILABILITY.....	200mg Tablet
ACTION.....	Enhances alertness / concentration
INDICATIONS.....	To facilitate functioning with limited rest periods
CONTRAINDICATIONS.....	Known hypersensitivity
PRECAUTIONS.....	aL CC ^a ?
OPERATIONAL STATUS?.....	Operational
SIDE EFFECTS.....	Insomnia, mild blood pressure elevation
INTERACTIONS.....	
DOSAGE.....	200mg once daily

**OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES**

CAFFEINE (No-Doz)

AVAILABILITY.....200mg Tablet
ACTION..... Enhances alertness
INDICATIONS.....Suspected caffeine withdrawal headache; to
facilitate functioning with limited rest periods
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... aL CB ^{a?}
OPERATIONAL STATUS?.....Operational
SIDE EFFECTS.....Insomnia
INTERACTIONS.....
DOSAGE..... 100-200mg / 3 to 4 hours as needed

11. Volume Expanders

HYDROXYETHYL STARCH (Hespan)

AVAILABILITY.....500 & 1000mL IV bags 6% solution
ACTION..... Volume expander
INDICATIONS.....Hemorrhagic shock / hypovolemia
CONTRAINDICATIONS.....Known hypersensitivity
PRECAUTIONS..... Attempt to maintain adequate urine output; aK CC ^{a?}
OPERATIONAL STATUS?.....NON-OPERATIONAL
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....500-1000mL 6% solution IV

3% NaCl (Hypertonic Saline)

AVAILABILITY.....250 & 500mL IV bags
ACTION..... Volume expander
INDICATIONS.....Hemorrhagic shock / hypovolemia
CONTRAINDICATIONS..... Known hypernatremia
PRECAUTIONS..... Attempt to maintain adequate urine output; aK CC ^{a?}
OPERATIONAL STATUS?.....NON-OPERATIONAL
SIDE EFFECTS.....
INTERACTIONS.....
DOSAGE.....100-500mL IV

12. Wound Management

Cyanoacrylate Tissue Adhesive (Dermabond)

AVAILABILITY.....Single use ampoules
ACTION..... Tissue adhesive
INDICATIONS.....Minor trauma
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... Avoid near eyes
OPERATIONAL STATUS?..... Operational
SIDE EFFECTS.....Transient local discomfort
INTERACTIONS.....N/A
DOSAGE.....As required for wound closure, 2-4 layered
applications

OPTIONAL SUPPLEMENTAL PROGRAM
TACTICAL EMERGENCY
MEDICAL SERVICES

**Powdered Hemostatic Agent or Impregnated Dressing
(Quik-Clot / equivalent)**

AVAILABILITY..... Single use packets
ACTION..... Blood clotting aid
INDICATIONS..... Hemorrhage
CONTRAINDICATIONS..... Known hypersensitivity
PRECAUTIONS..... Standard / Universal precautions for wound care
OPERATIONAL STATUS?.....NON-OPERATIONAL
SIDE EFFECTS.....N/A
INTERACTIONS.....N/A
DOSAGE..... Single or multiple packet(s) applied to bleeding
wound

**OPTIONAL SUPPLEMENTAL PROGRAM
TRANSPORT OF VENTILATED PATIENTS
EMT-Paramedic Only**

U. Transport of ACUTE Ventilated Inter-Facility 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 inter-facility transport of the "**acute ventilated inter-facility 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 who has ventilator changes within the last 4 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 Inspiratory and Expiratory ratios (I:E ratio)*
 - (d) *Positive End-Expiratory Pressure (PEEP)*
 - (e) *Peak airway pressure gauge*
 - (f) *Continuous Expiratory Volume measurement (Required)*
 - (g) *Modes*
 - (i) *Assist Control (AC)*
 - (ii) *Synchronized Intermittent Mandatory Ventilation (SIMV)*
 - (iii) *Controlled Mechanical Ventilation (CMV)*

**OPTIONAL SUPPLEMENTAL PROGRAM
TRANSPORT OF VENTILATED PATIENTS
EMT-Paramedic Only**

- (h) 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 inter-facility patients.
 - (3) Tracheal suctioning kits/catheters must be available.
 - (4) A tracheotomy replacement tube the same size and one size smaller shall be transported with the patient ventilated through a tracheotomy. (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 tracheotomy or endotracheal tube,
 - (3) equipment failure (with FDA report),
 - (4) discontinuance of ventilator and conversion to BVM,
 - (5) deterioration of patient and
 - (6) the upgrading of patient care to critical care.
- b) The Optional Program will require a training program which meets or exceeds the "Acute Ventilator Inter-Facility Patient" curriculum and be 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
EMT-Paramedic Only**

V. 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 inter-facility 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-B 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.*

(NEW '09)

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 a tracheostomy and ventilator settings have not been changed for 4 days
- (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 6,
 - (b) Peak pressures less than 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 EMT-P 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-B 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
EMT-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 Inspiratory and Expiratory ratios (I:E ratio)*
 - (d) *Positive End-Expiratory Pressure (PEEP)*
 - (e) *Peak airway pressure gauge*
 - (f) *Modes*
 - (i) *Assist Control (AC)*
 - (ii) *Synchronized Intermittent Mandatory Ventilation (SIMV)*
 - (iii) *Controlled Mechanical Ventilation (CMV)*
 - (g) *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-B 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.*

(NEW '09)

- (2) *Monitoring equipment must include pulse oximeter (provided by family or service)*
- (3) *Tracheal suctioning kits/catheters must be available*
- (4) *A tracheotomy replacement tube the same size and one size smaller shall be transported with the patient ventilated through a tracheotomy. (The endotracheal tube equivalent may be substituted.)*

**OPTIONAL SUPPLEMENTAL PROGRAM
TRANSPORT OF VENTILATED PATIENTS
EMT-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
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

W. TRANSPORT TO FREESTANDING MEDICAL FACILITY

1. PURPOSE

The purpose of this protocol is 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 meeting one or more of the following indications to a freestanding medical facility.

- a) A stable priority 3 or 4 patient as outlined in the *Maryland Medical Protocols for EMS Providers* who does not need a time-critical intervention.
- b) A (priority 1) patient with an unsecured airway or in extremis that requires stabilization beyond the capability of the EMS crew (eg, cardiac or respiratory arrest).

3. CONTRAINDICATIONS

Except as provided in #2, the following patients shall not be transported to a freestanding 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 only be provided at a hospital-based Emergency Department

4. PROCEDURE

The EMS provider when unclear of appropriate destination should consult with a Base Station and the freestanding medical facility prior to arrival. The Base Station shall direct the provider to the appropriate destination for the patient.

5. SPECIAL CONSIDERATIONS

None

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

X. WILDERNESS EMERGENCY MEDICAL SERVICES PROTOCOLS

A. INTRODUCTION

1. Scope & Applicability
 - a) These protocols shall be followed whenever the patient is in a remote, nontraditional EMS environment; when implementation is approved by an online Wilderness Command Physician; or when extended evacuation will be detrimental to the patient.
 - b) These protocols are meant to augment the most current version of the Maryland Medical Protocols for Emergency Medical Services Providers. When treating any patient in the Wilderness EMS setting, the provider shall follow the Maryland Medical Protocols for EMS Providers for their level of training prior to any treatment modalities outlined in the Wilderness EMS (WEMS) protocols. The providers shall take into account equipment and medication necessary and available to care for the patient.
 - c) WEMS protocols are complementary to local EMS protocols in a wilderness setting.
 - (1) Once the patient is transferred to a ground or air ambulance, the responsibility of WEMS personnel comes to an end, and the local EMS agency protocols are implemented.
 - (2) An exception may be made when WEMS personnel's specialized training is needed to manage a specific illness/injury.
 - (a) If the WEMS provider's specialized training is needed to manage the patient's illness/injury, then the highest-trained WEMS medical person shall ride to the hospital with the patient.
 - (b) If, during transport, WEMS personnel encounter a significant conflict between their protocols and those of the transporting EMS agency, they should attempt to contact their own Wilderness Command Physician and ask the Wilderness Command Physician to speak to the local Base Station Physician.
 - (c) If they cannot reach a Wilderness Command Physician, they should contact the local EMS Base Station for on-line medical consultation.
2. Definition of Wilderness Setting

As defined by the Wilderness EMS Institute, the definition of a wilderness environment shall include:

 - a) a tract or region uncultivated and not inhabited by human beings,
 - b) an uninhabitable region left in its natural condition,
 - c) something likened to a wild region in its bewildering vastness, perilousness, or unchecked profusion.
3. Demonstration of Need
 - a) Jurisdictions that seek approval for WEMS programs shall submit a demonstration of need letter outlining the necessity for the program.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

- b) The letter shall be submitted to the Executive Director of the Maryland Institute for Emergency Medical Services Systems for approval.

B. GENERAL PROTOCOLS

- 1. Medical Command
 - a) Personnel caring for a patient with any injury or illness should always attempt to contact a Wilderness Command Physician.
 - b) A Wilderness Command Physician is defined as an affiliated Emergency Department Physician who is Maryland licensed, trained in Wilderness Protocols and Procedures, has experience in online medical direction, and has base station certification.
- 2. Choice of Provider
 - a) Care of any patient should be coordinated by a single person termed the wilderness provider.



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, OR EMT-BASIC.

- (1) The person with the highest level of medical training should act as the WEMS provider.
 - (2) When the person with the highest level of medical training is needed to perform other vital functions, the next highest trained person should serve as the WEMS provider.
 - b) All communication with the patient(s) should be by the WEMS provider.
- 3. Rotation of Providers
 - a) It is appropriate for a provider to turn over care to a higher trained medical person as soon as one becomes available.
 - b) It is also appropriate for a WEMS provider to be replaced by another WEMS provider when he/she becomes physically exhausted.
 - c) When a WEMS provider becomes physically exhausted, it may be appropriate for the provider to be replaced by a person with less training.
 - d) When a WEMS provider turns over care of a patient during a rescue, the provider must turn over a written report to the new provider, with:
 - (1) The results of the initial patient examination, including any injury or illness detected,
 - (2) Any care rendered to this point,
 - (3) Vital signs, and
 - (4) Medical plans for the remainder of the rescue.
 - e) The only exception would be if the original provider were exhausted, hypothermic, or seriously injured.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

4. General Patient Care
 - a) Approach the scene and the patient as per the Maryland Medical Protocols for EMS Providers for your level of training.
 - b) Consider the possible need for additional resources not currently at the scene.



IF C-SPINE COMPROMISE IS A CONSIDERATION, THEN MANUAL C-SPINE CONTROL SHOULD BE TAKEN BY MEMBERS OF THE RESCUE TEAM.

- c) Prepare a full report for the Wilderness Medical Command/Base Physician or Base Station Physician. The report shall include the following:
 - (1) Team Identifier, Provider Name, and Certification Level
 - (2) Chief Complaint/Mechanism of Injury and Patient Priority
 - (3) SAMPLE History
 - (4) Physical Exam (initial assessment and detailed physical exam)
 - (a) AVPU
 - (b) DCAP/BTLS
 - (c) Vital Signs
 - (d) OPQRST
 - (5) Scene
 - (a) Weather
 - (b) Terrain
 - (c) Resources
 - (d) Prior Treatment
 - (e) Estimated Evacuation Time
 - (6) Provider Treatment Plan and Requested Orders

C. SPECIAL CONSIDERATIONS FOR WILDERNESS EMS

1. Management of External Bleeding

Patients who are bleeding from an external site should be approached with caution and the mechanism of injury should be considered. Initial bleeding control should be accomplished by direct pressure, and, if possible, elevation of the injury site. If bleeding is still not controlled, the WEMS provider should utilize the appropriate pressure point. If bleeding remains uncontrolled, visualize the wound and, with a gloved hand, apply direct digital pressure to the vessel. Finally, and as a last resort to control bleeding, a tourniquet should be applied. The time the tourniquet was applied should be noted, immediate and rapid evacuation to a trauma center initiated, and medical command should be advised immediately.
2. Assessment of Orthostatic Vital Signs
 - a) Unstable orthostatic vital signs should be documented and recorded on any patient complaining of dizziness or weakness or who has not ingested adequate fluids over the previous 6 to 12 hours.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

- (1) The blood pressure decreases by 20 mmHg, or
 - (2) The heart rate increases by 10 beats per minute.
 - b) Patients with unstable orthostatic vital signs should first be administered IV fluid challenges of 20cc/kg. If an IV cannot be obtained, oral hydration should be considered.
 - c) Medical command should be consulted.
3. Dehydration
- a) Patients who have been without food or water for a period of days should cautiously be given fluids and food P.O., depending on their level of consciousness.
 - b) Patients at risk for heat related emergency should be given fluids.
 - c) Special consideration should be given to patients with a decreased level of consciousness.
4. Clearing the Cervical Spine
- a) Facilitate and expedite the evacuation and transportation of patients with MOI normally requiring full spinal immobilization.
 - b) Always ensure that the patient:
 - (1) Is alert and oriented, and not intoxicated; and
 - (2) Has no significantly painful injury that may overshadow C-spine injury; and
 - (3) Has no complaint of neck pain or neurological deficit; and
 - (4) Has no tenderness on examination of the neck, nor any abnormality upon completion of the motor and sensory exam; and
 - (5) Can demonstrate a full range of motion of the neck without pain (after meeting all prior criteria).
5. Trauma
- a) Head Injury
 - (1) Head Injury and Hypothermia



RESCUERS SHOULD TREAT HYPOTHERMIA IN THE SETTING OF HEAD INJURY NO DIFFERENT FROM OTHER CASES OF HYPOTHERMIA.

- (2) Head Injury with Shock and/or Dehydration
 - Provide IV fluids until signs of dehydration and/or shock are eliminated.
- (3) Positioning and Evacuation
 - (a) Position the patient flat on a spine board unless the patient must be placed in the recovery position to protect the airway.
 - (b) Position the patient's head in a neutral position with respect to the rest of the body.
- b) Foreign Bodies in the Eye
 - (1) Examine the affected eye.

**OPTIONAL SUPPLEMENTAL PROGRAM
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- (2) Numb the eye with Tetracaine.
Place 2 drops in the affected eye. (See Additional Medications for Wilderness EMS.)
- (3) Evert the eyelid.
- (4) Remove any foreign particles from the eyelid or conjunctiva with a moist cotton applicator or equivalent.
- (5) Irrigate the eye with clean water to remove particles from the cornea.
- c) Nosebleeds
 - (1) Apply direct pressure to the nostrils for 10 minutes, with the patient sitting forward.
 - (2) Reassess.
 - (3) If still bleeding, hold the nostrils for another 10 minutes.
 - (4) Reassess.
 - (5) If bleeding persists and evacuation time is greater than two hours:
 - (a) Pack the nose with gauze pad or equivalent.
 - (b) Leave the gauze in place for no more than 2 days.
- d) Blunt Abdominal Injury
 - (1) Assess orthostatic vital signs.
 - (2) Evacuate immediately if patient's orthostatic vital signs are unstable, or patient has an acute abdomen.



ANY PATIENT WITH EVEN MINOR ABDOMINAL INJURY WHO DEVELOPS SUSTAINED LIGHTEADEDNESS OR DEVELOPS PAIN IN THE SHOULDER SHOULD BE EVACUATED FROM THE FIELD IMMEDIATELY.

- e) Penetrating Abdominal Injury
 - (1) Irrigate with the cleanest water available.
 - (2) Note carefully any visible tears of intestine, any fecal odor from the abdominal cavity, or any visible intestinal contents in the abdominal cavity.
 - (3) Cover wound with a dressing soaked in povidone-iodine (e.g. Betadine) diluted with 10 parts water.
 - (4) Apply occlusive dressing.
 - (5) If ALS provider, administer Ancef 1 gram IV q 6-hours. (See Additional Medications for Wilderness EMS.)
- f) Non-Traumatic Back Injury
Evacuate immediately if patient has:
 - (1) an inability to void, or
 - (2) severe leg weakness, or
 - (3) severe pain
- g) Wounds
 - (1) Contusions
 - (a) For the first 24-48 hours, RICE (Rest, Ice, Compression, Elevation).
 - (b) After 36 - 48 hours apply heat (if available) and continue rest.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

- (2) Open Soft-Tissue Wounds
 - (a) Examine the wound and classify it as either low risk or high risk for complications.
 - (b) High risk wounds include:
 - (i) Open fractures
 - (ii) Lacerations with bones or tendons exposed
 - (iii) Human or other bites
 - (iv) Deep punctures
 - (v) Grossly contaminated wounds, or
 - (vi) Severe crushing injuries.
 - (c) High Risk Wounds
 - (i) Control bleeding.
 - (ii) Irrigate the wound.
 - (iii) Leave the wound open.
 - (iv) Pack and cover the wound with gauze soaked in povidone-iodine diluted with 10 parts water.



NEVER PUT ALCOHOL, MERTHIOLATE, MERCUROCHROME, OR PEROXIDE INTO AN OPEN WOUND!

- (v) If ALS provider, administer Ancef 1 gram IV q 6-hours. (See Additional Medications for Wilderness EMS.)
 - (vi) Change dressing every 6 hours during a prolonged evacuation.
 - (vii) Evacuate the patient and notify the nearest trauma center.
 - (d) Low risk wounds include:
 - (i) Closed simple fractures
 - (ii) Minor lacerations
 - (iii) Abrasions and contusions
 - (e) Low-Risk Wounds
 - (i) Control bleeding.
 - (ii) Irrigate the wound.
 - (iii) Apply Bacitracin (antibiotic) ointment and a clean dry dressing.
 - (iv) Clean the wound with clean drinking water and soap twice a day.
 - (v) If the prehospital provider's assessment suggests surgical repair might be required, medical command should be notified and the nearest trauma center identified.
- h) Friction Blisters
 - (1) Leave the blister intact unless it is in a place where it will obviously rupture (e.g., the sole of the foot).
 - (2) If the blister, because of its location, will probably rupture, make a small hole at the edge of the blister with a sterilized pin, needle, or #11 scalpel blade.
 - (3) Press gently to remove the fluid.
 - (4) If the top of the blister is partially ripped off, trim it away neatly.

**OPTIONAL SUPPLEMENTAL PROGRAM
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- (5) Clean the area.
- (6) Cover the wound with povidone-iodine or bacitracin ointment and a dressing.
- (7) Keep the area clean.
- i) Impaled Objects
 - (1) Whenever possible, you should consult with a Base Station Physician; if you cannot contact a Base Station Physician, the highest trained WEMS provider at the scene must make a decision whether to stabilize or to remove the object.
 - (2) Whenever possible, stabilize the object by following the Maryland Medical Protocols for EMS Providers for your level of certification.
 - (3) If the object cannot be stabilized for evacuation:
 - (a) Use appropriate BSI.
 - (b) Prepare for object removal.
 - (c) Consult medical direction.
 - (d) Slowly remove the object, gently but firmly pulling opposite the direction the object entered.
 - (e) Stop your attempt and stabilize the object in place if you encounter any resistance.
 - (f) If ALS provider, administer Ancef 1 gram IV q 6-hours. (See Additional Medications for Wilderness EMS.)
 - (g) Frequently reassess the patient.
- j) Orthopedic Injury
 - (1) Spasms, cramps, or stiffness
 - (a) Apply heat and gently stretch the affected area.
 - (b) Administer Aspirin or Tylenol 650 mg q.i.d.
 - (2) Muscle Strains and Ligament Sprains
 - (a) For the first 24-48 hours, RICE. After 36-48 hours, apply heat if available.
 - (b) For spasms or cramps or stiffness, use gentle stretching after applying heat. Administer Aspirin or Tylenol 650 mg q.i.d.
 - (3) Probable Sprains

Patients with probable sprains may need to be splinted and evacuated; some may be taped and walk out; while others may be splinted or taped and continue with the task.
 - (4) Closed Fractures
 - (a) Indications for Realignment
 - (i) To correct or at least improve a sensory or vascular deficit secondary to the fracture.
 - (ii) To align severely deformed long bone fractures to allow splinting with adequate immobilization.
 - (iii) To facilitate patient packaging for evacuation.
 - (b) Do not try to reduce (set) the fracture or force all the bone fragments back into anatomic alignment.
 - (c) Administer Morphine Sulfate 2-10 mg IV, in 2 mg increments every 5 minutes as needed for pain.

**OPTIONAL SUPPLEMENTAL PROGRAM
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SERVICES PROTOCOLS**

- (d) Pull longitudinally along the normal axis of the injured extremity.
 - (e) Grasp the extremity distal to the fracture firmly.
 - (f) Do not release traction until the limb is fully splinted.
 - (g) If resistance is met, stop traction and splint in the deformed position.
 - (h) Make only 2 attempts at realignment of a long bone fracture.
 - (i) Administer Ancef 1 gram IV q 6 hours if fracture is open. See Additional Medications for Wilderness EMS.
- (5) Femur Fractures
- (a) Apply a Jones' Dressing.
 - (b) Use buddy splinting and long board.
- (6) Open Fractures
- (a) Control hemorrhage with a pressure dressing.
 - (b) If nerve or vascular damage is present:
 - (i) Realign the fracture.



CLEANSE PROTRUDING BONE BEFORE REALIGNMENT.

- a. Administer Morphine Sulfate 2-10 mg IV, in 2 mg increments every 5 minutes as needed for pain.
- b. Pull longitudinally along the normal axis of the injured extremity.
- c. Grasp the extremity distal to the fracture firmly.
- d. Do not release traction until the limb is fully splinted.
- e. If resistance is met, stop traction and splint in the deformed position.



MAKE ONLY 2 ATTEMPTS AT REALIGNMENT OF A LONG BONE FRACTURE.

- f. If ALS provider, administer Ancef 1 gram IV q 6 hours. (See Additional Medications for Wilderness EMS.)
 - (ii) Reevaluate.
 - (iii) Splint and Evacuate.
 - (c) If evacuation and transport time is greater than six hours:
 - (i) Cleanse.
 - (ii) Irrigate and remove large debris.
 - (iii) Apply sterile dressing.
 - (iv) Splint.
- (7) Dislocations
- (a) Evaluate evacuation time.
 - (b) Attempt reduction of all dislocations if there is:
 - (i) Loss of sensation
 - (ii) No pulse beyond dislocation
 - (c) If ALS provider, administer Morphine Sulfate 2-10 mg IV, in 2 mg increments every 5 minutes as needed for pain.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
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- (d) Apply traction gradually, steadily, and constantly.
- (e) Assess stability after a successful reduction by assessing range of motion.
- (f) Immobilize.
- (g) Attempt reduction of the following dislocations with or without neurological or vascular deficit:
 - (i) Jaw, finger or toe, elbow, shoulder, patella, knee, ankle
 - (ii) Apply traction gradually, steadily, and constantly.
 - (iii) Assess stability after a successful reduction by assessing range of motion.
 - (iv) Immobilize.



ATTEMPT HIP DISLOCATION REDUCTION ONLY IF NEEDED TO EVACUATE PATIENT.

- k) Amputations
 - (1) Control hemorrhage.
 - (2) Wrap amputated part in moistened sterile gauze or towel.
 - (3) Place the amputated part in a plastic bag.
 - (4) Transport the amputated part as cool as possible without freezing it.
 - (5) If ALS provider, administer Ancef 1 gram IV q 6 hours.
(See Additional Medications for Wilderness EMS.)



NEVER PLACE AN AMPUTATED PART IN DIRECT CONTACT WITH ICE OR ICY WATER.

- l) Burns
 - (1) For small (5% or less) second and third degree burns:
 - (a) Gently clean with soapy water.
 - (b) Apply Bacitracin ointment twice a day.
 - (c) Leave complete blisters intact, unless they are in an area where they are sure to rupture or are very large and tightly filled with bloody fluid. In such cases:
 - (i) Prep the blister with providone-iodine.
 - (ii) Drain the blister.
 - (iii) Apply the dressing.
 - (2) Lightning Strikes
 - (a) Assess ABC's.
 - (b) Ensure spinal immobilization.
 - (c) Evacuate immediately.
 - (d) Attach cardiac monitor if available.
 - (e) If evacuation will be prolonged, assess the patient's urine for signs of myoglobinuria (tea-like discoloration). If myoglobinuria is found, treat with IV fluids.
- m) Facial Injury
 - (1) If the tooth is completely dislodged from the socket (a complete avulsion):
 - (a) Rinse the tooth.



DO NOT SCRUB THE SURFACE OF THE TOOTH.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
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- (b) If you are within two hours of a dentist or oral surgeon, and a tooth is completely dislodged:
 - Keep the tooth moist using Hank's solution (keeping the tooth in the patient's cheek is acceptable).
- (c) If you are greater than two hours from a dentist or oral surgeon:
 - (i) Replace the tooth in its socket.
 - (ii) Apply dental splinting material to keep the tooth in place.
- (d) Take caution that the patient does not aspirate the tooth.



IF THE ROUTE OUT INVOLVES SOME DIFFICULT CLIMBING, OR IF THE PATIENT IS ONLY SEMICONSCIOUS, DO **NOT** PUT THE TOOTH IN THE MOUTH. PLACE THE TOOTH IN HANK'S SOLUTION.

- (e) Evacuate the patient.
- (f) Administer Aspirin or Tylenol 650 mg q.i.d.
- (2) If the tooth is NOT completely dislodged from the socket (i.e. loose):
 - (a) Apply dental splint.
 - (b) Administer Aspirin or Tylenol 10-15 mg/kg.
- n) Compartment Syndrome
 - (1) Evacuate immediately.
 - (2) If the patient cannot be evacuated immediately, consult medical direction and request that a surgeon be transported to the scene.

D. MEDICAL EMERGENCIES

- 1. Environmental Emergencies
 - a) Heat Emergencies
 - (1) Heat Cramps
 - Treat with gentle stretching and oral rehydration.
 - (2) Dehydration
 - (a) Assess mucous membranes.
 - (b) Assess orthostatic vital signs.
 - (c) Assess patient's temperature, if able, to rule out heat stroke.



IF NO THERMOMETER IS AVAILABLE AND SIGNS AND SYMPTOMS ARE PRESENT, EVACUATE AND TREAT FOR HEAT ILLNESS.

- (d) Rehydrate.
- (3) Heat Illness (Heat Exhaustion & Heat Stroke)
 - (a) Document the patient's temperature.
 - (b) Rehydrate.
 - (c) Place the patient in a cool area.
 - (d) Dampen the patient's clothing.
 - (e) Fan patient to cause evaporation heat loss.
 - (f) Place cold packs at the sides of the neck, armpits, and groin.
 - (g) Monitor cooling and bring patient's temperature down to 102 degrees F.
 - (h) Evacuate.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

- b) Cold Emergencies: Hypothermia
 - (1) Specific Treatment
 - Prevent Further Heat Loss.
 - (a) If possible, remove the patient from the environment.
 - (b) Remove wet clothing so the patient is dry.
 - (c) Apply a wind/vapor/moisture barrier (the WEMS provider should take extra care in covering the patient's head, feet, and hands).
 - (d) Insulate the patient from the environment.
 - (2) Mild Hypothermia
 - (a) Core Temperature between 93.2 and 96.8 F (34 -36 C)
 - (b) Rewarm. Give adequate food and drink as able.
 - (3) Moderate - Severe Hypothermia
 - (a) Core Temperature between 86 and 93.2 F (30 - 34 C)
 - (b) Add as much heat as possible using:
 - (i) Warm IVs
 - (ii) Warm fluids by mouth to patients with normal LOC
 - (iii) Heat packs at the lateral neck, armpits, and groin



DO NOT DELAY EVACUATION TO REWARM THE PATIENT.

- (c) Provide fluids and food calories if able.



MONITOR CLOSELY FOR FLUID OVERLOAD.

- (4) Handling Hypothermic Patients
 - (a) Handle gently to prevent ventricular fibrillation.
 - (b) Do not allow hypothermic patients to exert themselves during evacuation.
 - (c) Carry the patient flat or in a trendelenburg position.
- (5) Hypothermia and Cardiac Arrest
 - (a) Assess pulse and respirations for three minutes.
 - (b) If available, monitor EKG.
 - (i) If an organized rhythm is present with a rate of 20 or greater:
 - a. Start artificial respiration. Use supplemental oxygen if available.
 - b. Do not perform external cardiac compression.
 - (ii) If no organized rhythm is present: Begin CPR.
 - (c) Consider transport to a facility that can perform bypass rewarming. Consult to determine most appropriate destination.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
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- (6) Advanced Life Support Management of the Hypothermic Patient
 - (a) If the core temperature is greater than 86 F (30 C), follow standard protocols for resuscitation.
 - (b) If the core temperature is less than 86 F (30 C), rewarm the patient before attempting to defibrillate.
 - (c) Follow standard protocol for criteria for airway control.



DO NOT USE ATROPINE IN A HYPOTHERMIC PATIENT.
DO NOT USE EXTERNAL PACING ON A HYPOTHERMIC PATIENT.

- (7) Frostbite and Immersion Foot
 - (a) Superficial Frostbite
 - Rewarm the affected part.
 - (b) Deep Frostbite
 - (i) Treat Hypothermia first if present.
 - (ii) Rewarm the affected part if rewarming can be maintained.
 - (iii) Protect the patient from further exposure.
- c) Bites/Stings
 - (1) Snake Bites



DO NOT PACK IN ICE.

- (a) Place the patient supine.
 - (b) Use a Sawyer Extractor if available within 5 minutes of the bite.
 - (c) Do not make any incisions.
 - (d) Treat the open wound.
 - (e) If evacuation will be prolonged, assess the patient's urine for signs of myoglobinuria (tea-like discoloration). If myoglobinuria is found, treat with IV fluids.
 - (f) If possible, capture or identify the animal.
- (2) Animal Bites
 - (a) Irrigate the wound with soapy water.
 - (b) Dress wound.
 - (c) Evacuate patient.
 - (d) If possible, identify, capture, or kill the animal for rabies testing.
 - (3) Bee Stings
 - (a) Apply ice to reduce pain.
 - (b) Treat in accordance with appropriate Maryland Medical Protocols for EMS Providers.
 - (c) Monitor for signs of anaphylaxis.
 - (d) Administer epinephrine as appropriate for anaphylaxis.

2. Pain (non-traumatic)

- a) Chest Pain
 - (1) Treat as a suspected myocardial infarction until proven otherwise in accordance with the Maryland Medical Protocols for EMS Providers.

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

- (2) Any patient experiencing chest pain should be examined by a physician as soon as possible.
 - b) Abdominal Pain
 - Acute Abdomen
 - (1) Evacuate Immediately.
 - (2) Give nothing by mouth if less than 12 hours from the hospital.
 - (3) If there is no suspected C-spine injury, position the patient in a lateral recumbent position to alleviate pain.
 - (4) Consult medical direction.
 - c) Vomiting and Diarrhea
 - Rehydrate orally or by IV if signs and symptoms of shock are evident.
3. Difficulty Breathing
- a) For known asthmatic patients, assist patient with their own inhalers.
 - If BLS provider with specific training in administration of albuterol, assist the patient.
 - b) For patients exhibiting serious sign and symptoms, administer 0.3 mg SQ epinephrine 1:1000. A BLS provider with specific training may administer SQ epinephrine.
4. Cardiac Arrest
- Follow WEMS protocols as they may apply to existing environmental conditions.

E. INTRAVENOUS THERAPY

- 1. WEMS personnel will be trained to initiate and maintain intravenous (IV) lines in the WEMS class, if not already practicing that skill.
- 2. Examples of patients who need IV therapy are as follows:
 - a) Any patient with unstable orthostatic vital signs
 - b) Patients with uncontrolled external bleeding
 - c) Patients with significant blood loss
 - For WEMS purposes, significant blood loss is defined as greater than or equal to 1.0 Liter(s) as estimated by the on-scene WEMS personnel.
 - d) Patients with signs/symptoms of shock
 - For WEMS purposes, signs/symptoms of shock include, but are not limited to the following:
 - (1) Tachycardia
 - (2) Tachypnea
 - (3) Pale skin
 - (4) Cool/moist skin
 - (5) Weak thready pulse
 - (6) Dry mouth
 - (7) Hypotension
 - e) Unconscious patients
 - f) Any patient requiring IV medication
 - g) Any patient requiring immediate evacuation
 - h) Any time that medical command requests IV therapy

**OPTIONAL SUPPLEMENTAL PROGRAM
WILDERNESS EMERGENCY MEDICAL
SERVICES PROTOCOLS**

BACITRACIN

- AVAILABILITY..... Ointment supplied in 1, 15, and 30 gram tubes
ACTION A topical antimicrobial ointment
INDICATIONS..... Superficial trauma
CONTRAINDICATIONS... A patient with a known hypersensitivity
PRECAUTIONS Do not use more than one week.
SIDE EFFECTS Allergic contact dermatitis may occur
INTERACTIONS..... None
DOSE After cleaning the affected area, apply a thin coat three times daily.
PEDIATRIC DOSE..... After cleaning the affected area, apply a thin coat three times daily.

CEFAZOLIN (Ancef)

- AVAILABILITY..... Supplied in 500 mg or 1 gram vials.
ACTION..... Antimicrobial first generation cephalosporin with broad range aerobic and some anaerobic coverage.
INDICATIONS..... Cefazolin is indicated in the treatment of penetrating trauma.
CONTRAINDICATIONS... Patients with a known hypersensitivity to the cephalosporin group of antibiotics
PRECAUTIONS Patients who are allergic to penicillin have a 1 in 10 chance of reacting to cefazolin.
SIDE EFFECTS None in the prehospital setting
INTERACTIONS..... None applicable
DOSE 1 gram IV over 10-20 minutes, every 86 hours
PEDIATRIC DOSE..... 15 mg/kg IV over 10-20 minutes, every 86 hours

HANK'S SOLUTION

- AVAILABILITY..... A glass or plastic vial containing 100, 250, or 500 mL of solution
ACTION Maintains the tooth in a viable sterile environment.
INDICATIONS..... A permanent tooth that has been knocked out
CONTRAINDICATIONS... None
PRECAUTIONS Do NOT handle the tooth by the root. The tooth should be replanted as soon as possible.
INTERACTIONS..... None
DOSE Pick up tooth by the crown or enamel portion (not the root) and gently place it in the solution.
PEDIATRIC DOSE..... Pick up tooth by the crown or enamel portion (not the root) and gently place it in the solution.

**OPTIONAL SUPPLEMENTAL PROGRAM
MARYLAND VACCINATION & TESTING PROGRAM
FOR EMT-P PROVIDERS**

Y. MARYLAND VACCINATION & TESTING PROGRAM

Scope of practice for EMT-Paramedic personnel has been expanded to allow select immunization and 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 which are attached for your review. 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 EMT-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 "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 and becomes an "optional supplemental protocol."
- 8) Physician does not have to be physically present for the administration of vaccinations or tests by the trained paramedic called the Vaccination and Testing Officer (VTO).
- 9) Program instruction must be directed by and have participation by the jurisdictional medical director to select paramedics (EMT-Ps) 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.
- 12) Mechanism for meeting FDA storage and refrigeration standards for vaccines and test 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.



THE GOVERNOR'S ORIGINAL EXECUTIVE ORDER 01.01.2009.15 HAS BEEN RENEWED BY EXECUTIVE ORDER 01.01.2009.19 AND NOW EXTENDS UNTIL JANUARY 10, 2010. SO LONG AS THAT ORDER AND ANY RENEWAL OR REISSUE THEREOF REMAINS IN EFFECT, 18), 19), AND 20) OF THIS PROTOCOL WILL BE IN EFFECT. **(NEW '10)**

- 18) Cardiac Rescue Technicians who have been trained by the EMS Operational Program and credentialed by the Medical Director may vaccinate public safety personnel, health care providers, and members of the general public with H1N1 (Swine) flu vaccine (LAIV and IM injection) after appropriate screening by a Vaccination and Testing Officer, registered nurse, or physician.
- 19) Vaccination and Testing Officers and Cardiac Rescue Technicians are permitted to vaccinate public safety personnel, health care providers, and members of the general public with H1N1 (Swine) flu vaccine (LAIV and IM injection) at points of distribution that have been established or approved by Local Health Departments (e.g., a clinic, occupational health site, a fire house, or other location).
- 20) Screening, administration, tracking, and dosage requirements for H1N1 (Swine) flu vaccine (LAIV and IM injection) shall be provided by the Maryland Department of Health and Mental Hygiene and/or Local Health Departments.

**MARYLAND VACCINATION & TESTING PROGRAM
FOR EMT-P PROVIDERS
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) 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.

**MARYLAND VACCINATION & TESTING PROGRAM
FOR EMT-P PROVIDERS
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 healthcare 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 finger tips
- (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.

**Z. NEUROPROTECTIVE INDUCED HYPOTHERMIA (THERAPEUTIC)
AFTER CARDIAC ARREST - SCENE & INTERFACILITY TRANSFER
(NEW '10)**

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. If the transport time is greater than 30 additional minutes to an ED capable of maintaining hypothermia, the hypothermia protocol shall not be initiated.

Patient Inclusion Criteria:

- (1) Age 15 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 to 12 per minute for target end tidal CO₂ of 40-45mm Hg)
- (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

Patient Exclusion Criteria:

- (1) Cardiac Instability
 - a) Refractory or recurrent dysrhythmia
 - b) Inability to maintain SBP at least 90mm Hg (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

Procedure:

- (1)  Medical Consult required with potential receiving center to confirm their ability to maintain hypothermic intervention and to approve initiation of neuroprotective induced hypothermic procedure
- (2) Institute cooling as early as possible. Core temperature goal is 33°C.
- (3) Acutely Cooled with Either:
 - a) Rapid IV infusion of ice cold (4°C) LR (allowed to be carried on Supervisor units or ambulance). Give 2 liters for adult IV in single dose over a period of 30 minutes immediately.

OPTIONAL SUPPLEMENTAL PROGRAM

b) If not able to administer ice cold IV fluids, apply ice / cold packs bilaterally to patient's: neck, axilla, and femoral groins

PLUS

- (4) Reduce the covering on the patient while maintaining dignity
- (5) If IV Fluid administration completed before arrival at hospital, continue the cooling process by applying ice /cold packs bilaterally to patient's: neck, axilla, and femoral groins.
- (5) If patient begins shivering, administer midazolam
 -  Adult: (Reduce the below IV/IO/IM by 50% for patients 69 years or older.)
 - a) 0.1mg/kg in 2 mg increments slow IV push over one to two minutes per increment with maximum single dose 5 mg.
 - b) Additional doses to a maximum of 10 mg requires medical consultation for all providers.
- (6) Consider turning on vehicle air conditioning to assist with cooling enroute.
- (7) Documents initial GCS and pupillary response
- (8) Report to receiving hospital that can maintain the hypothermic intervention preferentially the Acute Cardiac Intervention Center.
- (9) 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

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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
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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.

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.

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.

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.

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.

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 pO₂; should be normal until near-terminal stage.

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/M³. 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.

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/m³); 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.

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.

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.

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).

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.

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.

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.

TREATMENT PROTOCOL

Nerve Agents (GA, GB, GD, GF, VX) (continued)

3. Treatment:

a. Initial Management:

(1) EMT-B 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.

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.

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.

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.

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.

MEDICATION DOSAGE CHARTS

ATROPINE dosage chart at 0.1 mg/ml drug concentration (0.02 mg/kg Pediatric, 2 mg adult)

Estimated age	Estimated weight	Dose in ML
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)

Estimated age	Estimated weight	Dose in ML
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

MEDICATION DOSAGE CHARTS

ATROPINE dosage chart at 1 mg/ml drug concentration (0.02 mg/kg Pediatric, 2 mg adult)

Estimated age	Estimated weight	Dose in ML
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)

Estimated age	Estimated weight	Dose in ML
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

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

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)

Estimated age	Estimated weight	Dose in ML
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

MEDICATION DOSAGE CHARTS

SODIUM THIOSULFATE dosage chart at 25% concentration (Pediatric 1.65 ml/kg, Adult 50 ml)

Estimated age	Estimated weight	Dose in ML
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

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).

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

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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