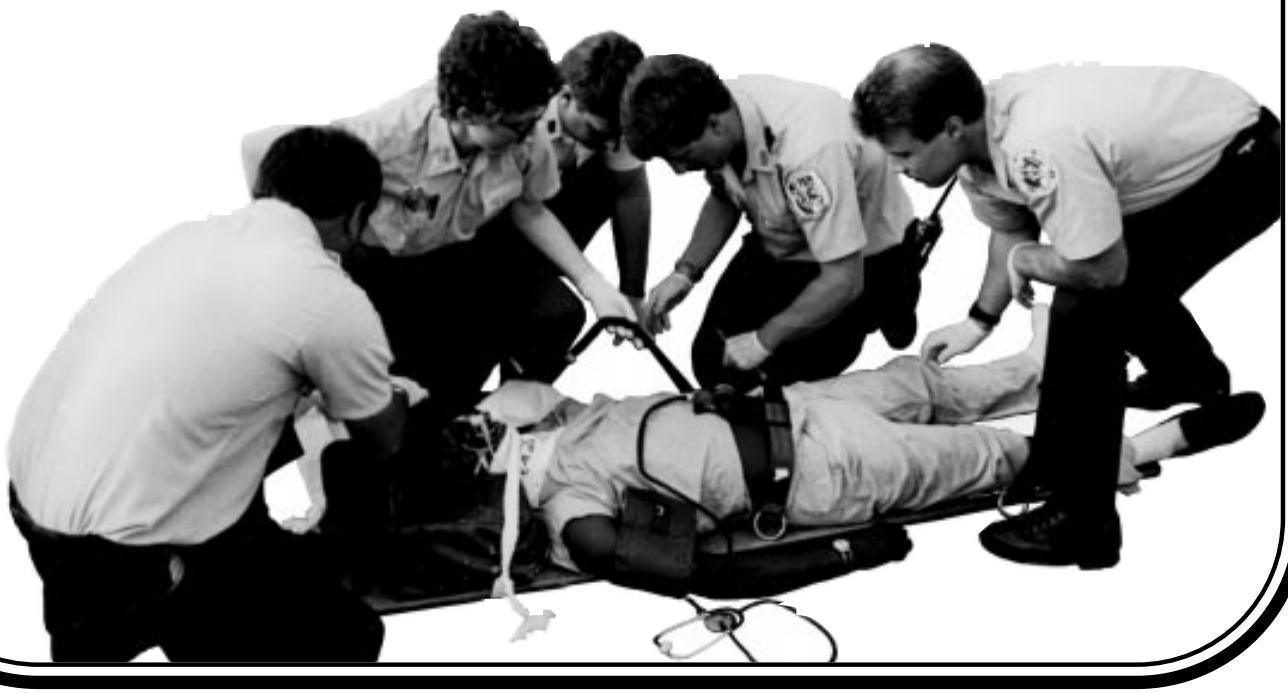
The Maryland

Medical Protocols

for Emergency Medical Services Providers

Effective July 1, 2000 with Jurisdictional Implementation by October 1, 2000.

**Maryland Institute
for Emergency Medical
Services Systems**



The complete “Maryland Medical Protocols for Emergency Medical Services Providers” is also available on the Internet. Check out the MIEMSS website

http://MIEMSS.umaryland.edu.

To the EMS Providers of Maryland:

In an effort to keep Maryland abreast of the ever-changing practice of emergency medical care, MIEMSS through the EMS Board has adopted several new protocols. In addition to the new protocols, several of the existing protocols and procedures have been updated. These modifications will go into effect July 1, 2000.

The following treatment protocols have been added to the Maryland Medical Protocols for EMS Providers:

- Croup (Nebulized Epinephrine & Nebulized Saline)
- Hyperbaric Therapy
- Intraosseous Infusion (expansion of protocol)

The Wilderness Pilot Program has been approved as a Jurisdictional Optional Program. The Wilderness Task Force was established with a diverse group of health care providers who addressed the unique needs of spelunking and the unusual inaccessible terrain in the rural areas of Maryland.

The committee reviewed multiple training curricula across the United States realizing that many of these programs are designed to enhance physician capabilities in a wilderness environment. With the strong EMS community support available, it was determined that there were instances in Maryland where EMS may have great difficulty extricating a patient to a health care facility in a timely fashion. The critical interventions within the Wilderness Protocol will allow the EMS provider to assist in extrication of injured or ill patients and ultimately improve patient outcome.

The Weapons of Mass Destruction (WMD) Supplement is a set of systematically developed guidelines adopted in total from the Office of Emergency Preparedness at the Department of Health and Human Services. The "Clinical Treatment Guidelines for Weapons of Mass Destruction (Based on 1996 Olympics Protocols)" were developed by national experts to address the treatment for both chemical and select biological exposures. The 1999 version of the Maryland Medical Protocols allowed for the use of antidotes specific to an agent if ordered by medical consultation and if available to the provider. In the event of a declared biological mass casualty incident, medical consultation can direct the administration of antibiotics (if available) specific to the organism in question. These guidelines are designed to bring EMS field providers, emergency departments, and the public health service together in a focused standard of care for a potential WMD event. The pharmaceutical supplies that are necessary to support these guidelines are not required by EMS operational programs. Those programs that are part of a Metro Medical Strike Team or a Metro Medical Response System may have antidote/ antibiotic caches available to them, and if appropriate, may administer those select antidotes and/or antibiotics with medical consultation.

The development of the new protocols and the update of the existing protocols are the result of consensus building and hard work based on the efforts of many individuals. The end result is a document that will position the Maryland EMS System for the new Millennium. Thank you for you continued participation and efforts in the Maryland EMS system.

Richard L. Alcorta, M.D., FACEP
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 the EMS providers, through medical consultation, render to patients at the scene of their illness or injury and during transport to the closest appropriate hospital. The intent of these protocols is to help EMS providers anticipate and prepare to follow the medical consultations for emergency patient care.

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, 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/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/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.

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. (NEW '99)

THE GENERAL PATIENT CARE SECTION AND THE ALGORITHMS DO HAVE A SPECIFIC SEQUENCE TO BE FOLLOWED. (NEW '99)

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.

B. IMPORTANT NUMBERS

1.	Commercial Ambulance Licensing and Regulation	Office	**(410) 706-8511**
		Fax	**(410) 706-8552**
2.	Critical Incident Stress Management		**(800) 648-3001**
3.	Office of Education & 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**
		or 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**
		or toll free	**877-498-5551**
		Fax	**(301) 513-5941**
5.	State EMS Medical Director	Office	**(410) 706-0880**
		Fax	**(410) 706-0853**
6.	SYSCOM/EMRC		**(800) 648-3001**
7.	Poison Control Centers		

ORDERS MUST COME FROM MEDICAL CONSULTATION AND MAY NOT BE TAKEN DIRECTLY FROM A POISON CONTROL CENTER.

a)	Maryland Poison Center/University of Maryland School of Pharmacy, Baltimore	**(800) 492-2414**
		(410) 706-7701
b)	National Capital Poison Center, Washington, DC	**(202) 625-3333**

IMPORTANT NUMBERS (Continued)

8. 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
230	Alexandria Hospital, VA
751	Alfred I. DuPont Hospital for Children (formerly Alfred I. DuPont Institute)
422	Alleghany General Hospital, Alleghany, PA
397	Altoona Rehabilitation Hospital
231	Andrew Rader Clinic, VA
221	Anne Arundel General Hospital
382	Anne Arundel Medical Park
550	Annie M. Warner Hospital
233	Arlington Hospital, VA
381	Atlantic General Hospital
520	Baltimore City Public Service Infirmary
350	Bayhealth Medical Center, Kent Hospital (formerly Kent General)
359	Bayhealth Medical Center, Milford Hospital (formerly Milford Memorial Hospital)
551	Bedford County Memorial Hospital, PA
358	Beebe Medical Center (formerly Beebe Hospital of Sussex County)
234	Beebe Medical Center, Millville Center (formerly Bethany Emergency Center)
355	Bethesda Naval Hospital / National Capital Region Naval Medical Command
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
554	Carlisle Hospital
555	Carpenter's Clinic
219	Carroll County General Hospital
238	Carter Community Mental Health & Retardation Center
755	Central Industrial Medical Center
276	Chambersburg Hospital, PA
284	Charlestown Area Medical Center
241	Chemtrec Chem Mfgrs Assn Chemical Transportation Emergency Center, Washington, DC
243	Chestnut Lodge Hospital
419	Children's Hospital - Hershey Medical Center - Hershey, PA
225	Children's Hospital & Center for Reconstructive Surgery - Baltimore, MD
756	Children's Hospital of Pennsylvania

Code	Health Care Facility Name
317	Children's National Medical Center, DC
818	Children's National Medical Center Neonatal Center - Wash., DC
718	Children's National Medical Center Pediatric Burn Center - Wash., DC
717	Children's National Medical Center Pediatric Trauma Center - Wash., DC
304	Christiana Care Health Systems, Christiana Hospital
299	Christiana Care Health Systems, Wilmington Hospital (formerly Wilmington Hospital)
202	Church Hospital
341	City Hospital, Martinsburg, WV
291	Civista (formerly Physicians Memorial Hospital
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
320	Cumberland Memorial Hospital & Medical Center
620	Cumberland Memorial Hospital & Medical Center Trauma Center
342	DC General Hospital
842	DC General Hospital Neonatal Center
254	Deaton Hospital & Medical Center of Christ Lutheran Church
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 Prince George's Co.)
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
421	Eastern Neurological Rehabilitation Hospital
331	Eastern Shore State Hospital
557	Elizabethtown Children's Hospital
306	Ellsmere Veteran's Administration Hospital, DE
558	Emmitsburg Hospital
340	Fair Oaks Hospital (formerly Commonwealth Hospital), VA
305	Fairfax Hospital, VA
224	Fallston General Hospital
258	Finan Center State Psychiatric Facility
279	Fort Dietrick Medical Center
247	Fort Howard Veteran's Administration Hospital
522	Fort Washington Hospital
203	Franklin Square Hospital
239	Frederick Memorial Hospital
253	Freeman Hospital
319	Frostburg Hospital
286	Fulton County Medical Center, PA
322	Garrett County Memorial Hospital
580	Geisinger Medical Center, PA

Code	Health Care Facility Name
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
559	Grant Memorial Hospital
217	Greater Baltimore Medical 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 General Hospital, PA
211	Harbor Hospital Center (formerly South Baltimore General Hospital)
220	Harford Memorial Hospital
562	Harryon State Hospital
399	Health South Chesapeake Rehabilitation Center (formerly Chesapeake Rehabilitation Hospital)
420	Health South Rehabilitation Hospital of Altoona
267	Highland State Health Facility Psychiatric Unit
244	Holy Cross Hospital of Silver Spring
450	Hospice of Baltimore - Gilchrist Center - Baltimore, MD
268	Hospital for Sick Children, DC
223	Howard County General Hospital
270	Howard University Hospital, DC
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 Burn Unit
201	Johns Hopkins Bayview Medical 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
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
904	Johns Hopkins Hospital Perinatal Center

Code	Health Care Facility Name
451	Joseph Richey Hospice - Joseph Richey House, Baltimore, MD
274	Kennedy-Krieger Institute (formerly John F. Kennedy Institute for Handicapped Children)
296	Kent and Queen Anne's Hospital
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
326	Loudoun Memorial Hospital, VA
354	Malcolm Grow U.S. Air Force Medical Center
280	Mary Washington Hospital, VA
206	Maryland General Hospital
281	Maryland Penitentiary Hospital
300	Maryland Poison Information Center at UMAB
285	Masonic Eastern Star Home, DC
566	McConnellsburg Hospital
332	McCready Memorial Hospital
339	McGuire Veteran's Administration Hospital, VA
398	Mechanicsburg Rehabilitation Hospital
774	Medlink, DC
404	Memorial Hospital, PA
567	Memorial Osteopathic Hospital, PA
207	Mercy Medical 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
282	Morgan County War Memorial Hospital, WV
287	Mount Vernon Hospital, VA
292	Mount Washington Pediatric Hospital
400	Myersdale Hospital, 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

Code	Health Care Facility Name
307	Newark Emergency Center, Newark, DE
568	Newark Hospital, NJ
762	Newmedico Rehabilitation
222	North Arundel General Hospital
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
309	NRH Regional Rehabilitation @ Irving Street, Washington, DC (formerly National Rehabilitation Hospital)
408	Peninsula Regional Medical Center
608	Peninsula Regional Medical Center, Trauma Center
301	Pennsylvania State University Hospital (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
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
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 State Facility
461	Ruby Hospital Morgantown, WV
321	Sacred Heart Hospital, MD
572	Sacred Heart Hospital, PA
573	Saint Agnes Burn Center, PA (formerly listed as a Delaware facility)
212	Saint Agnes Hospital
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
405	Saint Joseph Hospital, PA

Code	Health Care Facility Name
367	Saint Luke Institute
333	Saint Mary's Hospital
265	Shady Grove Adventist Hospital
368	Sheppard & Enoch Pratt Hospital
294	Shore Health Systems, Dorchester General Hospital (formerly listed as Dorchester General Hospital)
297	Shore Health Systems, Easton Memorial Hospital (formerly listed as Easton Memorial Hospital)
324	Sibley Memorial Hospital, Washington, D.C.
750	Sinai Head Injury Rehabilitation Hospital
210	Sinai Hospital of Baltimore
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
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
649	Suburban Hospital Association Adult Trauma Center
763	Suburban Hospital, Inc., Skilled Nursing Facility
371	Tawes-Bland Bryant Nursing Center
574	Taylor Hospital, WV
312	Taylor Manor Hospital
372	TB Clinic
373	Tidewater Memorial Hospital, VA
374	U.S. Naval Academy Primary Care Clinic
576	U.S. Public Health Hospital, MD
375	U.S. Soldier's and Airmen's Home, DC
298	Union Hospital of Cecil County
214	Union Memorial Hospital
714	Union Memorial Hospital, Curtis Hand Center
215	University of Maryland Medical System
815	University of Maryland Medical System Neonatal Center
915	University of Maryland Medical System Perinatal Center
575	University of Pennsylvania Hospital
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

Code	Health Care Facility Name
275	Veterans Affairs Medical Center, Martinsburg, VA (formerly Martinsburg V.A. Hospital and Newton T. Baker Hospital)
250	Walter Reed Army Medical Center, DC
377	Walter Reed Hospital Annex
552	War Memorial Hospital, Berkeley Springs, WV (formerly Berkeley Springs Hospital, WV)
328	Washington Adventist Hospital
289	Washington County Health System, MD
689	Washington County Health System, Adult Trauma Center
789	Washington County Health System, Comprehensive Inpatient Rehabilitation Services, MD
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
323	West Virginia University Hospital, WV
290	Western Maryland Center, MD
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**

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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

- The Johns Hopkins Hospital Adult Trauma Center, Baltimore

Level II Trauma Centers

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

Level III Trauma Centers

- Western Maryland Health System, Memorial Campus
- Peninsula Regional Medical Center, Salisbury

Specialty Referral Centers

Eye Trauma

- Wilmer Eye Institute's Eye Emergency Service/The Johns Hopkins Hospital, Baltimore
- Center for Sight/Georgetown University Hospital, Washington, DC

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

MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS (Continued)

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
- Union Memorial Hospital, Baltimore
- University of Maryland Medical System, Baltimore

E. PROTOCOL KEY

1. Basic Life Support Level Care

2. Advanced Life Support Level Care

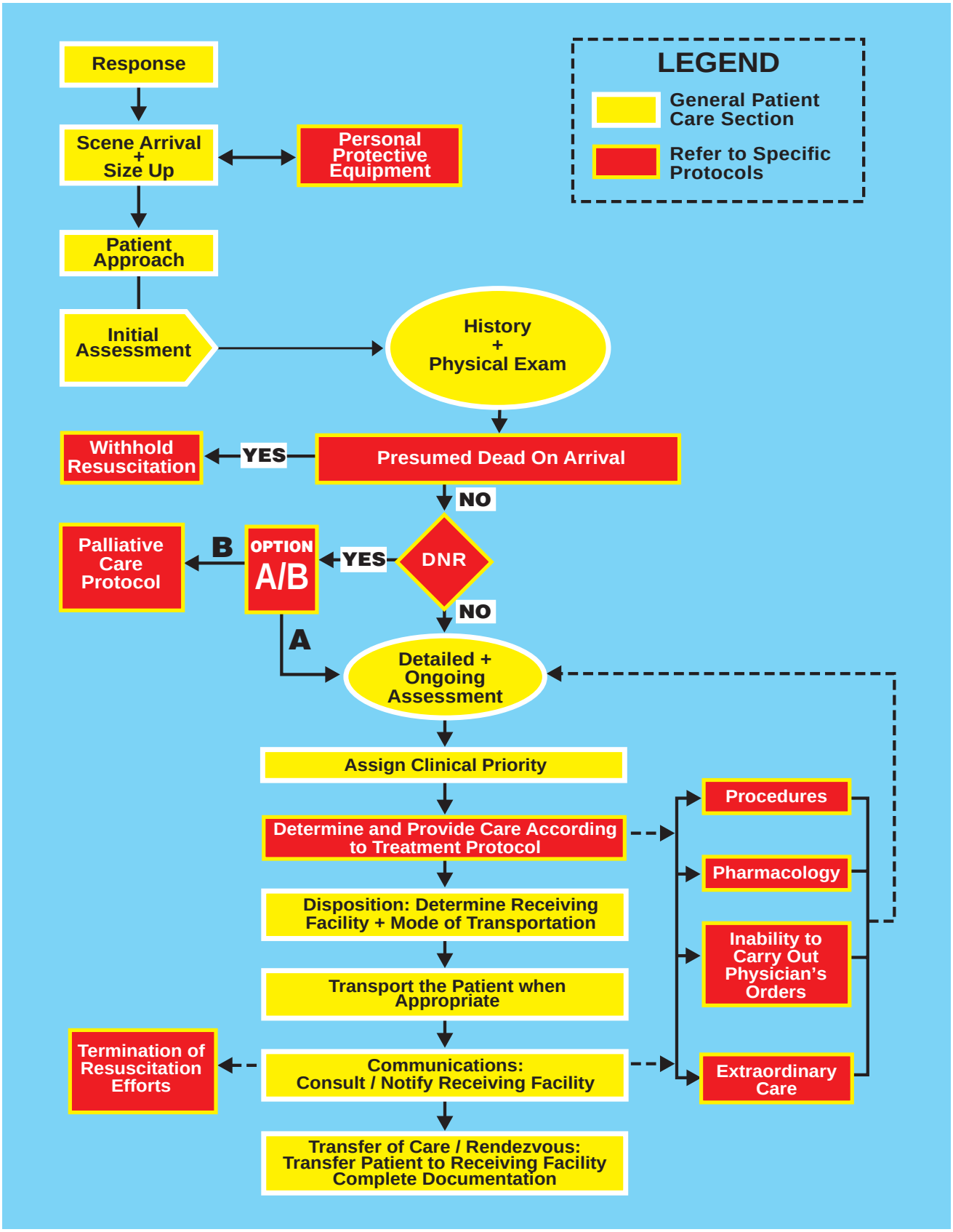
3. Requires Medical Consultation

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: 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), the provider must:

1. Notify the consulting physician via radio as soon as the error or variance is discovered, if prior to arrival at the receiving hospital.

2. Monitor the patient's condition very closely for any changes.

3. Notify receiving physician upon arrival.

4. Notify the local EMS jurisdiction or licensed commercial ambulance service and Program Medical Director within 24 hours of the incident.

5. Provide the following written notification:

    a) Public Service Programs (NEW ’99)

        (1) Submit written notification of the incident to the local EMS jurisdiction, the Program Medical Director, and the MIEMSS Regional Office. This shall be done within **5 days** of the incident. The MIEMSS Regional EMS Administrator shall notify the Regional Medical Director and the State EMS Medical Director. (NEW ’99)

        (2) The incident shall be investigated by the local EMS jurisdiction and the Program Medical Director within **14 days** of the written notification of the incident.

        (3) Written results of the investigation shall be forwarded by the local EMS jurisdiction and the Program Medical Director to the MIEMSS Regional Office within 30 days of the written notification of the incident.

    b) Licensed Commercial Programs (NEW ’99)

        (1) The commercial Program Medical Director shall notify the State Office of Commercial Ambulance Licensing and Regulation within **5 days** of any and all incidents that are potential violations of protocol.

        (2) The incident shall be investigated by the commercial ambulance company and/or the Program Medical Director. A written report of the investigation and its conclusions shall be forwarded by the commercial BLS/ALS Program Medical Director to the State Office of Commercial Ambulance Licensing and Regulation within **14 days** of the incident.

(3) The Director of the State Office of Commercial Ambulance Licensing and Regulation shall forward the results of incident investigations to the State EMS Medical Director within 30 days of written notification of the incident.

6. Reports of incidents shall be submitted monthly by the State EMS Medical Director to the Incident Review Committee.

H. INABILITY TO CARRY OUT PHYSICIAN ORDER: Occasionally a situation may arise in which a physician's order cannot be carried out; e.g., the provider feels the administration of an ordered medication would endanger the patient, a medication is not available, or a physician's order is outside the protocol. If this occurs, the provider must: (NEW '99)

1. Notify the consulting physician immediately as to the reason the order cannot be carried out.

2. Indicate on the ambulance runsheet what was ordered, the time, and the reason the order could not be carried out.

3. Notify the local EMS jurisdiction within 24 hours of the incident.

4. Provide the following written notification:

   a) Public Service programs (NEW '99)

      (1) Submit written notification of the incident through the local EMS jurisdiction and Program Medical Director to the Regional Medical Director, and a copy to the State EMS Medical Director. This shall be done within **5 days** of the incident, with the regional EMS administrator being notified at the discretion of the Regional Medical Director.

      (2) The incident shall be investigated by the local EMS jurisdiction and/or the Regional Medical Director within **14 days** of the written notification of the incident.

      (3) Written results of the investigation shall be forwarded to the Regional Medical Director and the State EMS Medical Director within 30 days of the written notification of the incident.

   b) Licensed Commercial programs (NEW '99)

      (1) 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 within **5 days** of the incident.

      (2) The incident shall be investigated by the commercial company and/or the Commercial Company Medical Director or his/her designee within **14 days** of the written notification of the incident.

      (3) Written results of the investigation shall be forwarded to the

Program Medical Director and to the Director of the State Office of Commercial Ambulance Licensing and Regulation within 30 days of the written notification of the incident.

(4) The Director of the State Office of Commercial Ambulance Licensing and Regulation shall forward written results of all incident investigations to the State EMS Medical Director within 7 days.

5. Reports of incidents shall be submitted by the State EMS Medical Director to the Incident Review Committee.

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 Medical 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 is 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, or 410-706-0880) 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 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.

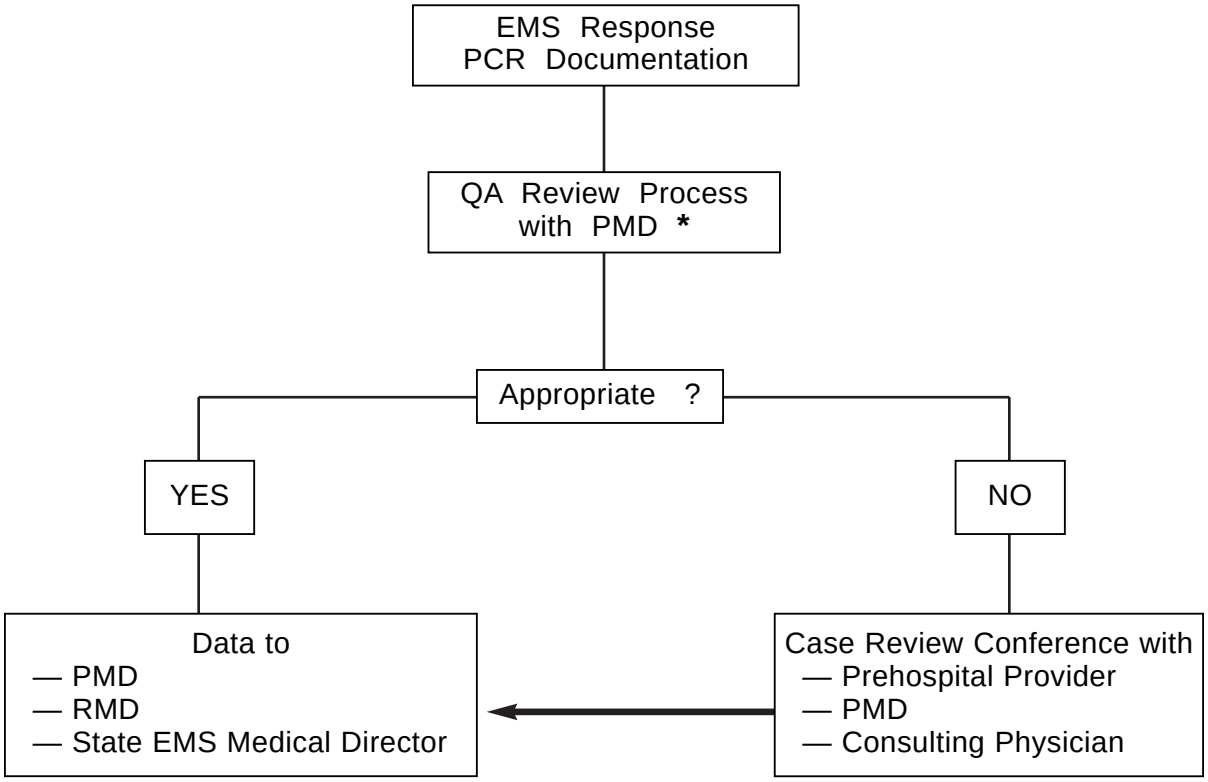
3. Protocols provide a safe basis for prehospital intervention and transport, and provide both prehospital providers and on-line physicians with parameters for this care. Extraordinary care situations not within the protocols may occur a handful of times over a span of years. The extraordinary care protocol 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.

Quality Assurance Mechanism for PILOT Programs and Procedures



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

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II. GENERAL PATIENT CARE (GPC)

A. RESPONSE

1. 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.

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.

IF A PATENT AIRWAY CANNOT BE ESTABLISHED, THE PATIENT MUST BE TRANSPORTED TO THE NEAREST APPROPRIATE HOSPITAL-BASED EMERGENCY DEPARTMENT. THE PATIENT'S NEED TO CONTINUE ON TO THE NEAREST APPROPRIATE TRAUMA OR SPECIALITY CENTER SHOULD BE MADE AFTER THE PATIENT'S AIRWAY HAS BEEN MANAGED.

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. (NEW '00)

Percent O_2 Saturation	Ranges	General Patient Care
95–100%	Normal	Give Oxygen
91–94%	Mild Hypoxia	Give Oxygen
86–90%	Moderate Hypoxia	Give 100% Oxygen Consider Assisting Ventilations
≤ 85%	Severe Hypoxia	Give 100% Oxygen Assist Ventilations if necessary If indicated, Intubate
False SPO_2 readings may occur in the following patients: Hypothermic, Hypoprofusion (Shock), Carbon Monoxide Poisoning, Hemoglobin Abnormality, Anemic, and Vasoconstriction.		

   b) Hyperventilate (rate of 24 breaths per minute) the head-injured patient:
      (1) Who is evaluated to have a GCS of 7 or lower or,
      (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 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%
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 brachial, radial, or carotid pulse.
      (1) Patients less than 1 year of age: (NEW ’00)
         (a) If patient is symptomatic with poor perfusion (unresponsive or only responds to painful stimuli) and pulse is less than 80 bpm or absent:
            (i) Ventilate for 30 seconds.
            (ii) If after 30 seconds, the pulse is less than 80, begin CPR.
         (b) If pulse is greater than 80 bpm, continue assessment.

      (2) Patients greater than 1 year but who have not reached their 15th birthday: (NEW ’00)
         (a) If patient is symptomatic with poor perfusion (unresponsive or only responds to painful stimuli) and pulse is less than 60 bpm or absent, begin CPR.
         (b) If pulse is greater than 60 bpm, continue assessment.

      (3) Patients greater than 8 years of age: (NEW ’00)
         (a) If pulse is absent, begin CPR and use AED or

          manual defibrillator.

   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).

6. Exposure
   a) 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 potentially life-threatening injury or illness.
   b) Priority 2 — Less serious condition, 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.

8. Disposition
   a) Mode
      (1) Consider mode of transport (air, land, water, etc.).
   b) Status
      (1) Evaluate need for emergent versus non-emergent transportation.

E. HISTORY AND PHYSICAL EXAMINATION/ASSESSMENT

1. Conduct a Focused Examination/Detailed Examination/Ongoing Assessment.

2. Obtain an EKG when appropriate.

F. TREATMENT PROTOCOLS

1. Refer to **ALL** appropriate protocols.

2. For pediatric patients:
   a) Equipment and medications should be tailored to the size and weight of the patient.
   b) The developmental age must be considered.
   c) Treatment priorities are similar to the adult patient.
   d) When appropriate, family members should remain with pediatric patients.

HISTORY AND PHYSICAL EXAMINATION (NEW '99)

TRAUMA PATIENT

Significant MOI

Rapid Trauma Assessment

D Head
- Crepitation

C Chest
- Crepitation
- Respiration
- Paradoxical Motion
- Breath Sounds

A

P

B Abdomen
- Rigidity
- Distention

T

L Pelvis/GU
- Pain on Motion
- Blood,Urine,Feces

S Extremities
- Pulse/Motor/Sensory

Posterior

Baseline Vital Signs
Obtain **SAMPLE** History

Signs & Symptoms
Allergies
Medications
Pertinent History
Last Oral Intake
Events Prior

Non-Significant MOI

Determine Chief Complaint

D

C

A

P

B

T

L

S

Perform Focused Examination of the Injured Site and Areas Compatible with Given MOI

Baseline Vital Signs
Obtain **SAMPLE** History

Signs & Symptoms
Allergies
Medications
Pertinent History
Last Oral Intake
Events Prior

MEDICAL PATIENT

Unresponsive Patient

Rapid Physical Examination

D Head

C Neck
- JVD
- Medical Alert Device

A Chest
- Breath Sounds

P Abdomen
- Rigidity
- Distention

B Pelvis/GU
- Blood,Urine,Feces

T Extremities
- MSP
- Medical Alert Device

L Posterior

S

Baseline Vital Signs
Obtain History of Episode
Onset
Provocation
Quality
Radiation
Severity
Time

Obtain **SAMPLE** History

Responsive Patient

Obtain History of Episode

Onset
Provocation
Quality
Radiation
Severity
Time

Baseline Vital Signs
Obtain **SAMPLE** History

Signs & Symptoms
Allergies
Medications
Pertinent History
Last Oral Intake
Events Prior

Focused Physical Exam
DCAPBTLS

Check areas suggested by **MOI** and **SAMPLE**.

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

DETAILED AND ONGOING ASSESSMENTS (NEW '99)

DETAILED EXAMINATION

D

HEAD
- Scalp & Cranium
  - Crepitation
- Eyes
  - Discoloration
  - Equality
  - Foreign Bodies

C

  - Blood in Anterior Chamber
- Ears & Nose
  - Fluid Drainage or Bleeding

A

  - Discoloration
- Mouth
  - Teeth & Foreign Bodies
  - Swelling or Lacerations

P

  - Breath Odor
  - Discoloration

NECK

B

  - Jugular Vein Distention
  - Trachea Position
  - Crepitation

CHEST

T

  - Paradoxical Motion
  - Breath Sounds
  - Crepitation

ABDOMEN

L

  - Rigidity
  - Distention

PELVIS/GU
- Pain on Motion

S

EXTREMITIES
- Pulse, Motor, Sensory
- Capillary Refill

POSTERIOR

ONGOING ASSESSMENT

MEDICAL PATIENT

REPEAT INITIAL ASSESSMENT

Reassess **AVPU**
Reassess Airway
Monitor Breathing
Reassess Circulation
Monitor Skin
Confirm Clinical Priority

REPEAT & RECORD VITAL SIGNS

REPEAT FOCUSED ASSESSMENT
Especially Chief Complaint or Injuries

CHECK ALL INTERVENTIONS

Assure Oxygen Adequacy
Check Bleeding
Check Interventions
Check for Trending
Stable Pt. Every 15 Min.
Unstable Pt.- Recommend Every 5 Min.

TRAUMA PATIENT

REPEAT INITIAL ASSESSMENT

Reassess **AVPU**
Reassess Airway
Monitor Breathing
Reassess Circulation
Monitor Skin
Confirm Clinical Priority

REPEAT & RECORD VITAL SIGNS

REPEAT RAPID TRAUMA ASSESSMENT

CHECK ALL INTERVENTIONS

Assure Oxygen Adequacy
Check Bleeding
Check Neck Stabilization
Check Interventions
Check for Trending
Stable Pt. Every 15 Min.
Unstable Pt.- Recommend Every 5 Min.

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

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. (NEW '99)

ON-LINE MEDICAL CONSULTATION MAY BE OBTAINED AT ANY TIME FOR ANY PATIENT, IF DESIRED BY THE PREHOSPITAL EMS PROVIDER.

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
   a) The following information must be communicated to the appropriate Trauma Center and/or Local Hospital:
      (1) Patient's age(s), injuries, ETA;
      (2) Number of victims;
      (3) Detailed description of the incident.

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.

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 closet 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 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.

1. Mode
   a) Consider mode of transport (air, land, water, etc.). (NEW '00)
      (1) 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.)
      (2) 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.
         (a) Pediatric Trauma Patients: Indications as per pediatric trauma protocol.
         (b) Spinal Trauma Patients: Indications as per spinal trauma protocol.
         (c) Head Injury Patients: Indications as per head injury protocol.
         (d) 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.
         (e) 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.
   2. Status
      a) 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

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

K. DOCUMENTATION

1. A Patient Care Report (PCR) will be completed for each incident/patient as per local jurisdictional and State requirements.

L. CONFIDENTIALITY

1. Patient confidentiality must be maintained at all times.

M. PROFESSIONAL CONDUCT

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

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III. TREATMENT PROTOCOLS

FOR ALL TREATMENT PROTOCOLS, THE LETTER AND NUMERICAL OUTLINE FORMAT IS STRICTLY FOR RAPID AND UNIFORM REFERENCE AND DOES NOT IMPLY OR DIRECT A MANDATORY SEQUENCE FOR PATIENT CARE. (NEW '99)

THE GENERAL PATIENT CARE SECTION AND THE ALGORITHMS DO HAVE A SPECIFIC SEQUENCE TO BE FOLLOWED. (NEW '99)

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. (NEW '99)

2. Presentation
   a) 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 fontanels and altered mental status in an infant) may also be seen.

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

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.

(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
   a) Seizures are a neuromuscular response to an underlying cause such as: epilepsy, hypoxia, hypoglycemia, hypoprofusion, 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.

   c) Initiate IV LR KVO.

   d) If available, use glucometer and treat accordingly.
   (See Section IV, Glucometer Protocol.)

   e) If glucometer is not available, administer dextrose 25 grams IVP.

   f)  Consider diazepam
   2.5 mg increments slow IVP
   Maximum dose 10 mg

ALTERED MENTAL STATUS: SEIZURES (Continued)

g) If the patient is still seizing:

(1) DO NOT RESTRAIN.

(2) Protect from further injury.

(3) Consider underlying cause of seizure.

h) 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.

i) Initiate IV/IO.

j) If available, use glucometer and treat accordingly.
(See Section IV, Glucometer Protocol.)

k) If glucometer is not available, administer dextrose
Child: 2-4 ml/kg D25W IV/IO
Neonate: 2 ml/kg D10W IV/IO

l) Administer fluid bolus, if appropriate
20 ml/kg of LR IV/IO

m)  Consider diazepam
0.25 mg/kg SLOW IVP/IO (NEW '99)
Maximum total dose 10 mg
OR
Up to 0.5 mg/kg rectal (NEW '99)
Maximum total dose 20 mg

4. Continue General Patient Care.

C. ALTERED MENTAL STATUS: UNRESPONSIVE PERSON

1. Initiate General Patient Care.

2. Presentation
   a) 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. (NEW BLS '99)

   b) Administer glucose paste (10-15 grams) between the gum and cheek.

   c) Initiate IV LR fluid therapy 20 ml/kg bolus. (NEW '99)
      Titrate to a systolic pressure of 100 mm Hg.

   d) Obtain blood sample using closed system.

   e) If narcotic overdose is suspected, administer naloxone before 50% dextrose.

   f) If available, use glucometer and treat accordingly.
      (See Section IV, Glucometer Protocol.)

   g) If glucometer is NOT available,
      (1) Administer 50% dextrose IVP or
      (2) If IV is NOT available, administer glucagon
          1 mg IM (if over 25 kg)
          0.5 mg IM (if less than 25 kg).

   h) Administer naloxone
      0.4 - 2.0 mg SLOW IVP/ET
      ET 1.0 -5.0 mg
      Titrate to adequate respiratory effort.

   i)  Consider an additional dose of naloxone.

   j)  Consider additional fluid administration
      Maximum 2,000 ml without medical consultation.

ALTERED MENTAL STATUS: UNRESPONSIVE PERSON (Continued)

k) Obtain pulse oximetry if available. (NEW '99)

l) Administer glucose paste (10-15 grams) between the gum and cheek.

---

m) Initiate IV/IO KVO.
   1) 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. (NEW '99)

n) Obtain blood sample using closed system.

o) If available, use glucometer and treat accordingly.
(See Section IV, Glucometer Protocol.)

p) If glucometer is NOT available
   (1) Administer 2-4 ml/kg D25W IVP/IO
   (2) If patient is 0-2 months of age
   Administer 2.0 ml/kg D10W IVP/IO
   (D10W is prepared by mixing one part of D50W with four parts LR in place of D25W.)
   (3) If IV is NOT available
   Administer glucagon
   For patients less than 25 kg, 0.5 mg IM
   For patients greater than 25 kg, 1.0 mg IM

q) Administer naloxone
0.1 mg/kg SLOW IVP/IO
Maximum dose 0.4-2.0 mg
ET dose 2-2.5 times the above dose

r) Consider repeating naloxone.

s) Third and subsequent fluid boluses at 10 ml/kg IV/IO

4. Continue General Patient Care.

D. BEHAVIORAL EMERGENCIES

1. Initiate General Patient Care.

2. Presentation
   a) 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. (NEW '99)

      (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.

d) Initiate IV LR KVO, if appropriate.

4. Continue General Patient Care.

E. CARDIAC EMERGENCIES: CARDIAC GUIDELINES

1. The following algorithmic and new standard formatted sections pertain to cardiac emergencies. Several guidelines apply to all algorithms when assessing and treating cardiac patients. These guidelines are: (NEW '99)

   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).

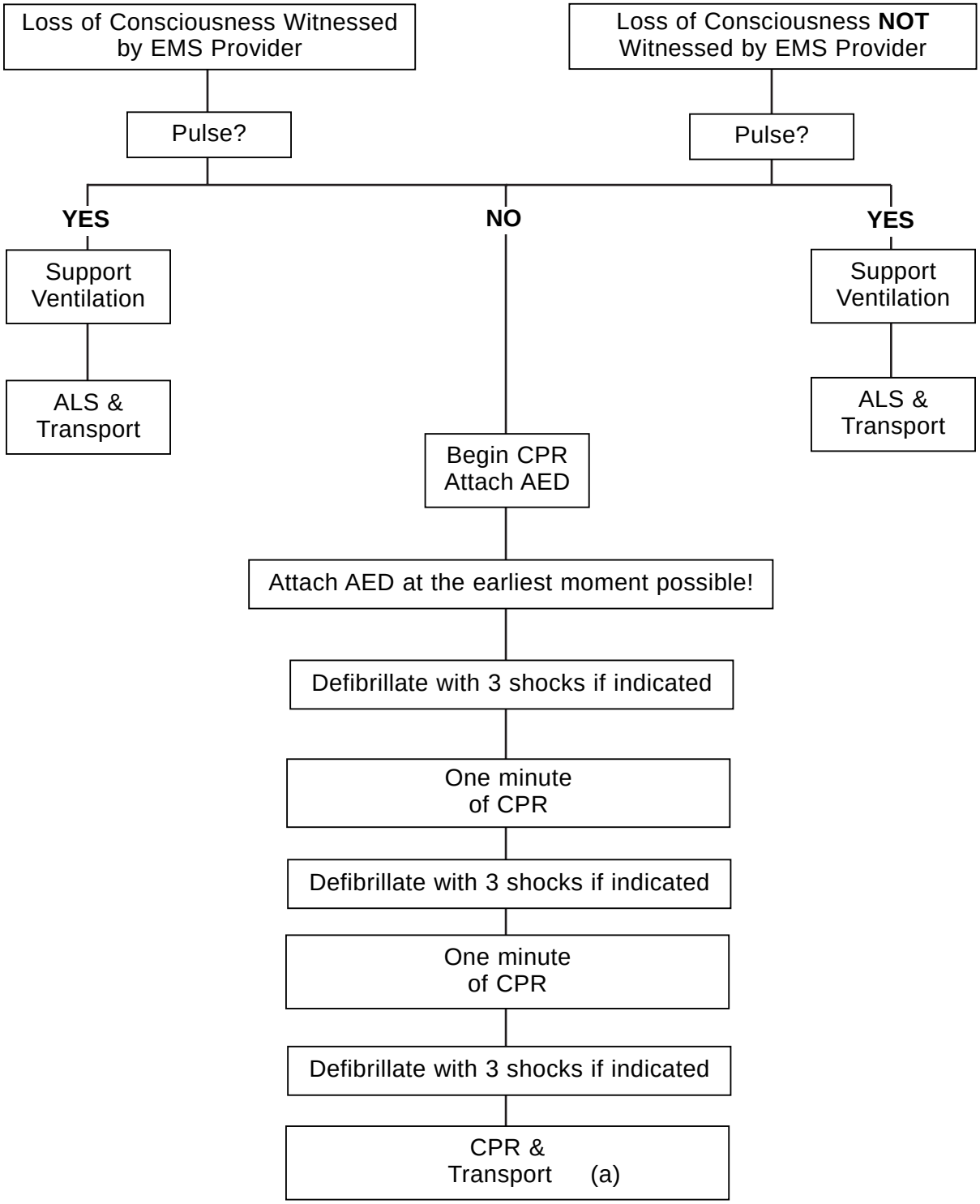
   b) As BCLS/ACLS guidelines indicate, definitive airway control is preferable, and if this can be achieved, along with other initial interventions, then the earlier the better. However, defibrillation is more important initially if the patient can be ventilated without intubation.

   c) 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.

   d) In the arrest situation, naloxone, atropine, epinephrine, and lidocaine can be administered via the ET route. Medications administered via the endotracheal route shall be 2-2.5 times the IV dose. Narcan, atropine (1mg/ml), and epinephrine (1:1,000) shall be diluted in 10 ml of lactated Ringer's for adults, and 3-5 ml of Lactated Ringer's for pediatrics. (NEW '99)

2.

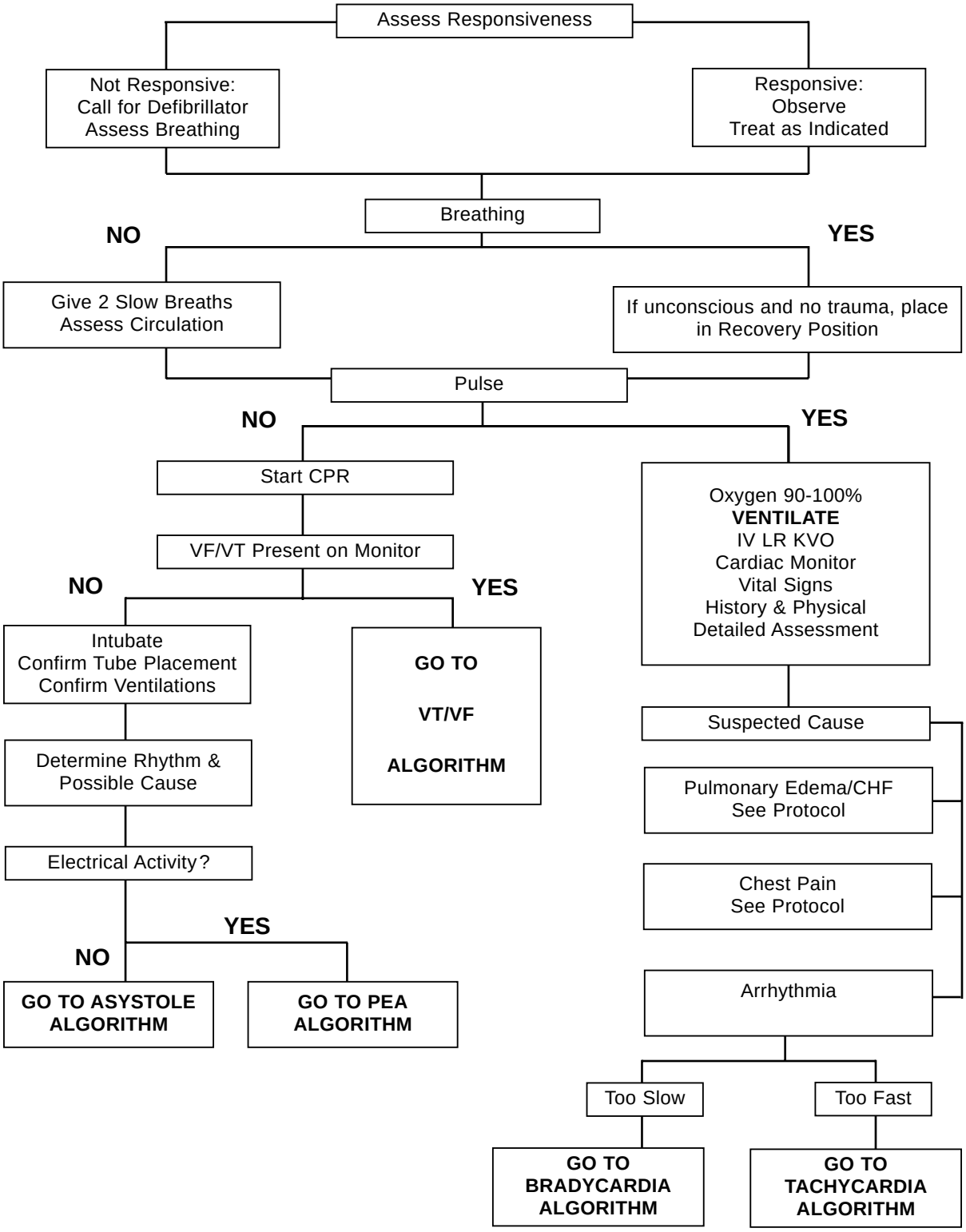
UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR BLS



(a) - Medical Consultation for additional defibrillation.

3.

UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR ALS



F. CARDIAC EMERGENCIES: BRADYCARDIA

1. Initiate General Patient Care.

2. Presentation
   a) 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. (EMT-P only)*

   f) If transcutaneous pacing is unsuccessful or not available, administer atropine:
   0.5 - 1.0 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 ug/kg/minute.

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

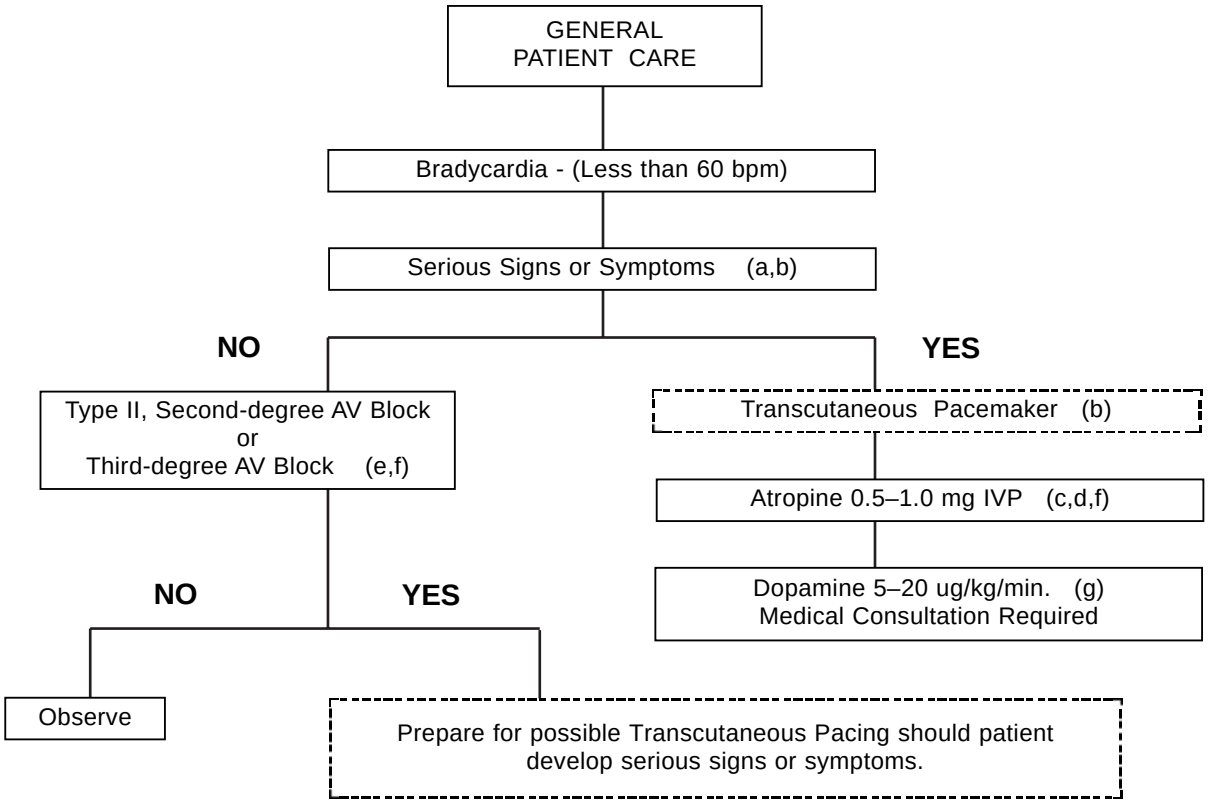
      (1) *Consider/Prepare for Transcutaneous Pacing. (EMT-P only)*

      (2) If patient develops discomfort with *TCP*
      Consider diazepam
      2-10 mg IVP

   i) Refer to appropriate algorithm.

4. Continue General Patient Care.

5. ADULT BRADYCARDIA ALGORITHM



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

(b) - Do not delay *TCP(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. (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. ET Dose: 2-2.5 times the above dose. 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) (NEW).

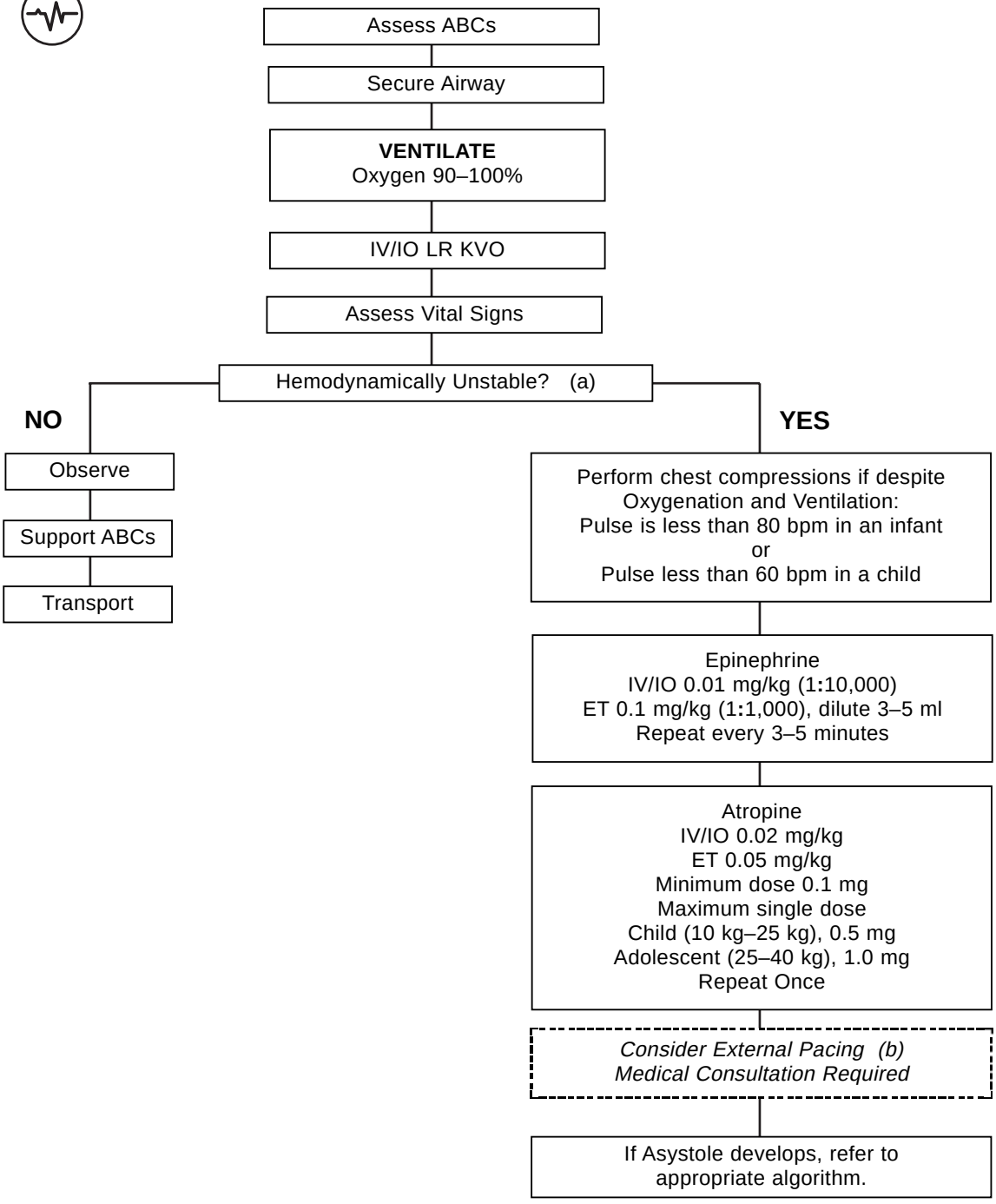
(e) - **Never** treat third-degree AV block plus ventricular escape beats with lidocaine.

(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. (NEW '99)

6.

PEDIATRIC BRADYCARDIA ALGORITHM



(a) - Hemodynamically unstable: a systolic blood pressure less than 70 plus twice the child's age in years [70 + (2 x years) = systolic BP] (NEW); altered mental status with hypoprofusion evidenced by delayed capillary refill; pallor; or peripheral cyanosis.

(b) -Transcutaneous Pacing available for EMT-P only. MEDICAL CONSULTATION REQUIRED.

G. CARDIAC EMERGENCIES: CARDIAC ARREST

1. Initiate General Patient Care.

2. Presentation
   a) Patient must be unconscious, apneic, and pulseless.

ALERT EARLY DEFIBRILLATION IS A PRIORITY.

3. Treatment
   a) Perform CPR.

   b) Utilize AED as appropriate.

   c) Transport
      (1) If no shock indicated, transport immediately.
      (2) If shock indicated, deliver up to 9 shocks and transport ASAP.

---

   d) Identify rhythm and treat according to appropriate algorithm.

   e) Perform CPR.

   f) Utilize AED as appropriate.

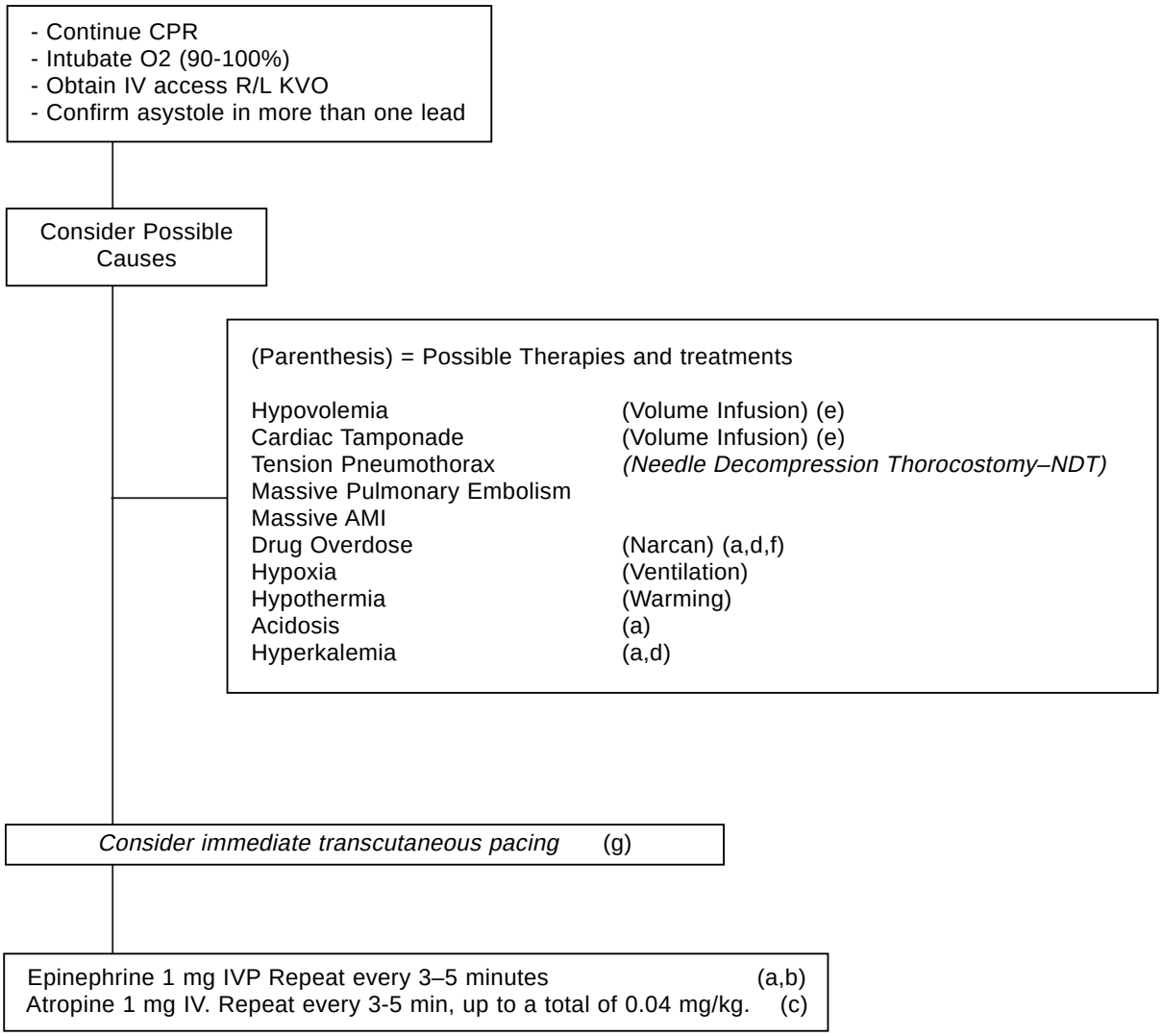
ALERT DO NOT USE AED FOR PATIENTS WHO ARE LESS THAN 8 YEARS OF AGE. (NEW ’00)

   g) Transport
      (1) If no shock indicated, transport immediately.
      (2) If shock indicated, deliver up to 9 shocks and transport ASAP.

---

   h) Identify rhythm and treat according to appropriate algorithm.

4. ASYSTOLE ALGORITHM



(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. ET Dose: 2-2.5 the above dose. If this dose fails, administer epinephrine, 2-5 mg IVP every 3-5 minutes with medical consultation.

(c) - Shorter atropine dosing intervals are acceptable, possibly helpful in asystolic arrest.

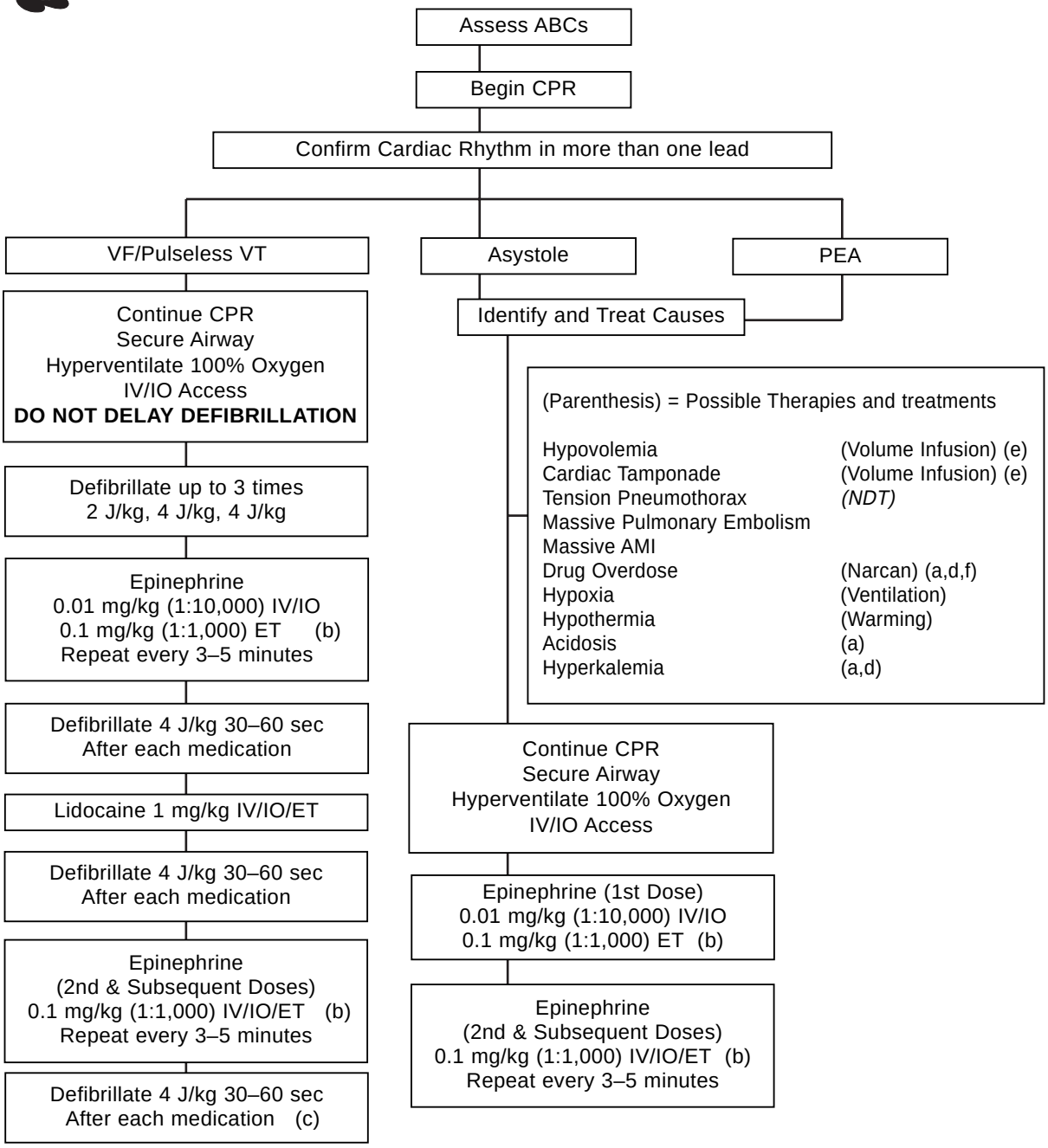
(d) - Calcium Chloride, 0.5-1.0 gram IVP, with medical consultation. See Calcium Chloride.

(e) - Volume infusion is 20 ml/kg.

(f) - *Glucagon 1 mg IVP every 5 minutes (maximum 3 mg) with medical consultation. See Glugagon.*

(g) - Do not delay *TCP* if patient is provider-witnessed asystole.

5. PEDIATRIC ASYSTOLE & PULSELESS ARREST ALGORITHM



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

(b) - Dilute ET administration of Epinephrine (1:1,000) in 3-5 ml of LR solution. (NEW '99)

(c) - Alternate: Lidocaine, defibrillate, then epinephrine, defibrillate.

(d) - Calcium Chloride, Administer 20 mg/kg (0.2 ml/kg) slow IVP/IO (50 mg/min). Maximum dose 1 gram or 10 ml. See Calcium Chloride.

(e) - Volume infusion is 20 ml/kg.

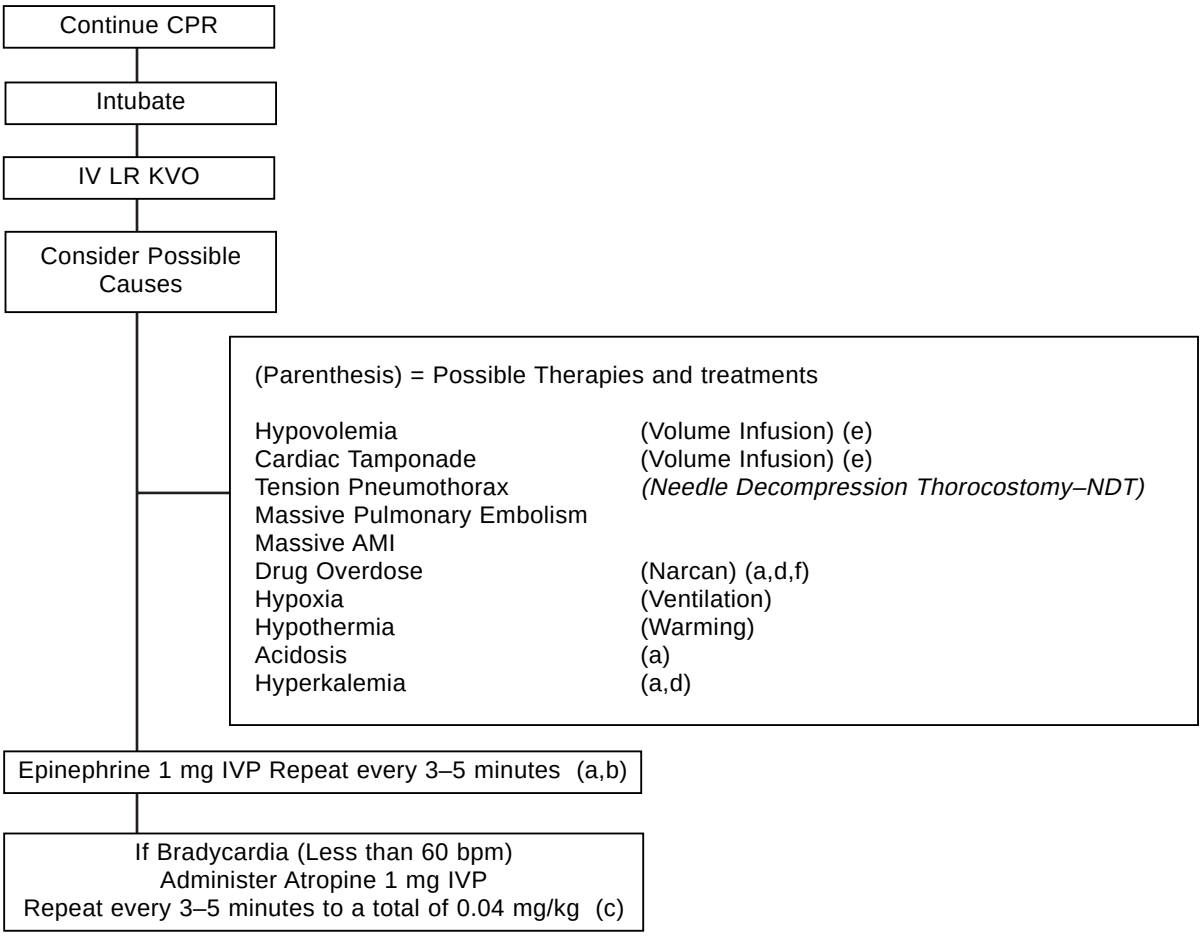
(f) - *Administer Glucagon every 5 minutes with medical consultation: For patients greater than 25 kg administer 1.0 mg IVP. For patients less than 25 kg administer 0.5 mg IVP. Maximum 3 mg.*

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) - The recommended dose for epinephrine is 1 mg IVP every 3-5 minutes. ET Dose: 2-2.5 the above dose. If this dose fails, administer epinephrine, 2-5 mg IVP every 3-5 minutes with medical consultation.

(c) - Shorter atropine dosing intervals are acceptable, possibly helpful in asystolic arrest.

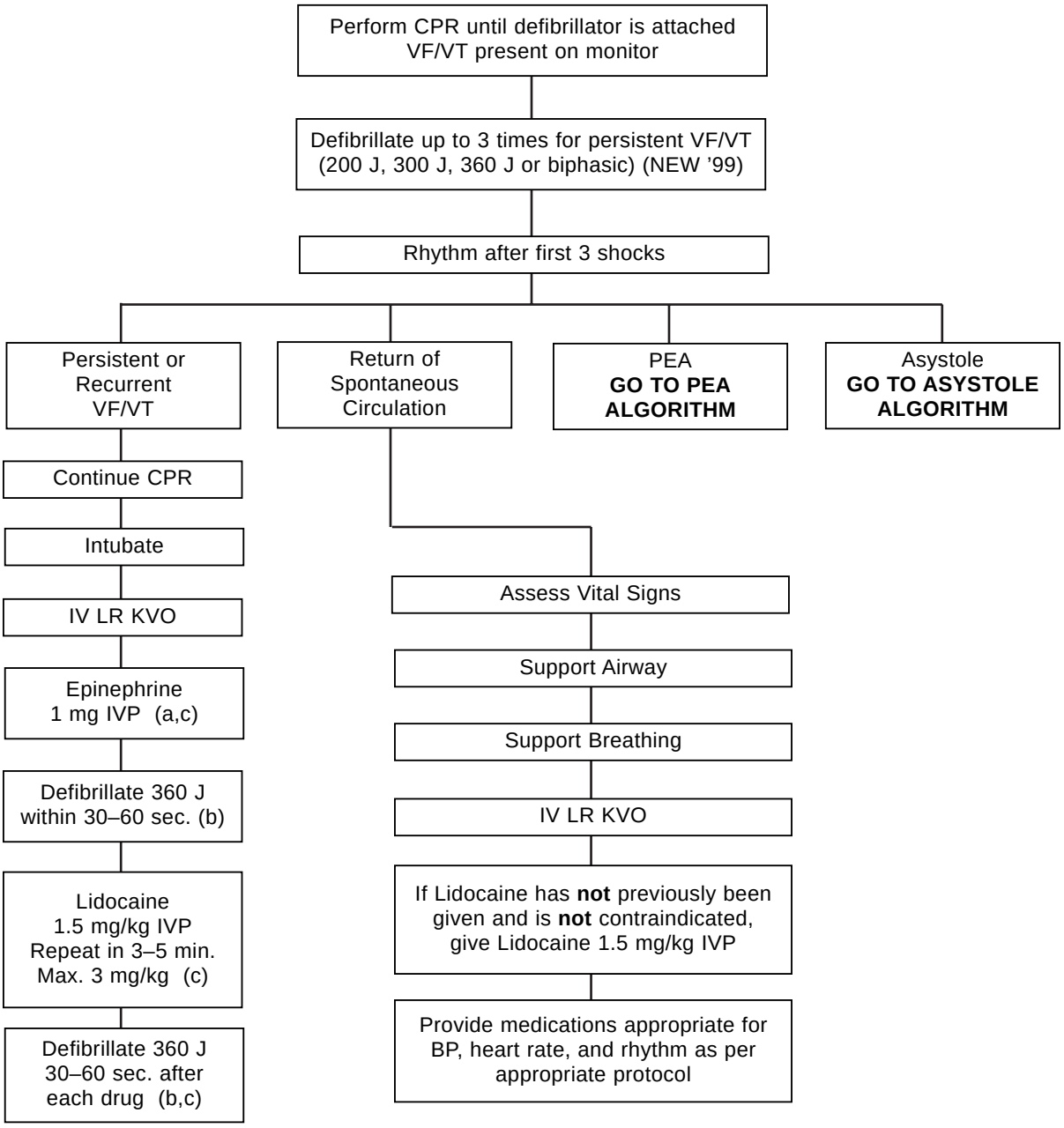
(d) - Calcium Chloride, 0.5-1.0 gram IVP, with medical consultation. See Calcium chloride.

(e) - Volume infusion is 20 ml/kg.

(f) - *Glucagon 1 mg IVP every 5 minutes (maximum 3 mg) with medical consultation. See Glugagon.*

7.

VENTRICULAR FIBRILLATION
PULSLESS VENTRICULAR TACHYCARDIA



(a) - The recommended dose of epinephrine is 1 mg IVP every 3-5 minutes. ET Dose: 2-2.5 times the above dose. If this dose fails, administer epinephrine, 2-5 mg IVP every 3-5 minutes if medical consult directed.

(b) - Multiple shocks (360 J, 360 J, 360 J or Biphasic) are acceptable here, especially when medications are delayed. (NEW '99)

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

H. CARDIAC EMERGENCIES: CHEST PAIN

1. Initiate General Patient Care.

2. Presentation
   a) 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.

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 VIAGRA WITHIN THE LAST 24 HOURS!

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

   e)  Additional doses of nitroglycerin require medical consultation.

   f) Initiate IV LR KVO.

   g) If patient has a prescription or previous history of nitroglycerin use, administer nitroglycerin: 0.4 mg SL.

      (1) 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 (Continued)

h) 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.

i) If IV cannot be established, nitroglycerin may be administered with medical consultation.

j) Identify rhythm and treat according to appropriate algorithm.

k)  Administer additional doses of nitroglycerin.

l)  Consider morphine sulfate
2-10 mg IVP (1-2 mg/minute)

m)  Consider aspirin 162 mg or 325 mg chewed, if acute myocardial infarction is suspected. (NEW ’99)

4. Continue General Patient Care.

I. CARDIAC EMERGENCIES: HYPERKALEMIA

1. Initiate General Patient Care.

2. Presentation
   a) 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 (e.g. crush syndrome) or renal dialysis patients **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)  Administer calcium chloride 0.5-1.0 grams slow IVP over 2 minutes.

MAY BE MODIFIED BY MEDICAL CONSULTATION.

   h) Place patient in position of comfort.

   i) Assess and treat for shock, if indicated.

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

CARDIAC EMERGENCIES: HYPERKALEMIA (Continued)

k) Initiate IV LR KVO.

l) Initiate Bradycardia protocol.

m) Administer calcium chloride 0.2 ml/kg IV/IO or 20 mg/kg IV/IO.

ALERT MAY BE MODIFIED BY MEDICAL CONSULTATION.

4. Continue General Patient Care.

J. NEWBORN RESUSCITATION - BIRTH TO 28 DAYS OLD (NEW '99)

1. Initiate General Patient Care.

2. Presentation:
   a) This protocol applies to patients presenting with respiratory compromise characterized by apnea, cyanosis, nasal flaring, paradoxical breathing, or substernal retractions, or compromised circulatory effort characterized by lack of pulse, a pulse less than 80 bpm, or capillary refill greater than 2 seconds.

RESUSCITATE NEONATES WITH SPONTANEOUS PULSE OR RESPIRATIONS REGARDLESS OF GESTATIONAL AGE. (NEW '00)
IS IT A BREATHING PROBLEM, OR A CIRCULATION PROBLEM, OR BOTH?

3. RESPIRATORY ARREST/COMPROMISE

   a) Place patient in neutral head and shoulder alignment.

   b) Ventilate the patient at the rate of 20 bpm or greater using a newborn or pediatric BVM if available.

ASSURE PROPER FITTING FACE MASK FOR THE PATIENT.

   c) Recheck patient after one minute and frequently afterwards for return of breathing.

4. CARDIAC ARREST/COMPROMISE

   a) Begin newborn CPR.

   b) Recheck patient after one minute and frequently afterwards for return of spontaneous pulse and respirations.

   c) Identify rhythm and treat according to appropriate algorithm.

5. Continue General Patient Care.

K. NEWBORN RESUSCITATION: BRADYCARDIA (NEW '99) (PULSE RATE LESS THAN 80 BPM)

1. Initiate General Patient Care.

2. Presentation
   a) Infant is likely to present with early signs of hypoperfusion and impending shock, including peripheral cyanosis and delayed capillary refill.

3. Treatment
   a) Ventilate for 30 seconds.

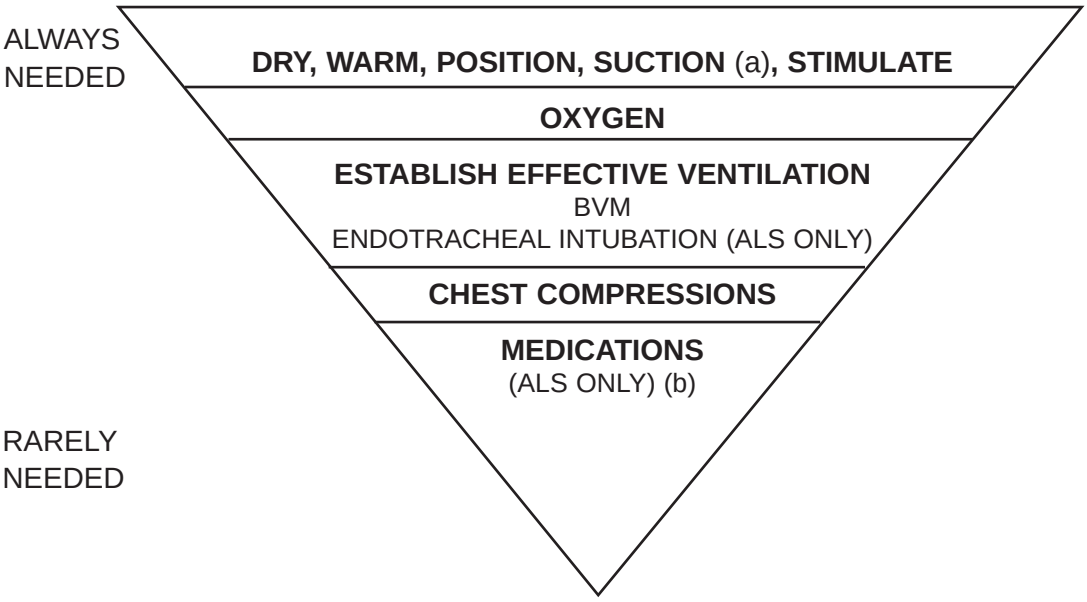
   b) If after 30 seconds the brachial pulse is still less than 80, begin newborn CPR.

   c) Recheck patient after one minute and frequently afterwards for return of spontaneous pulse and respirations.

4. Continue General Patient Care.

   a) **INVERTED PYRAMID**

Assess and Support:
Airway (Position and suction)
Breathing (Stimulate to cry)
Circulation (Heart rate and skin color)
Temperature (Warm and dry)



(a) - Suction mouth, then nose. If meconium is present, multiple suction attempts should be made.

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

APGAR SCORING CHART

A = Appearance (skin Color)
- 0 = Bluish, pale
- 1 = Pinkish with blue distal extremities
- 2 = Entire body pinkish

P = Pulse rate (Determine w/stethoscope over baby's heart for 30 seconds)
- 0 = Absent pulse
- 1 = Below 100
- 2 = Above 100

G = Grimace (Irritability - determine by flicking the infant on sole of the foot)
- 0= No response
- 1 = Crying, limited motion
- 2 = Crying, vigorous motion

A = Activity (Muscle tone)
- 0 = Limp, flaccid. You feel no resistance when straightening extremities.
- 1 = Some flexion of extremities
- 2 = Active, good motion in extremities

R = Respiration (Effort)
- 0 = Absent
- 1 = Slow, irregular, shallow, gasping
- 2 = Normal, regular, vigorous crying

L. CARDIAC EMERGENCIES: PREMATURE VENTRICULAR CONTRACTIONS (PVCs)

1. Initiate General Patient Care.

2. Presentation
   a) Irregular heart beat of ventricular origin. (NEW ’99)

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 VT (5 or more consecutive beats) (NEW ’99) 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 1.0-1.5 mg/kg IVP
      (2) Follow-up Doses: lidocaine 0.5-0.75 mg/kg IVP every 5-10 minutes
      (3) Maximum dose: 3.0 mg/kg IVP
      (4) ET dose: 2-2.5 times the above dose

MAY BE MODIFIED BY MEDICAL CONSULTATION.

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

4. Continue General Patient Care.

M. SUDDEN INFANT DEATH SYNDROME (SIDS)

1. Initiate General Patient Care.

2. Presentation
   a) 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. Dependent lividity and rigor mortis may be present. (NEW '99)

3. Treatment
   a) Perform an initial patient assesment, assign a treatment priority, and perform CPR.

   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.

4. Continue General Patient Care.

N. CARDIAC EMERGENCIES: TACHYCARDIA

1. Initiate General Patient Care.

2. Presentation
   a) 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.

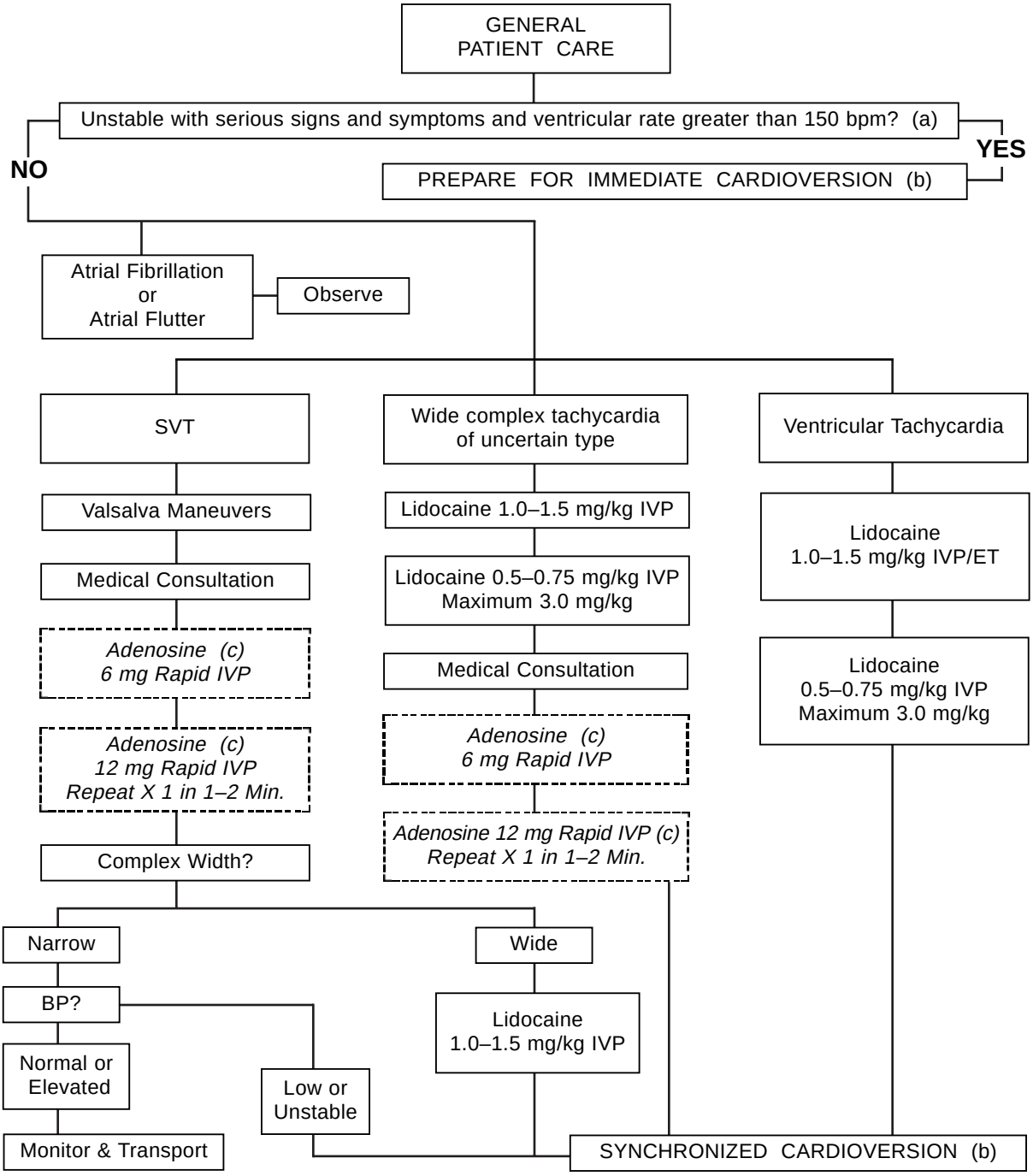
CARDIAC EMERGENCIES: TACHYCARDIA (Continued)

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. (NEW ’99)

p) If patient is hemodynamically stable, identify rhythm and proceed to appropriate algorithm.

4. Continue General Patient Care.

5. TACHYCARDIA ALGORITHM



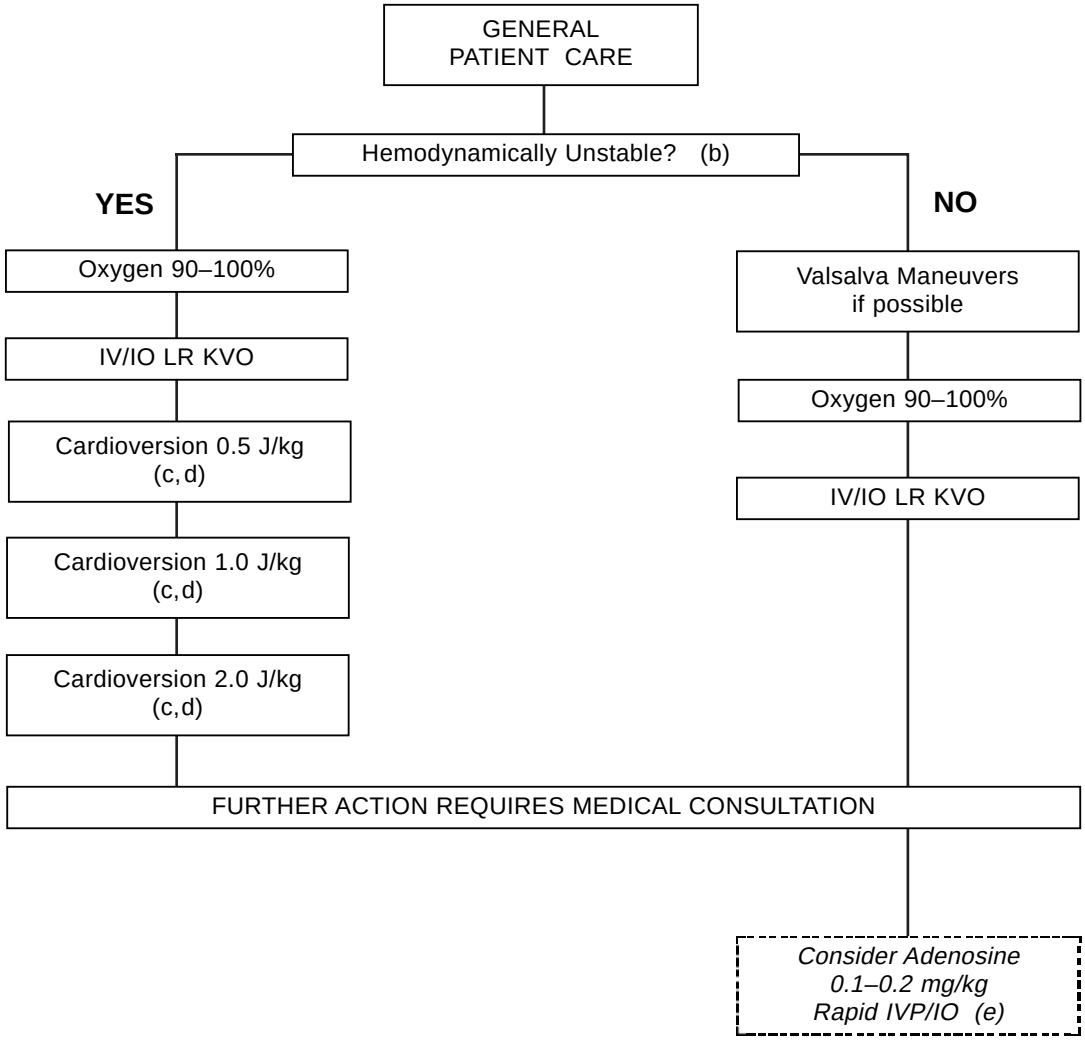
(a) - Unstable condition must be related to the tachycardia. Signs and symptoms may include chest pain, shortness of breath, decreased level of consciousness, hypotension, hypoperfusion, pulmonary congestion, CHF, and/or AMI. (NEW '99)

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

(c) - *Adenosine available for EMT-P only*

6.

PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA ALGORITHM (a)



(a) - Ventricular Heart Rates in excess of: Infant 220 bpm or Children 180 bpm (NEW '99)

(b) - Hemodynamically unstable: a systolic blood pressure less than 70 plus twice the child's age in years [70 + (2 x years) = systolic BP] (NEW); altered mental status with hypoprofusion evidenced by delayed capillary refill; pallor; or peripheral cyanosis.

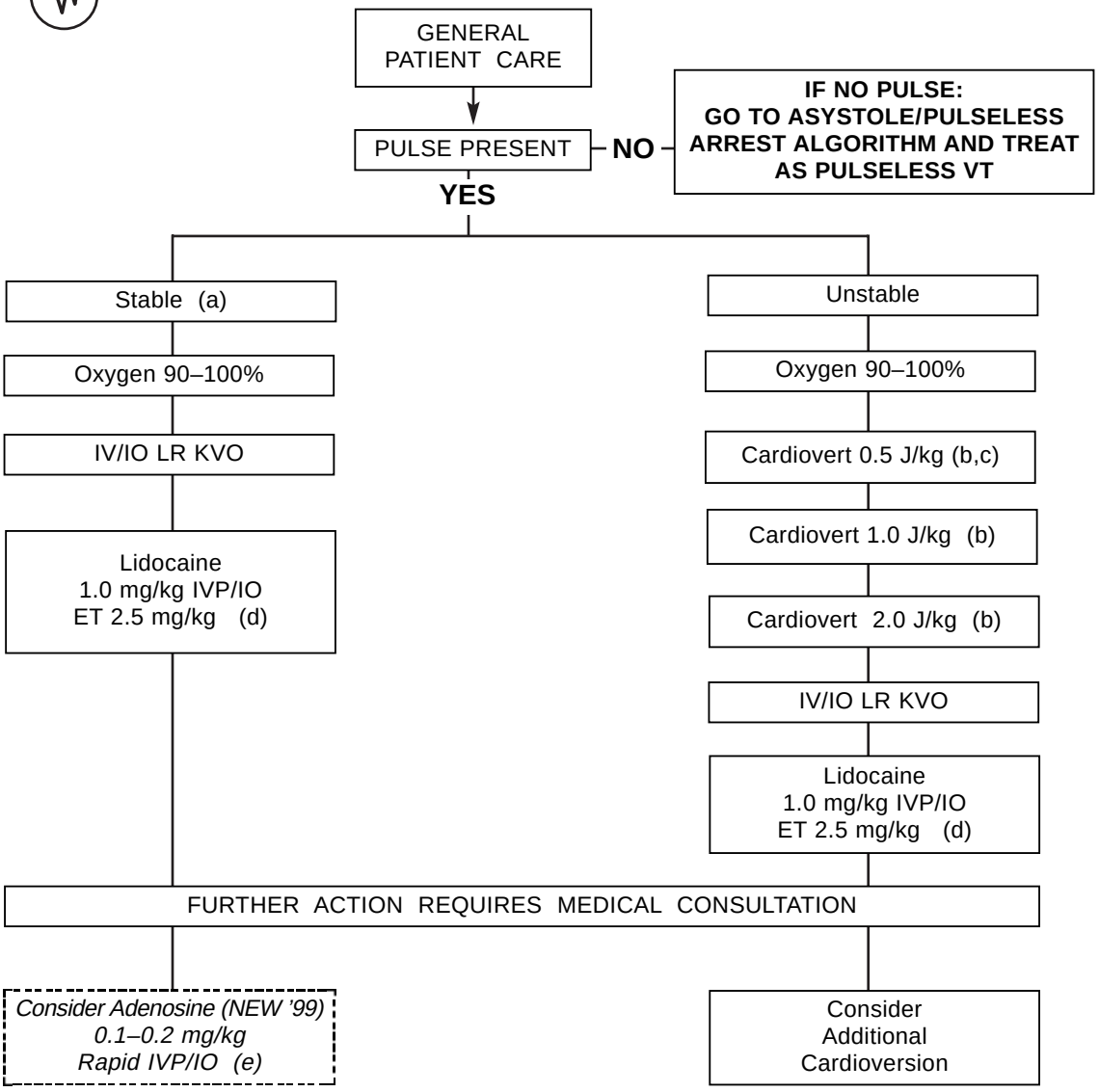
(c) - If calculated joules setting is lower than cardioversion device is able to deliver, use the lowest joules setting possible or obtain medical consultation. (NEW '99)

(d) - Consider sedation (diazepam 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.

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. (NEW '99)

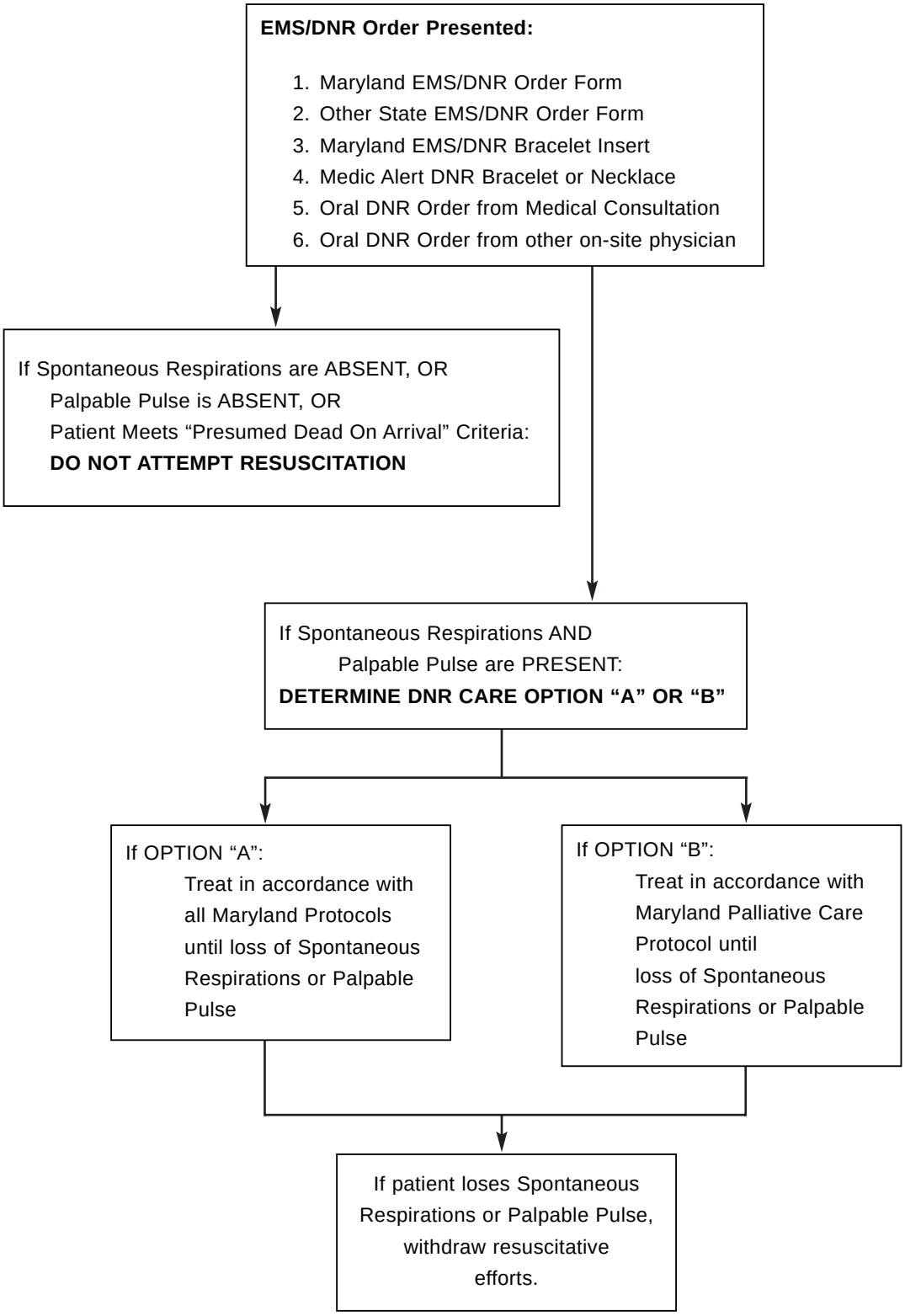
(c) - Consider sedation (diazepam with medical consultation). However, overall patient status including BP, may affect ability to administer sedative.

(d) - Lidocaine administration: 1.0 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.

O. EMS DNR Flowchart Effective 07/01/98

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



P. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (FROSTBITE) (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) 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 frost-bitten areas gently.

   c) Cover lightly with gauze.

   d) Protect from further heat loss.

ALERT 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 2-10 mg slow IVP (Adult Dose)

ALERT NO IM OR SQ MEDICATION ADMINISTRATION.

PEDIATRIC SECTION ON NEXT PAGE

ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (FROSTBITE) (Continued) (NEW '99)

g) Remove patient from cold environment.

h) Handle potential frost-bitten 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 IV/IO (1-2 mg/min).

ALERT NO IM OR SQ MEDICATION ADMINISTRATION.

4. Continue General Patient Care.

Q. ENVIRONMENTAL EMERGENCIES: COLD EMERGENCIES (HYPOTHERMIA) (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) Mild to moderate hypothermia (90°-95° F)

      (1) 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)

      (1) 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 ONE SET/ STACK OF THREE SHOCKS WITH THE AED IF INDICATED.

   e)  For further AED shocks, obtain medical consultation.

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.

R. ENVIRONMENTAL EMERGENCIES: DEPRESSURIZATION (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) 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.

S. ENVIRONMENTAL EMERGENCIES: HAZARDOUS MATERIALS EXPOSURE

1. Initiate General Patient Care.

2. Presentation
   a) 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. (NEW '99)

g) Medical Follow-Up

(1) 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.

T. 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). (NEW '99)
   Titrate to a systolic pressure of 100 mm Hg.

4. Continue General Patient Care.

U. ENVIRONMENTAL EMERGENCIES : NEAR-DROWNING (NEW ’99)

1. Initiate General Patient Care.

2. Presentation
   a) 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.

4. Continue General Patient Care.

V. ENVIRONMENTAL EMERGENCIES: OVERPRESSURIZATION (NEW ’99)

1. Initiate General Patient Care.

2. Presentation
   a) 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). (NEW ’99)
      Titrate to a systolic pressure of 100 mm Hg.

4. Continue General Patient Care.

W. HYPERBARIC THERAPY PROTOCOL (NEW '00)

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 who have had a loss of consciousness or altered mental status secondary to suspected carbon monoxide exposure and who may or may not have minor burns.
   b) Isolated suspected inhalation injury with suspicion of carbon monoxide inhalation (assess airway for direct thermal injury as noted by singed eyebrows or nasal hairs, facial burns, and soot in mouth). These patients may need emergent airway management.
   c) 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.

PATIENTS WHO MEET INCLUSION BASED ON THE TRAUMA DECISION TREE AND WHO ARE NOT YET 15 YEARS OF AGE, 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 20ml/kg bolus in unburned area, if possible.
Titrate to a systolic pressure of 100 mm Hg. (NEW '00)

(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. (NEW '00)

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

7. Continue General Patient Care.

X. HYPERTENSIVE CRISIS

1. Initiate General Patient Care.

2. Presentation
   a) A hypertensive emergency is the presence of organ system dysfunction primarily due to high blood pressure. Patients exhibit symptoms such as headache, decreased or blurred vision, focal motor deficits, changes in level of consciousness, or seizures, and a systolic blood pressure of 200 or greater and/or a diastolic blood pressure of 130 or greater. Cardiovascular problems such as angina, acute CHF, and aortic dissection may also be the presenting symptoms. Patients with suspected cocaine overdose or alcohol withdrawal may exhibit similar symptoms.

HYPERTENSION IS ALSO A NEUROPROTECTIVE REFLEX IN THE SETTING OF INCREASED INTRACRANIAL PRESSURE. GREAT CAUTION MUST BE EXERCISED IN ADMINISTERING ANTI-HYPERTENSIVE AGENTS.

HEADACHE IN THE PREGNANT PATIENT MAY BE DUE TO PRE-ECLAMPSIA.

3. Treatment
   a) Continue General Patient Care.

---

   b) Initiate IV LR KVO.

   c)  Consider nitroglycerin; 0.4 mg SL every 3-5 minutes

   d)  Consider furosemide; 0.5-1.0 mg/kg IVP

4. Continue General Patient Care.

Y. NON-TRAUMATIC SHOCK: HYPOPERFUSION

1. Initiate General Patient Care.

2. Presentation
   a) 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)  Consider PASG.

   c) Initiate IV LR KVO.

      (1) If lungs are clear, initiate fluid therapy (20ml/kg bolus). (NEW '99) 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.

   d)  Consider dopamine (2-20 ug/kg/min).
   Titrate to a systolic pressure of 100 mmHg.

   e)  Consider additional fluid administration
   Maximum Dose 2,000 ml without medical consultation

NON-TRAUMATIC SHOCK: HYPOPERFUSION (Continued)

f) The pediatric patient may present hemodynamically unstable or with hypoprofusion evidenced by altered mental status, delayed capillary refill greater than 2 seconds, pallor, peripheral cyanosis, hypotension. Hypotension is defined as a systolic blood pressure that is less than the total of 70 plus twice the child's age in years
[70 + (2 x years) = systolic BP]. (NEW '99)

g) Continue General Patient Care.

h) 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. If patient's condition does not improve, administer the second bolus of fluid at 20 ml/kg LR IV/IO. (NEW '99)

i) Third and subsequent fluid boluses at 10 ml/kg IV/IO.

j) Consider dopamine.
2-20 mg/kg/min IVP/IO
Titrate to age-specific vital signs.

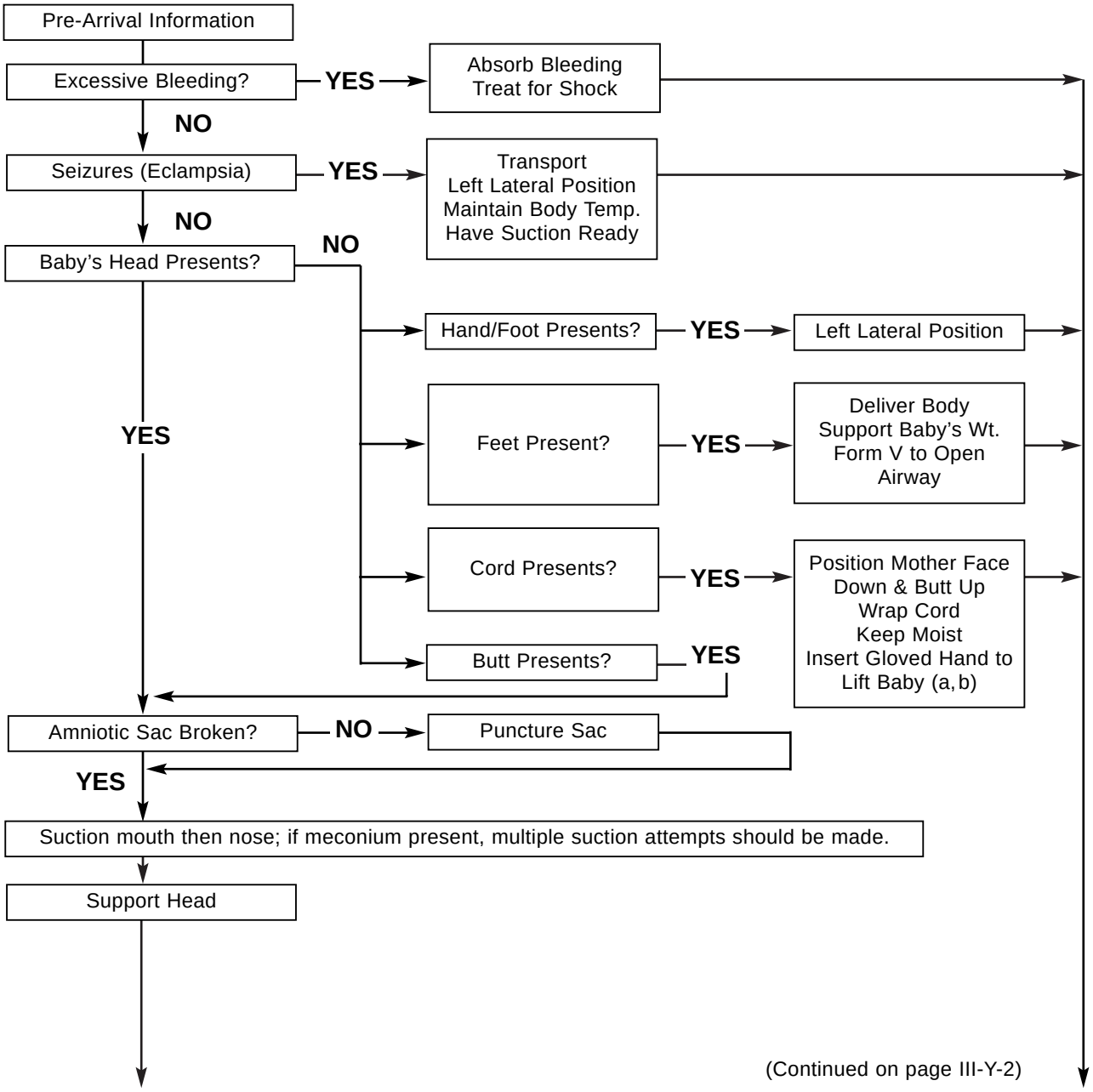
4. Continue General Patient Care.

Z. OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES: CHILDBIRTH ALGORITHM (NEW '99)

1. Initiate General Patient Care.

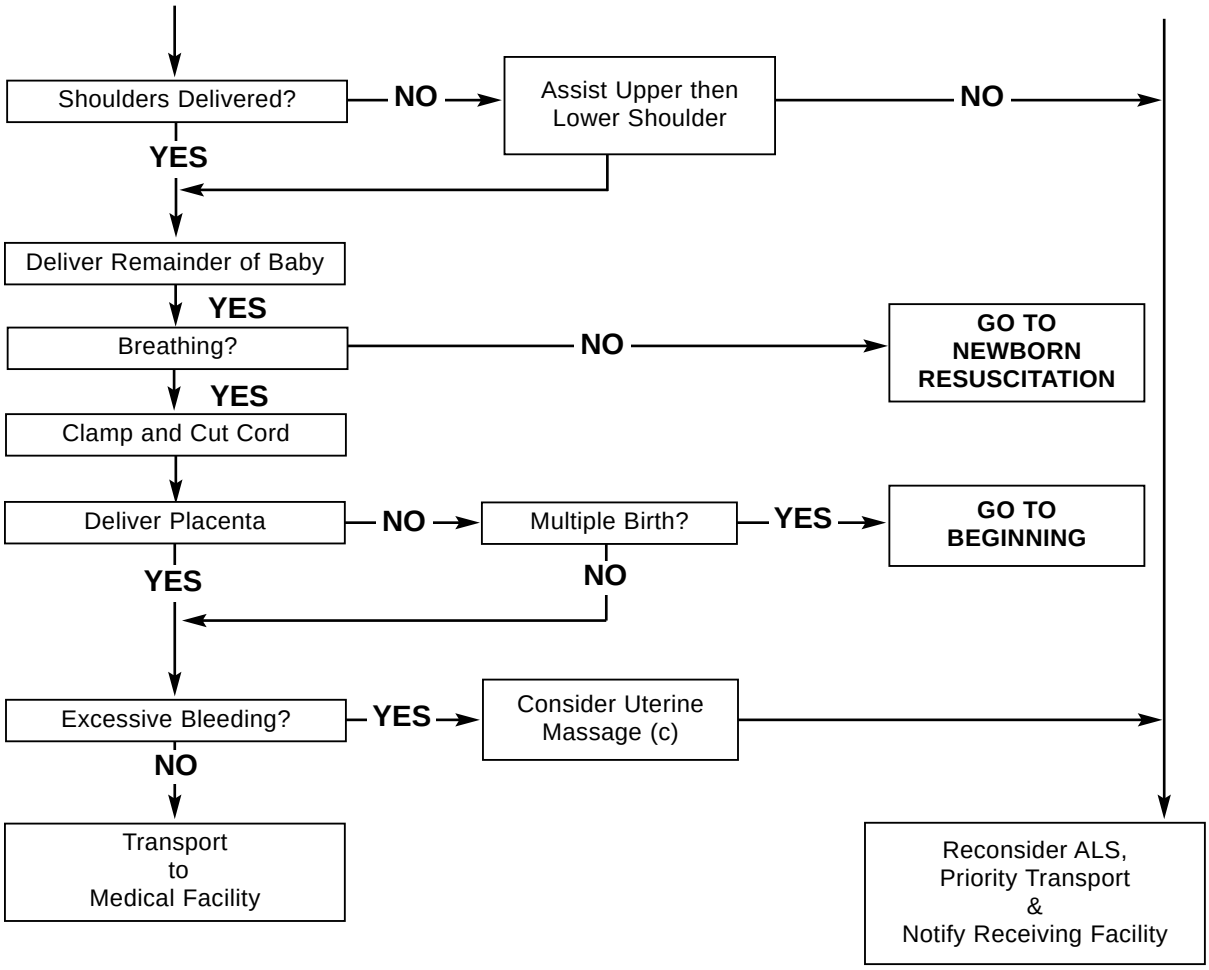
2. Presentation
   a) Patient presents pregnant, with contractions and/or pain, accompanied by bleeding or discharge, crowning during contraction, the feeling of an impending bowel movement, and/or a rock-hard abdomen.

3. Treatment



(Continued on page III-Y-2)

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 from the pubis toward the umbilicus only.

4. Continue General Patient Care.

AA. OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES: VAGINAL BLEEDING

1. Initiate General Patient Care.

2. Presentation
   a) Unusually heavy vaginal bleeding as a result of possible pregnancy, miscarriage, post-partum 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.

   e)  Consider PASG.

PRODUCTS OF CONCEPTION SHOULD BE BROUGHT TO THE HOSPITAL!

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

   f) Initiate IV LR fluid therapy 20ml/kg bolus. (NEW '99)
   Titrate to a systolic pressure of 100 mm Hg.

   g)  Consider additional fluid administration
   Maximum dose 2,000 ml without medical consultation

4. Continue General Patient Care.

BB. OVERDOSE/POISONING: ABSORPTION (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) 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. (NEW '99)

   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.

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. (NEW '99)

4. Continue General Patient Care.

CC. OVERDOSE/POISONING: INGESTION (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) 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!

THE POISON INFORMATION CENTER MAY BE CONTACTED, BUT ORDERS FOR MEDICATIONS CANNOT BE GIVEN EXCEPT THROUGH MEDICAL CONSULTATION.

a) Identify substance and amount ingested.

b)  Consider syrup of ipecac 30 ml PO
OR
Consider activated charcoal with or without sorbitol 1.0 gram/kg PO.

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

d)  Consider syrup of ipecac 30 ml PO
OR
Consider activated charcoal with or without sorbitol 1.0 gram/kg PO.

e)  If **dystonic, extrapyramidal, or mild allergic reaction**, consider diphenhydramine
25 mg IV or IM (NEW '99)

f)  If **beta blocker** overdose, consider glucagon (NEW '99)
1 mg every 5 minutes IVP
Maximum dose 3 mg

g)  If **calcium channel blocker** overdose, consider calcium chloride;
0.5 - 1.0 gram slow IVP (50 mg/min) (NEW '99)

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 50 mEq slow IVP

j) Consider antidote to specific agent if available.

k) Consider antibiotic specific to agent in mass casualty incident, if available. (NEW '99)

l) Identify substance and amount ingested.

m) Consider syrup of ipecac:
   (1) Patients 9-12 months of age: 10 ml orally
   (2) Patients greater than 1 year to 12 years of age: 15 ml orally
   OR

n) Activated charcoal 1.0 gram/kg PO

---

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

p) Consider syrup of ipecac:
   (1) Patients 9-12 months of age: 10 ml orally
   (2) Patients greater than 1 year to 12 years of age: 15 ml orally
   OR

q) Activated charcoal 1.0 gram/kg PO

r) If **dystonic, extrapyramidal, or mild allergic reaction**, consider diphenhydramine 1 mg/kg IVP/IO or IM (NEW '99)
   Maximum single dose 25 mg

s) If **beta-blocker** overdose, consider glucagon (NEW '99)
   1 mg IVP (25-40 kg);
   0.5 mg IVP (less than 25 kg);
   every 5 minutes as necessary
   Maximum dose 3 mg

OVERDOSE/POISONING: INGESTION (Continued)

t) If **calcium channel blocker** overdose, consider calcium chloride
20 mg/kg (0.2 ml/kg) slow IVP/IO (50 mg/ml) (NEW ’99)
Maximum dose1 gram or 10 ml

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

u) If **organophosphate** poisoning, consider atropine;
0.02 mg/kg IVP/IO or IM
Maximum single dose 2 mg
May be repeated every 5-10 minutes

v) If **tricyclic** overdose, consider sodium bicarbonate
1 mEq/kg diluted 1:1 slow IVP/IO

w) Consider antidote to specific agent if available.

x) Consider antibiotic specific to agent in mass casualty incident, if available. (NEW ’99)

4. Continue General Patient Care.

DD. OVERDOSE/POISONING: INHALATION (NEW ’99)

1. Initiate General Patient Care.

2. Presentation
   a) 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 WITH SUSPECTED CARBON MONOXIDE INHALATION WITHOUT MAJOR BURNS SHOULD BE CONSIDERED FOR TRANSPORT TO THE HYPERBARIC SPECIALTY CENTER. PATIENTS IN CLOSED SPACE INCIDENTS ARE MORE LIKELY TO EXPERIENCE CARBON MONOXIDE INHALATION AND MAY MANIFEST TOXICITY WITH ALTERED MENTAL STATUS. (NEW ’99)

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) Obtain venous blood sample, 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. (NEW ’99)

OVERDOSE/POISONING: INHALATION (Continued)

i) Remove patient from the toxic environment by appropriately trained personnel using proper level PPE.
(See Appendix G, page IV-G-26.)

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. NEW)

4. Continue General Patient Care.

EE. OVERDOSE/POISONING: INJECTION (NEW ’99)

1. Initiate General Patient Care.

2. Presentation
   a) 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 patient’s prescribed EpiPen or albuterol. (NEW-ALS ’99)

   d) Consider PASG.

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

   e) Immobilize extremity.

   f) Apply cool packs for relief of pain only.

---

   g) Initiate IV LR fluid therapy 20ml/kg bolus in uninjured extremity. (NEW ’99) Titrate to a systolic pressure of 100 mm Hg.

   h) If narcotic overdose is suspected, administer naloxone
   0.4-2.0 mg slow IVP
   ET dose 1-5 mg

   i) Consider PASG.

   j) Consider antidote to specific agent if available.

   k) Consider antibiotic specific to agent in mass casualty incident, if available. (NEW ’99)

OVERDOSE/POISONING: INJECTION (Continued)

l) Identify markings (insects, bites, needlestick, etc.).

m) Place distal and proximal constricting bands (allowing arterial flow) for a poisonous snakebite to an extremity.

n) Assist patient experiencing moderate to severe allergic reaction symptoms or mild symptoms with a history of life-threatening allergic reaction with patient's prescribed EpiPen or albuterol. (NEW-ALS '99)

---

o) Initiate IV LR fluid therapy 20 ml/kg bolus in uninjured extremity. (NEW '99) Titrate to a systolic pressure of 100 mm Hg

p) 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.

q) Consider PASG.

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

s) Consider antidote to specific agent if available.

t) Consider antibiotic specific to agent in mass casualty incident, if available. (NEW '99)

4. Continue General Patient Care.

FF. 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. 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 patient's prescribed Epinephrine auto-injector or albuterol. (NEW-ALS '99)

   b) Albuterol inhalor (2 puffs) may be repeated once within 30 minutes.

   c)  Consider additional doses of Epinephrine auto-injector or albuterol.

---

   d) Moderate to Severe Distress
      (1) Administer epinephrine 1:1000
      0.3 mg SC
      May repeat every 5 minutes for total of 3 doses for severe reactions (NEW '99)

      (2) Initiate IV LR fluid therapy 20ml/kg bolus. (NEW '99)
      Titrate to a systolic pressure of 100 mm Hg.

      (3) Administer diphenhydramine
      25 mg IVP or IM

      (4) Administer albuterol 2.5 mg via nebulizer in 3.0 ml normal saline or LR. May be repeated once.

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 1.0 mg

f) Mild Allergic Reaction

(1) Consider diphenhydramine
25 mg IVP or IM
OR
Consider epinephrine 1:1000
0.3 mg SC

(2) Consider additional fluid administration
Maximum dose 2,000 ml without medical consultation

(3) Consider PASG.

g) Assist patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with patient's prescribed Epinephrine auto-injector or albuterol. (NEW-ALS '99)

h) Albuterol inhalor (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 SC
Maximum single dose 0.3 mg
May repeat every 5 minutes for total of 3 doses for severe reactions (NEW '99)

(2) Initiate IV/IO.

(3) If age-related vital signs and patient's condition indicates 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. (NEW '99)

(4) Administer diphenhydramine
1 mg/kg slow IVP/IO or IM
Maximum single dose 25.0 mg)

(5) Administer albuterol
2.5 mg via nebulizer with 3.0 ml normal saline or LR
May be repeated once

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 1.0 mg

l) Mild Allergic Reaction

(1) Consider diphenhydramine
1 mg/kg slow IVP or IM
Maximum single dose 25.0 mg
OR
Consider epinephrine 1:1000
0.01 mg/kg SC
Maximum single dose 0.3 mg

4. Continue General Patient Care.

GG. RESPIRATORY DISTRESS: ASTHMA/COPD

1. Initiate General Patient Care.

2. Presentation
   a) 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
   a) Assist the patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with patient's prescribed Epinephrine auto-injector or albuterol. (NEW '99)

   b) Albuterol inhalor (2 puffs) may be repeated once within 30 minutes.

   c)  Consider additional doses of Epinephrine auto-injector or albuterol.

---

   d) Initiate IV LR KVO (on all Priority 1 or 2 patients and all patients with a history of cardiac disease).

   e) Administer albuterol
   2.5 mg via nebulizer in 3.0 ml normal saline
   May be repeated once

   AND

   f) Administer epinephrine 1:1,000
   0.3 mg SC

   OR

   g) Administer terbutaline
   0.25 mg SC

   h)  Consider additional doses of epinephrine, albuterol, or terbutaline.

RESPIRATORY DISTRESS: ASTHMA/COPD (Continued)

i) Assist patient(s) experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with patient's prescribed Epinephrine auto-injector or albuterol. (NEW-ALS '99)

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

k) Consider additional doses of Epinephrine auto-injector or albuterol.

---

l) Initiate IV/IO LR KVO.

m) Administer albuterol
2.5 mg via nebulizer in 3.0 ml normal saline
May be repeated once

AND/OR

n) Administer epinephrine 1:1,000
0.01 mg/kg SC
Maximum single dose 0.3 mg
Repeat twice for severe reactions (NEW '99)

o) Consider additional doses of epinephrine or albuterol.

4. Continue General Patient Care.

HH. RESPIRATORY DISTRESS: CROUP (NEW '00)

1. Initiate General Patient Care.

2. Presentation
   Pediatric Respiratory Distress with Stridor (Suspected Croup) "Barking Cough and Audible Stridor" CRT/EMT-P Protocol

   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) Perform an initial patient assessment and assign a treatment priority. If weight is > than 40kg (88lbs) treat under adult protocol.
   b) 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).

   c) Place patient on cardiac monitor and record vital signs. (This may be done concurrently with medication administration if patient is unstable.)
   d) Initiate IV LR fluid therapy at a KVO. **(Do not withhold nebulized epinephrine if IV is not easily obtainable.)**
   If provider is an EMT-P and the patient is at risk for imminent respiratory/cardiac arrest, then establish IO access after appropriate airway management has been done.

e) If the child is 8 years old or less without known cardiac disease and is having respiratory distress with audible stridor believed to be caused by croup, administer 3 cc's of normal saline via nebulizer for 3-5 minutes. 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. (Note: if inhaled normal saline decreases the patient's level of distress and symptoms, continues this therapy en route to the appropriate receiving facility.)

AND

f) If respiratory distress is so severe that respiratory arrest is imminent, administer 0.01mg/kg of epinephrine 1:1,000 SQ (max dose of 0.3mg) first.

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

ALERT

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.

II. RESPIRATORY DISTRESS: PULMONARY EDEMA /CONGESTIVE HEART FAILURE

1. Initiate General Patient Care.

2. Presentation
   a) 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, peripheral edema, jugular vein distention, or frothy, pink sputum.

3. Treatment
   a) Position patient in high Fowler's position.

---

   b) If patient has a prescription or previous history of nitroglycerin use, administer nitroglycerin: 0.4 mg SL.

      (1) 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.

   c) 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.

   d) If IV cannot be established, nitroglycerin may be administered with medical consultation.

   e) Initiate IV LR KVO.

   f) Identify rhythm and treat according to appropriate algorithm.

   g)  Consider additional nitroglycerin 0.4 mg SL

   h)  Consider albuterol 2.5 mg via nebulizer in 3.0 ml normal saline

   i)  Consider furosemide 0.5-1.0 mg/kg slow IVP

   j)  Consider morphine 2-10 mg slow IVP

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

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

4. Continue General Patient Care.

JJ. 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)
      (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. (NEW '99)
      (5) Circumferential burns

PATIENTS WITH SUSPECTED CARBON MONOXIDE INHALATION WITHOUT MAJOR BURNS SHOULD BE CONSIDERED FOR TRANSPORT TO THE HYPERBARIC SPECIALTY CENTER. PATIENTS IN CLOSED SPACE INCIDENTS ARE MORE LIKELY TO EXPERIENCE CARBON MONOXIDE INHALATION AND MAY MANIFEST TOXICITY WITH ALTERED MENTAL STATUS. (NEW '99)

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

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

TRAUMA PROTOCOL: BURNS (Continued)

DO NOT GIVE ANYTHING BY MOUTH.

DO NOT PLACE ICE ON ANY BURN GREATER THAN 5%. (NEW '99)

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 20ml/kg bolus in unburned area, if possible. Titrate to a systolic pressure of 100 mm Hg. (NEW '99)

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
2-10 mg slow IVP
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 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. (NEW '00)

j) Obtain medical consultation to initiate an IV in an area of burn, if unable to obtain an IV in unburned area. (NEW '00)

k) Third and subsequent fluid boluses at 10 ml/kg LR IV/IO.

l) Consider morphine sulfate 0.1 mg/kg slow IV/IO
1-2 mg/min

4. Continue General Patient Care.

KK. TRAUMA PROTOCOL: EYE TRAUMA (NEW '99)

1. Initiate General Patient Care.

2. Presentation
   a) 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
2-10 mg slow IVP
1-2 mg/min

4. Continue General Patient Care.

LL. TRAUMA PROTOCOL: HAND/EXTREMITY TRAUMA

1. Initiate General Patient Care.

2. Presentation
   a) Patient may exhibit a complete or incomplete amputation, degloving, crushing, or devascularization injury to a hand or lower (ankle/foot) extremity. (NEW ’99)

3. Treatment
   a) Indications for Referral to a Hand Center (NEW ’99)
      (1) Stable patients with an isolated injury
      (2) Complete or incomplete hand amputation
      (3) Partial or complete proximal finger or thumb amputation (at metacarpal phalangeal joint where the finger meets the hand)
      (4) Degloving, crushing or devascularization injuries of hand (NEW ’99)
      (5) Clean-cut foot amputation (child)
      (6) Clean-cut amputation at the ankle (child or adult)

LIFE BEFORE LIMB.

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

FOR MIDDLE FINGER SEGMENT/PHALANX AMPUTATION, CONSULT WITH THE NEAREST EMERGENCY DEPARTMENT OR TRAUMA CENTER.

   b) Contraindications for Referral to a Hand Center:
      (1) Patients with unstable or abnormal vital signs
      (2) Patients with major and/or multiple system trauma
      (3) Patients with finger-tip amputations (distal to last joint)
      (4) Patients with toe amputation (partial or complete)

   c) 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, PROXIMITY TO DESIGNATED TRAUMA CENTER, GOOD JUDGMENT, AND COMMON SENSE REGARDING MODE OF TRANSPORT. IF ESTIMATED TRANSPORT TIME TO DESIGNATED HAND CENTER IS LESS THAN 45 MINUTES, USE GROUND TRANSPORT.

TRAUMA PROTOCOL: HAND /EXTREMITY TRAUMA (Continued)

d) Initiate IV LR fluid therapy 20ml/kg bolus. (NEW ’99)
Titrate to a systolic pressure of 100 mm Hg.

e) Consider Morphine Sulfate
2-10 mg slow IVP
1-2 mg/min

f) Consider additional fluid administration
Maximum dose 2,000 ml without medical consultation

g) Initiate IV/IO LR.

h) 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. (NEW ’99)

i) Third and subsequent fluid boluses at 10 ml/kg LR IV/IO.

j) Consider Morphine Sulfate
0.1 mg/kg slow IVP/IO
1-2 mg/min

4. Continue General Patient Care.

MM. TRAUMA PROTOCOL: MULTIPLE/SEVERE TRAUMA

1. Initiate General Patient Care.

2. Presentation
   a) 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.

PATIENTS WHO MEET INCLUSION BASED ON THE TRAUMA DECISION TREE AND WHO ARE NOT YET 15 YEARS OF AGE, SHOULD BE TRANSPORTED TO A PEDIATRIC TRAUMA CENTER. (NEW '99)

3. Treatment
   a) Maintain spine stabilization.

   b) Control bleeding and immobilize patient, if indicated.

   c) Consider PASG.

   d)  Consider hyperventilation for patients with:
      (1) Glasgow Coma Score of 7 or less
      (2) Rapidly decreasing Glasgow Coma Score
      (3) If directed by on-line physician.

   e) Initiate IV LR fluid therapy 20ml/kg bolus. (NEW '99)
      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 spine stabilization.

h) Control bleeding and immobilize patient, if indicated.

i) Consider PASG, if appropriate.

---

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. (NEW '99)

l) Third and subsequent fluid boluses at 10 ml/kg LR IV/IO.

4. Continue General Patient Care.

NN. TRAUMA PROTOCOL: SEXUAL ASSAULT

1. Initiate General Patient Care.

2. Presentation
   a) 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. (NEW '99)

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.

OO. TRAUMA PROTOCOL: SPINAL CORD INJURY

1. Initiate General Patient Care.

2. Presentation
   a) 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) Consider PASG, if appropriate.

---

   f) Initiate IV LR fluid therapy 20 ml/kg bolus. (NEW '99)
      Titrate to a systolic pressure of 100 mm Hg.

   g) Consider additional fluid administration
      Maximum dose 2,000 ml without medical consultation

   h) Consider PASG, if appropriate.

PEDIATRIC SECTION ON NEXT PAGE

TRAUMA PROTOCOL: SPINAL CORD INJURY (Continued)

i) 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) Patients 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.

j) **Protect Airway!**

k) Immobilize and protect entire spine.

l) Consider PASG, if appropriate.

m) Initiate IV/IO LR.

n) 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. (NEW '99)

o) Third and subsequent fluid bolus at 10 ml/kg LR IV/IO.

p) Consider PASG, if appropriate.

4. Continue General Patient Care.

PP. TRAUMA PROTOCOL: TRAUMA ARREST

1. Initiate General Patient Care.

2. Presentation
   a) 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.

   e) Consider PASG.

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! (NEW '99)

   f)  Consider PASG, if appropriate.

   g) Initiate IV 20ml/kg. (NEW '99)
      Titrate to systolic pressure of 100 mm Hg.

   h) Identify rhythm and refer to appropriate algorithm.

   i)  Consider additional fluid administration
      Maximum dose 2,000 ml without medical consultation

   j)  Consider PASG, if appropriate.

TRAUMA PROTOCOL: TRAUMA ARREST (Continued)

k) Rapid assessment and extrication

l) Protect cervical spine.

m) CPR

n) Consider AED if arrest is believed to be medical in nature.
(See Section IV, page IV-G-8.)

ALERT

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! (NEW '99)

o) Consider PASG, if appropriate.

---

p) Initiate IV/IO LR.

q) 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. (NEW '99)

r) Third and subsequent fluid boluses at 10 ml/kg LR IV/IO

s) Consider PASG, if appropriate.

4. Continue General Patient Care.

GLASGOW COMA SCALE

Eye Opening

Spontaneously	**4**
To Voice	**3**
To Pain	**2**
No Response	**1**

Motor Response

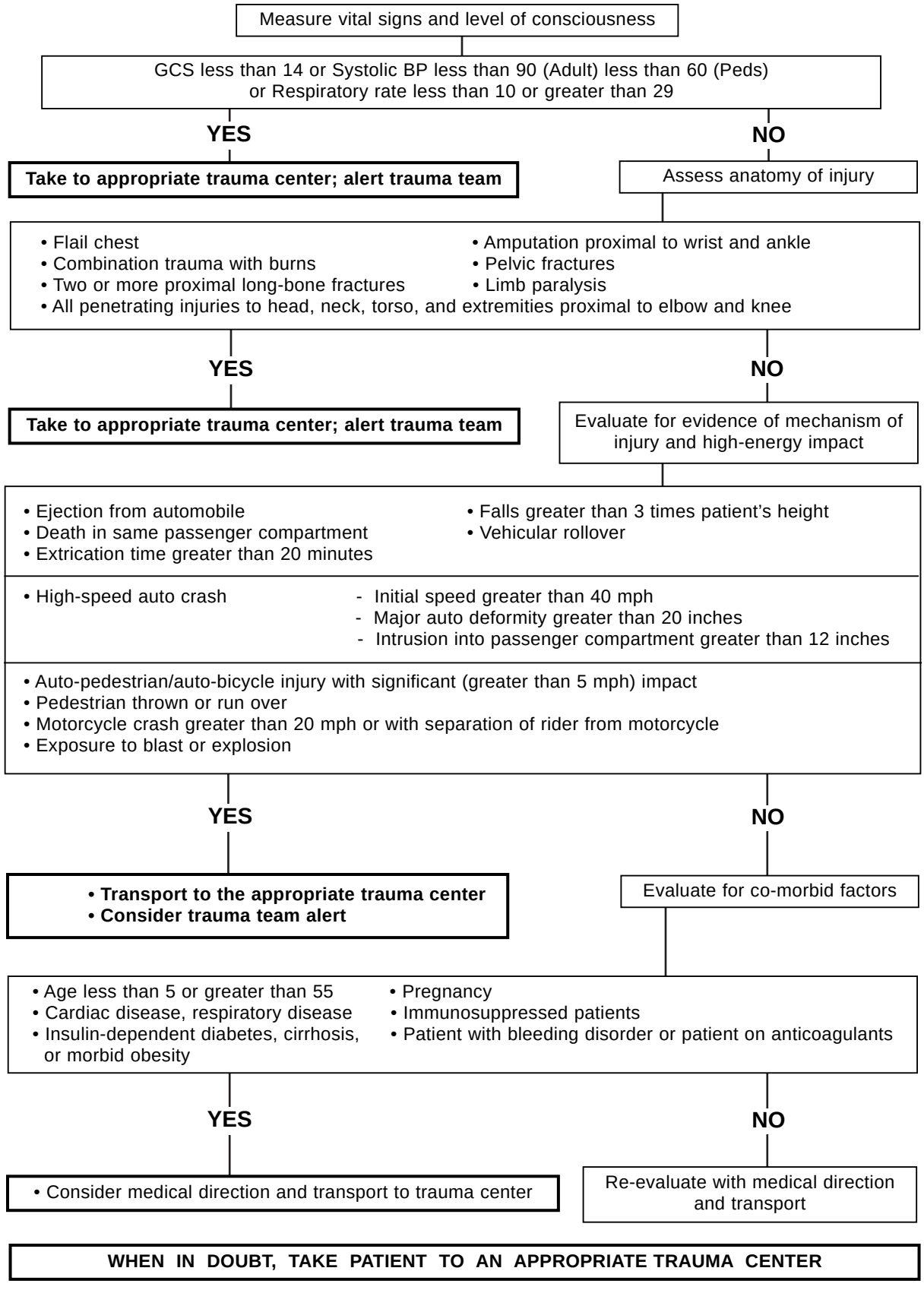
To Verbal Command	- Obeys	**6**
To Painful Stimulus	- Localizes Pain	**5**
	Flexion - Withdraw	**4**
	Flexion - Abnormal	**3**
	Extension	**2**
	No Response	**1**

Verbal Response

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

Glasgow Coma Score **Total (3-15)**

QQ. TRAUMA DECISION TREE ALGORITHM



IV. APPENDICES

A. GLOSSARY (NEW '99)

AED: Automated External Defibrillation.

AMI: Acute Myocardial Infarction.

APGAR score: An acronym and method of scoring to determine the condition of a newborn (see APGAR chart in Appendix C).

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: EMT-Basic.

BSI: Body Substance Isolation.

BVM: Bag-Valve-Mask.

Cart Blanche: Full discretionary power.

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).

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

CRT: Cardiac Rescue Technician.

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

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.

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.

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 anticholenergic medication use (e.g., anti-psychotic, anti-vomiting).

DNR: Do Not Resuscitate.

EJ: External Jugular vein of the neck periferal IV access site.

Emetic: Referring to a substance that causes vomiting.

EMS: Emergency Medical Services.

EMT-A: Emergency Medical Technician - Ambulance.

EMT-B: Emergency Medical Technician - Basic.

EMT-P: Emergency Medical Technician - Paramedic.

EOC: Emergency Operations Center.

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 anticholenergic medication use (e.g., anti-psychotic, anti-vomiting).

FR: First Responder.

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

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

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 vitals 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.

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.

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.

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.

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.

NOI: Nature of Illness.

NRB: Non-rebreather mask.

NTG: Nitroglycerin.

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.

PASG: Pneumatic Anti-Shock Garments (a.k.a. Medical Anti-Shock Trousers).

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.

PMD: Program Medical Director.

PO: By mouth.

PPE: Personal Protective Equipment.

Provider: Includes EMT-Basic, CRT, 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, 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.

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

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

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: **T**ype **O**f **I**ncident to which EMTs may be called upon to respond (for example: ill and/or injured patients, hazardous materials incidents, fires, mass casualty incidents, etc.)

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.

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 FOR EMS AND COMMERCIAL SERVICES

PROCEDURES

PROCEDURE	EMT-B	CRT	EMT-P
ADMINISTRATION OF MEDICATIONS			
Oral, Sublingual, IM (auto-injector)	**SO**	**SO**	**SO**
SQ, IM, IV, ET, Pediatric Rectal, Nebulizer	**–**	**SO**	**SO**
Intraosseous	**–**	**–**	**SO**
AIRWAY MANAGEMENT			
Carbon Dioxide Detector (not required)	**SO**	**SO**	**SO**
Capnograph (not required) (NEW ’99)	**–**	**SO**	**SO**
Combitube (NEW ’99)	**–**	**–**	**PP**
Cricothyroidotomy (NEW ’99)	**–**	**–**	**PP**
Direct Laryngoscopy	**–**	**SO**	**SO**
Gastric Tube (NEW-CRT ’99)	**–**	**SO**	**SO**
Nasotracheal Intubation	**–**	**–**	**SO**
Oropharyngeal/Nasopharyngeal Airway	**SO**	**SO**	**SO**
Orotracheal Intubation	**–**	**SO**	**SO**
Needle Decompression Thoracostomy (NDT)	**–**	**–**	**SO/MC**
Pulse Oximeter (not required) (NEW-BLS ’99)	**SO**	**SO**	**SO**
Suction	**SO**	**SO**	**SO**
Ventilator (NEW ’00)	_	**PP**	**PP**
ELECTROCARDIOGRAM			
Standard Limb Leads	**–**	**SO**	**SO**
12 Lead (not required)	**–**	**SO**	**SO**
ELECTRICAL THERAPY			
Automated External Defibrillator	**SO**	**SO**	**SO**
Cardioversion	**–**	**SO**	**SO**
Defibrillation	**–**	**SO**	**SO**
Transcutaneous Cardiac Pacing	**–**	**–**	**SO**
GLUCOMETER (required in 2000)	**–**	**SO**	**SO**
INTRAVENOUS THERAPY			
External Jugular Access & Maintenance	**–**	**–**	**SO**
Intraosseous Infusion & Maintenance	**–**	**–**	**SO**
Peripheral IV Access/Saline Lock	**PAO**	**SO**	**SO**
Peripheral IV Maintenance	**SO**	**SO**	**SO**
PNEUMATIC ANTI-SHOCK GARMENTS	**SO/MC**	**SO/MC**	**SO/MC**
SKELETAL STABILIZATION/IMMOBILIZATION	**SO**	**SO**	**SO**
SOFT TISSUE INJURY & BLEEDING MANAGEMENT	**SO**	**SO**	**SO**
VASOVAGAL MANEUVER			
Valsalva maneuver	**–**	**SO**	**SO**

SO Standing Order
PAO Program Approved Option
MC Medical Consultation Required
PP Pilot Program

B. MEDICATIONS FOR EMS AND COMMERCIAL SERVICES

MEDICATIONS

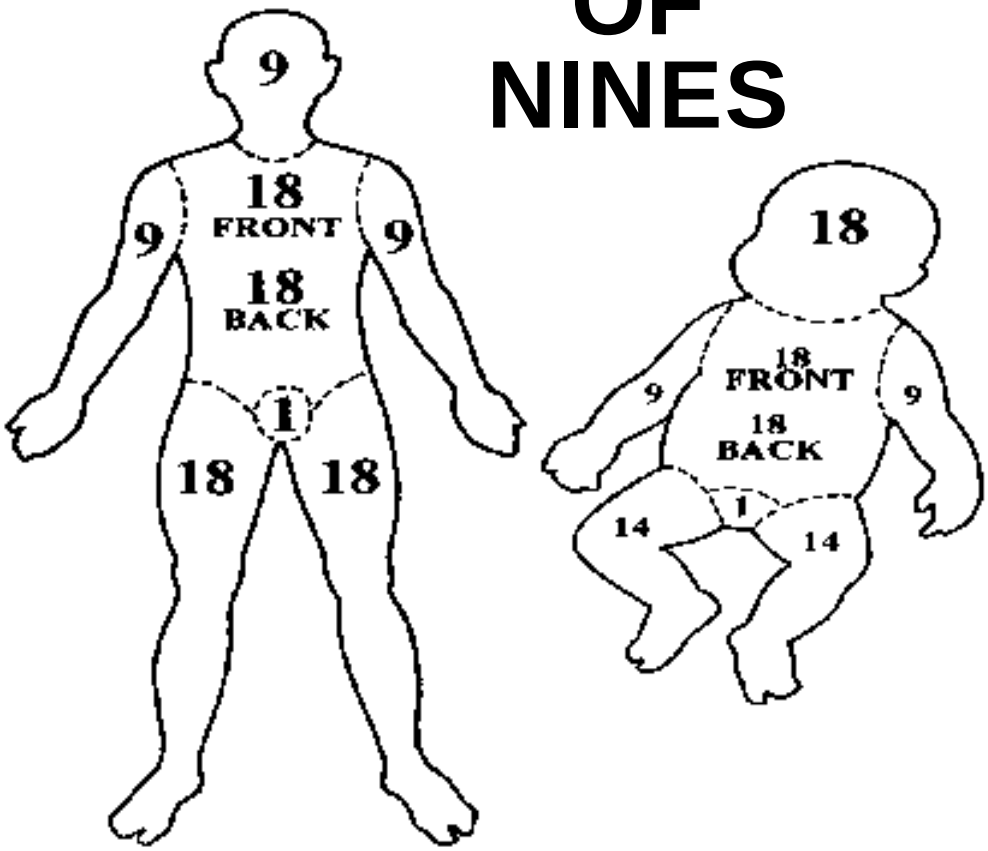
MEDICATION	EMT-B	CRT	EMT-P
Activated Charcoal (With or Without Sorbitol)	**MC**	**MC**	**MC**
Adenosine	**–**	**–**	**MC**
Albuterol Unit Dose Inhaler (Patient's Prescribed)	**SO**	**SO**	**SO**
Albuterol Sulfate Nebulizer	**–**	**SO**	**SO**
Aspirin (NEW '99)	**–**	**MC**	**MC**
Atropine Sulfate	**–**	**SO/MC**	**SO/MC**
Benzocaine	**–**	**–**	**SO**
Calcium Chloride (10% Solution)	**–**	**MC**	**MC**
Dextrose 50%	**–**	**SO**	**SO**
Diazepam	**–**	**MC**	**MC**
Diphenhydramine Hydrochloride	**–**	**SO/MC**	**SO/MC**
Dopamine Hydrochloride	**–**	**MC**	**MC**
Epinephrine Auto-Injector (Patient's Prescribed)	**SO**	**SO**	**SO**
Epinephrine 1:10,000/1:1,000	**–**	**SO**	**SO**
Furosemide	**–**	**MC**	**MC**
Glucagon	**–**	**–**	**SO/MC**
Hemophilia Blood Factor (VIII or IX) (Patient's Prescribed)	**–**	**SO**	**SO**
Ipecac	**MC**	**MC**	**MC**
Lidocaine	**–**	**SO**	**SO**
Midazolam (Versed) (NEW '99)	**–**	**–**	**PP**
Morphine Sulfate	**–**	**MC**	**MC**
Naloxone	**–**	**SO**	**SO**
Nitroglycerin [tablet /spray] (Patient's Prescribed)	**SO**	**SO**	**SO**
Nitroglycerin [tablet/spray]	**–**	**SO**	**SO**
Oral Glucose	**SO**	**SO**	**SO**
Oxygen	**SO**	**SO**	**SO**
Saline (Nebulized) (NEW '00)	_	_	**MC**
Sodium Bicarbonate	**–**	**MC**	**MC**
Succinylcholine (Anectine) (NEW '99)	**–**	**–**	**PP**
Terbutaline Sulfate	**–**	**SO**	**SO**
Vecuronium (Norcuron) (NEW '99)	**–**	**–**	**PP**

SO Standing Order
MC Medical Consultation Required
PAO Program Approved Option
PP Pilot Program

C. NORMAL VITAL SIGNS AND CHARTS

PATIENT	AGE	HEART RATE	RESPIRATORY RATE	SYSTOLIC B/P
INFANTS	UNDER 1 YEAR	120–160	40	80
TODDLERS	1–3 YEARS	90–140	40	84
PRESCHOOLERS	3–6 YEARS	80–110	30	86–92
SCHOOL-AGED	6–12 YEARS	75–100	20	92–100
ADOLESCENTS	12–18 YEARS	60–100	20	100–120
ADULTS	OVER 18 YEARS	60–100	16	110–140

RULE OF NINES



APGAR SCORING CHART

A = Appearance (Skin Color)
- 0 = Bluish, pale
- 1 = Pinkish with blue distal extremities
- 2 = Entire body pinkish

P = Pulse rate Determine w/stethoscope over baby's heart for 30 seconds
- 0 = Absent pulse
- 1 = Below 100
- 2 = Above 100

G = Grimace Irritability - determine by flicking the infant on sole of the foot
- 0 = No response
- 1 = Crying, limited motion
- 2 = Crying, vigorous motion

A = Activity (Muscle tone)
- 0 = Limp, flaccid, you feel no resistance when straightening extremities.
- 1 = Some flexion of extremities
- 2 = Active, good motion in extremities

R = Respiration (Effort)
- 0 = Absent
- 1 = Slow, irregular, shallow, gasping
- 2 = Normal, regular, vigorous crying

D. 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,

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) that is physically present "on-site." EMS shall not accept orders from private physician attendings 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) Maryland EMS/DNR Order Form
      (2) Other State EMS/DNR Order Form
      (3) Maryland EMS/DNR Bracelet Insert

(4) Medic Alert DNR Bracelet or Necklace
(5) Oral DNR Order from EMS System Medical Consultation
(6) Oral DNR Order from other on-site physician

b) The following **are no**t 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
(7) An oral order from an attending physician 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.

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. 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.

   b) PERFORM LIMITED PATIENT ASSESSMENT
      (1) Vital signs:
         (a) Check for absence of a palpable pulse.
         (b) Check for absence of spontaneous respirations in an unresponsive patient.

(c) 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 intubation for respiratory distress, cardiac monitoring, synchronized cardioversion for pulse-**present** ventricular or supraventricular tachycardia, cardiac pacing for pulse-**present** symptomatic bradycardia, insertion of IVs, and drug therapy), in an attempt to forestall cardiac or respiratory arrest.

(2) This option was requested primarily by long-term care facilities for their patients who are on DNR orders for potentially prolonged periods of time. Many of these patients are less concerned about palliation of pain and more concerned about the quality of life after a stroke or heart attack. The primary medical conditions seen in the field necessitating this option have been the desire to administer Lasix for pulmonary edema, dextrose for diabetic emergencies, and epinephrine for anaphylactic reactions in patients who, upon arrest, are not to be resuscitated.

(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).

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.

e) 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 (dressing, elevation, direct pressure, pressure points, cold packs, tourniquets, etc.).

(ii) No MAST/PASG trousers or IVs.

(c) Immobilize fractures using skills and devices that minimize pain.

(d) Uncontrolled pain or other symptoms (e.g., severe nausea)

(i) Allow patient, family, or health care providers (other than the prehospital provider) to administer patient's prescribed medications. Such health care providers administering medication will not have to accompany the patient to the hospital.

(ii) Patient controlled analgesia (PCA) systems for pain medication delivery and other patient-controlled medication (PCM) systems shall be left in place in DNR patients and monitored to the extent possible according to the provider's level of certification or licensure.

(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
(c) EMS-Initiated Medications (Except passive oxygen)
(d) CPR
(e) Intubation (EOA, endotracheal, nasotracheal, or gastric tube)
(f) Pneumatic anti-shock garment (PASG)
(g) Active ventilatory assistance, unless on an outpatient ventilator (pg. 32 ch. 5)

f) 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.

(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 original 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 the original 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).

EMS/DNR (Continued)

g) 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.
   (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.
   (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 signing the order, or the patient's hospice program, or on-line medical direction for assistance.

h) 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.
   (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 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 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 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.

(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).

i) PATIENT DISPOSITION IF NOT TRANSPORTED

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

(a) 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);**

(b) Do **no**t remove an EMS/DNR vinyl bracelet or metal emblem (bracelet or necklace) from the deceased patient;

EMS/DNR (Continued)

(c) 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:
   (i) By violence
   (ii) By suicide
   (iii) As a result of an accident
   (iv) Suddenly, if the deceased was in apparent good health, or
   (v) In any suspicious or unusual manner.

E. PRESUMED DEAD ON ARRIVAL (PDOA)

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

1. PURPOSE

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

2. INDICATIONS

a) Presumption of death in the field (without initiation of resuscitation) should be considered only in the following instances:
   (1) Decapitation
   (2) Decomposition
   (3) Rigor mortis with warm air temperature
   (4) Pulseless, apneic patient in multiple casualty situation where system resources are required for stabilization of living patients
   (5) 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. 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 intact. 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.

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.

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

1. PURPOSE

a) 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 (NEW '99)

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.

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G. PROCEDURES

1. AIRWAY MANAGEMENT: GASTRIC TUBE (NEW-CRT '99)

a) PURPOSE

(1) 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

(1) Have suction available since vomiting may be induced.

EMT-P ONLY

2. AIRWAY MANAGEMENT: NASOTRACHEAL INTUBATION

a) PURPOSE

(1) 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 (NEW '99)
(2) An oxygen saturation of less than or equal to 85% in a patient on 100% oxygen by face mask and respiratory distress
(3) A respiratory rate of 8 or less per minute or 44 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 14 years of age

d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS (NEW '99)

(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 (Benzocaine spray) should be applied to both nares to minimize pain.*

(2) *Nasal intubation may require facilitation with sedation. When hypovolemia is unlikely, morphine or valium, or a combination of both may be given by direct medical consultation to achieve mild sedation.*

EMT-P ONLY

3. AIRWAY MANAGEMENT: NEEDLE DECOMPRESSION THORACOSTOMY (NDT)

a) PURPOSE

(1) 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) (NEW '00)

(1) Patients who are assessed to have a life-threatening tension pneumothorax in extremis with diminished/absent lung sounds, hypotension, and/or arrest.

(2) ***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 is evident

4. OBSTRUCTED AIRWAY FOREIGN BODY REMOVAL: DIRECT LARYNGOSCOPY

a) PURPOSE

(1) The attempted correction of a foreign-body airway obstruction through direct laryngoscopy should be accomplished only by Maryland-certified/licensed CRTs and EMT-Ps. This is accomplished after the ALS provider has determined (by noting repeated unsuccessful attempts at dislodging the object by applying the standard method of abdominal thrusts 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 FOR TREATMENT

(1) Upper airway obstruction due to a foreign body that has not resolved with 5 abdominal thrusts

(2) Patient must be unconscious.

(3) Patient must be placed supine.

c) CONTRAINDICATIONS

(1) None

d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

(1) Trauma to the oral pharynx, vocal cords, esophagus, or trachea

e) PRECAUTIONS

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

5. 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 FOR TREATMENT

(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

(1) 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) Following intubation with either method, the gastric area and the lungs bilaterally are auscultated to confirm proper placement.

(3) The endotracheal tube may tend to slide into the right mainstem bronchus or withdraw beyond the cords. It is recommended to place the intubated patient in a cervical collar to limit these complications. (NEW '99)
(4) Maintain neutral alignment of head and neck with cervical stabilization when intubating trauma patients.
(5) 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) <u>Suggested Sizes for Endotracheal Tubes and Suction Catheters</u>

Age	Endotracheal Tube (Internal Diameter, mm)	Suction Catheters
New Born	3.0	6F
18 mo	4.0	8F
3 yr	4.5	8F
5 yr	5.0	10F
6 yr	5.5	10F
8 yr	6.0	10F
12 yr	6.5	10F
16 yr	7.0	10F
Adult (F)	7.5-8.0	12F
Adult (M)	8.0-8.5	14F

ENDOTRACHEAL TUBE SELECTION FOR A CHILD SHOULD BE BASED ON THE 16 PLUS CHILD'S AGE DIVIDED BY FOUR [(16 + YEAR) / 4 = TUBE SIZE]. AGE IN THE CHART IS A QUICK REFERENCE. ONE SIZE LARGER AND ONE SIZE SMALLER SHOULD BE ALLOWED FOR INDIVIDUAL VARIATIONS. (NEW '99)

6. ELECTRICAL THERAPY: AUTOMATED EXTERNAL DEFIBRILLATOR (AED)

a) INDICATIONS

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

b) CONTRAINDICATIONS

(1) Child less than 8 years of age (estimate based upon information available to individual operating AED).
(2) Patient is breathing, conscious, speaking, or making intentional movements.

ALERT 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.
(2) If shock is indicated:
    (a) Ensure all individuals are clear of the patient.
    (b) Initiate shock to the patient (200 J or biphasic).
    (c) Initiate analysis of the rhythm and repeat shock up to 3 times if indicated (300 J, 360 J or biphasic).

(d) If patient remains pulseless, perform CPR for 1 minute.

(3) Repeat the above sequence for a total of two additional cycles if indicated.

(4)  No more than 9 shocks will be delivered to one patient via AED without medical consultation.

(5) If shock is not indicated and the patient remains in cardiac arrest:
   (a) Perform CPR for 1 minute.
   (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.

(6) 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 analyses and shocks delivered, times of assessments and treatments, and the patient's response to shocks/CPR.

7. ELECTRICAL THERAPY: CARDIOVERSION

a) PURPOSE

(1) 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

(1) 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 (NEW '99)

(1) Adult
  (a) For symptomatic PSVT or atrial fibrillation/flutter:
    (i) Initial 50 J
    (ii) Susequent 100 J, 200 J, 300 J, 360 J
  (b) For other symtomatic tachydysrhythmias
    (i) Initial 100 J
    (ii) Susequent 200 J, 300 J, 360 J

(2) Pediatric
  (a) Symtomatic tachydysrhythmias
    (i) 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. (NEW '99)
    (ii) Subsequent 1.0 J/kg; repeat at 2.0 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

(1) Tachydysrhythmias due to digitalis toxicity

e) POTENTIAL ADVERSE EFFECTS/ COMPLICATIONS

(1) 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. (NEW ’99)

(2)  By medical consultation only, sedate by administering diazepam 2.5-10 mg slow IV push.

8. ELECTRICAL THERAPY: DEFIBRILLATION

a) PURPOSE

(1) 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 200 J or biphasic
  (b) Repeat delivered energy 300 J or biphasic
  (c) Repeat delivered energy 360 J or biphasic
(2) Pediatric
  (a) Initial delivered energy 2 J/kg or biphasic
  (b) Repeat delivered energy 4 J/kg or biphasic
  (c) Repeat delivered energy 4 J/kg or biphasic

d) CONTRAINDICATIONS

(1) 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. (NEW '99)

EMT-P ONLY

9. ELECTRICAL THERAPY: EXTERNAL TRANSCUTANEOUS CARDIAC PACING

a) PURPOSE

(1) 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 (NEW '99)

(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) 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.

(3) Bradycardia. (ECG other than second-degree Mobitz Type II or third-degree AV Block.)

(4) A patient with a heart rate of 60 BPM or less who is symptomatic, and presents with a systolic BP of 80-100 mmHg that is unresponsive to atropine.

(5) 

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.

(6) 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.

(7) 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 an EMT-P.

(8)  *Pediatric patients (40 kg or less) with profound symptomatic bradycardia unresponsive to optimal airway management, oxygenation, epinephrine, and atropine. Medical consultation is required for pacing pediatric patients.*

c) DOSAGE

(1) Start at a pacemaker heart rate of 80 beats per minute and the milli-amperes (m.a.) as low as possible and gradual increase m.a. until palpable pulse confirmed capture or 200 m.a.

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, consider diazepam 2.5-10 mg slow IV push with medical consultation.*

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

f) PRECAUTIONS

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

10. PASG (PNEUMATIC ANTISHOCK GARMENT [a.k.a. MAST])

a) PURPOSE

(1) PASG has the ability to provide stabilization of pelvic fractures and can reduce intra-abdominal hemorrhage when all three compartments are used simultaneously.

b) INDICATIONS FOR TREATMENT

ALERT PHYSICAL MANIFESTATIONS OF **PROFOUND SHOCK** MAY INCLUDE SOME OR ALL OF THE FOLLOWING: ALTERED MENTAL STATUS; LOSS OF PERIPHERAL PULSE; SEVERE HYPOTENSION.

(1) Adult Trauma
  (a) Must be in **profound shock** and have at least one of the following:
    (i) Suspected pelvic fracture
    (ii) Suspected intra-abdominal bleeding
    (ii) Suspected bilateral femur fractures

(2) Adult Non-Traumatic
  (a) Must be in **profound shock** and must obtain medical consultation

(3) Pediatric Trauma
  (a) Must be in **profound shock** and have a suspected pelvic fracture
  (b) Medical consultation must be obtained prior to inflation.

c) CONTRAINDICATIONS

(1) Uncontrolled hemorrhage at a site above the PASG application
(2) Respiratory distress
(3) Pulmonary edema
(4) Penetrating chest trauma
(5) Evisceration or impaled object in abdomen

d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

(1) Compromise diaphragmatic movement - respiratory compromise
(2) Unable to visualize or assess injuries under garment

ALERT SUDDEN REMOVAL OF THE PASG MAY PRECIPITATE CARDIOVASCULAR COLLAPSE.

e) PRECAUTIONS

(1) Re-assess respiratory status after inflation and ventilate with 100% oxygen as necessary.

(2) Direct manual pressure and visualization is superior to PASG application for control of localized external hemorrhage.

(3) PASG shall not to be used as an air splint for patients with extremity fractures (bilateral femur fractures excluded). This practice may induce compartment syndrome.

(4) All compartments of the PASG should be inflated simultaneously for adult and pediatric patients.

(5) Pediatric patient's weight must be between 18 and 45 kg (40 and 100 lbs.) and height between 3 feet 10 inches and 4 feet 10 inches.

ALERT DO NOT USE ADULT PASG ON PEDIATRIC PATIENTS IN ANY CONFIGURATION.

(6)  Medical consultation must be obtained prior to deflation of PASG.

(7) PASG shall be deflated slowly with careful monitoring of the blood pressure.

EMT-P ONLY

11. IV ACCESS AND MAINTENANCE: EXTERNAL JUGULAR (EJ) INTRAVENOUS ACCESS

a) PURPOSE

(1) The external jugular vein is a large vessel in the neck that may be used by EMT-Ps only for intravenous cannulation.

b) INDICATIONS

(1) EJs are appropriate when IV access is 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

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

e) PRECAUTIONS

(1) Carefully secure EJ catheter and tubing.

12. GLUCOMETER PROTOCOL (By January 1, 2000)

a) PURPOSE

(1) 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

(1) 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 are 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) If blood glucose is less than 70 mg/dl in **children over 2 months** of age, administer 2-4 ml/kg 25% dextrose (D25W is prepared by mixing D50W in equal parts with LR) 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 are present.

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

(e) If blood glucose is less than 30 mg/dl in **newborns (0-2 months)**, administer 2.0 ml/kg D10W (D10W is prepared by mixing one part of D50W with four parts LR). (NEW ’99)

EMT-P ONLY

13. INTRAOSSEOUS INFUSION (IO)

a) PURPOSE

(1) 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 infants and young children. More recently, it has been used frequently in the treatment of traumatically injured patients as well.

b) INDICATIONS

(1) Patients in which the following conditions are present: (NEW '99)
- *(a) Cardiac arrest,*
- *(b) Profound hypovolemia,*
- *(c) Status epilepticus,*
- *(d) Any life-threatening illness or injury requiring immediate pharmacological or volume intervention,*
- *(e) Unconscious, unknown etiology (i.e., near sudden infant death syndrome),* ***OR***
- *(f) Unavailability of vascular access, or following two unsuccessful peripheral IV attempts, for patients meeting the above criteria.*

(2) ***Allowable site*** *for IO;*
- *(a) Patients 6 years of age or less: locate the preferred site 1-3 cm distal to the tibial tuberosity on the anteromedial surface of the tibia(NEW '99)*

  OR

  locate the medial surface of the distal tibia just proximal to the medial malleolus (NEW '00)
- *(b) Patients greater than 6 years of age: locate the medial surface of the distal tibia just proximal to the medial malleolus (NEW '00)*

ALERT

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

c) 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 attempts in the same bone
(5) Cellulitis at the intended site of the procedure
(6) Patient with documented bone disorder

d) POTENTIAL ADVERSE EFFECTS / COMPLICATIONS

(1) Infection

(2) Extravasation of fluid

(3) Fat emboli

(4) Compartment syndrome

14. 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

(a) The EMT-Basic is authorized to perform IV maintenance of **NON-MEDICATED** IV solutions that contain only:
  (i) Lactated Ringer's solution
  (ii) 2.5%-10.0% dextrose in water
  (iii) 0.25%-0.9% saline solution
  (iv) Potassium chloride (KCL) added to the solution. The amount of KCL in solution shall not exceed 20 milli-equivilants (mEq)/liter. **OR**
  (v) Total Parenteral Nutrition (TPN)

ALERT

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

(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 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.

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

(i) Replace IV solution with an adequate volume, or

(ii) 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.

(a) If patient has signs or symptoms related to complications of IV therapy:

(i) Request authorized personnel at health care facility to correct the complication. (NEW ’99)

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.

ALERT 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.

ALERT 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

15. PERIPHERAL IV ACCESS FOR CRTs, EMT-Ps, AND IV ACCESS OPTION FOR EMT-B APPROVED BY THE EMS OPERATIONAL PROGRAM

a) PURPOSE

(1) 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. (NEW '99)
(4) In the event of a life-threatening emergency (with medical consultation) or cardiac arrest, indwelling central or peripheral venous catheters may be accessed for medication administration. (NEW '99)
(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) Maximum 2,000 ml LR without medical consultation (NEW '99)

(7) Second IV requires medical consultation.

c) CONTRAINDICATIONS

(1) See treatment protocols.

d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

(1) See IV Maintenance Therapy for EMT-B.

e) PRECAUTIONS

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

16. PERSONAL PROTECTIVE EQUIPMENT (NEW '99)

a) 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.

(1) OSHA Designations (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.

H. BLS PHARMACOLOGY

1. ACTIVATED CHARCOAL (WITH OR WITHOUT SORBITOL)

a) Indications

(1) Poisoning by mouth

b) Adverse Effects

(1) May indirectly induce vomiting and cause nausea

c) Precautions

(1) 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 grams/kg or (0.5 grams/lb)

(2) Pediatric: Administer 1 grams/kg or (0.5 grams/lb)

2. 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 repeat excessive use.
(2) Patient must have his/her own physician-prescribed hand-held aerosol inhaler.

d) Contraindications

(1) Inhaler not prescribed for the patient

e) Preparations

(1) 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.

3. EPINEPHRINE AUTO-INJECTOR

(Patient Prescribed, Patient Assisted)

a) Indications

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

(1) Patient must have his/her own physician-prescribed epinephrine auto-injector.
(2) Unless in severe allergic reaction or severe asthma, medical consultation should be obtained before administering to pregnant patients.

d) Contraindications

(1) Medication not prescribed for the patient
(2) None in the presence of anaphylaxis

e) Preparations

(1) Epinephrine Auto-injector only
(2) Adult: 0.3 mg
(3) Pediatric: 0.15 mg

f) Dosage

(1) Adult: 0.3 mg IM
(2) Pediatric: 0.15 mg IM
(3) Additional doses may be administered with medical consultation.

4. IPECAC

a) Indications

(1) Overdose of/ingested poison in alert patients

b) Adverse Effects

(1) Emesis may precipitate convulsions
(2) Retching may cause syncope

c) Precautions

(1) Must be followed by the administration of large amounts of water
(2) Protect patient from aspiration

d) Contraindications

(1) Altered mental status
(2) Ingestion of caustics or petroleum products
(3) Patients less than 9 months old

e) Preparations

(1) 15 or 30 ml vials of syrup

f) Dosage

(1) Adult:
    (a) Over 12 years of age: 30 ml followed by large amounts of water
(2) Pediatric:
    (a) 1-12 years of age: 15 ml orally followed by large amounts of water
    (b) 9-12 months of age: 10 ml orally followed by large amounts of water

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) Viagra™ ingestion within the last 24 hours

e) Preparations

(1) 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

(1) Not clinically significant

c) Precautions

(1) Patient without gag reflex may aspirate.

d) Contraindications

(1) Not clinically significant

e) Preparations

(1) 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.
(2) Pediatric: Administer 10-15 grams of glucose paste between the gum and cheek; this may be accomplished through several small administrations. (NEW ’99)

7. OXYGEN

a) Indications

(1) All medical and trauma patients

b) Adverse effects

(1) 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

(1) 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%

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I. ALS PHARMACOLOGY

1. ACTIVATED CHARCOAL (WITH OR WITHOUT SORBITOL)

a) Pharmacology
(1) Variable drug or toxin absorption when ingested

b) Pharmacokinetics
(1) Absorbs poisons and prevents toxins from entering body systems

c) Indications
(1) Poisoning by mouth

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

e) Adverse Effects
(1) Not clinically significant

f) Precautions
(1) Does not adsorb all drugs and/or toxic substances

g) Dose

(1) Adult: Administer 1.0 grams/kg (0.5 grams/lb)
(2) Pediatric: Administer 1.0 grams/kg (0.5 grams/lb)

2. ADENOSINE (ADENOCARD)

(EMT-Paramedic 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

(1) 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. (NEW '99)

d) Contraindications

(1) Known hypersensitivity

e) Adverse Effects

(1) Flushing, dyspnea, chest pressure, nausea, headache, dizziness, and hypotension

f) Precautions

(1) Effects antagonized by theophylline
(2) Effects enhanced by dipridimole (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

(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 to 0.2 mg/kg rapid IV/IO bolus; maximum initial dose of 6 mg; maximum second or third dose, 12 mg

3. 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)

d) Contraindications

(1) Known hypersensitivity

e) Adverse Effects

(1) 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

(1) Adult: 2.5 mg (3 ml) 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 (3 ml) by nebulized aerosol
    (b) Ages less than two years: 1.25 mg (1.5 ml) by nebulized aerosol

4. ASPIRIN (NEW '99)

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

b) Pharmacokinetics
(1) Blocks platelet aggregation

c) Indications
(1) Chest pain when acute myocardial infarction is suspected.

d) Contraindications
(1) Known hypersensitivity

e) Adverse Effects
(1) Heartburn
(2) Nausa and vomiting
(3) Wheezing

f) Precautions
(1) GI bleeding and upset

g) Dosage

(1) Adult: 162 mg or 325 mg chewed
(2) Pediatric: Not Indicated

5. ATROPINE SULFATE

a) Pharmacology

(1) Parasympatholytic (vagolytic action)
(2) Anticholingergic (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

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.): (NEW '99)
   (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

(1) Not clinically significant

g) Dosage

(1) Adult:

(a) Asystole: Administer 1.0 mg IVP/ET repeated every 3-5 minutes to a total of 0.04 mg/kg; maximum dose not to exceed 3.0 mg

(b) Bradycardia: Administer 0.5-1.0 mg IVP/ET repeated every 3-5 minutes to a total dose of 0.04 mg/kg

(2) Pediatric: Administer 0.02 mg/kg IV/IO/ET (with a **minimum** dose of 0.1 mg)

(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

6. BENZOCAINE

(EMT-Paramedic only)

a) Pharmacology

(1) Topical anesthetic on all accessible mucous membranes

b) Pharmacokinetics

(1) Rapid topical anesthesia in 15-30 seconds after application to mucous membranes

(2) Short duration of 15 minutes with virtually no systemic absorption

c) Indications

(1) Analgesia for nasal tracheal intubation

d) Contraindications

(1) Hypersensitivity/allergy to benzocaine

(2) Pediatric patients less than 14 years old since nasotracheal intubation is contrainidicated

e) Adverse Effects

(1) Loss of pharyngeal and tracheal gag reflex

f) Precautions

(1) Have suction ready, may precipitate coughing or vomiting

(2) Do not apply to the eyes

g) Dosage

(1) Adult: use 20% benzocaine spray in water-soluble base for 2-5 seconds per nares; may be repeated.

(2) Pediatric: Not indicated (Benzocaine is contraindicated for children under age 14.)

7. 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

(1) Rapid onset of action with IV administration

c) Indications

(1) Hyperkalemia
(2) Hypocalcemia
(3) To treat adverse effects caused by calcium channel blocker overdose (NEW '99)

d) Contraindications

(1) Not indicated in cardiac arrest except when hyperkalemia, hypocalcemia, or calcium channel toxicity are highly suspected
(2) Patient currently taking Digoxin with suspected calcium channel overdose (NEW '99)

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 -1.0 gram slow IVP (50 mg/min); may be repeated as needed at 10 minute intervals.
(2) Pediatric: Administer 20 mg/kg (0.2 ml/kg) slow IVP/IO (50 mg/min) Maximum dose 1 gram or 10 ml.

8. DEXTROSE 50%

a) Pharmacology

(1) 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

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

d) Contraindications

(1) Known hyperglycemia

e) Adverse Effects

(1) 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 25.0 grams in 50 ml IV (1 ampule of 50% solution)
(2) Pediatric:
    (a) If greater than 2 months of age - Administer 2.0-4.0 ml/kg of 25% dextrose IV/IO; (D25W is prepared by mixing D50W with an equal volume of lactated Ringer's).
    (b) If 0-2 months of age - Administer 2.0 ml/kg D10W IVP/IO (D10W is prepared by mixing one part of D50W with four parts LR).

9. DIAZEPAM (VALIUM)

a) Pharmacology

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

b) Pharmacokinetics

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

c) Indications

(1) Sustained and/or recurrent seizures
(2) Precardioversion to reduce anxiety
(3) Awake patient requiring transcutaneous pacing

d) Contraindications

(1) Known hypersensitivity, head injury, altered mental status
(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) It should be noted that 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

(1) Adult: Administer 2.5-10.0 mg IVP in 2.5 mg increments over 1 minute period.
(2) Pediatric: Administer 0.25 mg/kg slow IVP/IO over 3 minutes, maximum total dose 10 mg. (NEW '99)
Rectal Dose: Administer up to 0.5 mg/kg, maximum total dose 20 mg.

10. DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

a) Pharmacology

1) 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

(1) Known allergy to diphenhydramine

e) Adverse Effects

(1) 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 25.0 - 50.0 mg slow IVP or IM
(2) Pediatric: Administer 1.0 mg/kg slow IV/IO or IM
    Maximum single dose 25.0 mg
(3) Medical consultation required for doses greater than 25.0 mg.

11. 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 ug/kg/min
    (a) Dilates renal and mesenteric blood vessels
    (b) Venoconstricts
    (c) Arterial resistance varies
(5) At moderate doses, 2-6 ug/kg/min beta1 stimulating effect on heart
    (a) Results in increased cardiac output
(6) High dose, 6-10 ug/kg/min
    (a) 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
    (a) 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 ug/kg/min IV drip titrated to BP of 100 systolic or medical consultation selected BP; initial infusion rate 2-5 ug/kg/min (NEW '99)
(4) Pediatric: Administer 2-20 ug/kg/min IV drip titrated age specific BP or medical consultation selected BP; initial infusion rate is 2 ug/kg/min (NEW '99)

12. 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. (NEW ’00)

c) Indications

(1) Cardiac arrest
(2) Severe 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) (NEW ’00)

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 (NEW '00)

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 1.0 mg (1:10,000) IVP every 3-5 minutes;
    (ii) If this dose fails, consider 2-5 mg IVP every 3-5 minutes with medical consultation.
    (iii) If administered via ET, the dose should be 2-2.5 times the IV dose and if using 1:1,000 solution, dilute in 10 ml of lactated Ringer's.
  (b) Pediatric: IVP/IO:
    (i) 1st dose: 0.01 mg/kg (0.1 ml/kg) of 1:10,000
    (ii) 2nd dose: 0.1 mg/kg (1:1,000) (0.1 ml/kg); repeat every 3-5 minutes
    (iii) ET: All ET doses: 0.1 mg/kg of 1:1,000, diluted with 3-5 ml of lactated Ringer's solution; repeat every 3-5 minutes
(2) Bradycardia
  (a) Adult: not indicated
  (b) Pediatric IVP/IO:
    (i) Administer 0.01 mg/kg (0.1 ml/kg) of the 1:10,000 solution; repeat every 3-5 minutes
    (ii) ET: If administered via ET, the dose should be 2-2.5 times the IV dose; All ET doses: 0.1 mg/kg (1:1,000) solution, diluted in 3-5 ml of lactated Ringer's solution; repeat every 3-5 minutes (NEW '99)
(3) Anaphylactic Shock/Asthma
  (a) FOR ANAPHYLACTIC SHOCK ONLY
    (i) Consider Epinepherine 1:10,000 (0.1 mg/ml) with medical consultation; 0.01 mg/kg slow IVP/IO; maximum dose 1.0 mg (1 ml increments)

(b) Adult: 0.3 mg SC
(c) Pediatric: 0.01 mg/kg SC (1:1,000); maximum single dose: 0.3 mg

(4) Croup (NEW ’00)
(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

ALERT

ALL PATIENTS WHO RECEIVE NEBULIZED EPINEPHRINE MUST BE TRANSPORTED BY AN ALS UNIT TO AN APPROPRIATE FACILITY. (NEW ’00)

13. 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

(1) Acute pulmonary edema, CHF, hypertension, 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

(1) The administration of furosemide may cause or aggravate the following conditions:
    (a) Dehydration
    (b) Hypovolemia
    (c) Hypotension
    (d) Hyperosmolality
    (e) Hypokalemia

g) Dosage

(1) Adult: Administer 0.5-1.0 mg/kg slow IVP
(2) Pediatric: Administer 1.0 mg/kg slow IVP/IO; maximum dose of 50 mg

14. GLUCAGON *(EMT-Paramedic 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
(3) Beta blocker overdose with significant bradycardia (NEW '99)

d) Contraindications

(1) Known hypersensitivity

e) Adverse Effects

(1) Nausea and vomiting

f) Precautions

(1) Glucagon only works if liver has significant glycogen stores

g) Dosage

(1) For suspected hypoglycemia without IV access:
(a) Adult: Administer 1.0 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

15. IPECAC

a) Pharmacology

(1) Irritates the lining of the stomach
(2) Stimulates vomiting center in medulla

b) Pharmacokinetics

(1) Onset of action in 20-30 minutes

c) Indications

(1) Overdose of ingested poison in alert patients

d) Contraindications

(1) Altered mental status
(2) Ingestion of caustics or petroleum products
(3) Patients less than 9 months of age

e) Adverse Effects

(1) Emesis may precipitate convulsions.
(2) Retching may cause syncope.

f) Precautions

(1) Must be followed by the administration of large amounts of water
(2) Protect patient from aspiration

g) Dosage

(1) Adult:
    (a) Over 12 years of age: 30 ml orally followed by large amounts of water
(2) Pediatric:
    (a) 1-12 years of age - 15 ml orally followed by large amounts of water
    (b) 9-12 months of age - 10 ml orally followed by large amounts of water

16. LACTATED RINGER'S (NEW '99)

a) Pharmacology

(1) Isotonic crystalloid solution

(2) Lacted 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

(1) Lactated Ringer's is a water and electrolyte replacement.

c) Indications

(1) Hypovolemia

(2) Keep vein open

(3) Fluid boluses

d) Contraindications

(1) Fluid overload states

e) Adverse Effects

(1) 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). (NEW '99)

(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 challenge of 20 ml/kg LR IV/IO.

(c) If patient's condition does not improve, administer the second bolus of fluid at 20 ml/kg LR IV/IO. (NEW '99)

(d) Third and subsequent fluid boluses at 10 ml/kg LR IV/IO

17. LIDOCAINE (XYLOCAINE)

a) Pharmacology

(1) Suppresses ventricular ectopy
(2) Elevates VT and VF threshold
(3) Nasal anesthesia (NEW ’00)

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 (NEW ’00)

c) Indications

(1) Prevent recurrence of ventricular fibrillation/tachycardia after defibrillation and conversion to supraventricular rhythm (NEW ’99)
(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. (NEW ’99)
(6) Nasal tracheal intubation (NEW ’00)

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 1.0 -1.5 mg/kg IVP bolus followed by 0.5-0.75 mg/kg every 8-10 minutes as needed, up to 3.0 mg/kg.
ET dose: 2-2.5 times the above dose

(2) Adult without pulse: Administer 1.5 mg/kg IVP bolus initially followed by additional 1.5 mg/kg IVP bolus in 3-5 minutes to maximum of 3.0 mg/kg.
ET dose: 2-2.5 times the above dose

(3) Pediatric with pulse: Administer 1.0 mg/kg initial bolus and 0.5 mg/kg IVP/IO bolus every 8-10 minutes, as needed, to maximum of 3.0 mg/kg.
ET dose: 2-2.5 times the above dose

(4) Pediatric without pulse: Administer 1.0 mg/kg initial bolus IVP/IO bolus followed by 1.0 mg/kg IVP boluses in 3-5 minutes to a maximum of 3.0 mg/kg.
ET dose: 2-2.5 times the above dose

h) Inter-Facility Transport Only (NEW '99)

(5) IV Infusion

(6) Maintain the IV Infusion of lidocaine at the rate established by the sending physician and record vital signs every 15 minutes. (See Appendix, Lidocaine Infusion for Inter-Facility Transport.)

18. MORPHINE SULFATE

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) Acute pulmonary edema
(3) Burns
(4) Isolated injuries requiring pain relief

d) Contraindications

(1) Head injury
(2) Undiagnosed abdominal pain
(3) Multiple trauma
(4) COPD with compromised respiratory effort
(5) Hypotension
(6) 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.

g) 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) Pulmonary edema: Administer 2-10 mg slow IVP depending on age and weight of patient
    (c) Isolated injury (including burns): Administer 2-20 mg slow IVP at 1-2 mg/min increments to 20 mg or until pain is relieved
    (d) May also be administered IM dose 5-15 mg based on patient weight
(2) Pediatric: 0.1 mg/kg IVP/IO (1-2 mg/min)

19. NALOXONE (NARCAN)

a) Pharmacology

(1) 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 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

(1) To reverse respiratory and central nervous system depression induced by opiates

d) Contraindications

(1) Not clinically significant

e) Adverse Effects

(1) 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 is currently used.
(3) Should be administered and titrated so respiratory efforts return but not intended to restore full consciousness

g) Dosage

(1) Adult: Administer 0.4-2.0 mg IVP/IM; repeat as necessary to maintain respiratory activity.
ET dose: 2-2.5 times the above dose

(2) Pediatric: Administer 0.1 mg/kg IVP/IM, up to maximum initial dose of 2.0 mg; may be repeated as necessary to maintain respiratory activity.
ET dose: 2-2.5 times the above dose.

(3) Greater than 2.0 mg IV may be administered with medical consultation

20. 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

(3) Duration of action is less than 5 minutes

(4) Half-life is 1-4 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) Viagra™ ingestion within the last 24 hours

(4) Asymptomatic hypertension

(5) Blood pressure below 90 mmHg systolic

(6) Heart rate less than 60

e) Adverse Effects

(1) Headache, hypotension, nausea, vomiting, and dizziness, decreased level of consciousness

f) Precautions

(1) 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 3 times at 3-5 minute intervals)

(î) 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.

21. OXYGEN

a) Pharmacology

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

b) Pharmacokinetics

(1) 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

(1) Not clinically significant

e) Adverse Effects

(1) 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

22. SALINE NEBULIZED (NEW '00)

a) Pharmacology

(1) Increases moisture content in the airways.

b) Pharmacokinetics

(1) Nebulized saline droplets penetrate to the area of inflammation and provide cool moisture to the mucosa.

c) Indications

(1) Suspected croup

d) Contraindications

(1) 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
    (a) Contraindicated
(2) Pediatric
    (a) Administer 3 ml of saline by nebulizer.
    (b) May be repeated with medical direction.

23. SODIUM BICARBONATE

a) Pharmacology

(1) 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

(1) Pre-existing alkalosis

e) Adverse Effects

(1) Worsened intracellular acidosis due to carbon dioxide formation
(2) Hyperosmolality
(3) May precipitate CHF
(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 and repeated at 10-minute intervals of cardiac arrest; administration must be diluted (1:1)

24. 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

(1) 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 SC
(2) Pediatric: Not indicated

J. LIDOCAINE INFUSION FOR INTER-FACILITY TRANSPORT (NEW '99)

1. PURPOSE

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

2. INDICATIONS

a) 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

a) 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 referring 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

a) 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 (Q.I.) program monitoring the appropriateness and quality of care provided. The Q.I. program should be directed or coordinated by, at minimum, an ALS provider.

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K. RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE (NEW '99)

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 and inability to adequately suction airway*
- *(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 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) Combitube, Cricothyroidotomy equipment*
- *(e) Capnograph*

d) RSI Procedure

(1) Midazolam: Administer 0.05 mg/kg (2-5 mg) IVP over 1-2 minutes
(a) Hold for BP less than 80
(b) May omit for GCS = 3-8
(2) Lidocaine: Administer 1.0 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) May repeat succinylcholine 0.5 mg/kg IVP (20-50 mg) if inadequate relaxation after 2-3 minutes.

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 Combitube (refer to Combitube Section).
(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 Combitube as succinylcholine wears off, refer to Ventilatory Difficulty Secondary to Bucking Protocol.

g) If Unable to Ventilate

(1) Insert Combitube (refer to Combitube Protocol).

h) If still unable to ventilate using Combitube, remove and perform cricothyroidotomy (refer to Cricothyroidotomy Protocol).

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

a) Indication

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

b) Contraindication

(1) Non-intubated patients

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

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) If ventilatory difficulty is thought to be the result of pain response, Morphine may be used in addition to, or instead of, Midazolam:
  (a) 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

(4) Dose may be repeated in 4-6 minutes if necessary.

(5) Continue to monitor oxygen saturation and ventilate to desired end tidal carbon dioxide.

(6)  *Obtain on-line medical direction if further problems present.*

3. Pilot Protocol for Combitube

a) Indication

(1) 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)

b) Contraindications

(1) Responsive patients with an intact gag reflex
(2) Patients under 4 feet tall
(3) Known esophageal disease or ingestion of caustic substances

c) Procedure

(1) Select appropriate size Combitube:
(a) Combitube SA: Patients 4 ft-5½ ft tall
(b) Combitube: Patients greater than 5 ft tall
(2) Test cuffs and lubricate with water soluble jelly.
(3) Maintain cervical immobilization (if indicated) and lift tongue and jaw upward with one hand.
(4) Insert Combitube to the indicated depth; do not force.
(5) Inflate cuffs.
(6) Ventilate through primary tube #1 and evaluate lung ventilation (breath sounds, gastric sounds, chest rise, end tidal carbon dioxide, oxygen saturation).
(7) 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).
(8) If no lung ventilation, then deflate cuff #1, withdraw Combitube 2-3 cm, re-inflate cuff, and reevaluate ventilation through tube #1 (as in #6 and #7 of this section).
(9) Once effective ventilation is confirmed, continue to monitor oxygen saturation and ventilate to desired carbon dioxide level.
(10) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating Combitube, refer to Ventilatory Difficulty Secondary to Bucking Protocol.
(11) If unable to achieve adequate ventilation using Combitube, 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.

4. Protocol for Cricothyroidotomy (Surgical and Needle)

a) Indications

(1) Inability to ventilate despite having tried BVM with oropharyngeal/ nasopharyngeal airway, ET placement, and Combitube (if not contraindicated)

(2) Inability to place ET in the setting of life-threatening upper airway hemorrhage

(3) Completely obstructing upper airway foreign body that cannot be removed via BLS maneuvers or Magill forceps with direct visualization

b) Preparation

(1) Prepare suction and cricothyroidotomy kit.

(2) Begin at sternal notch and locate cricoid cartilage.

(3) Palpate cricothyroid membrane anteriorly between cricoid cartilage and thyroid cartilage.

(4) Prepare skin with betadine or alcohol swabs.

c) Surgical Cricothyroidotomy

(1) Stabilize thyroid cartilage and make vertical incision (1-1½ inches) over cricothyroid membrane. Alternatively, a needle puncture dilator device may be utilized.

(2) Palpate cricothyroid membrane with gloved finger and carefully make transverse incision through membrane. Insert scalpel handle and rotate 90 degrees.

(3) Insert a 6.0 mm cuffed ET tube, using the natural curve of tube.

(4) Insert ET tube to just beyond cuff.

(5) Inflate cuff and ventilate patient.

(6) Monitor oxygen saturation and 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.

Protocol for Cricothyroidotomy (Continued)

d) Needle Cricothyroidotomy

ONLY NEEDLE CRICOTHYROIDOTOMY SHOULD BE PERFORMED FOR PATIENTS LESS THAN THE AGE OF 10 WHO REQUIRE CRICOTHYROIDOTOMY.

(1) Insert 12- or 14-gauge over-the-needle catheter through the cricothyroid membrane at a 45-degree angle toward the feet. Aspiration of air with a syringe indicates tracheal entry.
(2) Hold needle in place and advance catheter, then remove needle.
(3) Attach catheter hub to intermittent jet oxygen insufflator valve.
(4) Manually secure catheter at hub at all times to prevent kinking or displacement.
(5) Monitor oxygen saturation.
(6) If significant resistance to ventilation develops, or if patient develops difficulty in tolerating cricothyroidotomy, refer to Ventilatory Difficulty Secondary to Bucking or Combativeness Protocol.

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 RAC Shock Trauma Attending Anesthesiologist, and*
- *(b) Must demonstrate proficiency to Attending Anesthesiologist's satisfaction*

b) Ongoing Demonstration of Proficiency

(1) A verification of all RSI skills and review of RSI principles of safety will be performed on a quarterly basis. In 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 SYSCOM Duty Officer for all RSI attempts

(3) Medical Director evaluation of all RSI attempts within 12 hours

d) Maintenance of detailed RSI database

6. MIDAZOLAM (VERSED)

a) Pharmacology

(1) Sedative
(2) Hypnotic

b) Pharmacokinetics

(1) 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

(1) 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 80 mmHg.

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

7. SUCCINYLCHOLINE (ANECTINE)

a) Pharmacology

(1) Neuromuscular blocking agent (depolarizing)

b) Pharmacokinetics

(1) Paralyzes skeletal muscles, including respiratory muscles, and removes gag reflex

c) Indications

(1) 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

(1) Paralysis occurs in 1-2 minutes and generally lasts 4-6 minutes.

g) Dosage/Route

(1) Ages 10 and up: 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.

8. VECURONIUM (NORCURON)

a) Pharmacology

(1) Neuromuscular blocking agent (non-depolarizing)

b) Pharmacokinetics

(1) Skeletal muscle relaxant
(2) Paralyzes skeletal muscles, including respiratory muscles

c) Indications

(1) 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) IP
(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.

V. OPTIONAL PROTOCOLS: WILDERNESS EMERGENCY MEDICAL SERVICES PROTOCOLS (NEW '00)

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
   a) As defined by the Wilderness EMS Institute, the definition of a wilderness environment shall include:
      (1) a tract or region uncultivated and not inhabited by human beings,
      (2) an uninhabitable region left in its natural condition,
      (3) 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.

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.

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
   a) Patients who are bleeding from an external site should be approached with caution and the mechanism of injury should be considered.
      (1) 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. Assement 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.

(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
         (a) 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.

(2) Numb the eye with Tetracaine.
  (a) 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 LIGHTHEADEDNESS 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 povadone-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
(1) Evacuate immediately if patient has:
  (a) an inability to void, or
  (b) severe leg weakness, or
  (c) 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.

(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.

(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
(a) 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.

(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.

(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.

(b) If you are within two hours of a dentist or oral surgeon, and a tooth is completely dislodged:
(i) 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
(a) 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.

b) Cold Emergencies
  (1) Hypothermia
    (a) Specific Treatment
      (i) 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.
    (b) Mild Hypothermia
      (i) Core Temperature between 93.2 and 96.8 F (34 -36 C)
      (ii) Rewarm.
        a. Give adequate food and drink as able.
    (c) Moderate - Severe Hypothermia
      (i) Core Temperature between 86 and 93.2 F (30 - 34 C)
      (ii) Add as much heat as possible using:
        a. Warm IVs
        b. Warm fluids by mouth to patients with normal LOC
        c. Heat packs at the lateral neck, armpits, and groin

DO NOT DELAY EVACUATION TO REWARM THE PATIENT.

      (iii) Provide fluids and food calories if able.

MONITOR CLOSELY FOR FLUID OVERLOAD.

    (d) Handling Hypothermic Patients
      (i) Handle gently to prevent ventricular fibrillation.
      (ii) Do not allow hypothermic patients to exert themselves during evacuation.
      (iii) Carry the patient flat or in a trendelenburg position.
    (e) Hypothermia and Cardiac Arrest
      (i) Assess pulse and respirations for three minutes.
      (ii) If available, monitor EKG.
        a. If an organized rhythm is present with a rate of 20 or greater:
          [1] Start artificial respiration. Use supplemental oxygen if available.
          [2] Do not perform external cardiac compression.
        b. If no organized rhythm is present:
          [1] Begin CPR.
      (iii) Consider transport to a facility that can perform bypass rewarming. Consult to determine most appropriate destination.

(f) Advanced Life Support Management of the Hypothermic Patient
(i) If the core temperature is greater than 86 F (30 C), follow standard protocols for resuscitation.
(ii) If the core temperature is less than 86 F (30 C), rewarm the patient before attempting to defibrillate.
(iii) 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.

(g) Frostbite and Immersion Foot
(i) Superficial Frostbite
a. Rewarm the affected part.
(ii) Deep Frostbite
a. Treat Hypothermia first if present.
b. Rewarm the affected part if rewarming can be maintained.
c. 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.

(2) Any patient experiencing chest pain should be examined by a physician as soon as possible.

b) Abdominal Pain
   (1) Acute Abdomen
      (a) Evacuate Immediately.
      (b) Give nothing by mouth if less than 12 hours from the hospital.
      (c) If there is no suspected C-spine injury, position the patient in a lateral recumbent position to alleviate pain.
      (d) Consult medical directiion.

c) Vomiting and Diarrhea
   (1) 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.
      (1) 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
   a) 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
      (1) 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
      (1) For WEMS purposes, signs/symptoms of shock include, but are not limited to the following:
         (a) Tachycardia
         (b) Tachypnea
         (c) Pale skin
         (d) Cool/moist skin
         (e) Weak thready pulse
         (f) Dry mouth
         (g) 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

Additional Medications for Wilderness EMS

1. Aspirin
2. Tetracaine
3. Cefazolin (Ancef)
4. Hank's solution
5. Acetaminaphen (Tylenol)
6. Bacitracin
7. Povidone-Iodine (Betadine)

ACETAMINOPHEN (Tylenol)

AVAILABILITY. . . . . Tablet: 325 mg acetaminophen (OTC)
ACTION. . . . . Analgesic, increases pain threshold
Antipyretic, acts on the hypothalamic heat regulating center
INDICATIONS. . . . . Minor aches, pains, headaches, fever
CONTRAINDICATIONS. . .Hypersensitivity to acetaminophen
PRECAUTIONS. . . . . .OD (greater than 10 g adult; greater than 140 mg/kg child) may cause hepatic toxicity.
Early symptoms include nausea, vomiting, diaphoresis, and malaise.
For pain, do not take for more than 10 days (adult) or 5 days (child).
For fever, do not take for more than 3 days.
SIDE EFFECTS. . . . . .Sensitivity is rare.
INTERACTIONS. . . . . None
DOSE. . . . . 325-650 mg (10-15 mg/kg) PO; q.i.d., PRN
PEDIATRIC DOSE. . . . . less than 6 yrs: 10-15 mg/kg PO; q 4 h, PRN
6-12 yrs: 160 mg PO; q.i.d., PRN

ASPIRIN

AVAILABILITY. . . . . Tablet: 325 mg aspirin (OTC)
Adult chewable (children's) aspirin: 81 mg aspirin (OTC)
ACTION. . . . . Inhibits prostaglandin synthesis of platelets, analgesic, antipyretic, anti-inflammatory
INDICATIONS. . . . . Minor aches, pains, headaches, fever
CONTRAINDICATIONS. . . Children less than 6 yrs (Reye's syndrome); last trimester of pregnancy; allergy to aspirin; asthma; gastric ulcers; suspected bleeding.
PRECAUTIONS. . . . . Do not use with prescription drugs for arthritis (anti-inflammatory); anticoagulation; diabetes; gout
SIDE EFFECTS. . . . . Gastritis; tinnitus (signs of overdose); hypertension
INTERACTIONS. . . . . Potentiates other analgesics, anticoagulants
DOSE. . . . . 325-650 mg (10-15 mg/kg) PO; q.i.d., PRN
PEDIATRIC DOSE. . . . . 6-12 yrs: 160 mg PO; q.i.d., PRN

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 mls 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.

POVIDONE-IODINE (Betadine)

AVAILABILITY. . . . . Supplied in a 10% solution
ACTION. . . . . A topical antimicrobial solution
INDICATIONS. . . . . Superficial trauma
CONTRAINDICATIONS. . . A patient with a known hypersensitivity
PRECAUTIONS. . . . . .For external use only
SIDE EFFECTS. . . . . .None
INTERACTIONS. . . . . None
DOSE. . . . . Clean the affected area with the solution and apply to the dressing as necessary.
PEDIATRIC DOSE. . . . . .Clean the affected area with the solution and apply to the dressing as necessary.

TETRACAINE

AVAILABILITY. . . . . Bottled solution (0.5%)
ACTION. . . . . Topical anesthetic for use on the eye
INDICATIONS. . . . . Foreign body in the eye
CONTRAINDICATIONS. . . Hypersensitivity
PRECAUTIONS. . . . . .Tolerance varies with the status of the patient.
INTERACTIONS. . . . . None
DOSE. . . . . Place 2 drops in affected eye.
PEDIATRIC DOSE . . . . . Not indicated

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 caualty 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.

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.

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/m^3); 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.

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).

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.

Nerve Agents (GA, GB, GD, GF, VX) (continued)

3. Treatment:

a. Initial Management:

(1) Mild to moderate: Dyspnea should be treated with one or two doses of atropine IM or IV and 1 dose of pralidoxime (IV drip) 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).

(2) Severe: Administer 3 doses of atropine IM (not IV in hypoxic patient) and start 1 dose of pralidoxime 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 (IM until hypoxia is improved, then IV) 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).

(3) Eyes: Do not treat miosis unless eye/head pain is severe. Use topical, not systemic, anticholinergic to relieve pain.

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.

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.

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

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

PRALIDOXIME (2-PAM, Protopam) dosage chart at 50 mg/mL (For IV use) – (50 mg/kg Pediatric, 1000 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)	20 mL
10 years	30 kg (66 lb)	20 mL
11 years	35 kg (77 lb)	20 mL
12 years	40 kg (88 lb)	20 mL
13 years	45 kg (99 lb)	20 mL
14 years or more	50 kg (110 lb) or more	20 mL
Adult	50 kg (110 lb) or more	20 mL

PRALIDOXIME (2-PAM, Protopam) dosage chart at 300 mg/mL (For IM use) – (40 mg/kg Pediatric, 1000 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
12 months	10 kg (22 lb)	1.3 mL
3 years or more	15 kg (33 lb) or more	2 mL
Adult	50 kg (110 lb) or more	20 mL

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

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:

Botulinim 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.

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 burnetti. 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 to12th 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 burnetti.. 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 beworn.
(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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