The Maryland

# Medical Protocols

## for Emergency Medical Services Providers

Effective July 1, 2004.

**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

**www.MIEMSS.org.**

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

The 2004 update of the *Maryland Medical Protocols for EMS Providers* is relatively small in comparison to previous updates. While few in number, the revisions are significant to the successful outcome of prehospital patient care delivered to the citizens of Maryland. This year a formal protocol update class is not required by MIEMSS; however, a jurisdiction may elect to have providers participate in an update program to receive their update material. **It is the responsibility of each provider to review the enclosed material to ensure he/she is familiar with the revisions.**

A copy of the 2004 Protocol Update Summary is included with the update. This spreadsheet specifically outlines each revision by providing the protocol title with its page and line numbers, as well as the old and new text for each change. The updated material, the entire protocol with the 2004 update revisions, and the Protocol Update Summary can be found in PDF format on the MIEMSS web page at www.MIEMSS.org.

Recommendations for new protocols are encouraged and should be directed to your EMS Operational Program Medical Director or to the Office of the State EMS Medical Director in writing with supporting documentation and/or justification for their implementation. Please send your recommendations by either email (ralcorta@miemss.org) or fax (410-706-0853). The Protocol Review Committee has already begun discussing additions for the 2005 update.

A "thank you" goes to all health care providers in Maryland for your hard work and dedication. Your continuous efforts will ensure that the Maryland EMS System remains a world leader in the delivery of prehospital emergency care.

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

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

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

ALERT

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

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

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

THE FIRST RESPONDER SHALL DOCUMENT ALL PATIENT CARE.

## B. IMPORTANT NUMBERS

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

## IMPORTANT NUMBERS (Continued)

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

8. Poison Control Centers
   a) Maryland Poison Center/University of Maryland School of Pharmacy, Baltimore **(800) 222-1222**

   b) National Capital Poison Center, Washington, DC **(800) 222-1222**

9. In-Patient Hospice Facilities
   a) Hospice of Baltimore–Gilchrist Center **(410) 512-8200**

   b) Joseph Richey Hospice–Joseph Richey House **(410) 523-2150**

   c) Stella Maris Hospice **(410) 560-9695**

   d) Stella Maris Hospice at Mercy Hospital **(410) 332-9534**

## C. HEALTH CARE FACILITY CODES

| Code | Health Care Facility Name |
|---|---|
| 345 | 10th Street Medical Center, Ocean City, MD |
| 346 | 26th Street Medical Center, Ocean City, MD |
| 379 | 63rd Street Medical Center, Ocean City, MD |
| 380 | 75th Street Medical Center, Ocean City, MD |
| 347 | 93rd Street Medical Center, Ocean City, MD |
| 409 | 126th Street Medical Center, Ocean City, MD |
| 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 Hospital Center |
| 238 | Carter Community Mental Health & Retardation Center |
| 755 | Central Industrial Medical Center |
| 276 | Chambersburg Hospital, PA |
| 284 | Charlestown Area Medical Center |
| 241 | Chemtrec Chemical Manufacturers Association Chemical Transportation Emergency Center, Washington, DC |
| 296 | Chester River Hospital Center (formerly Kent & Queen Anne's Hospital) |
| 243 | Chestnut Lodge Hospital |
| 419 | Children's Hospital - Hershey Medical Center - Hershey, PA |
| 225 | Children's Hospital & Center for Reconstructive Surgery - Baltimore, MD |

| Code | Health Care Facility Name |
|---|---|
| 756 | Children's Hospital of Pennsylvania |
| 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 |
| 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 |
| 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 |
| 335 | George Washington University Hospital, DC |
| 337 | Georgetown University Hospital, DC |

| Code | Health Care Facility Name |
|---|---|
| 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 |
| 451 | Joseph Richey Hospice - Joseph Richey House, Baltimore, MD |
| 274 | Kennedy-Krieger Institute (formerly John F. Kennedy Institute for Handicapped Children) |

| Code | Health Care Facility Name |
|---|---|
| 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 |
| 307 | Newark Emergency Center, Newark, DE |
| 568 | Newark Hospital, NJ |
| 762 | Newmedico Rehabilitation |

| Code | Health Care Facility Name |
|---|---|
| 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 |
| 454 | Peninsula Regional Medical Center, Transitional Care Unit |
| 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 |
| 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 |
| 367 | Saint Luke Institute |
| 333 | Saint Mary's Hospital |
| 455 | Salisbury Genisis Center |

| Code | Health Care Facility Name |
|---|---|
| 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 |
| 224 | Upper Chesapeake Health System |
| 374 | U.S. Naval Medical Clinic, Annapolis |
| 576 | U.S. Public Health Hospital, MD |
| 375 | U.S. Soldier's and Airmen's Home, DC |
| 298 | Union Hospital of Cecil County |
| 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 |
| 224 | Upper Chesapeake Health System (formerly Fallston General 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 |
| 456 | Washington County Health System, Psychiatric Unit |
| 764 | Washington County Health System, Skilled Nursing Facility, MD |
| 327 | Washington Hospital Center, DC |
| 728 | Washington Hospital Center, DC, Adult Trauma Center |
| 727 | Washington Hospital Center, DC, Burn Center |
| 269 | Waynesboro Hospital, Waynesboro, PA |
| 323 | West Virginia University Hospital, WV |
| 290 | Western Maryland Center, MD |
| 775 | Western Maryland Health System, Comprehensive Inpatient Rehabilitation Unit (Cumberland Memorial) |
| 320 | Western Maryland Health System, Cumberland Campus |
| 620 | Western Maryland Health System, Cumberland Trauma Center |
| 321 | Western Maryland Health System, Sacred Heart Campus |
| 776 | Western Maryland Health System, Sacred Heart Psychiatric Unit (Sacred Heart) |
| 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

***Level III Trauma Centers***

- Western Maryland Health System, Memorial Campus
- Peninsula Regional Medical Center, Salisbury
- Washington County Hospital, Hagerstown

### Specialty Referral Centers

***Eye Trauma***

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

***Hand/Extremity Trauma***

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

***Hyperbaric Medicine***

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

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

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

***Pediatric Trauma***

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

***Burns***

- Baltimore Regional Burn Center/ Johns Hopkins Bayview Medical Center, Baltimore
- Burn Center/ Washington Hospital Center, Washington, DC

## Specialty Referral Centers

***Perinatal Referral Centers***

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

## E. PROTOCOL KEY

1. Basic Life Support Level Care

2. Advanced Life Support Level Care

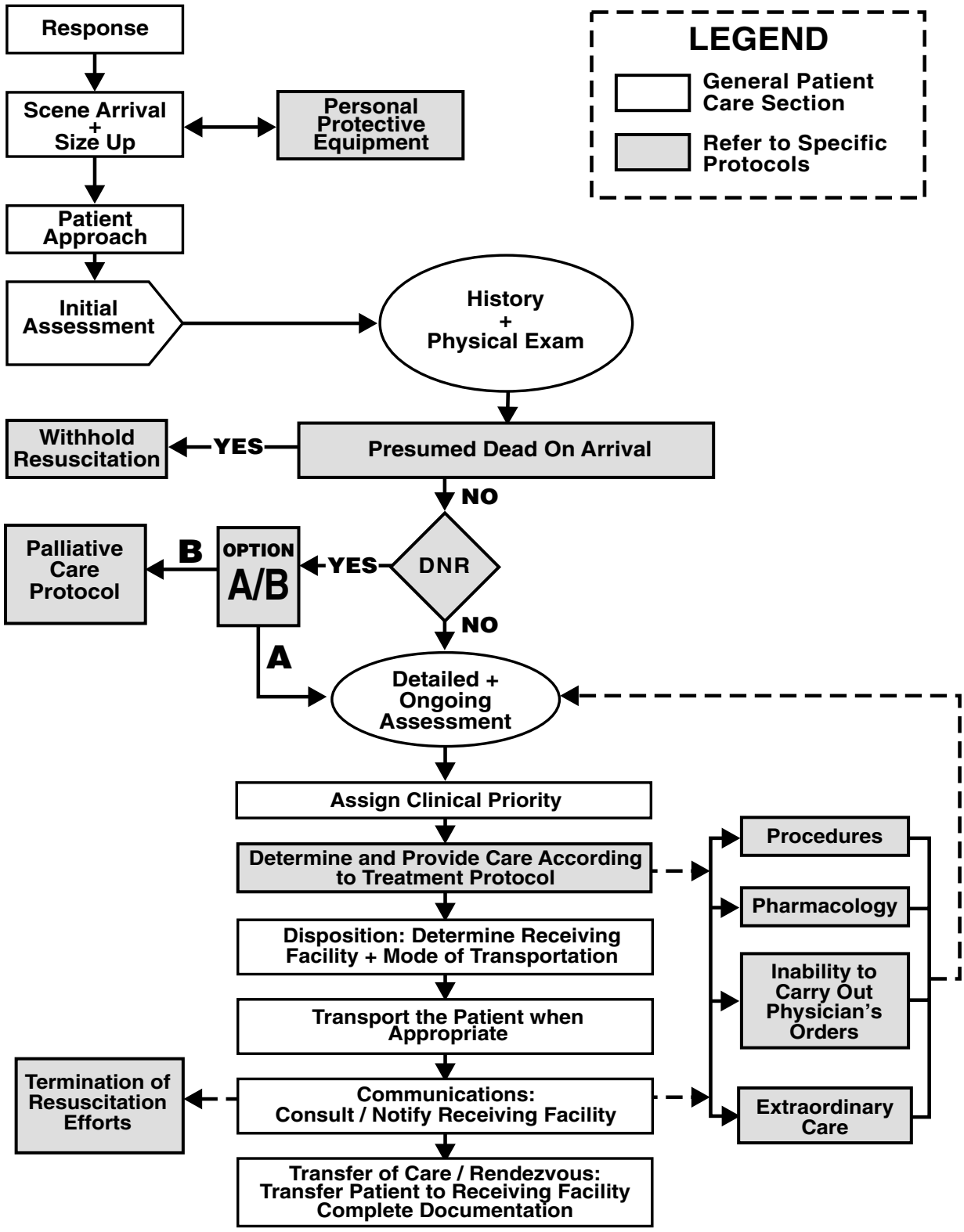
3. Requires Medical Consultation

4. Pediatric Care
   NOTE: ALL PROVIDERS (BLS & ALS) SHOULD CHECK ALL PEDIATRIC SECTIONS FOR NECESSARY CARE.

5. Caution/Warning/Alert

[ ] *or Italics* 6. Indicates EMT-Paramedic only

## F. PROTOCOL USAGE FLOW DIAGRAM



**G. PROTOCOL VARIATION PROCEDURE:** 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 the 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. Public Service Programs and Licensed Commercial Programs shall provide the following written notification:

   a) 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.

   b) 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.

   c) 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.

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

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**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:

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

      (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 MIEMSS 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

      (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 Treatment Protocols.

1. **ALL** of the following criteria MUST be present for prehospital providers to proceed with an order under this section:

   a) During the consultation, both the consulting physician and the provider must acknowledge and agree that the patient's condition and extraordinary care are not addressed elsewhere within these medical protocols, and that the order is absolutely necessary to maintain the life of the patient.

   b) The provider must feel capable, based on the instructions given by the consulting physician, of correctly performing the care directed by the consulting physician.

   c) When such an order is carried out, the consulting physician and the provider must immediately notify the State EMS Medical Director (via SYSCOM, 800-648-3001) of the extraordinary care situation. In addition, the provider must fax documentation of the rationale for extraordinary care within **24 hours** to the State EMS Medical Director at (410) 706-0853. Attendance at a subsequent review meeting shall be required.

   d) The prehospital provider must inform the consulting physician of the effect of the treatment, and notify the receiving physician of the treatment upon arrival at the hospital (if the receiving physician is different than the consulting physician). The prehospital provider must also notify his/her BLS/ALS Program Medical Director within **24 hours**.

   e) The public service local EMS jurisdiction and the Program Medical Director must then submit written notification of the incident to the Regional Medical Director with a copy to the State EMS Medical Director within **5 days** of the incident.

   f) The commercial ambulance company and the Program Medical Director must submit written notification of the incident to the Director of the State Office of Commercial Ambulance Licensing and Regulation and the State EMS Medical Director within **5 days** of the incident.

   g) The State EMS Medical Director shall conduct a review conference to include when appropriate: the prehospital provider, the on-line physician who provided the medical consultation, the appropriate local jurisdictional official(s), the Program Medical Director, and the Regional Medical Director.

h) Reports of incidents shall be submitted by the State EMS Medical Director to the Incident Review Committee and, when appropriate, to the Board of Physician Quality Assurance.

2. If a prehospital provider receives an order for care that is not covered by Maryland protocols, but does not feel comfortable with it or does not agree that it is absolutely necessary to maintain the life of the patient, he/she shall proceed with the “Inability to Carry Out a Physician's Order” section.

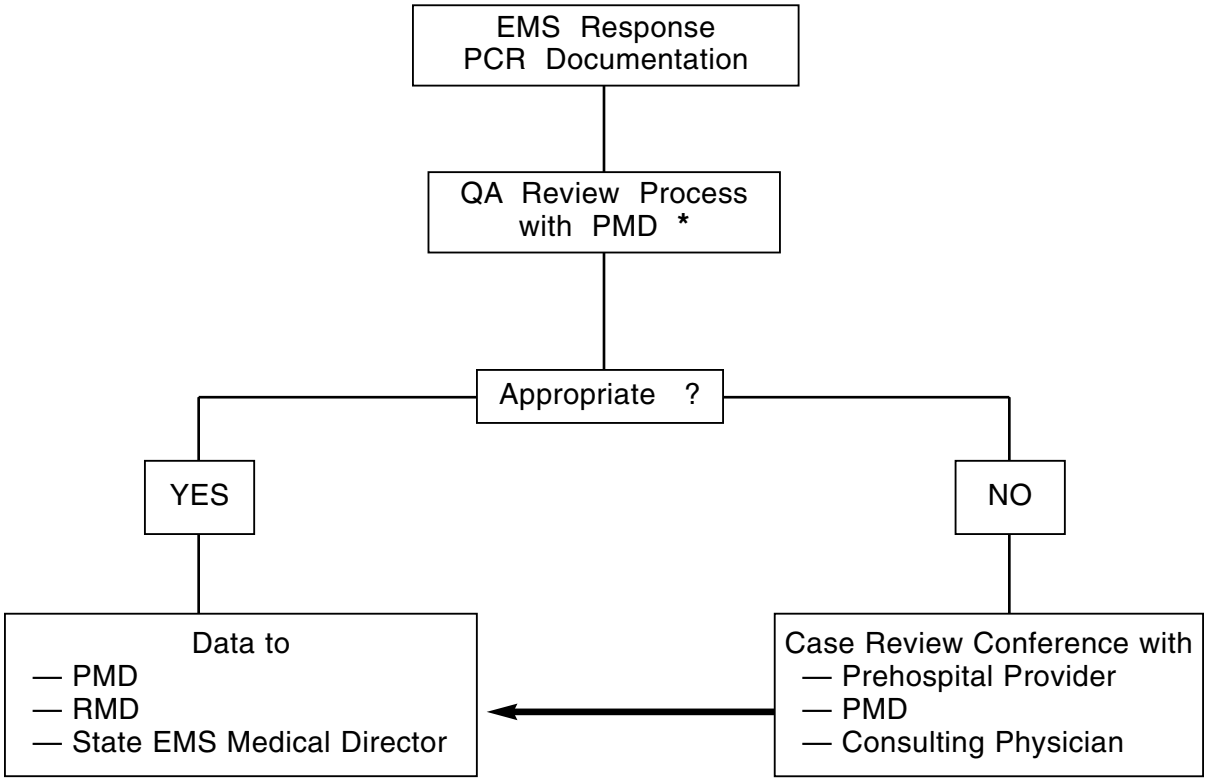
3. Protocols provide a safe basis for prehospital intervention and transport, and provide both prehospital providers and on-line physicians with parameters for this care. Extraordinary care situations not within the protocols may occur a handful of times over a span of years. The extraordinary care protocol is intended to address the potential moral/ethical dilemma which may arise in unanticipated or unforeseen situations not specifically addressed within protocols. The extraordinary care protocol is neither a "carte blanche" for any and all actions nor a device to avoid or circumvent protocols. In all situations, emergency health care providers, both prehospital providers and on-line physicians providing medical direction, are accountable for their actions in discharging their patient care responsibilities.

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

1. Through a quality assurance review process, directly involving the Program Medical Director (PMD), developed by the local program and approved by the PMD, the respective Regional Medical Director (RMD) and the State EMS Medical Director, the local program will review the runsheet and patient outcome records to determine the appropriateness of each individual use of the skill or administration of the medication. If the pilot procedure or medication is judged to be an appropriate intervention, the occurrence is added to the jurisdictional database and forwarded to the Regional Medical Director and the State EMS Medical Director.

2. If a variance or questions arise from the review of the case, a case review conference will be held with the provider, the PMD, and if indicated, the on-line medical consultant with the summary of the findings to be reported to the Regional Medical Director and the State EMS Medical Director.

**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

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).

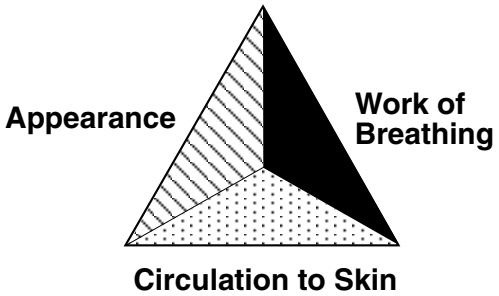
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures.

## D. INITIAL ASSESSMENT

ALERT

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

FOR PEDIATRIC PATIENTS, CONSIDER USING THE PEDIATRIC ASSESSMENT TRIANGLE (NEW '03)




1. Assess mental status
   a) **A**lert
   b) Responds to **V**erbal stimuli
   c) Responds to **P**ainful stimuli
   d) **U**nresponsive

2. Airway
   a) Open and establish airway using appropriate adjunct.
   b) Place patient in appropriate position.
   c) Suction airway as needed, including tracheostomy tubes. (New '04)

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.

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

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

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

ALERT NEVER WITHHOLD OXYGEN FROM A PATIENT IN RESPIRATORY DISTRESS!

| DEVICE | FLOW RATE | CONCENTRATION |
|---|---|---|
| Nasal Cannula | 2-6 lpm | 28-44% |
| 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:
         (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:
         (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 8 years of age or greater:
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).
   b) Cervical Spine Immobilization
      (1) If patient presents with a traumatic mechanism which could cause cervical spine injury and meets ANY of the following criteria, complete Spinal Immobilization (C-spine and back) should occur.
         (a) History of Loss of Consciousness (LOC) or Unconscious?
         (b) Disoriented or altered LOC?
         (c) Suspected use of Drugs or Alcohol?
         (d) Midline Cervical Tenderness or Pain?
         (e) Focal Neurologic Deficit?
         (f) Has a painful distracting injury that could mask cervical pain or injury?
         (g) Child less than 8 years of age

      (2) If NO to all of the above, transport as appropriate.

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

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

7. Assign Clinical Priority
   a) Priority 1 — Critically ill or injured person requiring immediate attention; unstable patients with 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
      Consider mode of transport (air, land, water, etc.).
   b) Status
      Evaluate need for emergent versus non-emergent transportation.

# HISTORY AND PHYSICAL EXAMINATION

## TRAUMA PATIENT

### Significant MOI

Rapid Trauma Assessment

D
C
A
P
B
T
L
S

- Head
  - Crepitation
- Chest
  - Crepitation
  - Respiration
  - Paradoxical Motion
  - Breath Sounds
- Abdomen
  - Rigidity
  - Distention
- Pelvis/GU
  - Pain on Motion
  - Blood,Urine,Feces
- Extremities
  - Pulse/Motor/Sensory
- Posterior

Baseline Vital Signs
Obtain **SAMPLE** History

**S**igns & Symptoms
**A**llergies
**M**edications
**P**ertinent History
**L**ast Oral Intake
**E**vents 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

**S**igns & Symptoms
**A**llergies
**M**edications
**P**ertinent History
**L**ast Oral Intake
**E**vents Prior

## MEDICAL PATIENT

### Unresponsive Patient

Rapid Physical Examination

D
C
A
P
B
T
L
S

- Head
- Neck
  - JVD
  - Medical Alert Device
- Chest
  - Breath Sounds
- Abdomen
  - Rigidity
  - Distention
- Pelvis/GU
  - Blood,Urine,Feces
- Extremities
  - MSP
  - Medical Alert Device
- Posterior

Baseline Vital Signs
Obtain History of Episode

**O**nset
**P**rovocation
**Q**uality
**R**adiation
**S**everity
**T**ime

Obtain **SAMPLE** History

### Responsive Patient

Obtain History of Episode

**O**nset
**P**rovocation
**Q**uality
**R**adiation
**S**everity
**T**ime

Baseline Vital Signs
Obtain **SAMPLE** History

**S**igns & Symptoms
**A**llergies
**M**edications
**P**ertinent History
**L**ast Oral Intake
**E**vents Prior

Focused Physical Exam
**DCAPBTLS**

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

CONSIDER ALS, PERFORM INTERVENTIONS, AND TRANSPORT.

# DETAILED AND ONGOING ASSESSMENTS

## DETAILED EXAMINATION

**D C A P B T L S**

HEAD
- Scalp & Cranium
  - Crepitation
- Eyes
  - Discoloration
  - Equality
  - Foreign Bodies
  - Blood in Anterior Chamber
- Ears & Nose
  - Fluid Drainage or Bleeding
  - Discoloration
- Mouth
  - Teeth & Foreign Bodies
  - Swelling or Lacerations
  - Breath Odor
  - Discoloration

NECK
- Jugular Vein Distention
- Trachea Position
- Crepitation

CHEST
- Paradoxical Motion
- Breath Sounds
- Crepitation

ABDOMEN
- Rigidity
- Distention

PELVIS/GU
- Pain on Motion

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.

## 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 must be appropriate for the size and weight of the patient.
   b) The developmental age of the infant/child must be considered in the communication and evaluation for treatment.
   c) Treatment priorities are similar to the adult patient.
   d) When appropriate, family members should remain with pediatric patients.
   e) Infants and children must be properly restrained prior to and during 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.

ALERT

ON-LINE MEDICAL CONSULTATION MAY BE OBTAINED AT ANY TIME FOR ANY PATIENT, IF DESIRED BY THE PREHOSPITAL EMS PROVIDER. PEDIATRIC AND SPECIALTY CONSULTATION IS ENCOURAGED FOR TRAUMA AND MEDICAL PATIENTS. CONSULTATION WITH PEDIATRIC AND SPECIALTY CENTERS SHALL OCCUR SIMULTANEOUSLY WITH A BASE STATION CONSULT. (NEW '03)

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

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.

2. Mode of transport (air, land, water, etc.)
   a) Medevac patients with indications for specialty referral center should be flown to the appropriate type of specialty center if not more than 10-15 minutes further than the closest trauma center. (Patients with an airway, breathing, or circulatory status who would be jeopardized by going an additional 10-15 minutes should go to the closest trauma center.)
   b) Consider utilization of a helicopter when the patient's condition warrants transport to a trauma or specialty referral center and the use of a helicopter would result in a clinically significant reduction in time compared with driving to a trauma/specialty center. (New '04)

c) If the time of arrival at the trauma or specialty referral center via ground unit is less than 30 minutes, there will generally not be a benefit in using the helicopter, especially for Trauma Decision Tree classes “C” and “D”. (New ’04)

d) Refer to the trauma decision tree when considering use of aeromedical transport. Provide SYSCOM with the patient’s Category (A, B, C, or D).

e) On-line medical direction should be obtained from the local trauma center and the specialty referral center when transport to the specialty center would require more than 10-15 minutes additional transport time.

(1) Pediatric Trauma Patients: Indications as per the pediatric section of the trauma protocols.

(2) Spinal Trauma Patients: Indications as per spinal trauma protocol.

(3) Head Injury Patients: Indications as per head injury protocol.

(4) 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.

(5) Hand Injury Patients: Indications as per hand protocol. Special note: Medevac patients with appropriate indications for hand center referral should normally be flown to the hand center, regardless of the location of the closest trauma center.

3. Status

Evaluate the need for emergent versus non-emergent transportation.

ALERT

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

## J. TRANSFER OF CARE/RENDEZVOUS

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

## K. DOCUMENTATION

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

## L. CONFIDENTIALITY

Patient confidentiality must be maintained at all times.

## M. PROFESSIONAL CONDUCT

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

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# III. TREATMENT PROTOCOLS

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

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

## A. ABUSE/NEGLECT

1. Initiate General Patient Care.

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

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

2. Presentation

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

3. Treatment
   a) Stabilize injuries according to protocol.

   b) Discourage patient from washing if sexual abuse is suspected.

   c) Document the following information on the PCR:
      (1) All verbatim statements made by the patient, the parent, or caregiver shall be placed in quotation marks, including statements made about the manner of the injuries.

      (2) Any abnormal behavior of either the patient, parent, or caregiver must be documented.

      (3) Document the condition of the environment and other residents present.

**ABUSE/NEGLECT (Continued)**

(4) Document the time the police/welfare agency was notified and the name of the person notified.

(5) Document the name of the receiving health care provider (RN, PA, MD) and any statements made.

d) Treat injuries according to presentation.

4. Continue General Patient Care.

## B. ALTERED MENTAL STATUS: SEIZURES

1. Initiate General Patient Care.

2. Presentation

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

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

   e) Consider diazepam (Paramedic may perform without consult for patients with active seizures.)
      2.5 mg increments slow IVP
      Maximum dose 10 mg
      If patient is status, consider IO administration of diazepam.

## ALTERED MENTAL STATUS: SEIZURES (Continued)

f) If the patient is still seizing:

(1) DO NOT RESTRAIN.

(2) Protect from further injury.

(3) Consider underlying cause of seizure.

g) When seizure activity has stopped:

(1) Identify and treat any injuries.

(2) If patient is a known diabetic, glucose paste (10-15 grams) should be administered between the gum and cheek.

---

h) Initiate IV/IO.

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

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

ALERT

FOR A CHILD ACTIVELY SEIZING, ADMINISTER RECTAL VALIUM AND RESERVE IO FOR LIFE-THREATENING ILLNESS.

k) The paramedic may assist patients with the administration of their prescribed benzodiazepine. (NEW '03)

l) Consider diazepam for seizures lasting greater than 10 minutes (Paramedic may perform without consult for patients with active seizures.)
Up to 0.2 mg/kg rectal
Maximum total dose 10 mg
**OR**
0.10 mg/kg SLOW IVP/IO
Maximum total dose 5 mg

m) Additional doses of diazepam require medical consultation

4. Continue General Patient Care.

## C. ALTERED MENTAL STATUS: UNRESPONSIVE PERSON

1. Initiate General Patient Care.

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

ALERT

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

3. Treatment
   a) Obtain pulse oximetry, if available.

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

---

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

   d) Obtain blood sample using closed system.

   e) **If patient has constricted pupils and respiratory depression or is unresponsive and the provider strongly suspects a narcotic overdose,**
      Administer naloxone
      0.4 - 2.0 mg SLOW IVP/ET/IM
      ET 1.0-5.0 mg
      Titrate to adequate respiratory effort.

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

   g) Consider an additional dose of naloxone.

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

## ALTERED MENTAL STATUS: UNRESPONSIVE PERSON (Continued)

i) Obtain pulse oximetry if available.

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

---

k) 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.

   (2) If possible, obtain blood sample using closed system.

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

m) **If patient has constricted pupils and respiratory depression or is unresponsive and the provider strongly suspects a narcotic overdose,**
   Administer naloxone
   0.1 mg/kg SLOW IVP/IO/IM
   Maximum dose 0.4-2.0 mg
   ET dose 2-2.5 times the above dose

n) Consider repeating naloxone.

o) 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

   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).

ALERT

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

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

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

3. Treatment

   a) When considering the prehospital use of restraints, a law enforcement officer should apply the device and accompany the provider and the patient in the ambulance.

   b) For interfacility transport, a physician order must be obtained for physical restraint.

   c) Implement **SAFER** model.

      (1) **S**tabilize the situation by containing and lowering the stimuli.

      (2) **A**ssess and acknowledge the crisis.

      (3) **F**acilitate the identification and activation of resources (chaplain, family, friends, or police).

      (4) **E**ncourage patient to use resources and take actions in his/her best interest.

      (5) **R**ecovery or referral - leave patient in care of responsible person or professional, or transport to appropriate facility.

d) Initiate IV LR KVO, if appropriate.
e) Consider Chemical Restraint

4. Continue General Patient Care.

## E. CARDIAC EMERGENCIES: CARDIAC GUIDELINES

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

   a) When the patient's condition changes, indicating the transition to a new treatment algorithm, the new treatment shall take into account prior therapy (e.g., previously administered medications).

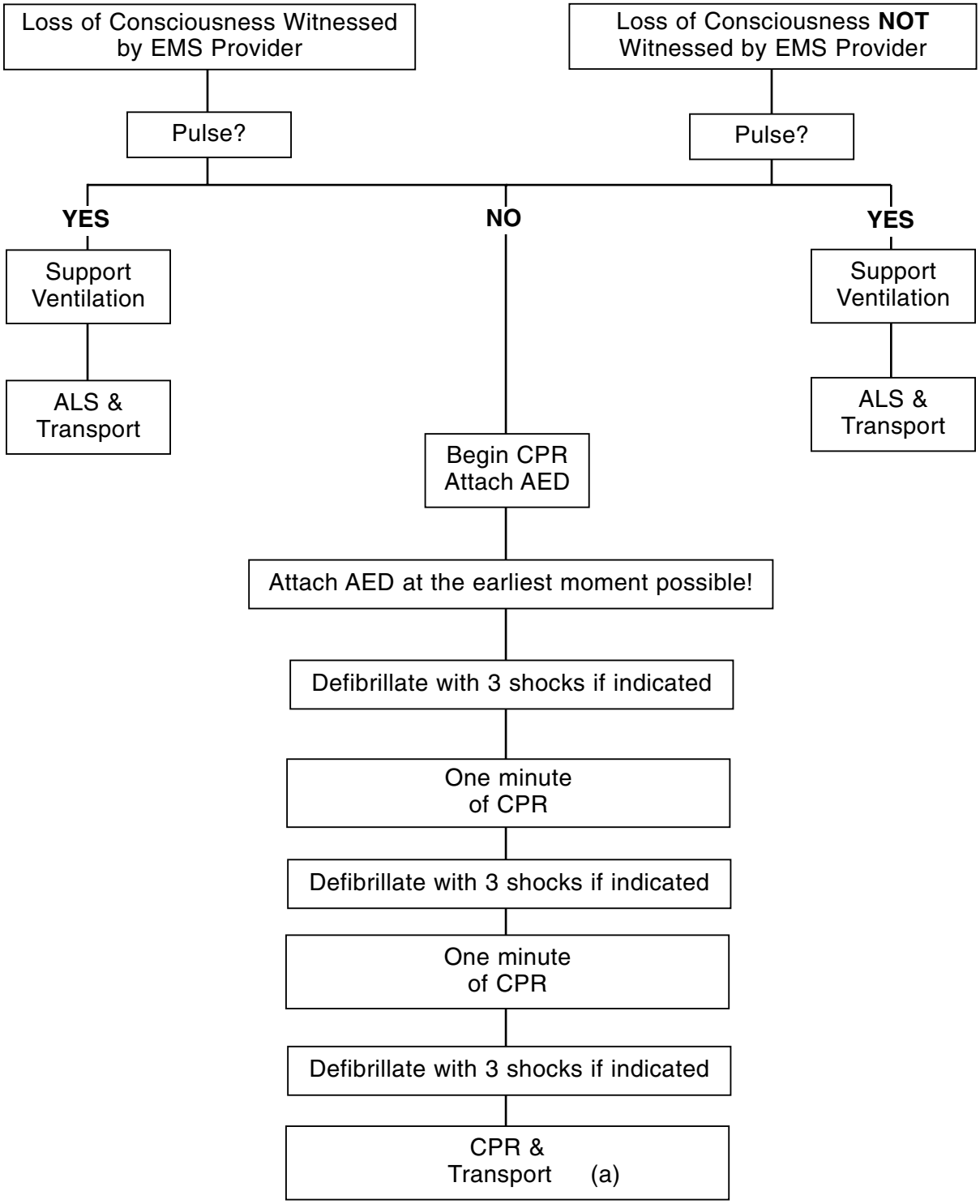
   b) As BLS/ALS guidelines indicate, definitive airway control is preferable, and if this can be achieved, along with other initial interventions, then the earlier the better. However, defibrillation is more important initially if the patient can be ventilated without intubation.

   c) 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.

2.

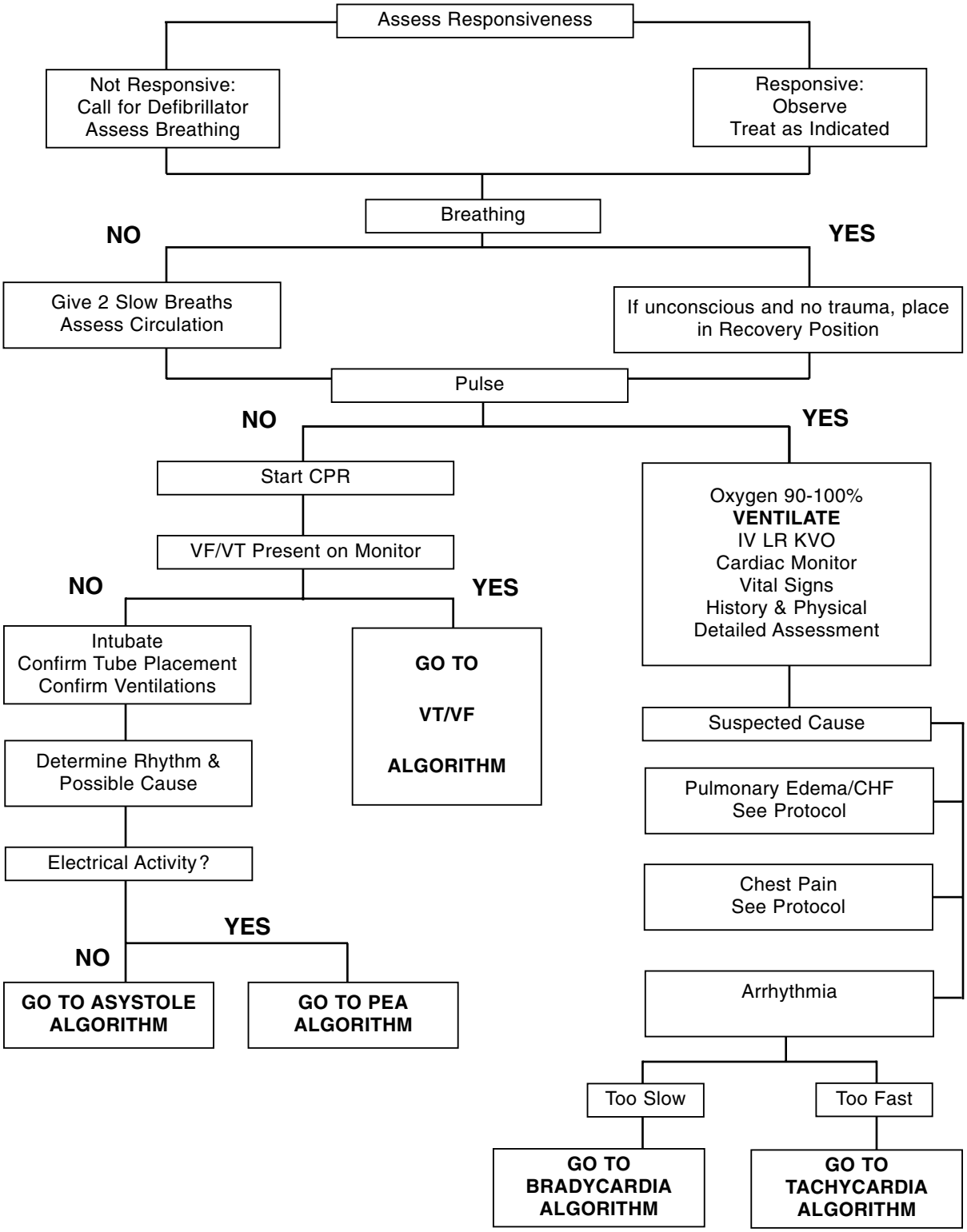
## UNIVERSAL ALGORITHM FOR ADULT EMERGENCY CARDIAC CARE FOR BLS




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

3. Treatment
   a) Place patient in position of comfort.

   b) Assess and treat for shock, if indicated.

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

---

   d) Initiate IV LR KVO.

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

   f) If transcutaneous pacing is unsuccessful or not available, administer atropine:
      0.5 - 1.0 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:

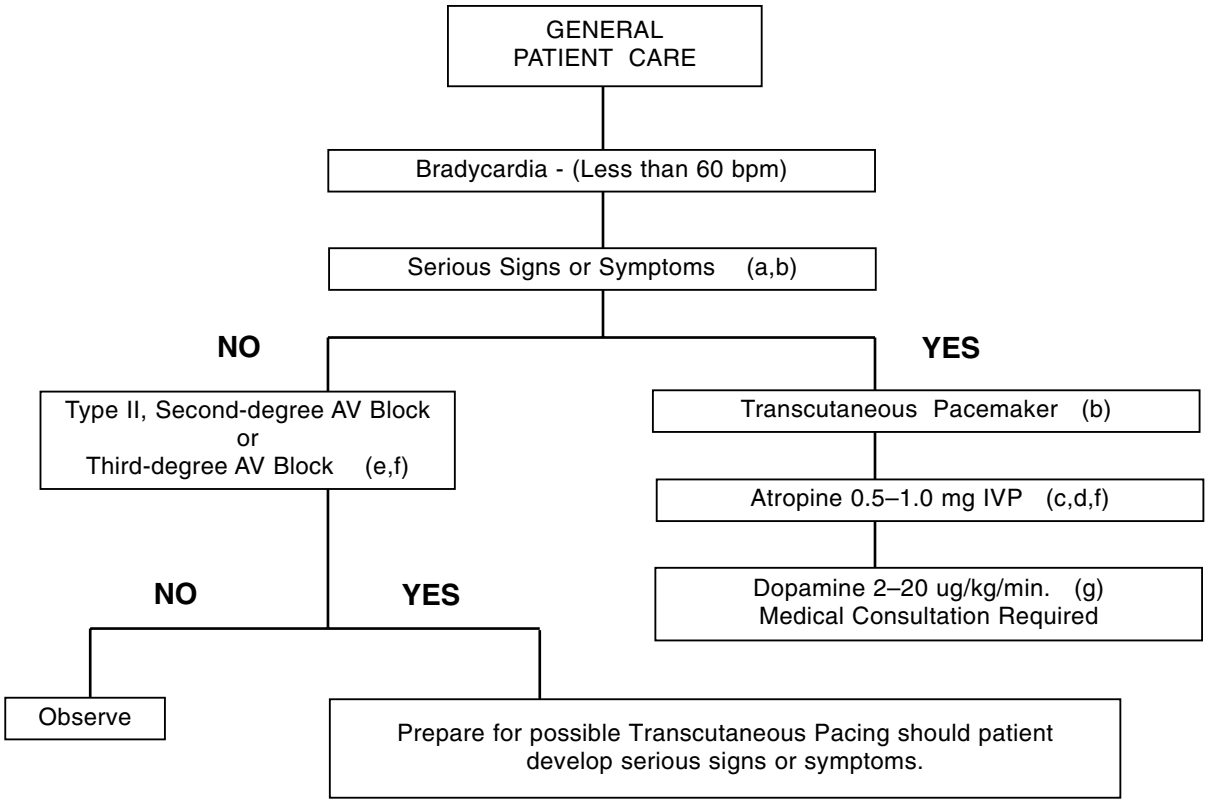
      (1) Consider/Prepare for Transcutaneous Pacing. (CRT-(I) & EMT-P only)

      (2) If patient develops discomfort with TCP
      Consider Morphine 1-2 mg/min IVP (Paramedic may perform without consult.)
      **OR**
      Consider Diazepam 2-10 mg IVP (Paramedic may perform without consult.)

   i) Refer to appropriate algorithm.

4.

## ADULT BRADYCARDIA ALGORITHM




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

(b) - Do not delay TCP (CRT-(I) & EMT-P only) while awaiting IV or atropine to take effect if the patient is symptomatic, or if patient is provider-witnessed asystole.

(c) - Denervated transplanted hearts will not respond to atropine. Go at once to TCP. (CRT-(I) & EMT-P only).

(d) - Atropine shall be given in repeat doses in 3-5 minute intervals up to a total of 0.04 mg/kg. ET Dose: 2-2.5 times the above dose. Medical consultation required. Consider shorter intervals in severe clinical conditions. Atropine shall be used with caution in AV block at the His-Purkinje level (Type II AV block and new third-degree block with wide QRS complexes).

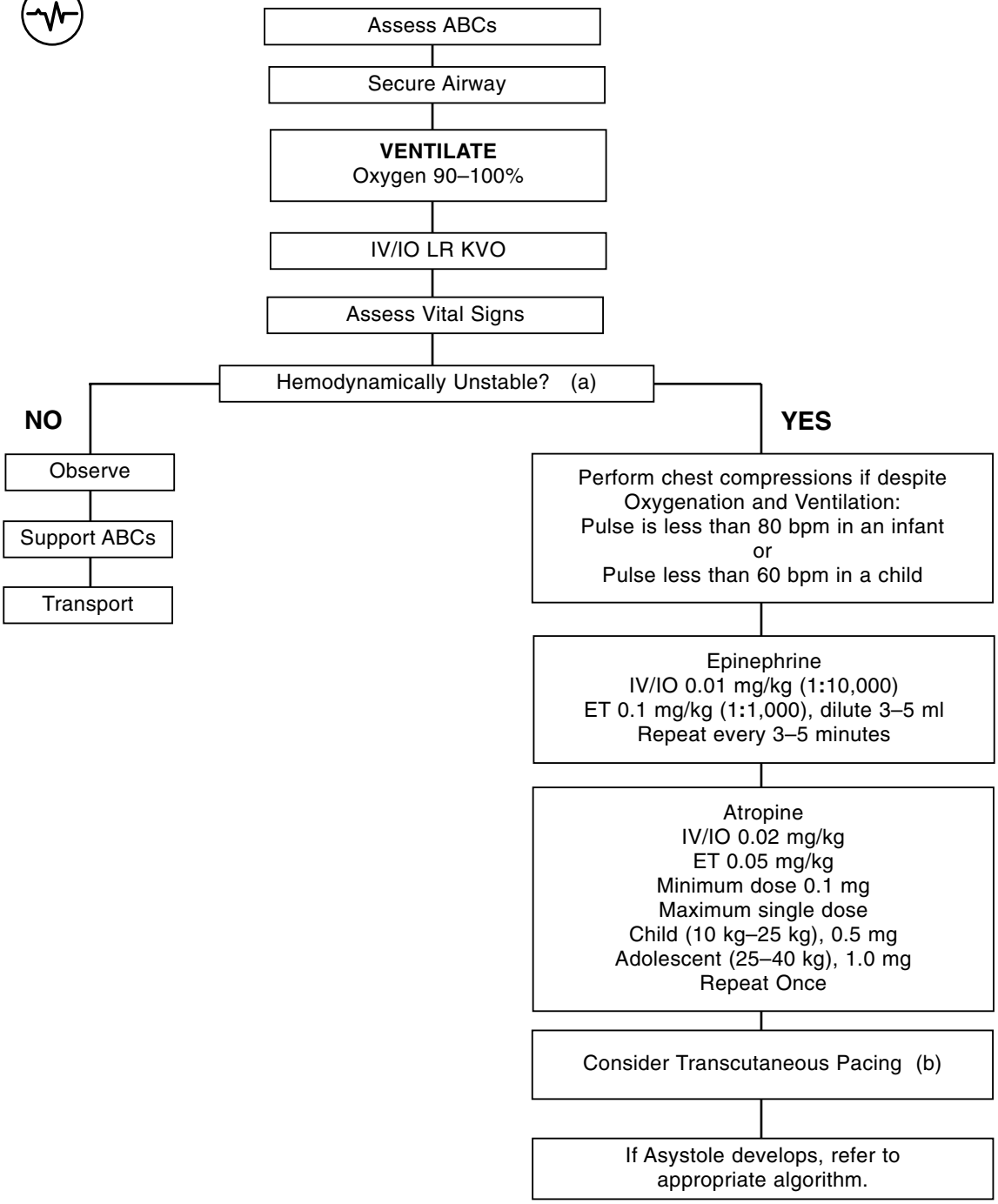
(e) - **Never** treat third-degree AV block plus ventricular escape beats with lidocaine.

(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.

5.

## 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]; altered mental status with hypoperfusion evidenced by delayed capillary refill; pallor; or peripheral cyanosis.

(b) - Transcutaneous Pacing available for CRT-(I) & EMT-P only. Medical consultation required.

## G. CARDIAC EMERGENCIES: CARDIAC ARREST

1. Initiate General Patient Care.

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

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.

DO NOT USE AED FOR PATIENTS WHO ARE LESS THAN 12 MONTHS OF AGE. USE ONLY PEDIATRIC AED FOR PATIENTS 12 MONTHS TO 8 YEARS OF AGE.

   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. ADULT ASYSTOLE ALGORITHM

- Continue CPR
- Intubate O2 (90-100%)
- Obtain IV access R/L KVO
- Confirm asystole in more than one lead

↓

Consider Possible Causes

↓

Consider immediate transcutaneous pacing (f)

↓

Epinephrine 1 mg IVP Repeat every 3–5 minutes (b)
Atropine 1 mg IV. Repeat every 3-5 min, up to a total of 0.04 mg/kg. (c)

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

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

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

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

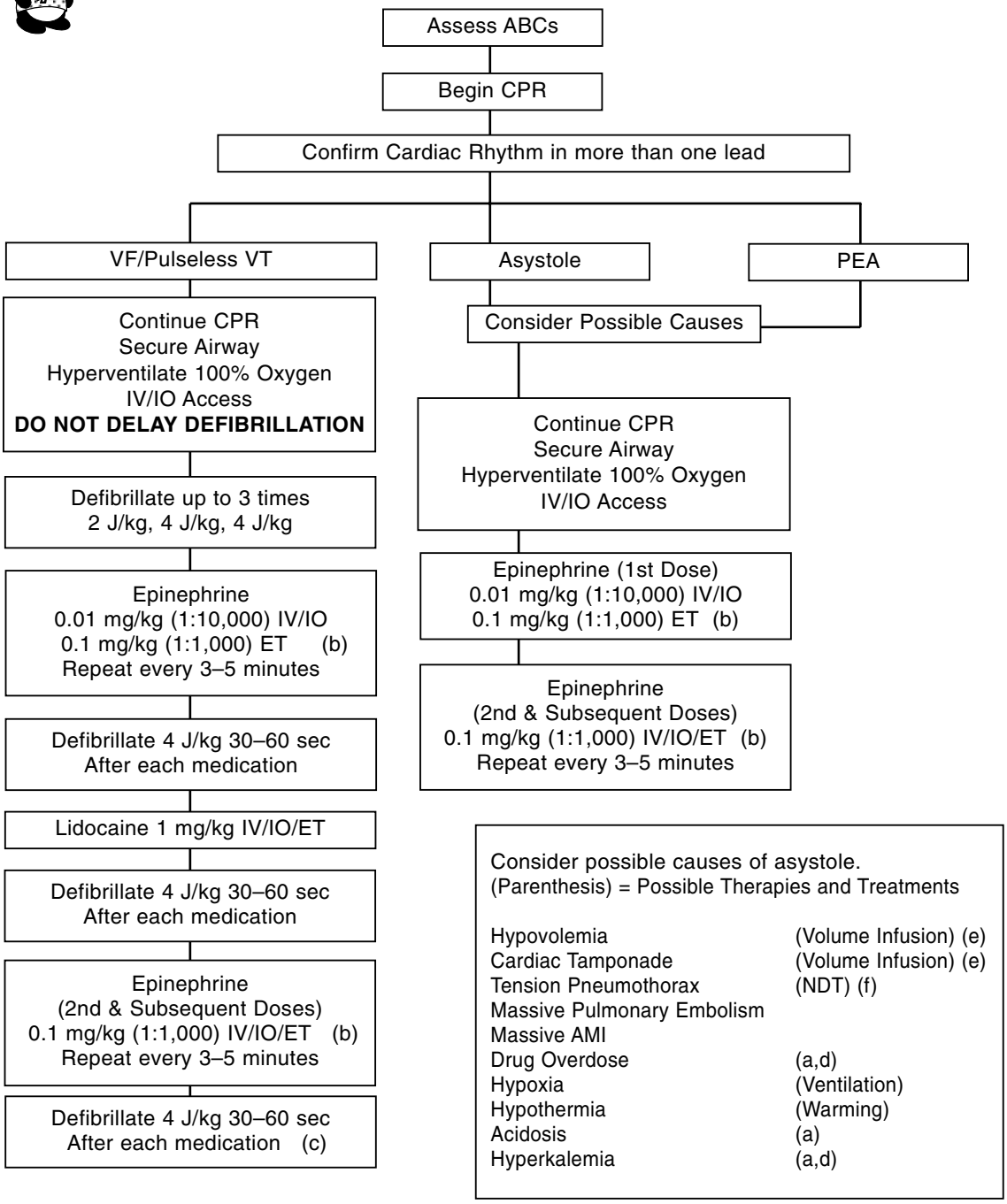
(d) - Calcium Chloride, 0.5-1.0 gram IVP, with medical consultation. See Calcium chloride.

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

(f ) - Do not delay TCP if patient is provider-witnessed asystole. (CRT-(I) & EMT-P only)

(g) - NDT for CRT-(I) and EMT-P only.

## 5. PEDIATRIC ASYSTOLE & PULSELESS ARREST ALGORITHM




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

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

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

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

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

(f) - NDT for CRT-(I) and EMT-P only.

6.

# PULSELESS ELECTRICAL ACTIVITY (PEA) ALGORITHM

Includes:

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

Continue CPR

↓

Intubate

↓

IV LR KVO

↓

Consider Possible Causes

↓

Epinephrine 1 mg IVP. Repeat every 3–5 minutes (b)

↓

If Bradycardia (Less than 60 bpm)
Administer Atropine 1 mg IVP
Repeat every 3–5 minutes to a total of 0.04 mg/kg (c)

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

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

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

(b) - Administer epinephrine 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.

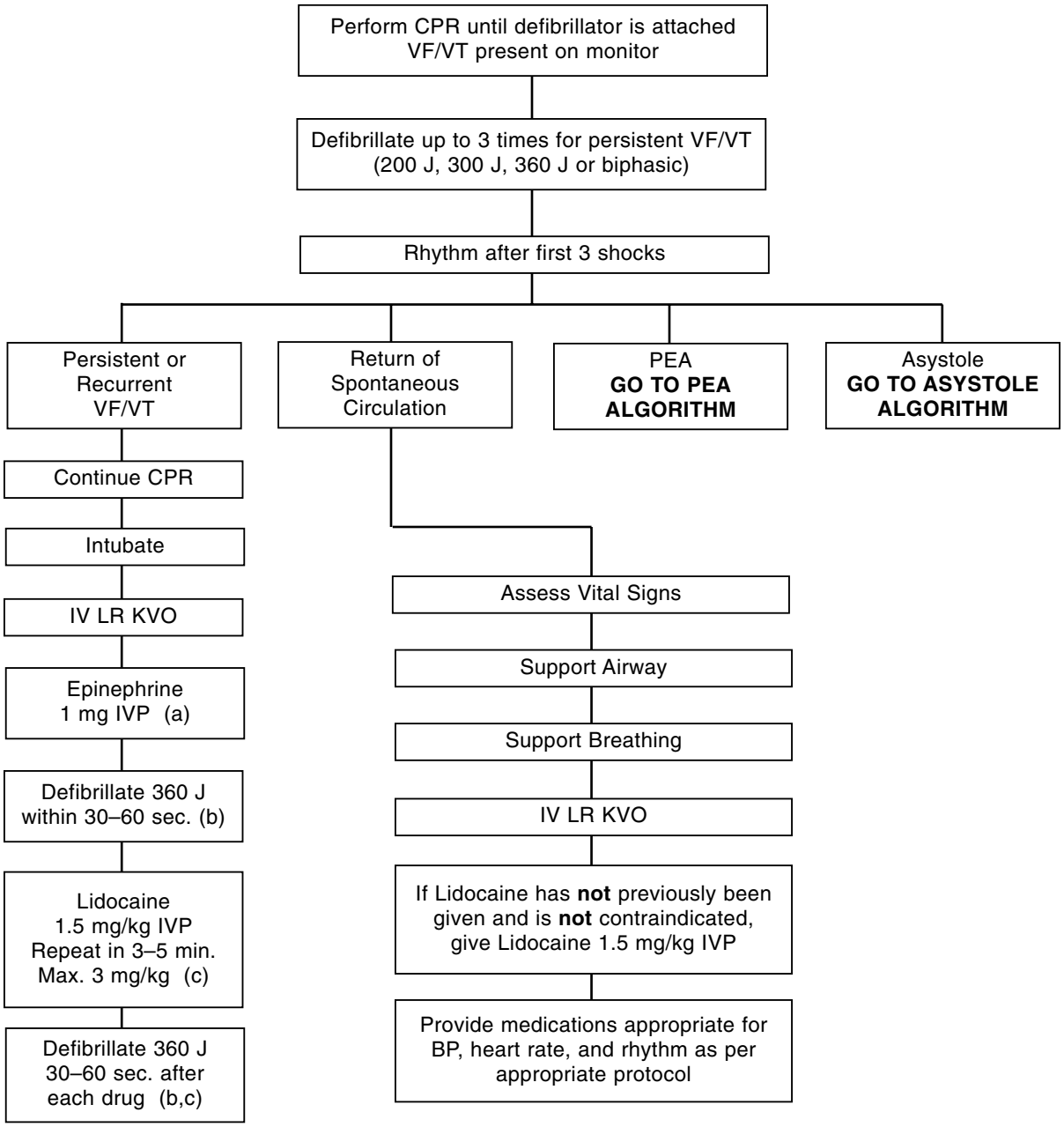
(d) - Calcium Chloride, 0.5-1.0 gram IVP, with medical consultation. See Calcium chloride.

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

(f) - NDT for CRT-(I) and EMT-P only.

7.

# VENTRICULAR FIBRILLATION
# PULSELESS VENTRICULAR TACHYCARDIA




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

(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

   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.

ALERT

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 NITROGLYCERIN, 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.

      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 slow IV/IM/IO
Administer 1-2 mg/min

m) Consider aspirin 162 mg or 325 mg chewed, if acute myocardial infarction is suspected. (Paramedic may perform without consult.)

4. Continue General Patient Care.

## I. CARDIAC EMERGENCIES: HYPERKALEMIA

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

   a) Patients must meet the following criteria:

      (1) Suspected hyperkalemia (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.

   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.

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.

4. Continue General Patient Care.

## J. NEWBORN RESUSCITATION - BIRTH TO 28 DAYS OLD

1. Initiate General Patient Care.

2. Presentation:
   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 60 bpm (NEW ’03), or capillary refill greater than 2 seconds.

ALERT WHEN IN DOUBT, RESUSCITATE NEONATES. KEEP THE INFANT WARM.

**3. RESPIRATORY ARREST/COMPROMISE**

a) Place patient in neutral head and shoulder alignment.

b) Ventilate the patient at a rate of 40-60 breaths per minute using a neonatal or pediatric BVM if available. (NEW ’03)

ALERT 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 (PULSE RATE LESS THAN 80 BPM)

1. Initiate General Patient Care.

2. Presentation

   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.

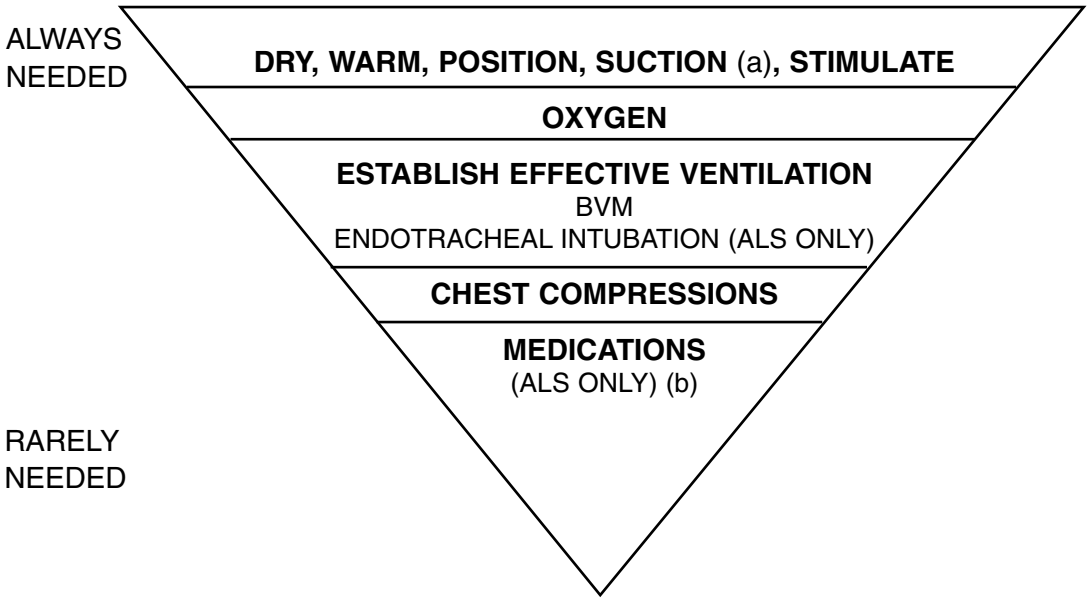
   b) If after 30 seconds the brachial pulse is still less than 60, begin newborn CPR.

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

4. Continue General Patient Care.

**INVERTED PYRAMID**

| | | |
|---|---|---|
| Assess and Support: | **A**irway | (Position and suction) |
| | **B**reathing | (Stimulate to cry) |
| | **C**irculation | (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 CHART

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

**Nasal or Oral Suction Catheter Stimulus*

## L. CARDIAC EMERGENCIES: PREMATURE VENTRICULAR CONTRACTIONS (PVCs)

1. Initiate General Patient Care.

2. Presentation
   Irregular heart beat of ventricular origin.

3. Treatment indications:
   a) PVCs in the presence of cardiac symptoms that are:
      (1) Near the "T" wave.
      (2) Multifocal (different shape)
      (3) Sequential or closely coupled or

   b) Runs of VT (5 or more consecutive beats) or ventricular tachycardia with a pulse or

   c) Once successful electrical conversion from ventricular tachycardia or ventricular fibrillation to a supraventricular rhythm

   d) Place patient in position of comfort.

   e) Assess and treat for shock, if indicated.

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

---

   g) Initiate IV LR KVO.

   h) Patients meeting the above criteria:
      (1) Initial Dose: lidocaine 1.0-1.5 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

ALERT 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

   The unexpected arrest of an apparently healthy infant in which resuscitation is unsuccessful and there is no attributable cause of death. The infant is often discovered by a caretaker in the early morning hours after having been uneventfully laid down to sleep the night before.

3. Treatment

   a) Perform an initial patient 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.

ALERT

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. DEPENDENT LIVIDITY AND RIGOR MORTIS MAY BE PRESENT (SEE PRESUMED DEAD ON ARRIVAL PROTOCOL).

4. Continue General Patient Care.

## N. CARDIAC EMERGENCIES: TACHYCARDIA

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

   a) Place patient in position of comfort.

   b) Assess and treat for shock, if indicated.

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

---

   d) Initiate IV LR KVO.

   e) Verify presence of pulse.

   f) If no pulse present, treat as pulseless VF/VT.

   g) If patient is hemodynamically unstable with a ventricular rate greater than 150, prepare for immediate cardioversion.

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

   i) Place patient in position of comfort.

   j) Assess and treat for shock, if indicated.

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

---

   l) Initiate IV LR KVO.

   m) Verify presence of pulse.

   n) If no pulse present, treat as pulseless VF/VT.

## CARDIAC EMERGENCIES: TACHYCARDIA (Continued)

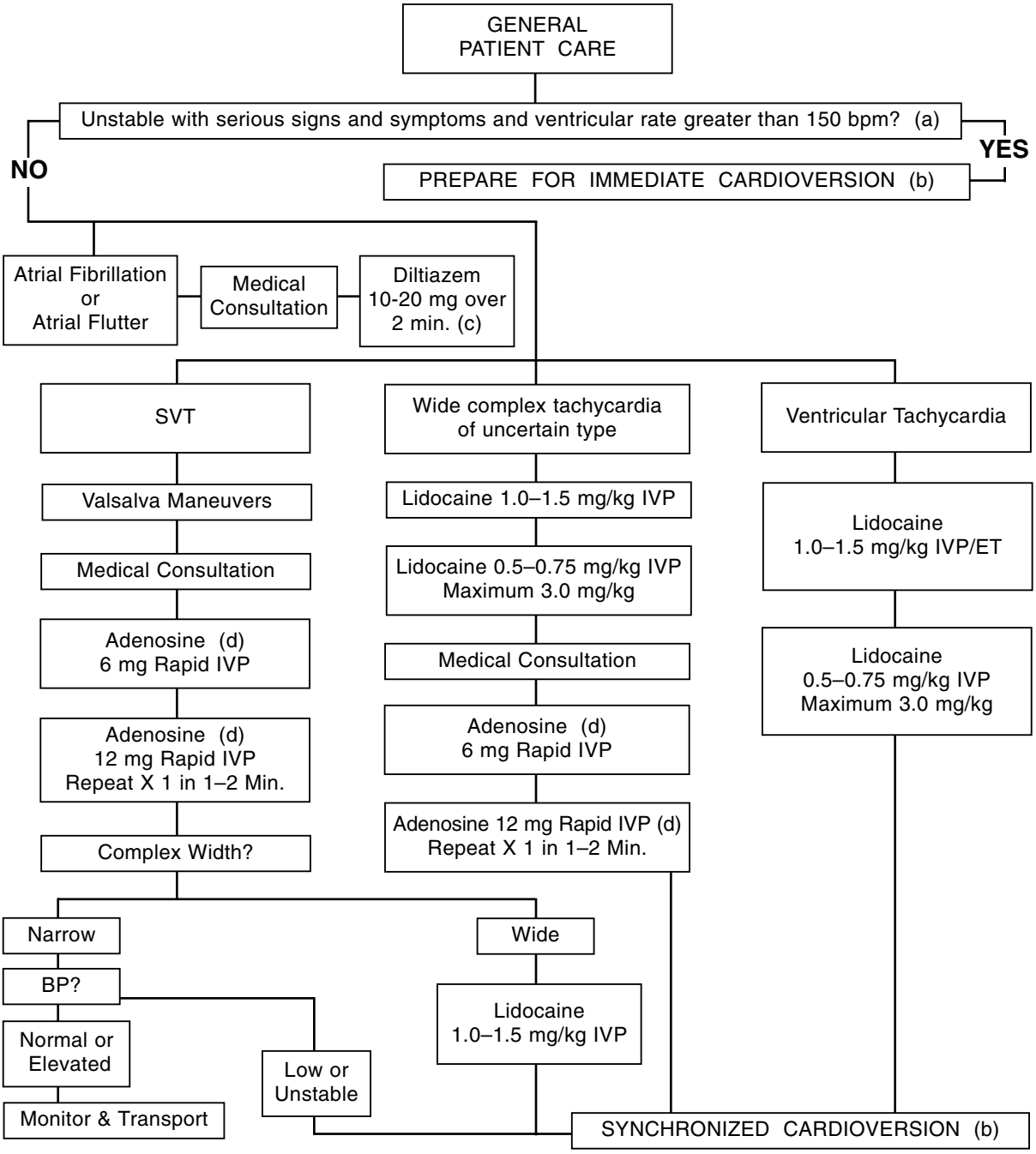
o) If patient is hemodynamically unstable with a ventricular rate greater than 220 for an infant or 180 for a child, prepare for immediate cardioversion.

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

4. Continue General Patient Care.

5.

## ADULT TACHYCARDIA ALGORITHM




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

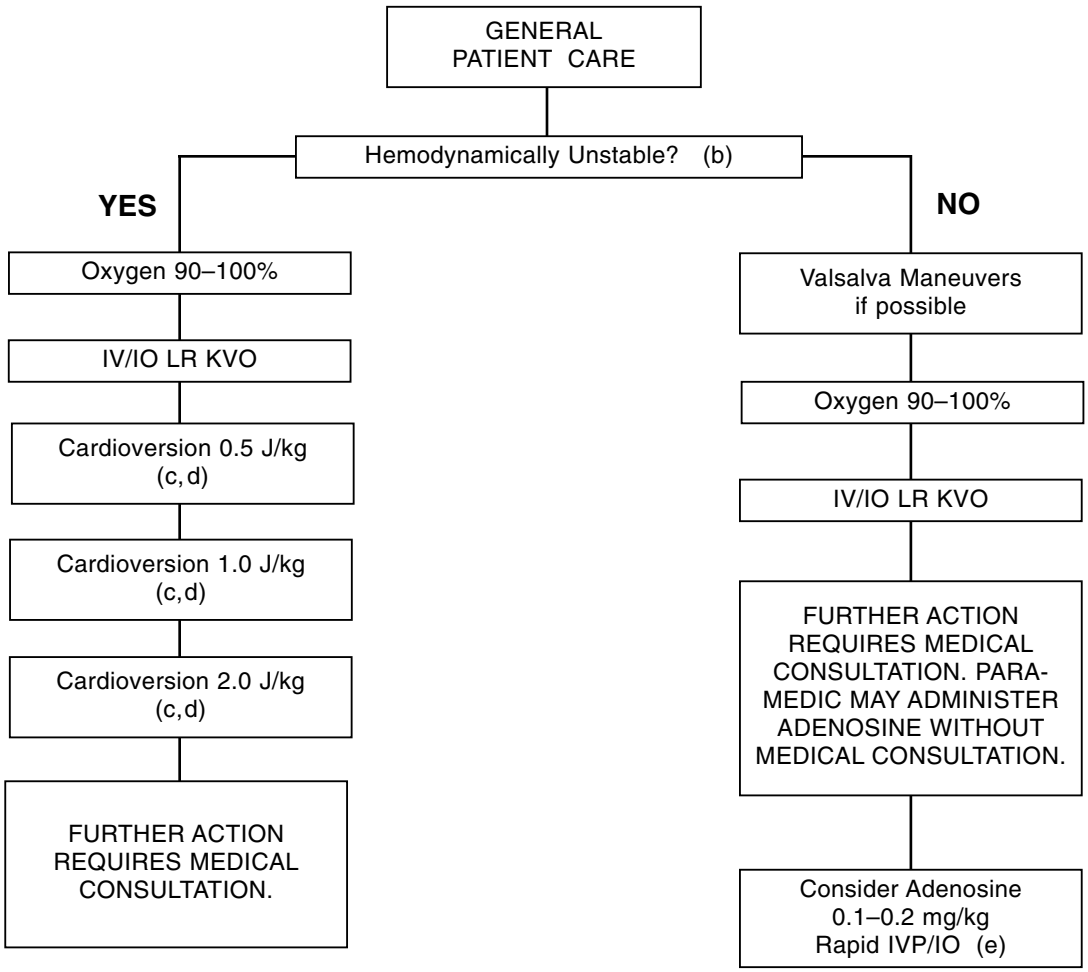
(b) - Consider sedation (diazepam with medical consultation). However, overall patient status, including BP, may affect ability to administer sedative.

(c) - Consider Calcium Chloride 250 mg IVP for hypotension induced by Diltiazem. Medical consultation required. If rate does not slow in 15 minutes, administer a second dose of Diltiazem (15-25 mg over 2 minutes.) Medical consultation required.

(d) - Adenosine available for CRT-(I) & EMT-P only. (Paramedic may administer without consult.)

6.

# PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA ALGORITHM (a)




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

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

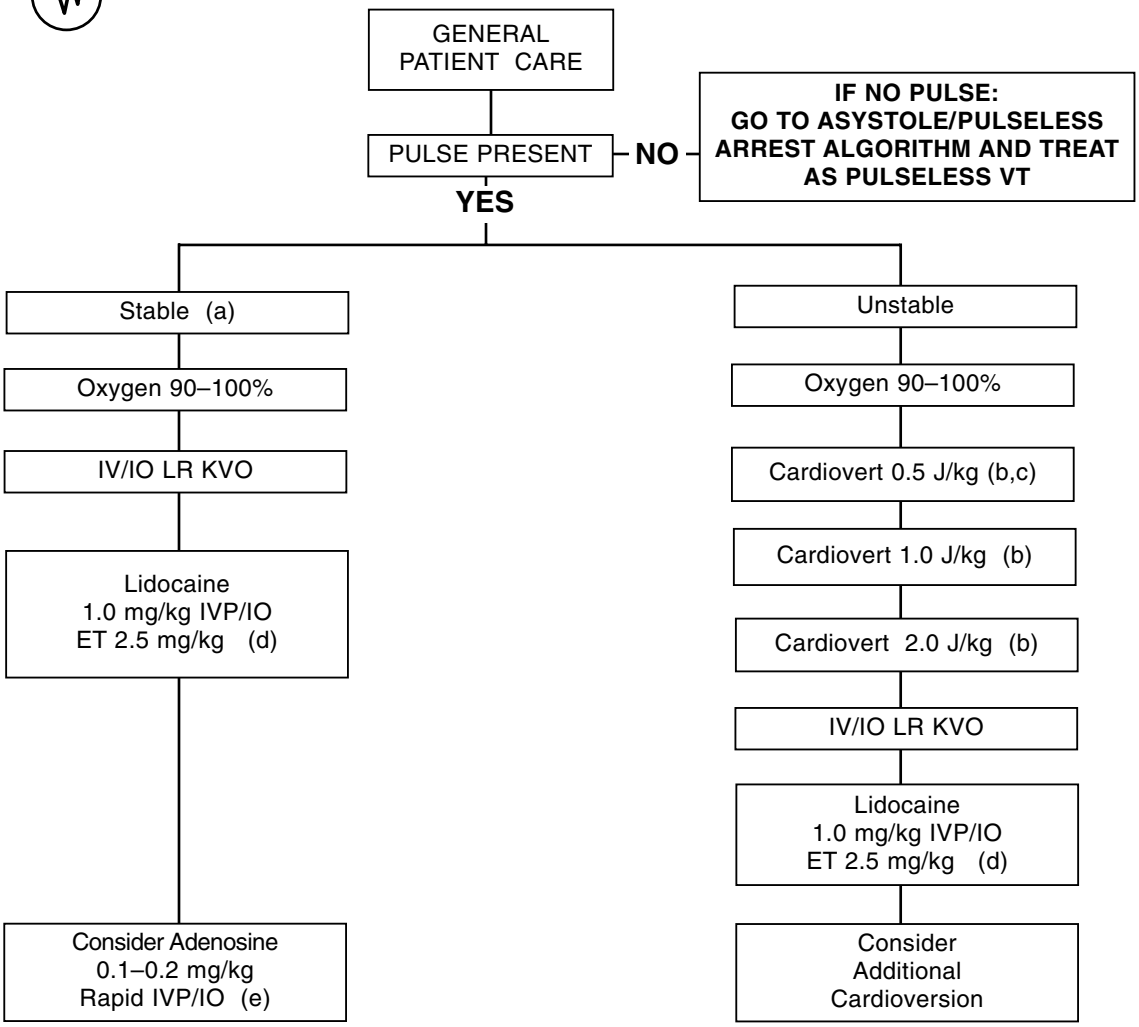
(c) - If calculated joules setting is lower than cardioversion device is able to deliver, use the lowest joules setting possible or obtain medical consultation.

(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. Adenosine available for CRT-(I) & EMT-P only. (Paramedic may perform without consult.)

7.

# PEDIATRIC VENTRICULAR TACHYCARDIA ALGORITHM




(a) - If patient decompensates, move directly to unstable path and cardioversion

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

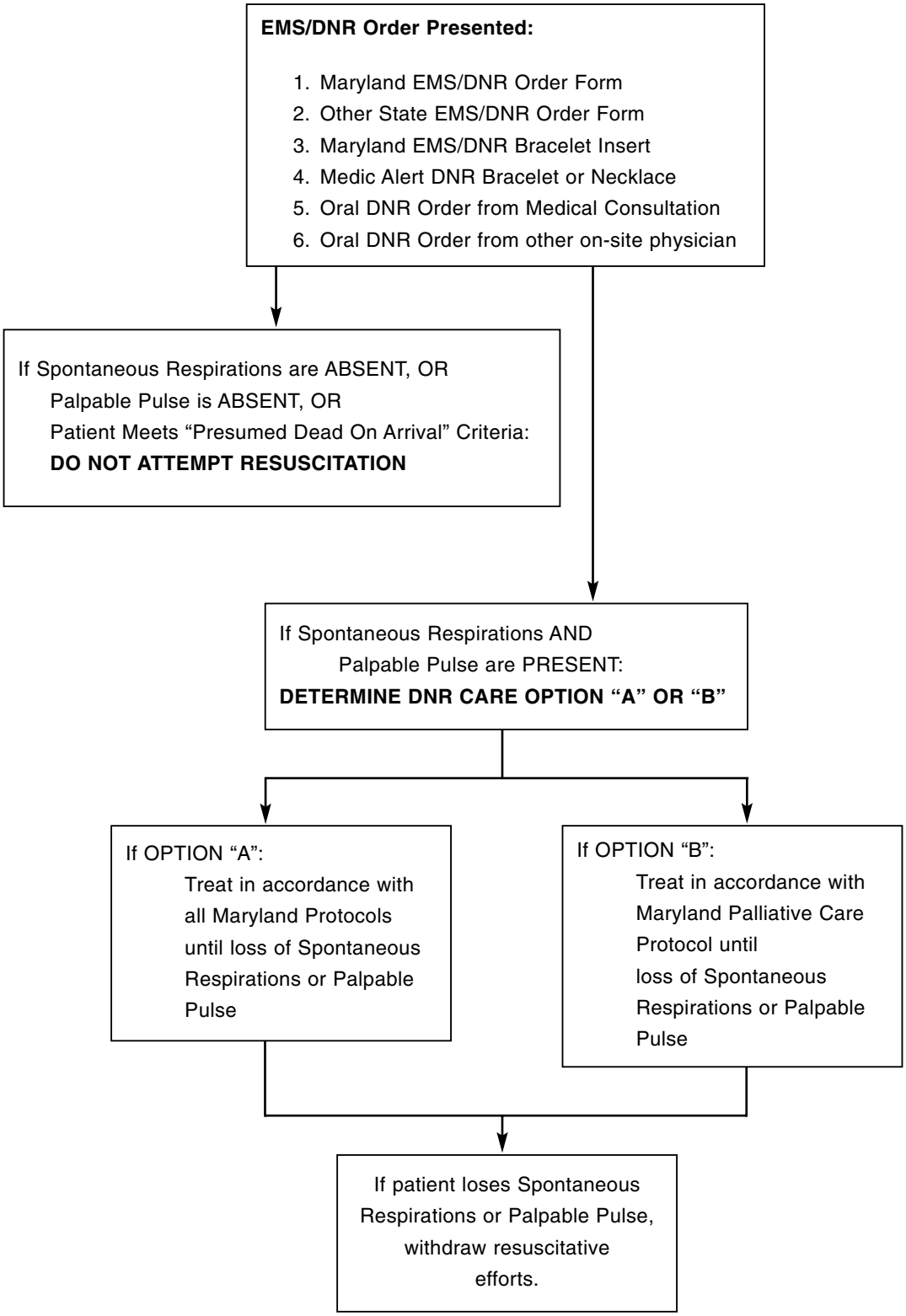
(c) - Consider sedation (diazepam with medical consultation). However, overall patient status including BP, may affect ability to administer sedative.

(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. Adenosine available for CRT-(I) & EMT-P only. (Paramedic may perform without consult.)

## O. EMS DNR Flowchart Effective 07/01/98

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



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

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

   a) Remove patient from cold environment.

   b) Handle potential frostbitten areas gently.

   c) Cover lightly with gauze.

   d) Protect from further heat loss.

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 (Paramedic may perform without consult.)
      2-10 mg slow IV/IM/IO
      Administer 1-2 mg/min.

**PEDIATRIC SECTION ON NEXT PAGE**

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

g) Remove patient from cold environment.

h) Handle potential frostbitten areas gently.

i) Cover lightly with gauze.

j) Protect from further heat loss.

---

k) Consider IV/IO LR KVO.

l) Consider morphine sulfate
0.1 mg/kg IV/IM/IO
Administer 1-2 mg/min.

4. Continue General Patient Care.

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

1. Initiate General Patient Care.

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

   b) Severe hypothermia (less than 90° F)
      Core body temperature (if available) less than 90° F. Patient may present with any of the symptoms listed above except shivering.

ALERT 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.

ALERT 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.

ALERT

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

4. Continue General Patient Care.

## R. ENVIRONMENTAL EMERGENCIES: DEPRESSURIZATION

1. Initiate General Patient Care.

2. Presentation

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

CONSIDER TRANSPORT TO HYPERBARIC MEDICINE SPECIALTY CENTER.

AEROMEDICAL TRANSPORT MAY BE APPROPRIATE FOR PATIENTS WITH BAROTRAUMA.

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

3. Treatment

   a) Remove patient from water.

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

---

   c) Initiate IV LR KVO.

4. Continue General Patient Care.

## S. ENVIRONMENTAL EMERGENCIES: HAZARDOUS MATERIALS EXPOSURE

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

ALERT 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.

ALERT 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.

g) Medical Follow-Up

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

4. Continue General Patient Care.

## 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.

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

   c) If patient is fully conscious and not nauseated, give electrolyte-rich fluid if available.

   d) If **heat stroke**, aggressively cool patient and place patient in semi-fowler's position.

---

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

4. Continue General Patient Care.

## U. ENVIRONMENTAL EMERGENCIES: NEAR-DROWNING

1. Initiate General Patient Care.

2. Presentation
   Confirmed or suspected near drowning, altered level of consciousness, dyspnea, cyanosis, vomiting, seizures, or cardiopulmonary arrest.

3. Treatment
   a) Remove patient from water.

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

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

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

   b) Protect from and/or treat for hypothermia.

---

   c) Initiate IV LR KVO.

   d) Identify rhythm and treat according to appropriate algorithm.

   e) Protect from and/or treat for hypothermia.

---

   f) Initiate IV/IO LR KVO.

   g) Identify rhythm and treat according to appropriate algorithm.

4. Continue General Patient Care.

## V. ENVIRONMENTAL EMERGENCIES: OVERPRESSURIZATION

1. Initiate General Patient Care.

2. Presentation

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

ALERT

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

AEROMEDICAL TRANSPORT MAY BE APPROPRIATE FOR PATIENTS WITH BAROTRAUMA.

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

3. Treatment

   a) Treat associated trauma.

---

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

4. Continue General Patient Care.

## W. HYPERBARIC THERAPY PROTOCOL

1. Initiate General Patient Care.

2. Presentation
   a) Patients involved in a closed space fire and/or explosion incident with exposure to products of combustion or toxic gas inhalation are more likely to have carbon monoxide toxicity.
   b) Patients with a recent history of scuba diving exhibiting signs of decompression complications.

3. INDICATIONS FOR REFERRAL TO A HYPERBARIC MEDICINE SPECIALTY CENTER
   a) Patients 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.

ALERT

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.

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.

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

(3) Consider additional fluid administration
(Max 2,000 cc without medical consultation)

d) Initiate IV/IO LR.

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

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

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

   b) Priority II Patients (no immediate threat to life)
      Consider air transport if drive time is greater than 30 minutes.

7. Continue General Patient Care.

## X. HYPERTENSIVE CRISIS

1. Initiate General Patient Care.

2. Presentation

   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.

ALERT

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

   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). 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

**PEDIATRIC SECTION ON NEXT PAGE**

## 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 ].

g) Continue General Patient Care.

---

h) Initiate IV/IO LR.

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.

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

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

4. Continue General Patient Care.

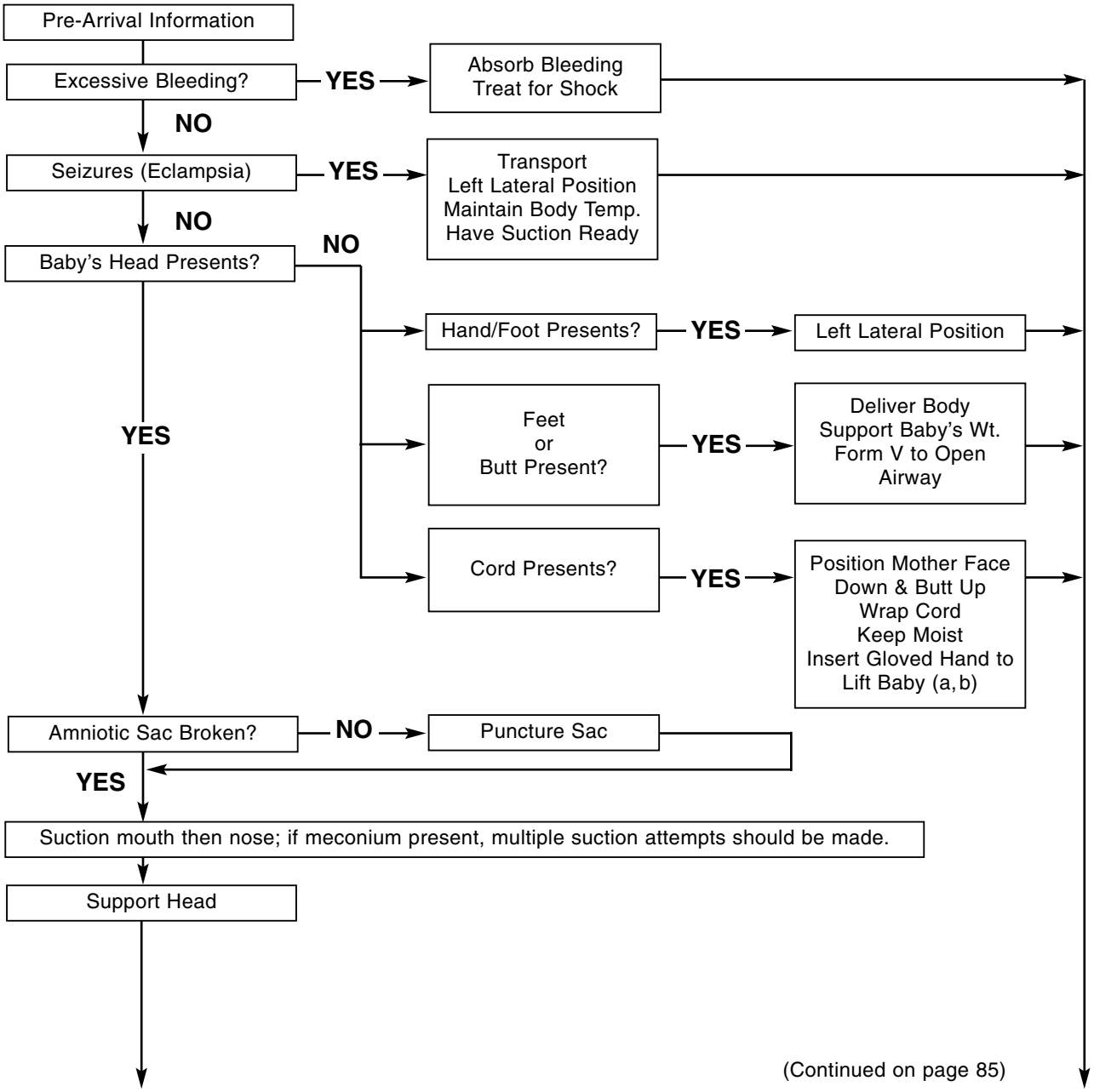
## Z. OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES: CHILDBIRTH ALGORITHM

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

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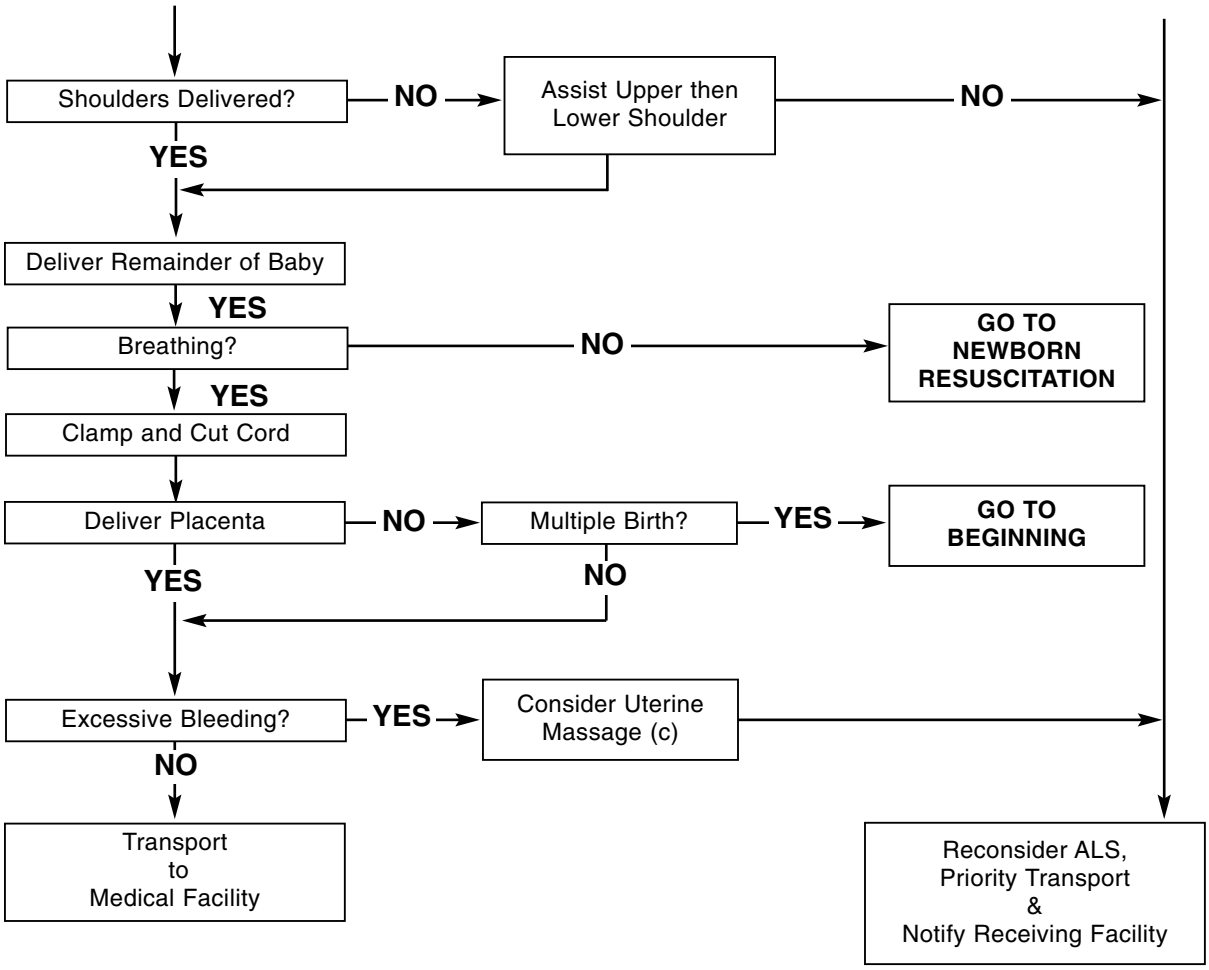
## OBSTETRICAL/ GYNECOLOGICAL EMERGENCIES (Continued)




(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

   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.

ALERT

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.
      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

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

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

   b) Identify agent and mechanism of exposure.

   c) Decontaminate as appropriate.

---

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

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

   f) Consider antidote to specific agent if available.

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

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

   i) Identify agent and mechanism of exposure.

   j) Decontaminate as appropriate.

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

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

m) Consider antidote to specific agent if available.

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

4. Continue General Patient Care.

## CC. OVERDOSE/POISONING: INGESTION

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

ALERT 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

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

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

ALERT 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.

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
Maximum single dose 25 mg

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

## 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)
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.

4. Continue General Patient Care.

## DD. OVERDOSE/POISONING: INHALATION

1. Initiate General Patient Care.

2. Presentation

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

ALERT 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.

3. Treatment

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

   b) Identify agent and mechanism of exposure.

   c) Decontaminate as appropriate.

---

   d) 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.

## OVERDOSE/POISONING: INHALATION (Continued)

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

j) Identify agent and mechanism of exposure.

k) Decontaminate as appropriate.

---

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

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

n) Consider antidote to specific agent if available.

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

4. Continue General Patient Care.

## EE. OVERDOSE/POISONING: INJECTION

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

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

   b) Place distal and proximal constricting band (allowing arterial flow) for poisonous snakebite to an extremity.

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

   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. 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.

## 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 the patient's prescribed or EMS service's Epinephrine auto-injector or patient's prescribed albuterol.

---

o) Initiate IV LR fluid therapy 20 ml/kg bolus in uninjured extremity. 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.

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.
   b) Allergic reactions may range from mild to severe life-threatening anaphylactic reactions.

      (1) **MILD:** Local swelling and itching at the site

      (2) **MODERATE:** Hives and mild wheezing

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

3. Treatment
   a) Assist the patient experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's Epinephrine auto-injector or patient's prescribed albuterol.

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

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

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   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

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

      (3) Administer diphenhydramine
      25 mg IVP or IM

      (4) Administer a combination of albuterol/atrovent via nebulizer
      Albuterol 2.5 mg and Atrovent 500 mcg (NEW '03)

      (5) If further treatments are indicated, an additional albuterol-only nebulizer may be given. (NEW '03)

## 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 the patient's prescribed or EMS service's Epinephrine auto-injector or patient's prescribed albuterol.

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

(2) Initiate IV/IO.

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

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

(5) Administer a combination of albuterol/atrovent via nebulizer: (NEW '03)
- **For an infant less than 1 year of age**, contraindicated.
- **For a child 1 year of age or greater, but less than 2 years of age**, administer albuterol 1.25 mg and atrovent 250 mcg.
- **For a patient 2 years of age or greater**, administer albuterol 2.5 mg and atrovent 500 mcg.

(6) If further treatments are indicated, an additional albuterol-only nebulizer may be given. (NEW '03)

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

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

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

3. Treatment

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

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

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

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

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

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e) Consider continuous positive airway pressure (CPAP).

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

g) Administer a combination of albuterol/atrovent via nebulizer
   Albuterol 2.5 mg and Atrovent 500 mcg (NEW '03)

h) If further treatments are indicated, an additional albuterol-only nebulizer may be given. (NEW '03)

i) Consider the administration of epinephrine 1:1,000
   0.3 mg SC
   May repeat every 5 minutes for a total of 3 doses for severe reactions.
   **OR**

j) Consider the administration of terbutaline
   0.25 mg SC

## RESPIRATORY DISTRESS: ASTHMA/COPD (Continued)

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

l) Assist patient(s) experiencing moderate to severe symptoms or mild symptoms with a history of life-threatening allergic reaction with the patient's prescribed or EMS service's Epinephrine auto-injector or patient's prescribed albuterol. Medical consultation is required if the child has a cardiac history.

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

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

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o) Administer a combination of albuterol/atrovent via nebulizer: (NEW '03)
- **For an infant less than 1 year of age**, contraindicated.
- **For a child 1 year of age or greater, but less than 2 years of age**, administer albuterol 1.25 mg and atrovent 250 mg.
- **For a patient 2 years of age or greater**, administer albuterol 2.5 mg and atrovent 500 mg.

p) If further treatments are indicated, an additional albuterol-only nebulizer may be given. (NEW '03)

**AND/OR**

ALERT CONSIDER MEDICAL CONSULTATION FOR PATIENTS WITH A CARDIAC HISTORY.

q) Administer epinephrine 1:1,000
0.01 mg/kg SC
Maximum single dose 0.3 mg
May repeat every 5 minutes for a total of 3 doses for severe reactions.

r) Consider additional doses of albuterol or epinephrine.

s) Consider initiating an IV/IO of LR KVO.

4. Continue General Patient Care.

## HH. RESPIRATORY DISTRESS: CROUP

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

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

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

d) 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.

e) If no change in patient's condition, then administer 2.5 ml of epinephrine 1:1,000 via nebulizer. For priority one patients, a second dose of 2.5 ml may be administered with medical consultation. (Note: if inhaled normal saline decreases the patient's level of distress and symptoms, continue 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 less than 1 year of age, if additional nebulized epinephrine is needed due to level of distress, or if other interventions or directions are needed.

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

   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.

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   b) Consider continuous positive airway pressure (CPAP).

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

      May be repeated if symptoms persist, and BP is greater than 90 mm Hg, and pulse is greater than 60 bpm, to a maximum dose of 1.2 mg.

   d) 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.

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

   f) Initiate IV LR KVO.

   g) Identify rhythm and treat according to appropriate algorithm.

   h) Consider additional nitroglycerin
      0.4 mg SL

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

   j) Consider furosemide.
      (Paramedic may administer without consult.)
      0.5-1.0 mg/kg slow IVP

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

k) Consider morphine
2-10 mg slow IVP

l) 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. STROKE: NEUROLOGICAL EMERGENCIES (NEW '03)

1) Initiate General Patient Care.

2) Presentation

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

**The Cincinnati Prehospital Stroke Scale**

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

**Facial Droop** (have patient show teeth or smile):
- Normal – both sides of face move equally
- Abnormal – one side of face does not move as well as the other side

**Arm Drift** (patient closes eyes and holds both arms straight out for 10 seconds):
- Normal – both arms move the same or both arms do not move at all (other findings, such as strength of grip, may be helpful)
- Abnormal – one arm does not move or one arm drifts down compared with the other

**Abnormal Speech** (have the patient say "you can't teach an old dog new tricks"):
- Normal – patient uses correct words with no slurring
- Abnormal – patient slurs words, uses the wrong words, or is unable to speak

3) Treatment

a) Administer oxygen at 2-6 liters via nasal cannula (unless hypoxic or in respiratory distress).
b) Position patient lying flat or slightly elevated.
c) Complete the Fibrinolytic Therapy Checklist for Ischemic Stroke.
d) If the patient is a candidate for fibrinolytic therapy AND symptoms have been present for less than 2 hours at the time of EMS arrival, transport the patient to the closest Designated Stroke Center. If there is not one within 30 minutes, then go to the nearest hospital.

ALERT

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

STROKE TREATMENTS ARE TIME SENSITIVE.

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e) Use Glucometer and treat if glucose less than 70 mg/dl.
f) Initiate an IV LR KVO.
g) If the patient is hypotensive, obtain medical consultation.
h) Obtain blood sample using closed system.
i) Do not treat hypertension in the field.

## STROKE: NEUROLOGICAL EMERGENCIES (Continued)

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

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

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

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

4. Continue General Patient Care.

### Fibrinolytic Therapy Checklist for Ischemic Stroke

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

**INCLUSION CRITERIA**
(**All** of the **"YES"** boxes must be checked)

**YES**
- ❑ Age greater than or equal to 15 years
- ❑ Signs and symptoms of stroke with neurologic deficit (abnormal Cincinnati Stroke Scale)
- ❑ Time of symptom onset less than 120 minutes prior to EMS arrival

**EXCLUSION CRITERIA**
(**All** of the **"NO"** boxes must be checked)

**NO**
- ❑ Active internal bleeding (eg, gastrointestinal bleeding or urinary bleeding within the last 21 days)
- ❑ Known bleeding disorder
- ❑ Within 3 months of intracranial surgery, serious head trauma, or previous stroke
- ❑ Within 14 days of major surgery or serious trauma
- ❑ History of intracranial hemorrhage
- ❑ Witnessed seizure at stroke onset
- ❑ History of cancer of the brain

## KK. 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.
      (5) Circumferential burns

ALERT

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

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.

3. Treatment
   a) Eliminate source of burn.

   b) Determine percent of body surface area (BSA) and depth.

   c) Treat associated trauma.

   d) Dress wounds appropriately:
      (1) Dry, sterile dressings
      (2) Moist dressings for burns less than 9% BSA

## TRAUMA PROTOCOL: BURNS (Continued)

DO NOT GIVE ANYTHING BY MOUTH.

DO NOT PLACE ICE ON ANY BURN GREATER THAN 5%.

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

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

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

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

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

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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.

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

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

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

4. Continue General Patient Care.

## LL. TRAUMA PROTOCOL: EYE TRAUMA

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

NEVER APPLY PRESSURE TO THE EYEBALL OR GLOBE!

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

DO NOT USE CHEMICAL COLD PACKS ON THE FACE.

a) **Foreign objects NOT embedded in the eye(s)**: Flush with copious amounts of water (preferably sterile), normal saline, or LR from the bridge of the nose outward.

b) **Injury to orbits (area around the eye)**: Stabilize and immobilize the patient's head and spine; apply cold packs if the eyeball is NOT injured.

c) **Lacerations/injuries to the eyeball or globe**: Shield affected eyeball and dress other eye to reduce movement; protect loss of fluids; immobilize the patient's head and spine and elevate the head of the backboard to decrease intraocular pressure.

d) **Impaled objects**: Stabilize object; shield affected eyeball; and dress other eye to reduce movement.

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e) Initiate IV LR KVO.

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

## TRAUMA PROTOCOL: EYE TRAUMA (Continued)

g) **Foreign objects NOT embedded in the eye(s)**: Flush with copious amounts of water (preferably sterile), normal saline, or LR from the bridge of the nose outward.

h) **Injury to orbits (area around the eye)**: Stabilize and immobilize the patient's head and spine; apply cold packs if the eyeball is NOT injured.

i) **Lacerations/injuries to the eyeball or globe**: Shield affected eyeball and dress other eye to reduce movement; protect loss of fluids; immobilize the patient's head and spine and elevate the head of the backboard to decrease intraocular pressure.

j) **Impaled objects**: Stabilize object; shield affected eyeball; and dress other eye to reduce movement.

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k) Initiate IV/IO LR KVO.

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

4. Continue General Patient Care.

## MM. TRAUMA PROTOCOL: HAND/EXTREMITY TRAUMA

1. Initiate General Patient Care.

2. Presentation

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

3. Treatment

   a) Indications for Referral to a Hand Center
      (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
      (5) Clean-cut foot amputation (child)
      (6) Clean-cut amputation at the ankle (child or adult)

ALERT 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.**

ALERT 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.
Titrate to a systolic pressure of 100 mm Hg.

e) Consider Morphine Sulfate. (Paramedic may administer without consult.)
2-10 mg slow IV/IM/IO
Administer 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.

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

j) Consider Morphine Sulfate
0.1 mg/kg slow IV/IM/IO
Administer 1-2 mg/min

4. Continue General Patient Care.

## NN. TRAUMA PROTOCOL: MULTIPLE/SEVERE TRAUMA

1. Initiate General Patient Care.

2. Presentation

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

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

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.

3. Treatment

   a) Maintain spine stabilization.

   b) Control bleeding and immobilize patient, if indicated.

   c) Consider PASG.

   d) Hyperventilate the head-injured patient (infant rate of 35, child and adult rate of 25 breaths per minute): (NEW ’03)
      (1) Who has signs of herniation such as unequal pupils, posturing, or paralysis
      (2) Who is manifesting a rapidly decreasing GCS **or**,
      (3) With on-line medical consultation.

---

   e) Initiate IV LR fluid therapy 20ml/kg bolus.
      Titrate to a systolic pressure of 100 mm Hg.

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

g) Maintain appropriate spine stabilization.

h) Control bleeding and immobilize patient, if indicated.

i) Consider PASG, if appropriate.

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

---

k) Initiate IV/IO.

l) 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.

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

4. Continue General Patient Care.

## GLASGOW COMA SCALE

**Eye Opening**

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

**Motor Response**

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

**Verbal Response**

| | Less than 2 years old | 2-5 years old | Greater than 5 years old | |
|---|---|---|---|---|
| **5** | SMILES/COOS/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)**

## OO. TRAUMA PROTOCOL: SEXUAL ASSAULT

1. Initiate General Patient Care.

2. Presentation

   Patient may present with no overt evidence of trauma, or may present with bruising, bleeding, or associated physical and/or emotional trauma.

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

3. Treatment

   a) Patient may feel more comfortable talking to someone of the same sex.

   b) Maintain non-judgmental, but caring attitude.

   c) Preserve crime scene and clothing articles, if practical.

   d) Maintain strict confidentiality.

   e) Do not perform a genital examination.

   f) Dress wounds (do not attempt to clean).

   g) Discourage any self-treatment (shower, washing, changing clothes).

   h) Treat injuries according to presentation.

4. Continue General Patient Care.

## PP. TRAUMA PROTOCOL: SPINAL CORD INJURY

1. Initiate General Patient Care.

2. Presentation
   Patients may exhibit any of the following: paralysis below the site of injury, loss of motor or neurological function and/or neurogenic shock. Associated injuries will also include pain.

3. Treatment
   a) Indications for Referral to a Specialty Spinal Center:
      (1) Signs and symptoms of new paraplegia or quadriplegia in the presence of trauma **and**
      (2) Patent airway **and**
      (3) Hemodynamically stable **and**
      (4) Patients who are 15 years of age or older should be transported to the Adult Spinal Specialty Center.

   b) Consult with nearest Trauma Center and, when possible, the Adult Spinal Specialty Center.

   c) **Protect Airway!**

   d) Immobilize and protect entire spine.

   e) Consider PASG, if appropriate.

---

   f) Initiate IV LR fluid therapy 20 ml/kg bolus.
      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**

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) Maintain appropriate spine stabilization.

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.

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

p) Consider PASG, if appropriate.

4. Continue General Patient Care.

## QQ. TRAUMA PROTOCOL: TRAUMA ARREST

1. Initiate General Patient Care.

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

3. Treatment
   a) Rapid assessment and extrication

   b) Protect cervical spine.

   c) CPR

   d) Consider AED if arrest is believed to be medical in nature and the patient meets the criteria.

   e) Consider PASG.

ALERT

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!

   f) Consider PASG, if appropriate.

---

   g) Initiate IV 20ml/kg.
      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, AED.)

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!

o) Consider PASG, if appropriate.

---

p) Initiate IV/IO LR.

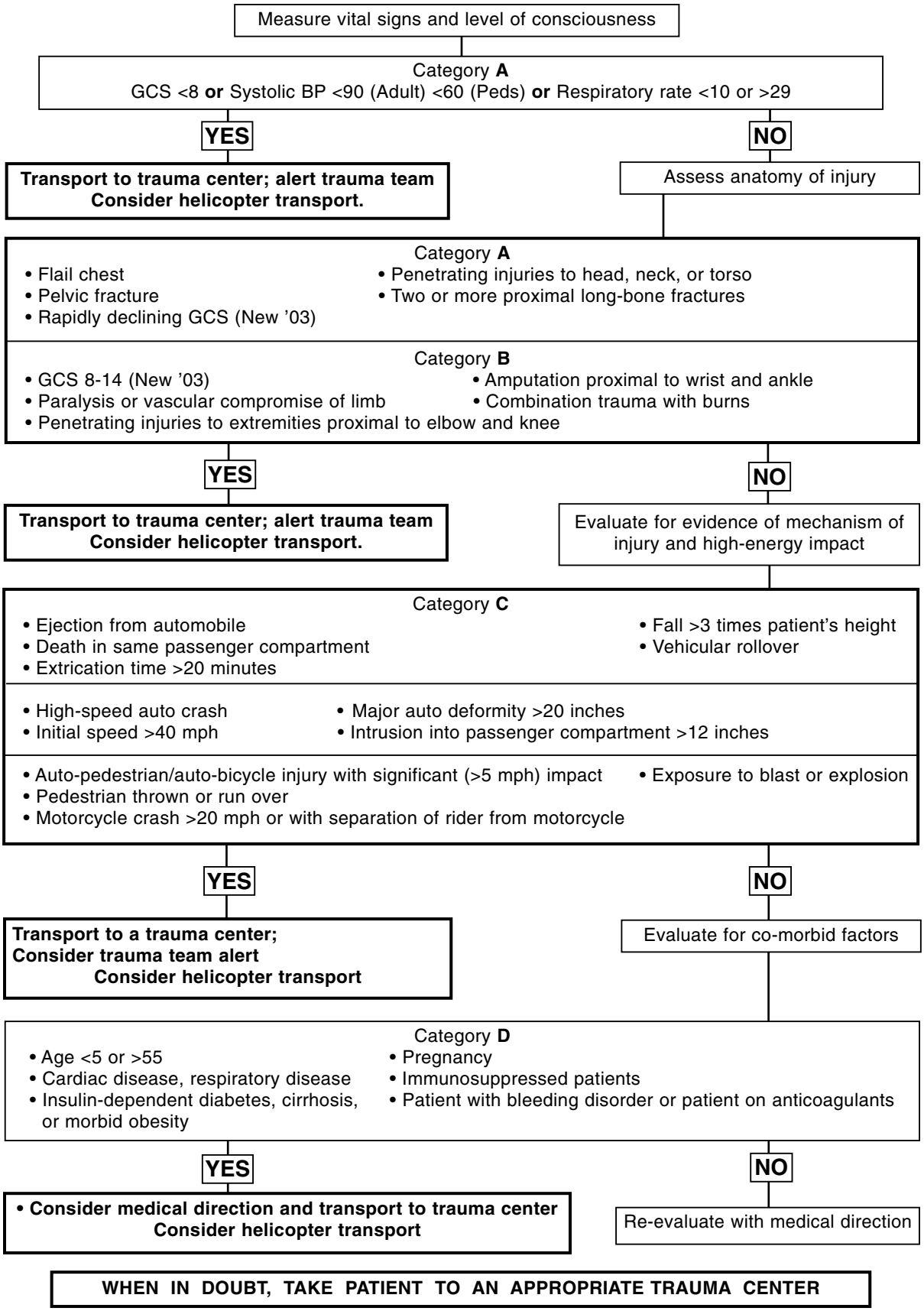
q) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid challenge of 20 ml/kg LR IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 20 ml/kg LR IV/IO.

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

s) Consider PASG, if appropriate.

4. Continue General Patient Care.

## RR. TRAUMA DECISION TREE




**WHEN IN DOUBT, TAKE PATIENT TO AN APPROPRIATE TRAUMA CENTER**

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# IV. APPENDICES

## A. GLOSSARY

**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 on page 60).

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

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

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

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

**Basic**: Emergency Medical Technician-Basic.

**BSI**: Body Substance Isolation.

**BVM**: Bag-Valve-Mask.

**Carte Blanche**: Full discretionary power.

**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.

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

**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 peripheral 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 or administration of medication through IV.

**IVP**: Intravenous push.

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

**JVD**: Jugular vein (external) distention.

**kg**: Kilogram metric measure of weight equal to 1000 grams. 1 kg = 2.2 pounds.

**KVO**: Keep vein open. A slow IV flow rate.

**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, CRT-(I), and EMT-Paramedic.

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

**PVC**: Premature ventricular contraction.

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

**RMD**: Regional Medical Director.

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

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

**SC**: Subcutaneously.

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

**SL**: Sublingual. Under the tongue.

**SMOI**: Significant Mechanism Of Injury.

**SOP**: Standard Operational Procedure. Defined by local jurisdiction or region.

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

**Sublingually**: Under the tongue.

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

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

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

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

**TOI**: **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, MEDICAL DEVICES, AND MEDICATIONS FOR EMS AND COMMERCIAL SERVICES

| PROCEDURE | EMT-B | CRT | CRT-(I) | EMT-P |
|---|---|---|---|---|
| **ADMINISTRATION OF MEDICATIONS** | | | | |
| Oral, Sublingual, IM (auto-injector) | SO | SO | SO | SO |
| SQ, IM, IV, ET, Rectal, Nebulizer, Intranasal | – | SO | SO | SO |
| Intraosseous | – | – | SO | SO |
| Intradermal PPD (Public Safety Personnel only) | – | – | – | OSP |
| **AIRWAY MANAGEMENT** | | | | |
| Carbon Dioxide Detector (ALS required) | SO | SO | SO | SO |
| Capnograph (not required) | – | SO | SO | SO |
| Combitube | – | – | SO | SO |
| Continuous Positive Airway Pressure | – | – | OSP | OSP |
| Cricothyroidotomy | – | – | – | PP |
| Direct Laryngoscopy | – | SO | SO | SO |
| Gastric Tube (BLS “Burp,” ALS insert) | – | SO | SO | SO |
| Nasotracheal Intubation | – | – | – | SO |
| Oropharyngeal/Nasopharyngeal Airway | SO | SO | SO | SO |
| Orotracheal Intubation | – | SO | SO | SO |
| Needle Decompression Thoracostomy (NDT) | – | – | SO/MC | SO/MC |
| Pulse Oximeter (ALS required) | SO | SO | SO | SO |
| Suction | SO | SO | SO | SO |
| Ventilator | – | – | – | OSP |
| **CHEMICAL RESTRAINT** | – | – | – | MC |
| **ELECTROCARDIOGRAM** | | | | |
| Standard Limb Leads | – | SO | SO | SO |
| 12 Lead (not required) | – | SO | SO | SO |
| **ELECTRICAL THERAPY** | | | | |
| Automated External Defibrillator | SO | SO | SO | SO |
| Cardioversion | – | SO | SO | SO |
| Defibrillation | – | SO | SO | SO |
| Transcutaneous Cardiac Pacing | – | – | SO | SO |
| **GLUCOMETER** | OSP | SO | SO | SO |
| **INTRAVENOUS THERAPY** | | | | |
| External Jugular Access & Maintenance | – | – | SO | SO |
| Intraosseous Infusion & Maintenance | – | – | SO | SO |
| Peripheral IV Access/Saline Lock | OSP | SO | SO | SO |
| Peripheral IV Maintenance | SO | SO | SO | SO |
| **PNEUMATIC ANTI-SHOCK GARMENTS** | SO/MC | SO/MC | SO/MC | SO/MC |
| **SKELETAL STABILIZATION/IMMOBILIZATION** | SO | SO | SO | SO |
| **SOFT TISSUE INJURY & BLEEDING MANAGEMENT** | SO | SO | SO | SO |
| **VASOVAGAL MANEUVER** | | | | |
| Valsalva maneuver | – | SO | SO | SO |

**SO** Standing Order
**OSP** Optional Supplemental Program
**MC** Medical Consultation Required
**PP** Pilot Program

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

| DEVICE | EMT-B | CRT | CRT-(I) | EMT-P |
|---|---|---|---|---|
| Apnea Monitors | SO | SO | SO | SO |
| Arterial Lines and Cardiac Sheaths | – | – | – | – |
| Chemotherapy Administration/Drip | – | – | – | – |
| Chest tubes with Chest Drainage System | – | – | – | – |
| Chest tubes with Heimlick Valve | – | – | SO | SO |
| Colostomy bag | SO | SO | SO | SO |
| External Orthopedic Fixators | SO | SO | SO | SO |
| Foley catheter | SO | SO | SO | SO |
| Foley catheter with irrigation | SO | SO | SO | SO |
| Gastrostomy and jeujunal feeding tubes (Non-infusing) | SO | SO | SO | SO |
| HALO Cervical Immobilization | SO | SO | SO | SO |
| IABP InterAortic Balloon Pump | – | – | – | – |
| Iliostomy tube (Non-infusing) | SO | SO | SO | SO |
| **PICC**–peripherally inserted central line (venous) or **CVA**–central venous access line, capped only. | SO | SO | SO | SO |
| **PICC**–peripherally inserted central line (venous) or **CVA**–central venous access line, subclavian/femoral or internal jugular may be monitored if fluid/medication being administered meets protocol. The ALS provider may access the line in a life-threatening emergency. | – | SO | SO | SO |
| Intraventricular/Intracranial Monitor | – | – | – | – |
| Left Ventrical Assist Device (LVAD) Scene (BLS & ALS) | SO | SO | SO | SO |
| Left Ventrical Assist Device (LVAD) Interfacility | – | – | – | – |
| Nasogastric and Orogastric tubes (Existing, Non-infusing or Capped) | SO | SO | SO | SO |
| Nephrostomy Tubes | SO | SO | SO | SO |
| Portable Outpatient Fixed Medication Pump/PCA Pump | SO | SO | SO | SO |
| Peritoneal Dialysis (Non-active, Capped) | SO | SO | SO | SO |
| Physical Restraint | SO | SO | SO | SO |
| Sengstaken-Blakemore tube | – | – | – | – |
| Suprapubic catheter | SO | SO | SO | SO |
| Surgical drains | SO | SO | SO | SO |
| Swan-Ganz | – | – | – | – |
| Tracheostomy (Existing) | SO | SO | SO | SO |
| Transtracheal $O_2$ (Out Patient/Existing) | SO | SO | SO | SO |
| Transvenous Pacemaker (Temporary Transvenous) | – | – | – | – |
| Ventilators (Chronic, Scene, Interfacility) | – | – | – | SO/MC |
| Ventricular Peritoneal Shunt | SO | SO | SO | SO |

**SO** Standing Order
**OSP** Optional Supplemental Program
**MC** Medical Consultation Required
**PP** Pilot Program

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

| MEDICATIONS | EMT-B | CRT | CRT-(I) | EMT-P |
|---|---|---|---|---|
| Activated Charcoal (With or Without Sorbitol) | MC | MC | MC | MC |
| Adenosine | – | – | MC | SO |
| Albuterol Unit Dose Inhaler (Patient's Prescribed) | SO/MC | SO/MC | SO/MC | SO/MC |
| Albuterol Sulfate Nebulizer | – | SO/MC | SO/MC | SO/MC |
| Aspirin | – | MC | MC | SO |
| Atropine Sulfate | – | SO/MC | SO/MC | SO/MC |
| Atrovent (NEW '03) | – | – | SO | SO |
| Benzocaine | – | – | – | SO |
| Calcium Chloride (10% Solution) | – | MC | MC | MC |
| Dextrose 50% | – | SO | SO | SO |
| Diazepam | – | MC | MC | SO/MC |
| Diltiazem | – | – | MC | MC |
| Diphenhydramine Hydrochloride | – | SO/MC | SO/MC | SO/MC |
| Dopamine Hydrochloride | – | MC | MC | MC |
| Epinephrine Auto-Injector | SO/MC | SO | SO | SO |
| Epinephrine Nebulizer | – | – | MC | MC |
| Epinephrine 1:10,000/1:1,000 | – | SO | SO | SO |
| Furosemide | – | MC | MC | MC/SO |
| Glucagon | – | – | SO/MC | SO/MC |
| Glycoprotein IIb/IIIa (NEW '03) | – | – | – | OSP |
| Haldol (NEW '03) | – | – | – | MC |
| Hemophilia Blood Factor (VIII or IX) | – | SO | SO | SO |
| Heparin (Inter-facility trasnport only) | – | – | – | OSP |
| Ipecac | MC | MC | MC | MC |
| Lidocaine | – | SO | SO | SO |
| MARK I (Atropine & 2 PAM) (NEW '03) | OSP | OSP | OSP | OSP |
| Midazolam (Versed) | – | – | – | PP |
| Morphine Sulfate | – | MC | MC | SO/MC |
| Morphine Sulfate (Infusion) (NEW '03) | – | – | – | MC |
| Naloxone (IV and intranasal) | – | SO | SO | SO |
| Nitroglycerin (tablet /spray) (Patient's Prescribed) | SO | SO | SO | SO |
| Nitroglycerin (tablet/spray) | – | SO | SO | SO |
| Oral Glucose | SO | SO | SO | SO |
| Oxygen | SO | SO | SO | SO |
| Purified Protein Derivative (Public Safety Personnel only) | – | – | – | PP |
| Saline (Nebulized) | – | SO | SO | SO |
| Sodium Bicarbonate | – | MC | MC | MC |
| Succinylcholine (Anectine) | – | – | – | PP |
| Terbutaline Sulfate | – | SO | SO | SO |

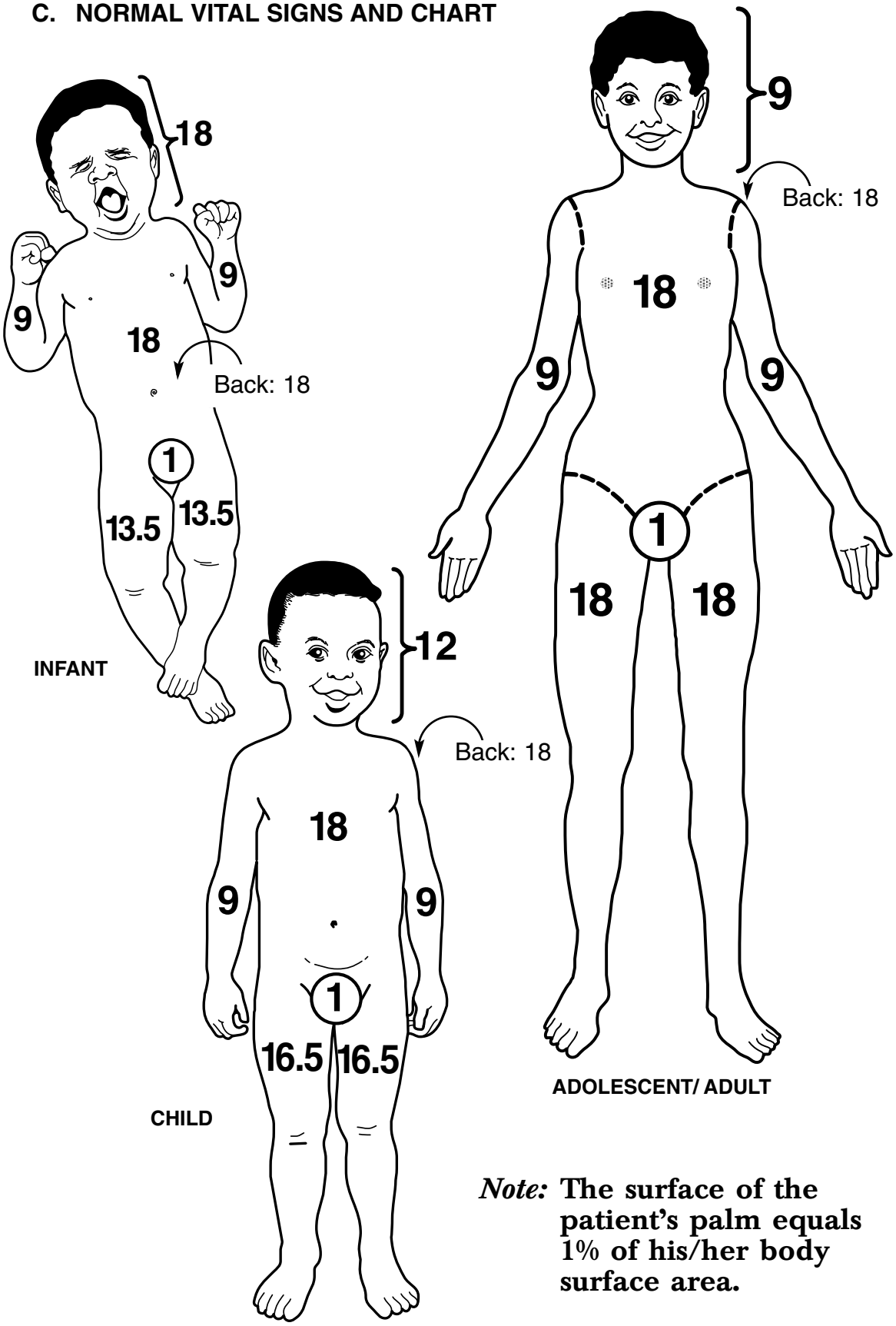
**SO** Standing Order **MC** Medical Consultation Required
**OSP** Optional Supplemental Program **PP** Pilot Program

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

| MEDICATIONS | EMT-B | CRT | CRT-(I) | EMT-P |
|---|---|---|---|---|
| Vaccines (Hepatitis and Influenza) (Public Safety Personnel only) | – | – | – | **OSP** |
| Vecuronium (Norcuron) | – | – | – | **PP** |

**SO** Standing Order
**OSP** Optional Supplemental Program
**MC** Medical Consultation Required
**PP** Pilot Program

## C. NORMAL VITAL SIGNS AND CHART




***Note:*** **The surface of the patient's palm equals 1% of his/her body surface area.**

C. NORMAL VITAL SIGNS AND CHART (continued)

# Average Normal Vital Signs

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

## 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.

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

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

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

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

4. ORAL EMS/DNR ORDERS (pg. 19 ch. G)
   a) EMS providers may follow an oral EMS/DNR Order directly from a Maryland- licensed physician (MD or DO) 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) Original Maryland EMS/DNR Order Form

(2) Copy of the Maryland EMS/DNR Order Form
(3) Other State EMS/DNR Order Form
(4) Maryland EMS/DNR Bracelet Insert
(5) Medic Alert DNR Bracelet or Necklace
(6) Oral DNR Order from EMS System Medical Consultation
(7) Oral DNR Order from other on-site physician

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.

## EMS/DNR (Continued)

c) Section 5-610 of the Health Care Decision Act (Health General Article, Annotated Code of Maryland) makes willful concealment, cancellation, defacement, obliteration, or damage of an advance directive (including EMS/DNR Orders), without the patient's or authorized decision maker's consent, a misdemeanor subject to a fine not exceeding $10,000, imprisonment not exceeding one year, or both.

8. ANTICIPATED LOCATIONS FOR EMS/DNR ORDER FORMS: (pg. 25 ch. N) EMS personnel shall be directed to look for an EMS/DNR Order in the following places:
   a) About a patient's wrist, hung from a necklace, or safety-pinned to a patient's clothing.
   b) At medical facilities, in the patient's chart.
   c) In residences and domicile facilities, by the bedside, behind the patient's bedroom door or on the refrigerator door.
   d) In schools and educational institutions, in the nurse's office, health room, or with the student's attendant caregiver/aide.
   e) Family or caregivers will be expected to retrieve the original EMS/DNR Order prior to the ambulance's arrival.

9. IDENTIFICATION OF PATIENT (pg. 25 ch. O)
   a) If the patient is able, the patient can self-identify during the initial assessment.
   b) If the patient is unable to communicate, then family, caregivers, or bystanders can identify the patient for EMS providers.
   c) If an EMS/DNR vinyl bracelet with insert or metal emblem (bracelet or necklace) is attached to a patient (on wrist, pendant from neck, pinned to clothing, etc.) the patient's identity can be reasonably assumed by EMS providers.
   d) If an EMS/DNR vinyl bracelet insert or metal emblem (bracelet or necklace) is found detached from the patient, EMS personnel must treat it as an EMS/DNR Order form and identify the subject of the EMS/DNR Order as the patient. A valid bracelet insert alone, without the vinyl bracelet, is a valid EMS/DNR Order so long as EMS providers confirm the patient's identity (pg. 17 ch. D).
   e) If EMS personnel are unable to ascertain with reasonable certainty, when required to do so, that the subject of the EMS/DNR Order is the patient, they may resuscitate the patient.

10. HEALTH PROVIDER/EMS PERSONNEL IMMUNITY (pg. 26 ch. R)
    a) General immunity provisions, such as Good Samaritan immunity for volunteers and sovereign immunity for government employees, may apply under specific circumstances.

## EMS/DNR (Continued)

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

11. EMS/DNR MEDICAL PROTOCOLS (pg. 29 ch. T)
   a) DISPATCH
      (1) Option B EMS/DNR patients (7/98 version) or patients with older version EMS/DNR orders (pg. 22 ch K) only require a BLS response. Once the on scene BLS provider has determined the need for additional pain control, an ALS rendevous may be requested. Medevac requests are not appropriate for these patients. (NEW '03)
      (2) Option A EMS/DNR patients (7/98 version) who are not in arrest may require a range of responses from BLS through the highest echelon of response available. This will depend on the information available to dispatch and the service requested. The response complement in these cases will be dictated by local standard operating procedures (SOP).
      (3) If a dispatch center is unclear whether the DNR order is an EMS/DNR order or is unclear about the pre-arrest patient care option selected (A or B), the dispatch center shall dispatch the appropriate resources based on the information available.
      (4) In the absence of knowledge to the contrary, information from medical professionals at a health care facility about the EMS/DNR status of a patient may be presumed to be reliable.

## EMS/DNR (Continued)

b) PERFORM LIMITED PATIENT ASSESSMENT
Vital signs:
(1) Check for absence of a palpable pulse.
(2) Check for absence of spontaneous respirations in an unresponsive patient.
(3) Check for a valid EMS/DNR Order form, vinyl bracelet insert worn either on the wrist, as a necklace, or pinned to clothing, or for a metal emblem (bracelet or necklace).

c) RESUSCITATE/DO NOT RESUSCITATE CRITERIA
(1) If an EMS /DNR Order is not present, revoked, or otherwise void, the EMS provider shall treat and, if necessary, transport the patient.
(2) If an EMS/DNR Order is not present, but the EMS provider believes that resuscitation or further resuscitation is futile, they may contact on-line medical direction to consult regarding "physician-directed termination of unsuccessful non-traumatic resuscitation in the field."
(3) If a valid EMS/DNR order is found and the patient is in cardiac or respiratory arrest, no resuscitative measures shall be initiated.
(4) If the patient is conscious and able to communicate that he/she revokes the EMS/DNR orally directly to EMS providers, EMS providers shall treat and, if necessary, transport the patient.
(5) If the EMS/DNR patient (Option A or B) arrests, withhold or withdraw further resuscitation and provide support to the family and caregivers. Consider notifying appropriate personnel.

d) MAXIMAL (RESTORATIVE) CARE PROTOCOL
(1) When Option A - "Maximal (Restorative) Care Before Arrest, Then DNR" is selected on an EMS/DNR Order, the patient shall receive the full scope of restorative interventions permissible under the Maryland EMS Medical Protocols (including intubation for respiratory distress, cardiac monitoring, synchronized cardioversion for pulse-**presen**t 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).

ALERT

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 $O_2$ 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.

(iii) For the patient with significant pain, and/or, pain with a prolonged transport, morphine may be administered. (NEW '03)

(e) Existing IV lines may be in place and, if so, shall be monitored to the extent possible according to the provider's level of certification and licensure.

**(2) Inappropriate Care for a Palliative Care Patient**

(a) Cardiac monitoring, including 12-lead EKG, pacing, cardioversion, and defibrillation

(b) Initiation of IV therapy (except when directed by online physician for morphine administration for pain control as in 1 (d) (iii) (NEW '03)

(c) EMS-Initiated Medications (Except oxygen and morphine administration for pain control as in 1 (d) (iii)) (NEW '03)

(d) CPR

(e) Intubation (Combitube, 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.

## EMS/DNR (Continued)

(3) The State EMS Board may authorize additional facilities under 6.2.2 or 6.2.4 (pp. 35-36), if recognized in the future by DHMH in accordance with 42 CFR 418.98 and 42 CFR 418.100. EMS jurisdictions and commercial ambulance services will be notified by MIEMSS of any facilities that become eligible and elect to receive patients by ambulance, become ineligible, or elect to discontinue their participation.

(4) Take a copy of EMS/DNR Order, vinyl bracelet with insert, or metal emblem (bracelet or necklace) to the hospital with the patient. If returning the patient from a previous transport, be sure to request a copy of the EMS/DNR Order form, vinyl bracelet with insert, or metal emblem (bracelet or necklace) from the staff (see pg. 20 ch H2 and the "EMS/DNR Order Retrieval Strategies" on pg. 58 of the EMS/DNR program booklet).

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.

## EMS/DNR (Continued)

(2) If the EMS/DNR protocol is initiated:
   (a) On the 7/94 MAIS runsheet, until the supply of those runsheets is exhausted, complete the "Hospice" dot in the "Conditions" section under "Assessment." On the 7/95 and subsequent MAIS runsheets, complete the DNR dot. On runsheets shipping 7/1/98 you will be able to select DNR-A or DNR-B to match the patient care options on the 7/1/98 revision of the EMS/DNR Orders;
   (b) Document, in the narrative section:
      (i) Who gave you the EMS/DNR Order (as an applicable person physically providing the written order, name of on-site physician, or 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.

## EMS/DNR (Continued)

(5) If a copy of the EMS/DNR Order is available to EMS providers, it shall be attached to the official copy of the call runsheet that is retained by the EMS service.

(6) A vinyl bracelet with insert or metal emblem (bracelet or necklace) shall be left where found on the patient. Bracelets or metal emblems shall not be removed without the permission of the patient or the patient's authorized decision maker and when possible, shall be returned with the patient to the sending facility (see pg.16 ch. C of the EMS/DNR Program booklet).

i) PATIENT DISPOSITION IF NOT TRANSPORTED

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

(1) Follow local operational procedures for handling deceased patients **(see "How to Best Tell the Worst News" on pp.105-106 of the EMS/DNR program booklet);**

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

(3) Law enforcement personnel or a representative of the medical examiner's office needs to be notified only in the case of sudden or unanticipated death which occurs:

(a) By violence

(b) By suicide

(c) As a result of an accident

(d) Suddenly, if the deceased was in apparent good health, or

(e) In any suspicious or unusual manner.

## E. PRESUMED DEAD ON ARRIVAL (PDOA)

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

### 1. PURPOSE

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

### 2. INDICATIONS

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

a) Decapitation
b) Decomposition
c) Rigor mortis
d) Pulseless, apneic patient in multiple casualty situation where system resources are required for stabilization of living patients
e) Pulseless, apneic patient with injury not compatible with life (with the exception of an obviously pregnant female where resuscitation attempts should be initiated and the patient transported to the nearest appropriate facility)

### 3. CONTRAINDICATIONS

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

### 4. PRECAUTIONS

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

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

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

### 2. INDICATIONS

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

### 3. CONTRAINDICATIONS

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

### 4. PROCEDURE

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

### 5. SPECIAL RURAL CONSIDERATIONS

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

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## G. PROCEDURES

### 1. AIRWAY MANAGEMENT: BAG VALVE MASK VENTILATION

#### a) PURPOSE

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

#### b) INDICATIONS

(1) Inadequate respiratory rate
  (a) Infant/Toddler less than 20
  (b) Child less than 16
  (c) Adolescent less than 12
  (d) Adult less than 8
(2) Inadequate respiratory effort
  (a) Absent or diminished breath sounds
  (b) Paradoxical breathing (chest and abdomen moving in opposite directions)
  (c) Cyanosis on 100% oxygen by nonrebreather mask
(3) Bradycardia
  (a) Infant Heart rate less than 80
  (b) Child Heart rate less than 60
  (c) Adult Heart rate less than 60
(4) Cardiac arrest
(5) Altered mental status
  Glasgow coma scale less than 9

#### c) CONTRAINDICATIONS

None

#### d) POTENTIAL ADVERSE EFFECTS / COMPLICATIONS

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

## e) PRECAUTIONS

(1) Have suction available since vomiting may occur.
(2) Use an appropriate size airway adjunct with BVM.
(3) Use an appropriate size mask to avoid pressure over the eyes (pediatric patient), which may cause vagal stimulation.
(4) For single provider BVM use the "E-C clamp" technique to achieve an adequate seal and avoid pressure on the soft tissues of the face or neck: Place the third, fourth, and fifth fingers along the jaw to provide a chin lift (forming an E); use the thumb and index finger to hold the mask on the child's face (forming a C).
(5) If the patient does not have adequate chest rise and breath sounds with BVM, consider the following interventions:
    (a) Disable the pressure pop-off valve to increase the delivery of air into the patient.
    (b) Use a larger bag to increase the volume of air delivered into the patient.
    (c) Evaluate and treat the patient for gastric distension.
        (i) BLS providers: manually decompress the stomach. This may be accomplished by opening an existing gastric tube or button.
        (ii) ALS providers: insert a gastric tube.

## f) SUGGESTED SIZES FOR RESUSCITATION MASKS

| Age | Mask Size | |
|---|---|---|
| Premature infants | Neonatal | (#0, #00) |
| Newborn to 1 year | Infant | (#1) |
| 1 – 4 years | Toddler | (#2) |
| 4 – 10 years | Pediatric | (#3) |
| 10 – 14 years | Small adult | (#4) |
| Adult | Adult | (#5) |

## g) SUGGESTED SIZES FOR RESUSCITATION BAGS

| Age/Weight | Bag Size | |
|---|---|---|
| Newborn to 3 months | Neonatal | 450-500 ml |
| Child less than 30 kg | Pediatric | 750 ml |
| Child over 30 kg | Adult | 1000-1200 ml |
| Adult | Adult | 1000-1200 ml |

**CRT-(I) & EMT-P ONLY**

## 2. AIRWAY MANAGEMENT: COMBITUBE

### a) INDICATION

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

### 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.

## 3. AIRWAY MANAGEMENT: GASTRIC TUBE

### a) PURPOSE

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

### b) INDICATIONS

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

### c) CONTRAINDICATIONS

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

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

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

### e) PRECAUTIONS

Have suction available since vomiting may be induced.

**EMT-P ONLY**

## 4. AIRWAY MANAGEMENT: NASOTRACHEAL INTUBATION

### a) PURPOSE

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

### b) INDICATIONS

(1) Use is primarily for hypoxemic CHF and COPD patients and is allowed for closed head injury patients with clenched teeth
(2) An oxygen saturation of less than or equal to 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

(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 discomfort.

(2) Confirmation of ET placement
   (a) Utilization of the back airway airflow monitor [BAAM] device when available
   (b) Auscultation of all lung fields to confirm air exchange
   (c) Auscultation of the epigastrium to deny disturbance of gastric fluids upon ventilation
   (d) Observation of bilateral expansion of the thorax
   (e) End tidal $CO_2$ detection device in arrest situations
   (f) The esophageal detection device
   (g) Documentation of tube depth at the nares
   (h) Other clinical signs of improved perfusion and ventilation (i.e. pupillary response, skin color, etc.)

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

**CRT-(I) & EMT-P ONLY**

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

### a) PURPOSE

Needle Decompression Thoracostomy is a procedure of introducing a needle/catheter (with flutter valve attached) into the pleural space of the chest to provide temporary relief for the patient suffering from a tension pneumothorax.

### b) INDICATIONS

ALERT MEDICAL CONSULTATION REQUIRED UNLESS THE DELAY WOULD COMPROMISE PATIENT CARE

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

(2) Allowable Site: Second intercostal space anterior midclavicular line

### c) CONTRAINDICATIONS

(1) Patients with suspected simple pneumothorax

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

### d) POTENTIAL ADVERSE EFFECTS / COMPLICATIONS

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

### e) PRECAUTIONS

(1) Reassessment of catheter patency

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

## 6. OBSTRUCTED AIRWAY FOREIGN BODY REMOVAL: DIRECT LARYNGOSCOPY

### a) PURPOSE

The attempted correction of a foreign-body airway obstruction through direct laryngoscopy should be accomplished only by a Maryland-certified/licensed CRT, CRT-(I), or EMT-P. This is accomplishedafter 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

(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

None

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

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

### e) PRECAUTIONS

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

## 7. AIRWAY MANAGEMENT: OROTRACHEAL INTUBATION

### a) PURPOSE

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

### b) INDICATION

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

### c) CONTRAINDICATIONS

Upper airway obstruction due to foreign objects

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

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

### e) PRECAUTIONS

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

(2) Confirmation of ET placement

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

(a) Visualization of the ET Tube protruding adequately past the vocal cords and into the trachea
(b) Auscultation of all lung fields to confirm adequate air exchange
(c) Auscultation of the epigastrium to deny disturbance of the gastric fluids upon ventilation
(d) Observation of the bilateral expansion of the thorax
(e) End Tidal $CO_2$ detection device. At a minimum utilize colorimetric devices.
(f) The esophageal detection device
(g) Documentation of tube depth at the lip
(h) Other clinical signs of improved perfusion and ventilation (i.e. pupillary response, skin color, etc.)

(3) Once initial placement is confirmed

(a) The tube must be adequately secured
(b) The patient must be prepared for transport in such a fashion as to minimize movement of the head and neck. This may include the use of a long backboard, and cervical collar, or other means of stabilization of the head and neck.

(4) Placement of the tube should be verified by all means possible (as in "(2)" above) and as often as possible as part of the providers' ongoing assessments. It has been further noted that flexion of the neck can cause 3-5 cm displacement of the ET Tube dislodging the tube from the trachea. At a minimum this reconfirmation should occur

(a) Once the patient is prepared for transport,
(b) Anytime the patient is moved,
(c) Anytime dislodgment of the tube is suspected, and
(d) When responsibility for care is transferred to any other provider.

(5) During routine reporting procedures, documentation of proper placement should include which methods were utilized and at which points, in the care of the patient, verification was accomplished.

(6) Maintain neutral alignment of head and neck with cervical stabilization when intubating trauma patients.

(7) The Blind Digital method may be utilized for intubation of a patient in whom hyperextention of the cervical spine may be contraindicated. It may also benefit patients with severe facial trauma. However, it must be emphasized that this can be a difficult procedure, and the provider must be certain that the patient cannot bite.

f) SUGGESTED SIZES FOR ENDOTRACHEAL TUBES AND SUCTION CATHETERS

# Equipment Sizes

| AGE | ORAL AIRWAY | BAG VALVE MASK | ETT SIZE | ETT BLADE | SUCTION CATHETER | GASTRIC TUBE |
|---|---|---|---|---|---|---|
| PREMATURE | 0 | NEONATAL (00) | 2.5–3.0 | 0 | 6F | 5F |
| NEWBORN | 0 | NEONATAL (0) | 3.0–3.5 | 0–1 | 6F | 5–8F |
| 3 mo. | 1 | INFANT | 3.5 | 1 | 6–8F | 5–8F |
| 6 mo. | 1 | INFANT | 3.5–4.0 | 1 | 8F | 8F |
| 1 yr. | 1 | INFANT | 4.0 | 1 | 8F | 8F |
| 2 yrs. | 2 | CHILD | 4.0–4.5 | 1–2 | 8–10F | 8–10F |
| 3 yrs. | 2 | CHILD | 4.5 | 2 | 10F | 10F |
| 4 yrs. | 3 | CHILD | 4.5–5.0 | 2 | 10F | 10–12F |
| 6 yrs. | 4 | CHILD | 5.0–5.5 | 2 | 10F | 12–14F |
| 8 yrs. | 4 | CHILD | 5.5–6.0 | 2 | 10–12F | 14F |
| 10 yrs. | 5 | CHILD | 5.5–6.5 | 3 | 12F | 14F |
| 12 yrs. | 5 | ADULT SMALL | 6.5–7.0 | 3 | 12F | 14–18F |
| 14 yrs. | 5 | ADULT | 6.5–7.5 | 3 | 12–14F | 16–18F |
| ADULT | 5 | ADULT | 7.0–10.0 | 4 | 12–14F | 16–18F |

ALERT

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. CONSULT BRASLOW TAPE™ IF AVAILABLE.

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

### a) INDICATIONS

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

| | |
|---|---|
| Infant less than 12 months | Not indicated (NEW ’03) |
| Infant 12 months - Child 8 years | If available, pediatric AED only (NEW ’03) |
| Child 8 years of age or greater | Adult AED |

### b) CONTRAINDICATIONS

(1) Infant less than 12 months of age (estimate based upon information available to individual operating AED). (NEW ’03)
(2) Patient exhibiting signs of life. (NEW ’03)

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.

## 9. ELECTRICAL THERAPY: CARDIOVERSION

### a) PURPOSE

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

### b) INDICATIONS FOR TREATMENT

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

### c) DOSAGE

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

(2) Pediatric

Symptomatic tachydysrhythmias
- (a) Initial 0.5 J/kg; if the calculated joules setting is lower than the defibrillation device is able to deliver, use the lowest joules setting possible or obtain medical consultation.
- (b) Subsequent 1.0 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

Tachydysrhythmias due to digitalis toxicity

## e) POTENTIAL ADVERSE EFFECTS/ COMPLICATIONS

An unsynchronized shock can result in ventricular fibrillation.

## f ) PRECAUTIONS

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

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

## 10. ELECTRICAL THERAPY: DEFIBRILLATION

### a) PURPOSE

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

### b) INDICATIONS FOR TREATMENT

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

### c) DOSAGE

(1) Adult
  (a) Initial delivered energy 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

None

### e) POTENTIAL ADVERSE EFFECTS / COMPLICATIONS

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

### f) PRECAUTIONS

(1) Patients who are fully digitalized may require less than the normal recommended delivered energy.
(2) If the calculated joules setting is lower than the defibrillation device is able to deliver, use the lowest joules setting possible or obtain medical consultation.

**CRT-(I) & EMT-P ONLY**

## 11. ELECTRICAL THERAPY: EXTERNAL TRANSCUTANEOUS CARDIAC PACING

### a) PURPOSE

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

### b) INDICATIONS

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

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

(3) Second-degree Mobitz Type II and third-degree AV block with a systolic BP of less than 80 mmHg, or 80-100 mm Hg with shock-like signs or symptoms.
In the presence of Mobitz II and third-degree AV block, medical consultation is required for atropine administration.

(4) Pacing may be indicated in certain instances in which the heart rate is 60-75 BPM and shock-like symptoms persist.
Pacing in these instances requires medical consultation from a physician.

(5) Patients who experience provider-witnessed cardiopulmonary arrest and who present with asystole, or patients whose ECG converts to asystole while the ECG is being monitored.

(6) Prompt application of the transcutaneous cardiac pacemaker is appropriate prior to the administration of epinephrine and atropine when a patient converts to asystole as a primary rhythm during ECG monitoring by a CRT-(I) or EMT-P.

(7) Pediatric patients (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**

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 and has adequate blood pressure consider:

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

OR

Diazepam 2.5-10 mg slow IV/IO push with medical consult.

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

**f) PRECAUTIONS**

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

## 12. HYPOPERFUSION ADJUNCT: PASG (PNEUMATIC ANTISHOCK GARMENT [a.k.a. MAST])

### a) PURPOSE

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
Must be in **profound shock** and have at least one of the following:

(a) Suspected pelvic fracture

(b) Suspected intra-abdominal bleeding

(c) Suspected bilateral femur fractures

(2) Adult Non-Traumatic
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 are 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.

**CRT-(I) & EMT-P ONLY**

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

### a) PURPOSE

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

### b) INDICATIONS

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

### c) CONTRAINDICATIONS

(1) Inability to visualize the vein

(2) Suspected spinal trauma

### d) POTENTIAL ADVERSE EFFECTS /COMPLICATIONS

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

### e) PRECAUTIONS

Carefully secure EJ catheter and tubing.

## 14. GLUCOMETER PROTOCOL

### a) PURPOSE

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

### b) INDICATIONS

The glucometer should be utilized for any patient presenting with an altered mental status, seizure activity, or unresponsiveness.

### c) TREATMENT

(1) ADULT

(a) If blood glucose is less than 70 mg/dl, administer 25 grams 50% dextrose IVP.

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

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

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

(2) PEDIATRIC

(a) **Patient 2 months of age or less** - If blood glucose is less than 30 mg/dl, administer 5.0–10.0 ml/kg of 10% dextrose IV/IO (D10W is prepared by mixing one part of D50W with four parts LR). (NEW '03)

(b) **Patient greater than 2 months but less than 2 years of age** - If blood glucose is less than 70 mg/dl, administer 2.0-4.0 ml/kg of 25% dextrose IV/IO; (D25W is prepared by mixing D50W with an equal volume of LR). (NEW '03)

(c) **Patient 2 years of age or greater** - If blood glucose is less than 70 mg/dl, administer 1–2 ml/kg of 50% dextrose IV/IO. Maximum dose 25.0 grams. (NEW '03)

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

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

**CRT-(I) & EMT-P ONLY**

## 15. INTRAOSSEOUS INFUSION (IO)

### a) PURPOSE

The administration of fluids and medications via intraosseous infusion has long been known to be a relatively safe and effective procedure in the treatment of critically ill patients. 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:
- (a) Cardiac arrest,
- (b) Profound hypovolemia,
- (c) Any life-threatening illness or injury requiring immediate pharmacological or volume intervention,
- (d) Unconscious, unknown etiology (i.e., near sudden infant death syndrome), **OR**
- (e) 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
  **OR**
  locate the medial surface of the distal tibia just proximal to the medial malleolus
- (b) Patients greater than 6 years of age: locate the medial surface of the distal tibia just proximal to the medial malleolus

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

## 16. INTRAVENOUS MAINTENANCE THERAPY FOR EMT-B

a) Provider-controlled IV solutions

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

(a) The IV Solution **DOES NOT** contain:
  (i) **MEDICATIONS**,
  (ii) **WHOLE BLOOD**, or
  (iii) **BLOOD PRODUCTS** (such as plasma, platelets, or packed red blood cells)
(b) The IV catheter is placed in a **PERIPHERAL LIMB VEIN**, or
(c) The IV catheter is a capped (i.e., heparin-locked) peripheral or central line, and
(d) No other ALS interventions are required.

(2) IV fluids

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

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.

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

c) Provide patient care according to appropriate protocol.

d) Routine IV maintenance procedures.

(1) Ensure IV solution and catheter placement meets criteria above.

(a) Request assistance of appropriate level health care provider if IV solution and/or IV catheter placement do not meet criteria above, or

(b) Request authorized personnel at health care facility to:

(i) Replace IV solution with an appropriate IV solution, or

(ii) Discontinue the IV prior to departing the scene.

(2) Confirm appropriate IV solution drip rate prior to transport.

(3) Ensure IV bag contains adequate volume of solution for duration of patient transport.

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

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

(b) Discontinue the IV prior to departing the scene.

(4) Ensure IV solution is flowing at appropriate rate.

(5) Ensure patient has no signs or symptoms specifically related to complications of IV therapy prior to transport.

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

e) Complications of IV Therapy

(1) During patient transport, many possible complications of IV therapy may occur that the EMT-B must be prepared to manage.

(a) Local complications may include: pain, hematoma, infiltration, infection, dislodged catheter, and tissue sloughing.

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

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

### a) PURPOSE

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

### b) INDICATIONS

(1) See treatment protocols for initiation of IV.

(2) If the protocol indicates to start an IV, the "Program Approved Option" EMT-B may initiate an IV or saline-lock, if appropriate.

(3) **Saline locks** may be substituted for IV KVO anywhere in the protocol with the understanding that if the patient needs a fluid challenge or medication, the saline lock is converted to an IV of LR.

(4) In the event of a life-threatening emergency (with medical consult) or cardiac arrest, indwelling or implanted central or peripheral venous catheters may be accessed for medication administration.

(5) When a patient is a **Hemophiliac A or B** (Factor VIII or IX) and the family or patient states that the patient must have factor concentrate administered, the ALS provider may assist the patient in the IV administration of the patient's own factor concentrate (VIII or IX). Notify the receiving hospital of the administration of blood factor concentrate.

(6) All ALS providers (CRT, CRT-(I) & EMT-P) may access lower extremity IV sites. The CRT-(I) & EMT-P should consider lower extremity IV sites prior to IO attempts (EMT-IV technicians may not access lower extremity IV sites).

(7) Maximum 2,000 ml LR without medical consultation

(8) Second IV requires medical consultation.

### c) CONTRAINDICATIONS

See treatment protocols.

### d) POTENTIAL ADVERSE EFFECTS/COMPLICATIONS

See IV Maintenance Therapy for EMT-B.

### e) PRECAUTIONS

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

## 18. PERSONAL PROTECTIVE EQUIPMENT

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

(a) Level A: An SCBA or supplied-air with escape cylinder, in combination with a fully encapsulating chemical protective suit, capable of maintaining a positive air pressure inside the suit. Level A ensembles include both outer and inner chemical-resistant gloves, chemical-resistant steel-toed boots, and two-way radio communications. Additional items, such as long underwear or coveralls, may also be included. This ensemble is required for the highest level of protection for skin, eyes, and the respiratory system.

(b) Level B: Same respiratory protection as Level A, along with hooded chemical-resistant clothing, outer and inner chemical-resistant gloves, chemical-resistant steel-toed boots, and other optional items, such as face shields, hard hats, boot covers, and coveralls. OSHA Level B does not include a positive-pressure suit. Level B PPE is used when the type and atmospheric concentrations of substances have been identified and require a high level of respiratory protection, but a lesser level of skin protection.

(c) Level C: Full face piece or half face piece air-purifying respirators with hooded, chemical-resistant clothing, inner and outer chemical-resistant gloves, and chemical-resistant boots. Level C PPE should be used when the atmospheric contaminants have been identified, concentrations measured, and an air-purifying respirator is appropriate and available to remove the contaminants of interest.

(d) Level D: A work uniform affording minimal protection, used for nuisance contamination only.

## 19. PHYSICAL AND CHEMICAL RESTRAINTS (NEW ’03)

### a) PURPOSE

To prevent harm to patient and/or others

### b) INDICATIONS

(1) Patient restraints (physical and/or chemical) should be utilized only when necessary and only in situations where the patient is exhibiting behavior that the EMS Provider believes will present a danger to the patient or others.

(2) The procedure does apply to patients treated under implied consent.

### c) PROCEDURE

(1) The physical restraint procedure applies to patients greater than 1 year of age.

(a) Ensure that the scene is safe.

(b) Ensure sufficient personnel are present to control the patient while restraining. USE POLICE ASSISTANCE WHENEVER AVAILABLE.

(c) Position the patient for safe transport:

ALERT

PATIENT POSITIONING SHOULD BE MODIFIED WHEN RESTRAINING PATIENTS WITH LIMITED MOBILITY (E.G. CONFINED TO BED OR WHEELCHAIR). USE PASSIVE RESTRAINT AND PLACE PATIENTS WITH PREVIOUS INJURY OR PRE-EXISTING CONDITIONS, SUCH AS OSTEOPOROSIS OR CONTRACTURE, IN A NEUTRAL POSITION.

(i) Method. (Be prepared to logroll immediately in the event of vomiting.)

1. Place patient face up or on his/her side, if at all possible.
2. Secure extremities:
   For adults, use 4-point restraints (ideally with one arm up and the opposite arm down) or use a sheet to carefully wrap the patient before applying a Reeves-type stretcher.
   For patients 12 years and under, use 3-point restraints (two arms, one leg) or use a sheet to carefully wrap the patient before applying a Reeves-type stretcher.

ALERT

IF POLICE HANDCUFFED THE PATIENT, JOINTLY WITH POLICE, REPOSITION THE PATIENT IN FACE-UP POSITION AND WITH HANDS ANTERIOR AND SECURED TO STRETCHER.

3. If necessary, utilize cervical-spine precautions to control violent head or body movements.
4. Place padding under patient’s head. Pad any other area needed to prevent the patient from further harming him or herself or restricting circulation.
5. Secure the patient onto the stretcher for transport, using additional straps if necessary. Be prepared at all times to logroll, suction, and maintain airway.

(d) Monitor airway status continuously, utilize pulse oximetry when available, vital signs, and neurocirculatory status distal to restraints. Document findings every 15 minutes, along with reason for restraint.

(e) For interfacility transfers, obtain a written physician's order for use of restraints.

---

(2) Chemical Restraint Procedure

**BE SURE TO ASSESS FOR EVIDENCE OF TRAUMATIC OR MEDICAL CAUSES FOR PATIENT'S AGITATION.**

(a) Prepare airway equipment, including suction, BVM, and intubation equipment

(b) Administer Haloperidol.

(1) Adult

a. **Patient 16-69 years of age:**
5-10 mg IM or IV

b. **Patient greater than 69 years of age:**
0.5 - 2.5 mg IM or IV

(2) Pediatric

a. **Child less than 6 years of age:**
Contraindicated

b. **Child 6-12 of years of age:**
0.05 mg/kg IM or IV, Max of 2.5 mg

c. **Patient 13-15 years of age:**
2-5mg IM or IV

(c) Start IV LR KVO, if possible.

(d) Use Glucometer and treat accordingly.

(e) Repeat doses may be given with Medical Direction.

(f) Monitor vital signs, ECG, and pulse oximetry.

(g) Be prepared to treat hypotension with fluid challenge.

(h) Treat acute dystonic or extrapyramidal reactions with Diphenhydramine adult: 25-50 mg IV push /IM (1mg/kg Pediatrics with Max dose of 25 mg)

(i) Monitor airway status continuously, utilize pulse oximetry when available, vital signs, and neurocirculatory status distal to restraints. Document findings every 15 minutes, along with reason for restraint.

## d) ADDITIONAL INFORMATION

(1) Physical-restraint guidelines:

(a) Use the minimum restraint necessary to accomplish necessary patient care and ensure safe transportation (soft restraints may be sufficient in some cases). If law-enforcement or additional personnel are needed, call for assistance prior to attempting restraint procedures. Do not endanger yourself or your crew.

(b) Avoid placing restraints in such a way as to preclude evaluation of the patient's medical status (airway, breathing, and circulation). Consider whether placement of restraints will interfere with necessary patient-care activities or will cause further harm.

(c) Once restraints are placed, do not remove them until you arrive at the hospital unless there is a complication from their use. If at all possible, take extra personnel during transport to hospital to deal with potential complications.

(2) Chemical-restraint guidelines:

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

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## H. BLS PHARMACOLOGY

### 1. ACTIVATED CHARCOAL (WITH OR WITHOUT SORBITOL)

**a) Indications**

Poisoning by mouth

**b) Adverse Effects**

May indirectly induce vomiting and cause nausea

**c) Precautions**

Does not absorb all drugs and toxic substances

**d) Contraindications**

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

**e) Preparations**

(1) 25 grams/125 ml bottle
(2) 50 grams/250 ml bottle

**f) Dosage**

(1) Adult: Administer 1 gram/kg or (0.5 gram/lb)
(2) Pediatric: Administer 1 gram/kg or (0.5 gram/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 repeated excessive use.
(2) Patient must have his/her own physician-prescribed hand-held aerosol inhaler.

**d) Contraindications**

Inhaler not prescribed for the patient

**e) Preparations**

Hand-held (unit dose) aerosol inhaler

**f) Dosage**

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

## 3. EPINEPHRINE AUTO-INJECTOR

**a) Indications**

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

**b) Adverse Effects**

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

**c) Precautions**

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

**d) Contraindications**

None in the presence of anaphylaxis

**e) Preparations**

Epinephrine Auto-injector only (Patient prescribed or EMS services')
(1) Adult: 0.3 mg
(2) Pediatric: 0.15 mg

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

**f) Dosage**

(1) **Patients 3 years of age or greater: (NEW '03)**
Adult Auto-injector: 0.3 mg IM
(2) **Patients less than 3 years of age: (NEW '03)**
Pediatric Auto-injector: 0.15 mg IM

(3) Additional doses may be administered with medical consultation.

## 4. IPECAC

**a) Indications**

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**

15 or 30 ml vials of syrup

**f) Dosage**

(1) Adult:
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™, Cialis™ or Levitra™ ingestion within the last 24 hours

**e) Preparations**

Spray or tablet

**f) Dosage**

(1) Adult: One tablet or one spray sublingually
   (a) Repeat in 3 to 5 minutes if chest pains persists
   (b) Maximum of three doses (a combination of patient-administered and EMT-B-administered) of nitroglycerin
(2) Pediatric: Not Indicated (nitroglycerin contraindicated for children under age 12)

(3) Additional doses may be administered with medical consultation.

## 6. ORAL GLUCOSE

### a) Indications

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

### b) Adverse Effects

Not clinically significant

### c) Precautions

Patient without gag reflex may aspirate.

### d) Contraindications

Not clinically significant

### e) Preparations

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

### f) Dosage

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

## 7. OXYGEN

### a) Indications

All medical and trauma patients

### b) Adverse effects

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

### c) Precautions

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

### d) Contraindications

None

### e) Dosage

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

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

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# I. ALS PHARMACOLOGY

## 1. ACTIVATED CHARCOAL (WITH OR WITHOUT SORBITOL)

**a) Pharmacology**

Variable drug or toxin absorption when ingested

**b) Pharmacokinetics**

Absorbs poisons and prevents toxins from entering body systems

**c) Indications**

Poisoning by mouth

**d) Contraindications**

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

**e) Adverse Effects**

Not clinically significant

**f) Precautions**

Does not adsorb all drugs and/or toxic substances

**g) Dose**

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

## 2. ADENOSINE (ADENOCARD)

(CRT-(I) & EMT-P only)

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

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

### d) Contraindications

Known hypersensitivity

### e) Adverse Effects

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

### f) Precautions

(1) Effects antagonized by theophylline
(2) Effects enhanced by 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: (Paramedic may perform without consult.)
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

To reverse bronchospasm (wheezing)

### d) Contraindications

Known hypersensitivity

### e) Adverse Effects

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

### f) Precautions

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

### g) Dosage

(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

**a) Pharmacology**

(1) Platelet inhibitor
(2) Anti-inflammatory

**b) Pharmacokinetics**

Blocks platelet aggregation

**c) Indications**

Chest pain when acute myocardial infarction is suspected.

**d) Contraindications**

Known hypersensitivity

**e) Adverse Effects**

(1) Heartburn
(2) Nausa and vomiting
(3) Wheezing

**f) Precautions**

GI bleeding and upset

**g) Dosage (Paramedic may perform without consult.)**

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

## 5. ATROPINE SULFATE

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

(1) Symptomatic bradycardia
(2) Asystole, idioventricular rhythm
(3) Organophosphate poisoning

### d) Contraindications

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

### e) Adverse Effects

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

### f) Precautions

Not clinically significant

**g) Dosage**

(1) Adult:

(a) Asystole: Administer 1.0 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. ATROVENT (Ipratropium) (NEW '03)

(CRT-(I) & EMT-P only)

### a. Pharmacology

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

### b. Pharmacokinetics

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

### c. Indications

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

### d. Contraindications

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

### e. Adverse Effects

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

### f. Precautions

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

**g) Dosage**

(1) Adult:
Single adminstration ONLY, 500 mcg (2.5 ml) by nebulized aerosol connected to 6-8 lpm of oxygen in combination with albuterol 2.5 mg.

(2) Pediatric:
Single administration ONLY. In combination with albuterol, nebulized aerosol is connected to 6 - 8 lpm of oxygen.

a. **Age 2 and older:**
500 mcg (2.5 ml) by nebulized aerosol

b. **Ages 1 year but less than 2 years:**
250 mcg (1.25 ml) by nebulized aerosol

## 7. BENZOCAINE

*(EMT-Paramedic only)*

### a) Pharmacology

*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

*Analgesia for nasal tracheal intubation*

### d) Contraindications

*(1) Hypersensitivity/allergy to benzocaine*

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

### e) Adverse Effects

*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.)*

## 8. CALCIUM CHLORIDE (10% Solution)

### a) Pharmacology

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

### b) Pharmacokinetics

Rapid onset of action with IV administration

### c) Indications

(1) Hyperkalemia
(2) Hypocalcemia
(3) To treat adverse effects caused by calcium channel blocker overdose
(4) Hypotension secondary to Diltiazem administration.

### d) Contraindications

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

### e) Adverse Effects

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

### f) Precautions

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

### g) Dosage

(1) Adult: Administer 0.5 -1.0 gram slow IVP (50 mg/min); may be repeated as needed at 10 minute intervals. Administer 250 mg slow IVP for hypotension following Diltiazem administration.
(2) Pediatric: Administer 20 mg/kg (0.2 ml/kg) slow IVP/IO (50 mg/min) Maximum dose 1 gram or 10 ml.

## 9. DEXTROSE 50%

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

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

### d) Contraindications

Known hyperglycemia

### e) Adverse Effects

May worsen hyperglycemia (high blood sugar)

### f) Precautions

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

### g) Dosage

(1) Adult: Administer 25.0 grams in 50 ml IV (1 ampule of 50% solution)
(2) Pediatric:
    (a) If less than 2 months of age - Administer 5.0–10.0 ml/kg D10W IV/IO (D10W is prepared by mixing one part of D50W with four parts LR).
    (b) If greater than 2 months but less than 2 years of age - Administer 2.0-4.0 ml/kg of 25% dextrose IV/IO; (D25W is prepared by mixing D50W with an equal volume of Lactated Ringer's).
    (c) If greater than 2 years of age - Administer D50W 1–2 ml/kg IV/IO. Maximum dose 25.0 grams.

## 10. 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 (Paramedic may perform without consult for patients with active seizures.)**

(1) Adult: Administer 2.5-10.0 mg in 2.5 mg increments slow IVP. Maximum total dose 10 mg.
(2) Pediatric: Administer 0.10 mg/kg slow IVP/IO. Maximum total dose 5 mg.
Rectal Dose: Administer up to 0.2 mg/kg, maximum total dose 10 mg.

## 11. DILTIAZEM (Cardizem)

(CRT-(I) & EMT-P only)

**a) Class**

Calcium channel blocker

**b) Actions**

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

**c) Indications**

Symptomatic atrial fibrillation and atrial flutter

**d) Contraindications**

(1) Hypotension below 90 mm Hg, second or third degree heart block, hypersensitivity to the drug
(2) Patients less than 12 years of age

**e) Precautions**

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

**f) Side effects**

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

**g) Significant interactions**

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

**h) Dosage**

(1) Adult:
   (a) 0.25 mg/kg by IV bolus administered slow IV over 2 minutes; if response is not adequate, repeat in 15 minutes with a dosage of 0.35 mg/kg over 2 minutes.
   (b) For patients older than 50 years of age or borderline blood pressure, consider initial bolus 5-10 mg administered IV over 2 minutes.
(2) Pediatric:
   Contraindicated for patients less than 12 years of age.

**i) Overdose or Toxicity Presentation**

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

**j) Treatment of Overdose or Other Adverse Reactions**

(1) Give general supportive measures, monitor vitals, administer oxygen.

(2) Hypotension: Consider calcium chloride 250 mg SLOW IVP with medical consultation and IV fluid challenge with lactated Ringer's; evaluate legs.

(3) Bradycardia: Consider atropine (0.5 to 1.0 mg); if necessary, consider pacing.

## 12. DIPHENHYDRAMINE HYDROCHLORIDE (BENADRYL)

**a) Pharmacology**

Antihistamine

**b) Pharmacokinetics**

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

**c) Indications**

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

**d) Contraindications**

Known allergy to diphenhydramine

**e) Adverse Effects**

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

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

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

**g) Dosage**

(1) Adult: Administer 25.0 - 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.

## 13. 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
  Results in increased cardiac output
(6) High dose, 6-10 ug/kg/min
  Exhibits alpha1 effects; peripheral vasoconstriction including renal and mesenteric vessels, increases left and right ventricular preload
(7) Doses greater than or equal to 10 ug/kg/min
  Alpha1 stimulating effects may reverse mesenteric and renal artery dilatation resulting in decreased blood flow, causing increased preload due to effects on venous system

**b) Pharmacokinetics**

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

**c) Indications**

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

**d) Contraindications**

(1) Pheochromocytoma (adrenal tumor which causes excessive release of epinephrine and norepinephrine)
(2) Pre-existing tachydysrhythmias
(3) Uncorrected hypovolemia

**e) Adverse Effects**

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

**f) Precautions**

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

**g) Dosage**

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

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

**a) Pharmacology**

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

(2) Causes a reduction with bronchodilation by relaxing smooth muscles in the bronchial tree (bronchial dilation)

**b) Pharmacokinetics**

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

**c) Indications**

(1) Cardiac arrest
(2) 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)

**d) Contraindications**

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

**e) Adverse Effects**

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

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

**f) Precautions**

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

**g) Dosage**

(1) Cardiac Arrest
  (a) Adult:
    (i) Administer 1.0 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

(3) Anaphylactic Shock/Asthma

(a) FOR ANAPHYLACTIC SHOCK ONLY

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

(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.

## 15. FUROSEMIDE (LASIX)

**a) Pharmacology**

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

**b) Pharmacokinetics**

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

**c) Indications**

Acute pulmonary edema, CHF, 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**

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

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

**g) Dosage (Paramedic may perform without consult except in hypertensive crisis.)**

(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

## 16. GLUCAGON (CRT-(I) & EMT-P only)

**a) Pharmacology**

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

**b) Pharmacokinetics**

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

**c) Indications**

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

**d) Contraindications**

Known hypersensitivity

**e) Adverse Effects**

Nausea and vomiting

**f) Precautions**

Glucagon only works if liver has significant glycogen stores.

**g) Dosage**

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

## 17. HALOPERIDOL (HALDOL) (NEW '03)

(EMT-P Only)

### a) Pharmacology

(1) An effective anxiolytic agent. Very effective in the management of aggressive and violent patients.

(2) Also has antiemetic properties. Useful in the management of severe nausea and vomiting.

(3) Weak anticholinergic (atropine-like) and alpha-blocking agent (vasodilation).

### b) Pharmacokinetics

(1) Onset of action is within 10 minutes of the IM administration.

### c) Indications

(1) Chemical restraint for violent, agitated, and aggressive patients who present a danger to themselves or to others and who cannot be safely managed otherwise. Most violent/agitated patients can be handled with verbal or physical restraint alone. This is a joint paramedic–base station physician decision that relies heavily on paramedic judgment.

### d) Contraindication

(1) Children under 6 years of age

(2) Parkinson's disease

(3) CNS depression

(4) Acute CNS injury

### e) Adverse Effects

(1) Extrapyramidal symptoms (dystonic reaction) are the most common side effects. These are generally not encountered with short-term use. In the event that they should develop, a single dose of diphenhydramine 25-50 mg (1 mg/kg for pediatrics to a max of 25 mg) will generally relieve symptoms (medical consult required).

(2) Hypotension and tachycardia are common (20-25%) but usually self-limiting side effects. Fluid challenge is indicated with a significant drop blood pressure or hypotension.

**f) Precautions**

(1) Violent patients should be physically restrained while the medication is administered.

(2) May mask subsequent evaluation.

**g) Dosage**

(1) Adult

a. **Patient 16-69 years of age:**
5-10 mg IM or IV

b. **Patient greater than 69 years of age:**
0.5 - 2.5 mg IM or IV

(2) Pediatric

a. **Child less than 6 years of age:**
Contraindicated

b. **Child 6-12 of years of age:**
0.05 mg/kg IM or IV, Max of 2.5 mg

c. **Patient 13-15 years of age:**
2-5mg IM or IV

## 18. IPECAC

**a) Pharmacology**

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

**b) Pharmacokinetics**

Onset of action in 20 - 30 minutes

**c) Indications**

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:
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

## 19. LACTATED RINGER'S

**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**

Lactated Ringer's is a water and electrolyte replacement.

**c) Indications**

(1) Hypovolemia

(2) Keep vein open

(3) Fluid boluses

**d) Contraindications**

Fluid overload states

**e) Adverse Effects**

Rare in therapeutic doses

**f) Precautions**

(1) Patients receiving lactated Ringer's should be monitored to prevent circulatory overload.

(2) Lactated Ringer's should be used with caution in patients with congestive heart failure or renal failure.

**g) Dosage**

(1) Maximum dose 2,000 ml without medical consultation

(2) Adult:

(a) KVO

(b) Initiate IV LR fluid therapy (20 ml/kg bolus).

(c) Titrate to a systolic pressure of 100 mm Hg.

(3) Pediatric:

(a) KVO

(b) If age-related vital signs and patient's condition indicate hypoperfusion, administer initial fluid 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.

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

## 20. LIDOCAINE (XYLOCAINE)

**a) Pharmacology**

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

**b) Pharmacokinetics**

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

**c) Indications**

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

**d) Contraindications**

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

**e) Adverse Effects**

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

**f) Precautions**

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

(2) Bolus doses should be administered over a 1-minute period, except in ventricular fibrillation/ventricular tachycardia, when they are administered IVP.

**g) Dosage**

(1) Adult with pulse: Administer 1.0 -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**

(1) IV Infusion

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

## 21. 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, frostbite, eye trauma): Administer 2-10 mg slow IVP at 1-2 mg/min increments to 10 mg or until pain is relieved (Paramedic may perform without consult.) For doses above 10 mg, contact medical direction (NEW ’03)
   (d) May also be administered IM dose 5-15 mg based on patient weight
(2) Pediatric: 0.1 mg/kg IVP/IO/IM (1-2 mg/min)

## 22. NALOXONE (NARCAN)

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

To reverse respiratory and central nervous system depression induced by opiates

### d) Contraindications

Not clinically significant

### e) Adverse Effects

Not clinically significant

### f) Precautions

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

### g) Dosage

(1) Adult: Administer 0.4-2.0 mg IVP/IM/intranasal; 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

## 23. NITROGLYCERIN

**a) Pharmacology**

(1) Vasodilator-effect on veins more than arteries

(2) Decreases right heart return (preload) by venous pooling, thereby decreasing myocardial workload and oxygen consumption

**b) Pharmacokinetics**

(1) Absorbed through oral mucosa

(2) Antianginal and vasodilation effects within 1-2 minutes after administration. Half-life is 1-4 minutes.

(3) Duration of action is less than 5 minutes.

**c) Indications**

(1) For treatment of angina

(2) Congestive heart failure, acute pulmonary edema

**d) Contraindications**

(1) Known hypersensitivity

(2) Pediatric patient under the age of 12

(3) Viagra™, Cialis™ or Levitra™ 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**

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

**f) Precautions**

May cause hypotension

**g) Dosage**

(1) Adult

(a) If patient has a prescription or previous history of nitroglycerin use, administer nitroglycerin: 0.4 mg SL (may repeat dose 3 times at 3-5 minute intervals)

May be repeated if symptoms persist, and BP is greater than 90 mm Hg, and pulse is greater than 60 bpm, to a maximum dose of 1.2 mg

(b) If patient does **not** have a prescription or previous history of nitroglycerin use, establish IV prior to the administration of nitroglycerin, then administer nitroglycerin as above.

(c) Additional doses may be administered with medical consultation.

(2) Pediatric: Not indicated

## 24. OXYGEN

**a) Pharmacology**

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

**b) Pharmacokinetics**

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

**c) Indications**

(1) Acute chest pain
(2) Suspected hypoxemia of any etiology
(3) Cardiopulmonary arrest
(4) Trauma
(5) Dyspnea

**d) Contraindications**

Not clinically significant

**e) Adverse Effects**

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

**f) Precautions**

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

**g) Dosage**

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

## 25. SALINE NEBULIZED

**a) Pharmacology**

Increases moisture content in the airways.

**b) Pharmacokinetics**

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

**c) Indications**

Suspected croup

**d) Contraindications**

History of airway hyperresponsiveness

**e) Adverse Effects**

(1) Wheezing or bronchospasm
(2) Patient discomfort

**f ) Precautions**

(1) The extent of patient monitoring should be determined on the basis of the stability and severity of the patient's condition.
(2) Monitor the patient for:
  (a) Dyspnea
  (b) Restlessness
  (c) Respiratory rate
  (d) Respiratory pattern
  (e) Accessory muscle use

**g) Dosage**

(1) Adult: Not indicated
(2) Pediatric
  (a) Administer 3 ml of saline by nebulizer.
  (b) May be repeated with medical direction.

## 26. SODIUM BICARBONATE

**a) Pharmacology**

Sodium bicarbonate corrects acidosis.

**b) Pharmacokinetics**

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

**c) Indications**

(1) Used in cardiac arrest only after more definitive treatments
(2) Hyperkalemia
(3) Tricyclic and phenobarbital overdose

**d) Contraindications**

Pre-existing alkalosis

**e) Adverse Effects**

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

**f) Precautions**

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

**g) Dosage**

(1) Should only be given after airway has been secured and ventilations achieved
(2) Adult: Administer 1 mEq/kg IVP bolus initially with 0.5 mEq/kg at 10-minute intervals.
(3) Pediatric: Administer 1 mEq/kg IVP/IO and repeated at 10-minute intervals of cardiac arrest; administration must be diluted (1:1).

## 27. TERBUTALINE SULFATE

**a) Pharmacology**

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

**b) Pharmacokinetics**

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

**c) Indications**

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

**d) Contraindications**

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

**e) Adverse Effects**

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

**f) Precautions**

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

**g) Dosage**

(1) Adult: 0.25 mg SC
(2) Pediatric: Not indicated

## J. LIDOCAINE INFUSION FOR INTER-FACILITY TRANSPORT

### 1. PURPOSE

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

### 2. INDICATIONS

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

### 3. CONTRAINDICATIONS

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

### 4. PROCEDURE

a) Follow the appropriate ALS algorithm and maintain the infusion as directed by the sending physician.
b) The sending physician must document the infusion to be administered on the patient's transport record or transport note, including the concentration of the medication and the infusion rate.
c) The infusion must be maintained on an infusion pump designed for transport, and the provider must be trained in the appropriate use of that specific make and model infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
d) The total volume of lidocaine infused must be recorded on the patient care report.
e) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report at least every 15 minutes.
f) When in doubt, contact the **sending** physician for medical direction.

### 5. SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pumps(s) being used. They must also have a quality improvement (QI) program monitoring the appropriateness and quality of care provided. The QI program should be directed or coordinated by, at minimum, an ALS provider.

## K. MORPHINE SULFATE INFUSION FOR INTER-FACILITY TRANSPORT

### 1. PURPOSE

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

### 2. INDICATIONS

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

### 3. CONTRAINDICATIONS

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

### 4. PROCEDURE

a) Maintain the infusion as directed by the sending physician.
b) The sending physician must document the infusion to be administered on the patient's transport record or transport note, including the infusion rate.
c) The infusion must be maintained on an infusion pump designed for transport, and the provider must be trained in the appropriate use of that specific make and model infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
d) The total volume of morphine infused must be recorded on the patient care report.
e) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report at least every 15 minutes.
f) When in doubt, contact the **sending** physician for medical direction.

### 5. SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pumps(s) being used. They must also have a quality improvement (QI) program monitoring the appropriateness and quality of care provided. The QI program should be directed or coordinated by, at minimum, a Paramedic.

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## *L. PEDIATRIC RAPID SEQUENCE INTUBATION PROTOCOL PACKAGE (For children less than 10 years of age)*

### *1. Rapid Sequence Intubation (RSI) Pilot Program*

#### *a) Indications*

*(1) Inability to tolerate laryngoscopy, and have the following:*

*(a) GCS less than or equal to 8, indicated by a patient that will not: open eyes, cry, say words or show purposeful movement in response to painful stimulus.*

***AND***

*(b) Respiratory insufficiency ,demonstrated by oxygen saturation ≤90% on non-rebreather face mask, respiratory rate ≤8, or respiratory rate ≥45 (age < 1 yr), ≥40 (age 1-5 yrs), ≥35 (age 6-9 yrs) with signs of air hunger and accessory muscle use.*

*PATIENTS WITH AN IDENTIFIED DIFFICULT AIRWAY WHO CAN BE BAGGED TO AN OXYGEN SATURATION >90% REQUIRE ON-LINE MEDICAL DIRECTION FOR RSI, PREFERABLY FROM A PEDIATRIC BASE STATION.*

*(2) On-line medical direction for RSI may be requested (preferably from a pediatric Base Station), in the following situations:*

*(a) GCS less than or equal to 8 with clenched jaw 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)*

*(c) Identified difficult airway patient with a GCS less than or equal to 8 and signs of respiratory insufficiency who cannot tolerate laryngoscopy but is able to be bagged to an oxygen saturation greater than 90%.*

#### *b) Contraindications*

*(1) Conditions that may cause hyperkalemia:*

*(a) Burns greater than 24 hours old*

*(b) Spinal cord injury greater than 24 hours old*

*(c) Known neuromuscular disease (Guillain-Barré Syndrome, myasthenia gravis, amyotrophic lateral sclerosis, muscular dystrophy)*

*(d) Chronic renal failure on hemodialysis/ Presence of hemodialysis access*

*(2) History of malignant hyperthermia*

#### *c) Preparation*

*(1) Pre-oxygenate with 90-100% oxygen.*

*(2) Monitor oxygen saturation with pulse oximetry and ECG.*

*(3) Ensure functioning IV and fluid therapy as per protocol.*
*(4) Evaluate for difficult airway.*
*(5) Perform focused RSI neurologic exam.*
*(6) Prepare equipment*
*(a) Intubation kit*
*(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 equal to 3-8*
*(2) Lidocaine: Administer 1.0 mg/kg IVP over 1-2 minutes*
*(3) If patient is less than 8 years of age (or if unknown and using ET tube smaller than 6.0), pretreat patient with Atropine 0.02 mg\kg IVP (minimum dose of 0.1 mg).*
*(4) In-line cervical spine stabilization by second caregiver (in trauma setting)*
*(5) Apply cricoid pressure (by third caregiver).*
*(6) Succinylcholine: Administer 1.5 mg/kg rapid IVP*
*(7) Intubate trachea and verify ET placement.*
*(8) May repeat succinylcholine 0.5 mg/kg IVP 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.*

***g) If Unable to Ventilate***

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

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

#### *a) Indication*

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

#### *b) Contraindication*

*Unsecured airway*

#### *c) Procedure*

*(1) Midazolam up to 0.05 mg/kg IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic: >60 (age <1 yr), >70 (age 1-5 yrs), >80 (age 6-9 yrs)*

*(2) If ventilatory difficulty is thought to be the result of pain response, Morphine may be used in addition to, or instead of, Midazolam: Morphine 0.05 mg/kg IVP over 1-2 minutes, titrated to abate bucking and relax ventilation while maintaining BP systolic: >60 (age <1 yr), >70 (age 1-5 yrs), >80 (age 6-9 yrs) 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 (May not be used for patients with needle cricothyroidotomy because of inability to monitor breath to breath $ETCO_2$ ).*

*PRE-SEDATION MUST BE PROVIDED WHEN VECURONIUM IS ADMINISTERED TO A PATIENT WHO IS EITHER RESPONSIVE TO STIMULUS, OR WHO MAY BECOME RESPONSIVE TO STIMULUS DURING NEUROMUSCULAR BLOCKADE. VECURONIUM MAY ONLY BE USED IF CONTINUOUS, BREATH TO BREATH, $ETCO_2$ MONITORING CAN BE PROVIDED.*

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

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

*(5) Obtain on-line medical direction (preferably from a pediatric Base Station), if further problems present.*

### *3. Protocol for Needle Cricothyroidotomy*

#### *a) Indications*

*(1) Inability to ventilate despite having tried BVM with oropharyngeal/ nasopharyngeal airway, ET placement*
*(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.*

***Protocol for Cricothyroidotomy (Continued)***

#### *c) Needle Cricothyroidotomy*

ALERT *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.*

### *4. Pediatric RSI Quality Assurance Process*

#### *a) Individual Paramedic Approval for Pediatric RSI Pilot Participation*

*(1) Successful completion of small group training includes all of the following:*
- *(a) Classroom lecture*
- *(b) Mannequin instruction*
- *(c) Must demonstrate proficiency through skills testing and written test*

*(2) Successful completion of individualized Operating Room Training*
- *(a) Individual Operating Room training with Pediatric/Critical Care/Anesthesiology Attending approved by the Associate State EMS Medical Director for Pediatrics*
- *(b) Must demonstrate proficiency to Attending Pediatric/Critical Care/ Anesthesiologist's satisfaction*

#### *b) Ongoing Demonstration of Proficiency*

*A verification of all pediatric and adult RSI skills and review of pediatric and adult RSI principles of safety will be performed on a quarterly basis.*

#### *c) Review of Each Call*

*(1) Mechanism for follow-up of each call will be in accordance with the Quality Review Procedure for Pilot Programs (formerly "Class B" Additional Procedure Algorithm) of the Maryland Medical Protocols, with the following additions:*

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

#### *d) Maintenance of detailed RSI database*

## *5. MIDAZOLAM (VERSED)*

### *a) Pharmacology*

*(1) Sedative*
*(2) Hypnotic*

### *b) Pharmacokinetics*

*A short-acting benzodiazepine with strong hypnotic and amnestic properties*

### *c) Indications*

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

### *d) Contraindications*

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

### *e) Adverse Effects*

*(1) Respiratory depression, or apnea*
*(2) Hypotension*
*(3) Amnesia*

### *f) Precautions*

*The effects of midazolam can be accentuated by CNS depressants, such as narcotics and alcohol*

### *g) Dosage*

*Administer 0.05 mg/kg slow IVP over 1-2 minutes,*
*while maintaining BP systolic >60 (age <1 yr, >70 (age 1-5 yr), >80 (age 6-9 yr)*

ALERT

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

## *6. SUCCINYLCHOLINE (ANECTINE)*

### *a) Pharmacology*

*Neuromuscular blocking agent (depolarizing)*

### *b) Pharmacokinetics*

*Paralyzes skeletal muscles, including respiratory muscles, and removes gag reflex*

### *c) Indications*

*To achieve paralysis to facilitate endotracheal intubation in patients as per Rapid Sequence Intubation Protocol*

### *d) Contraindications*

*(1) Conditions that may cause hyperkalemia:*
- *(a) Burns greater than 24 hours old*
- *(b) Spinal cord injury greater than 24 hours old*
- *(c) Known neuromuscular disease (Guillain-Barré Syndrome, myasthenia gravis, amyotrophic lateral sclerosis, muscular dystrophy)*
- *(d) Chronic renal failure on hemodialysis or presence of hemodialysis access*

*(2) History of malignant hyperthermia*

*(3) Patients with known hypersensitivity to the drug*

### *e) Adverse Effects*

*(1) Bradycardia*

*(2) Prolonged paralysis*

### *f) Precautions*

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

### *g) Dosage/Route*

*Administer 1.5 mg/kg rapid IVP.*
*If relaxation is inadequate after 2-3 minutes, a repeat dose of 0.5 mg/kg rapid IVP may be given.*

## *7. VECURONIUM (NORCURON)*

### *a) Pharmacology*

*Neuromuscular blocking agent (non-depolarizing)*

### *b) Pharmacokinetics*

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

### *c) Indications*

*For treatment of ventilatory difficulty secondary to bucking or combativeness in intubated patients*

### *d) Contraindications*

*(1) Non-intubated patients*
*(2) Patients with known hypersensitivity to the drug*

### *e) Adverse Effects*

*(1) Bradycardia*
*(2) Prolonged paralysis*

### *f) Precautions*

*(1) Pre-sedation must be provided when vecuronium is administered to a patient who is either responsive to stimulus or who may become responsive to stimulus during neuromuscular blockade.*
*(2) Paralysis occurs within 2-4 minutes and generally lasts 25-40 minutes.*

### *g) Dosage/Route*

*(1) Administer 0.05 mg/kg IVP.*
*(2) If bucking or combativeness persists 4-6 minutes after initial vecuronium administration, a second dose of 0.05 mg/kg IV may be administered.*

# V. JURISDICTIONAL OPTIONAL PROTOCOLS

## M. CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

### 1. INDICATIONS

a) Respiratory distress or failure, due to cardiogenic pulmonary edema or COPD/Asthma in which the patient demonstrates spontaneous respirations and a patent, self-maintained airway.
b) Patients 15 years of age or greater.

### 2. CONTRAINDICATIONS

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

### 3. PROCEDURE

a) Assure patent airway.
b) Administer 100% $O_2$ via appropriate delivery system.
c) Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter ($SpO_2$) reading, and cardiac rhythm.
d) Apply CPAP device per manufacturer's instructions.
e) Continuously reassess the patient.
f) Monitor continuous pulse oximetry.
g) Monitor continuous $ETCO_2$ monitoring with nasal prongs (if available).
h) Follow the appropriate set of standing orders for continued treatment.
i) Contact the medical control as soon as possible to allow for prompt availability of hospital CPAP equipment and respiratory personnel.

ALERT

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

CPAP MAY BE CONSIDERED FOR NON-CARDIOGENIC PULMONARY EDEMA.

## 4. JUSTIFICATION

a) The use of CPAP has long been recognized as an effective treatment for patients suffering from exacerbation of congestive heart failure and COPD. CPAP has recently shown promise in the out-of-hospital setting as well, by demonstrating favorable results in the treatment of acute congestive heart failure.

b) The use of CPAP for the treatment of patients who might otherwise receive endotracheal intubation holds several benefits:
   (1) CPAP is a less invasive procedure with a lesser risk if infection. This eliminates the possibility for adverse reactions following the administration of any antibiotics given for infection.
   (2) CPAP eliminates the necessity of weaning a patient off an ET tube and ventilator.
   (3) CPAP eliminates the necessity of sedating or paralyzing an alert patient by ALS or the emergency department staff in order to perform laryngoscopy.
   (4) CPAP allows the alert patient to have a continued dialogue with his/her caregivers. This allows for the exchange of additional medical history. It also allows for the patient to be involved in the decision-making process for his/her care.

## 5. SPECIFIC METHODS

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

b) The Medical Director will gather data and review the findings relevant to this treatment.

## N. GLYCOPROTEIN IIB/IIIA ANTAGONIST INFUSIONS (NEW '03)

(EMT-Paramedic only)

### 1. PURPOSE

During inter-facility transports, a paramedic may monitor a patient on a continuous IV Glycoprotein IIb/IIIa infusion as long as the following criteria have been met.

### 2. INDICATIONS

The Glycoprotein IIb/IIIa infusion must have been started by the hospital staff prior to an inter-hospital transfer. IV Glycoprotein IIb/IIIa transports may NOT be started by the prehospital provider in the prehospital setting.

### 3. CONTRAINDICATIONS

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

### 4. PROCEDURE

a) Maintain the infusion as directed by the sending physician.
b) The sending physician must document the infusion to be administered on the patient's transport record or transport note. This includes the concentration of the medication and the infusion rate.
c) The infusion must be maintained on an infusion pump designed for transport. The provider must be trained in the appropriate use of the specific make and model infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
d) The total volume of Glycoprotein IIb/IIIa infused must be recorded on the patient care report.
e) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report at least every 15 minutes.
f) When in doubt, contact the sending physician for medical direction.

### 5. SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of the infusion pump(s) being used. They must also have a quality improvement (QI) program monitoring the appropriateness and quality of care provided. The QI program should be directed or coordinated by, at minimum, a Paramedic.

## O. GLYCOPROTEIN IIb/IIIa ANTAGONIST (NEW '03)

(EMT-Paramedic only)

### 1. Pharmacology

Platelet glycoprotein antagonist. This agent reversibly prevents fibrinogen, von Willenbrand's factor, from binding to the Glycoprotein IIb/IIIa receptor, inhibiting platelet aggregation.

### 2. Pharmacokinetics

Glycoprotein IIb/IIIa has a half-life of 2.5 hours. Metabolism of this drug is limited and is excreted via the kidneys.

### 3. Indications

Patients with acute coronary syndrome including those with PCI (percutaneous coronary intervention).

### 4. Contraindications

a) Hypersensitivity, active internal bleeding, history of bleeding, stroke within one month, major surgery with severe trauma, severe hypotension, history of intracranial bleeding, intracranial neoplasm, arteriovenous malformation/aneurysm, aortic dissection, dependence on renal dialysis
b) Pediatric patients

### 5. Side Effects/Adverse Reactions

a) Cardiovascular: Stroke, hypotension
b) Systemic: Bleeding, anaphylaxis
c) Other: Hematuria, Thrombocytopenia

### 6. Precautions

Glycoprotein IIb/IIIa is a medication designed to inhibit the clotting factor in blood. Patients on this medication should be protected from further injuries which may cause bleeding. Attempts to start IVs should not be made without a doctor's orders.

### 7. Dose

a) INITIAL BOLUS: Follow Standard Dosing. Insert bolus based on patient weight.
b) MAINTENANCE IV DRIP: Follow Standard Dosing. Insert drip based on patient weight.

ALERT

IF CHEST PAIN OR HYPOTENSION DEVELOPS DURING TRANSPORT THE PARAMEDIC MUST CONSULT WITH EITHER THE SENDING OR RECEIVING PHYSICIAN FOR FURTHER INSTRUCTIONS.

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

### 1. PURPOSE

During inter-facility transports, a paramedic may monitor a patient on a continuous IV heparin infusion as long as the following criteria have been met.

### 2. INDICATIONS

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

### 3. CONTRAINDICATIONS

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

### 4. PROCEDURE

a) Follow the appropriate ALS algorithm and maintain the infusion as directed by the sending physician.
b) The sending physician must document the infusion to be administered on the patient's record or transport note, including the concentration of the units per hour.
c) The infusion must be maintained on an infusion pump designed for transport, and the provider must be trained in the appropriate use of that specific make and model infusion pump. The ambulance must have an inverter to power the pump while in the vehicle.
d) The total volume of heparin infused must be recorded on the patient care report.
e) The patient must be on a cardiac monitor and vital signs should be documented on the patient care report every 15 minutes.
f) When in doubt, contact the sending physician for medical direction.

### 5. SPECIAL CONSIDERATIONS

The ALS service or jurisdiction must provide and document training of the ALS providers on the operation of infusion pump(s) being used. They must also have a quality improvement (QI) program monitoring the appropriateness and quality of care provided. The QI program should be directed or coordinated by, at minimum, an ALS provider.

## Q. HEPARIN

(EMT-Paramedic only)

### 1. Pharmacology

Heparin is an anticoagulant that works by neutralizing several of the clotting factors (XIII, XII, XI, X, IX, and II).

### 2. Pharmacokinetics

a) Heparin inhibits the coagulation mechanism in 3 sites:
   (1) activation of factor X
   (2) formation of thrombin from prothrombin
   (3) conversion of fibrinogen to fibrin

b) Heparin's effect, which is to retard or prevent blood clotting, is immediate. The half-life of intravenous heparin is 1 - $1^1/_2$ hours.

### 3. Indications

a) Thromboembolic disease, such as pulmonary embolism, deep vein thrombophlebitis, and arterial embolization

b) Acute myocardial infarction. (Heparin may be given alone or in conjunction with thrombolytic therapy.)

### 4. Contraindications

a) Patients who have had trauma or surgery to the brain, eye, spinal cord, urinary tract, joints, or retroperitoneum within the last 7 days

b) Patients with active bleeding

c) Third trimester pregnancy

### 5. Adverse Effects

Increased potential for bleeding

### 6. Precautions

a) Inadvertent infusion of too much heparin can result in over-anticoagulation and the potential for bleeding complications.

b) If it is necessary to draw blood or start an IV while a patient is receiving heparin, extra time to hold pressure over the puncture site will be necessary to stop the bleeding.

c) Use with caution for patients with extreme hypertension.

### 7. Dose

a) Adult: Administer a maximum of 1500 units per hour.

b) Pediatric: Administer an initial bolus of 50 U/kg and immediately follow with a continuous infusion of 20 U/kg/hr.

## R. Administration of MARK I Kits Atropine and 2-PAM Auto-Injectors (NEW '03)

### 1. Initiate General Patient Care.

### 2. General Information

a) Nerve agents are a group of highly toxic chemicals that may potentially be released in a WMD event. These agents act to inhibit cholinesterase and therefore prolong the effects of acetylcholine. These agents are potent, long acting, and all bind to acetylcholine irreversibly unless an oxime is given.

b) Nerve agents include Tabun (GA), Sarin (GB), Soman (GD) and GF. There are also V agents such as VX.

c) The G-type agents evaporate and become vapor or may be dispersed in the air by weapons. When a person inhales this vapor, effects begin within seconds to minutes.

d) The V-type agents are oily and evaporate very slowly. They persist on the ground, foliage, etc., for long periods of time. Exposure to this liquid on the skin causes effects to start as soon as 10 minutes or as long as 18 hours after contact. The vapor hazard from these is not as great as from the G-type agents.

e) Many insecticides currently in use are organophosphates and are chemically related to nerve agents. The organophosphate insecticides may have a slower onset and a longer lasting effect compared with chemical agents.

### 3. Presentation

a) Characteristic signs and symptoms may identify nerve agent poisoning. After vapor exposure, early manifestations of poisoning occur in the eyes, nose, and airway. With liquid/dermal contact exposure, early manifestations occur in the skin and the GI tract. Thus, when looking at the chart below, consider the mechanism of release and the associated signs and symptoms. (Refer to the chart below with the mnemonic P-SLUDGE-MC for symptoms and signs. NOTE: This mnemonic is used for all

**Nerve Agents**
Signs & Symptoms of Chemical Agents

| | | | Vapor Exposure | Liquid Exposure |
|---|---|---|---|---|
| | **P** - | Pinpointing pupils | x | Not Seen |
| | **S** - | Salivation | x | Not Seen |
| **Mild** | **L** - | Lacrimation (tearing) | x | Not Seen |
| **Severe** | **U** - | Urination | x | x |
| | **D** - | Defecation | x | x |
| | **G** - | Gastrointestinal; pain/gas | x | x |
| | **E** - | Emesis (vomiting) | x | x |
| | **M** - | Muscle twitching | x | x |
| | **C** - | Convulsions | x | x |

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

organophasphate toxicity. Pupillary response occurs only with vapor exposure and will not be seen unless there is direct liquid contact with the eye. Urinary incontinence is also very rare.)

b) EMS providers must know the following MILD and SEVERE signs and symptoms of nerve agent poisoning. When providers recognize most or all of the symptoms listed below they must IMMEDIATELY receive treatment (first aid or buddy aid).

(1) MILD poisoning (self-aid). Casualties with mild symptoms may experience most or all of the following:
- (a) Unexplained runny nose
- (b) Unexplained sudden headache
- (c) Sudden drooling
- (d) Difficulty in seeing (dimness of vision, constricted pupil)
- (e) Tightness in the chest or difficulty in breathing
- (f ) Wheezing and coughing
- (g) Localized sweating and muscular twitching in the area of the contaminated skin
- (h) Stomach cramps
- (i) Nausea without vomiting

(2) MODERATE effects would be the above, but also include more severe effects such as diarrhea, moderate to severe difficulty breathing, and some skeletal-muscular twitching /fasciculations. The progression of symptoms from mild to moderate indicates either inadequate treatment or continuing exposure to the nerve agent.

(3) SEVERE symptoms. Providers with severe symptoms will not be able to treat themselves and must receive prompt buddy aid and medical treatment. Casualties with severe symptoms may experience most or all of the MILD symptoms plus most or all of the following:
- (a) Impaired thinking
- (b) Increasing wheezing and increased difficulty breathing
- (c) Severe pinpoint pupils
- (d) Red eyes with tearing
- (e) Vomiting
- ( f ) Severe muscular twitching and general weakness
- (g) Involuntary defecation
- (h) Convulsions
- (i ) Unconsciousness
- ( j ) Respiratory Failure
- (k) Bradycardia

**4. Prevention of Poisoning**

a) In the setting of an exposure to a nerve agent, the most rapid absorption occurs through the respiratory tract. When it is suddenly determined that providers are in the Hot Zone, do **not** look for the **invisible** vapor cloud. Providers should hold their breath until they don and clear their breathing

apparatus or protective masks. Once masked, a provider will then give the alarm to other providers. This may be done with hand signals or through the mask. If a fellow provider is severely poisoned with altered consciousness in the hot zone, the initial, less poisoned masked provider should mask the casualty.

b) When the masked casualty is severely poisoned after exposure to vapor and liquid, he/she should be decontaminated by removing clothing, blotting the agent (if a liquid exposure), and diluting the agent by using a flush with large amounts of water. Decontamination should be done as soon as possible, but it will usually occur in the warm zone or a safe area.

c) When treating a severely poisoned casualty, the treating provider should take care to avoid exposure to the liquid agent (which could occur when kneeling next to the casualty). Squatting next to the casualty while masking or treating him/her will help the caregiver to avoid exposure to liquid nerve agent.

d) Do not administer nerve agent antidotes before actual exposure to nerve agents or development of clinical symptoms occurs. Nerve agent antidotes may degrade performance in the hot zone (creating a heat-stressed provider) and should be administered only when symptoms and signs of nerve agent poisoning are present.

**5. Treatment**

a) The ABC priorities of prehospital treatment require modification to AABCs standing for “Antidote then ABCs.” The antidote (Atropine and 2–PAM) should be given as soon as possible, because toxic exposure to the nerve agent will make ventilation difficult. If the antidote is not immediately available, prevent further exposure to the nerve agent, provide ABC support, and evacuate the patient to an area where the antidote is available.

b) Dosage scheme for Mark I auto-injector administration

(1) Vapor (small exposure)

(a) Symptoms may include pinpoint pupils, runny nose, and/or mild shortness of breath.

(b) Onset of symptoms: within seconds

(c) If only symptoms are pinpoint pupils and/or runny nose, DO NOT TREAT; otherwise, treatment should begin with one dose of the Mark I antidote kit initially. This dosage may be repeated in 10 minutes if the patient remains symptomatic.

(2) Liquid (small exposure)

(a) Symptoms may include sweating, twitching, vomiting, and/or weakness

(b) Onset: minutes to hours

(c) Treatment should begin with one dose of Mark I antidote kit initially. The dosage may be repeated in 10 minutes if the patient remains symptomatic.

(3) Vapor or liquid (moderate exposure)
   (a) Symptoms may include more severe respiratory distress, muscular weakness, and/or vomiting and diarrhea.
   (b) Treatment should begin with 2 doses of Mark I antidote kit initially. The dosage may be repeated in 10 minutes if the patient remains symptomatic.
(4) Vapor or liquid (large exposure)
   (a) Symptoms may include copious secretions, unconsciousness, convulsions, and/or apnea.
   (b) Onset: seconds to hours
   (c) Treatment should begin with 3 doses of Mark I antidote kit initially. Dosage may be repeated until symptoms decrease or cease.

c) Monitoring effectiveness of treatment
   (1) Mark I antidote treatment is initiated when symptoms are present in a WMD potential nerve agent setting.
   (2) Evidence of response to treatment includes improvement in initial symptoms and **drying of secretions**. If neither occurs after initial Mark I administration, then administer additional atropine until these endpoints are reached. In this setting the pulse will generally be above 90 beats per minute (bpm) as an additional sign of atropinization. Pupillary constriction (pinpoint/miosis) usually occurs from direct exposure, will not respond to systemic atropine, and should not be used as a sign of the effect of treatment.
   (3) The duration of effect of each 2 mg. Atropine auto-injector is approximately 5 to 15 minutes. If secretions return and the pulse drops below 90 bpm, then additional atropine treatment should be given.

d) Advanced Life Support care should be initiated once the patient is adequately decontaminated.
   (1) Once an IV is established, a patient may be treated with Atropine 2–4 mg IVP or IM every 5–10 minutes for symptoms listed above. Treatment should be titrated to the endpoints listed above.
   (2) If 2-PAM has not previously been administered, 1–2 grams may be administered IM.
   (3) Seizures should be treated with Diazepam as indicated in protocol.

## S. Transport of ACUTE Ventilated Inter-Facility Patients

**1. PURPOSE**

To define the indications for use of a mechanical ventilator by a Paramedic for the acute ventilated patient

a) The level of care required for the inter-facility transport of the **"acute ventilated inter-facility patient"** is beyond the routine training curriculum for a paramedic; this type of patient must be transported by a higher level health care provider who is credentialled, educated, and competent in dealing with the ventilator and the ventilated patient. **or**

b) When a critical interfacility transfer is needed and a credentialled, educated, and competent higher level health care provider is **genuinely unavailable**, a credentialled, educated, and competent paramedic (through a MIEMSS approved training program) may attend the ventilator and the ventilated patient with the addition of a second ALS provider or advanced airway trained health care provider when determined appropriate by the sending/referring physician.

**2. INDICATIONS**

**ACUTE VENTILATED PATIENTS** for the interfacility transport are defined as:

a) Intubated **or**

b) Tracheostomy patient when the reason for transport is:

(1) For increased level of care from a hospital, **or**

(2) To continue the same level of care in an acute care setting, **or**

(3) The new tracheostomy patient who has ventilator changes within the last 4 days

**3. VENTILATOR STANDARDS**

**a) ACUTE VENTILATOR DEVICE STANDARDS**

(1) The ventilator that the service is to use for the acute ventilated patient should be able to match the existing ventilator settings. The following minimum device features (including circuit) must be present for this category of patient:

(a) Set rate of ventilations

(b) Adjust delivered Tidal Volume

(c) Adjustable Inspiratory and Expiratory ratios (I:E ratio)

(d) Positive End-Expiratory Pressure (PEEP)

(e) Peak airway pressure gauge

(f) Continuous Expiratory Volume measurement (Required)

(g) Modes

(i) Assist Control (AC)

(ii) Synchronized Intermittent Mandatory Ventilation (SIMV)

(iii) Controlled Mechanical Ventilation (CMV)

(h) Alarms
(i) Peak airway pressure
(ii) Disconnect

(2) Strongly recommended options are:
Blend percentage oxygen

(3) Must perform periodic maintenance (including calibration) meeting the manufacturer's specifications

**b) ACUTE VENTILATOR USAGE**

(1) A ventilator maintained by the ambulance service or health care facility must be specifically designed for transport use and capable of providing the required settings.

(2) Continuous pulse oximeter and continuous capnography monitoring equipment must be used on all acute ventilated inter-facility patients.

(3) Tracheal suctioning kits/catheters must be available.

(4) A tracheotomy replacement tube the same size and one size smaller shall be transported with the patient ventilated through a tracheotomy. (The endotracheal tube equivalent may be substituted.)

**4. POTENTIAL ADVERSE EFFECTS**

a) Pneumothorax
b) Barotrauma
c) Hypoxemia
d) Hyperventilation
e) Hypoventilation
f) Extubation of endotracheal or tracheostomy tube

**5. PRECAUTIONS**

If any problems arise with mechanical ventilation, the patient shall be disconnected from the ventilator and manually ventilated.

**6. OPTIONAL PROGRAM REQUIREMENTS**

a) A special "Ventilated Patient" report form will be completed for each mechanically ventilated patient and will include vital signs, pulse oximeter readings, and lung sounds (recorded a minimum of every 5 minutes), and documentation of any of the following;

(1) cardiac arrest during transport,
(2) dislodgment of tracheotomy or endotracheal tube,
(3) equipment failure (with FDA report),
(4) discontinuance of ventilator and conversion to BVM,
(5) deterioration of patient and
(6) the upgrading of patient care to critical care.

b) The Optional Program will require all cases to be reviewed by the operational program medical director with reports generated to the Office of the State EMS Medical Director quarterly. The report shall provide copies of runsheet reports (MAIS) and "Ventilated Patient" forms for all cases in which the ventilator was used, any complications, and recommended changes to the protocol that occurred during the Optional Program.

c) The Optional Program will require a training program which meets or exceeds the "Acute Ventilated Inter-Facility Patient" curriculum and be approved by the operational program medical director with skills validation. A copy of the training program shall be reviewed and be approved or disapproved by MIEMSS.

## T. Optional Program Transport of CHRONIC and SCENE Ventilated Patients

**1. PURPOSE**

To define the indications for use of a mechanical ventilator by a EMT-P for the following patient categories:

a) Chronic ventilated patient
The level of care required for the inter-facility transport of **"chronic ventilated patients"** is within the scope of practice of a paramedic who has been credentialled, is competent, and received adequate training specific to the patient's condition and the equipment necessary to provide care.

b) Patient ventilated at the scene of an emergency
The level of care required for the transport of a ventilated patient from the **"scene of an emergency"** is within the scope of practice of a paramedic who has been credentialled, is competent, and received adequate training specific to the patient's condition and the equipment to provide care.

**2. INDICATIONS**

**a) CHRONIC VENTILATED PATIENTS** are defined as:

(1) Have a tracheostomy and ventilator settings have not been changed for 4 days

(2) Point of origin or destination is:
- (a) Long-term care facility,
- (b) Home,
- (c) Outpatient setting,
- (d) Hospital; **and**

(3) Reason for transport is:
- (a) Return from or transport to a scheduled appointment,
- (b) For extended care, **or**
- (c) For emergency treatment (but not complication of airway or respiratory distress); **and**

(4) Ventilator settings are:
- (a) Positive End-Expiratory Pressure (PEEP) less than 6,
- (b) Peak pressures less than 30, and
- (c) No changes in the ventilator settings are required during the transport.

**b) SCENE OF AN EMERGENCY** – Out of Hospital

(1) Point of origin is at the scene of an out-of-hospital emergency

(2) A EMT-P may utilize mechanical ventilation once the patient is intubated.

(3) Reason for mechanical ventilation is respiratory arrest when the patient is not bucking the ventilator

(4) Once the patient is on a ventilator, a second provider (EMT-B or higher) is required to assist with patient care.

(5) Destination – closest appropriate hospital
(6) Contraindicated in children 8 years of age or less.

**3. VENTILATOR STANDARDS**

**a) CHRONIC VENTILATOR DEVICE STANDARDS**

(1) The ventilator that the service is to use for the acute or chronically ventilated patient should be able to match the existing ventilator settings. The following minimum device features (including circuit) must be present for this category of patient:
  (a) Set rate of ventilations
  (b) Adjust delivered Tidal Volume
  (c) Adjustable Inspiratory and Expiratory ratios (I:E ratio)
  (d) Positive End-Expiratory Pressure (PEEP)
  (e) Peak airway pressure gauge
  (f) Modes
    (i) Assist Control (AC)
    (ii) Synchronized Intermittent Mandatory Ventilation (SIMV)
    (iii) Controlled Mechanical Ventilation (CMV)
  (g) Alarms
    (i) Peak airway pressure
    (ii) Disconnect
(2) Strongly recommended options are:
  (a) Continuous Expiratory volume measurement
  (b) Blend percentage oxygen
(3) Must perform periodic maintenance (including calibration) meeting the manufacturer's specifications

**b) CHRONIC VENTILATOR USAGE**

(1) Ventilator used is:
  (a) The patient's own ventilator intended for home/transport use and have the patient or/home-care provider manage the ventilator, **or**
  (b) A ventilator maintained by the ambulance service or health care facility specifically designed for transport use and capable of providing the required settings. If the patient's ventilator is the same as the company ventilator, the paramedic may manage the ventilator without the home-care provider accompanying patient.
(2) Monitoring equipment must include pulse oximeter
(3) Tracheal suctioning kits/catheters must be available
(4) A tracheotomy replacement tube the same size and one size smaller shall be transported with the patient ventilated through a tracheotomy. (The endotracheal tube equivalent may be substituted.)

**c) SCENE OF AN EMERGENCY VENTILATOR DEVICE STANDARDS**

Mechanical ventilator used must:

(1) Be intended for transport use,
(2) Deliver 100% oxygen and
(3) Have minimal parameters to set rate and volume (both adjustable to meet the needs of pediatric and adult patients)

**4. POTENTIAL ADVERSE EFFECTS**

a) Pneumothorax
b) Barotrauma
c) Hypoxemia
d) Hyperventilation
e) Hypoventilation
f) Extubation of endotracheal or tracheostomy tube

**5. PRECAUTIONS**

a) Any acutely ill or injured **breathing** patient at the "scene of an emergency" requiring assisted ventilation shall be manually ventilated.
b) If any problems arise with mechanical ventilation, the patient shall be disconnected from the ventilator and manually ventilated.

6. OPTIONAL PROGRAM REQUIREMENTS

a) The Optional Program will require all cases where patients are mechanically ventilated to be reviewed by the operational program medical director with reports generated to the Office of the State EMS Medical Director quarterly. The report shall provide copies of all cases in which the ventilator was used, any complications, and recommended changes to the protocol that occurred during the Pilot Program.
b) A special "Ventilated Patient" report form will be completed for each patient and will include vital signs, pulse oximeter readings, and lung sounds (recorded a minimum of every 15 minutes), and documentation of any of the following;
   (1) Cardiac arrest during transport
   (2) Dislodgment of tracheotomy or endotracheal tube
   (3) Equipment failure (with FDA report)
   (4) Discontinuance of ventilator and conversion to BVM
   (5) Deterioration of patient and
   (6) The upgrading of patient care to that of nurse or higher level of health care provider
c) The Optional Program will require a training program that meets or exceeds the attached "Chronic and Scene Ventilated Patient" curriculum and be approved by the operational program medical director. A copy of that training program shall be reviewed and be approved or disapproved by MIEMSS.

# WILDERNESS EMERGENCY MEDICAL SERVICES PROTOCOLS

## A. INTRODUCTION

1. Scope & Applicability
   a) These protocols shall be followed whenever the patient is in a remote, nontraditional EMS environment; when implementation is approved by an online Wilderness Command Physician; or when extended evacuation will be detrimental to the patient.
   b) These protocols are meant to augment the most current version of the Maryland Medical Protocols for Emergency Medical Services Providers. When treating any patient in the Wilderness EMS setting, the provider shall follow the Maryland Medical Protocols for EMS Providers for their level of training prior to any treatment modalities outlined in the Wilderness EMS (WEMS) protocols. The providers shall take into account equipment and medication necessary and available to care for the patient.
   c) WEMS protocols are complementary to local EMS protocols in a wilderness setting.
      (1) Once the patient is transferred to a ground or air ambulance, the responsibility of WEMS personnel comes to an end, and the local EMS agency protocols are implemented.
      (2) An exception may be made when WEMS personnel's specialized training is needed to manage a specific illness/injury.
         (a) If the WEMS provider's specialized training is needed to manage the patient's illness/injury, then the highest-trained WEMS medical person shall ride to the hospital with the patient.
         (b) If, during transport, WEMS personnel encounter a significant conflict between their protocols and those of the transporting EMS agency, they should attempt to contact their own Wilderness Command Physician and ask the Wilderness Command Physician to speak to the local Base Station Physician.
         (c) If they cannot reach a Wilderness Command Physician, they should contact the local EMS Base Station for on-line medical consultation.

2. Definition of Wilderness Setting
   As defined by the Wilderness EMS Institute, the definition of a wilderness environment shall include:
   a) a tract or region uncultivated and not inhabited by human beings,
   b) an uninhabitable region left in its natural condition,
   c) something likened to a wild region in its bewildering vastness, perilousness, or unchecked profusion.

3. Demonstration of Need
   a) Jurisdictions that seek approval for WEMS programs shall submit a demonstration of need letter outlining the necessity for the program.

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.

ALERT 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

   Patients who are bleeding from an external site should be approached with caution and the mechanism of injury should be considered. Initial bleeding control should be accomplished by direct pressure, and, if possible, elevation of the injury site. If bleeding is still not controlled, the WEMS provider should utilize the appropriate pressure point. If bleeding remains uncontrolled, visualize the wound and, with a gloved hand, apply direct digital pressure to the vessel. Finally, and as a last resort to control bleeding, a tourniquet should be applied. The time the tourniquet was applied should be noted, immediate and rapid evacuation to a trauma center initiated, and medical command should be advised immediately.

2. 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

ALERT

RESCUERS SHOULD TREAT HYPOTHERMIA IN THE SETTING OF HEAD INJURY NO DIFFERENT FROM OTHER CASES OF HYPOTHERMIA.

(2) Head Injury with Shock and/or Dehydration

Provide IV fluids until signs of dehydration and/or shock are eliminated.

(3) Positioning and Evacuation

(a) Position the patient flat on a spine board unless the patient must be placed in the recovery position to protect the airway.
(b) Position the patient's head in a neutral position with respect to the rest of the body.

b) Foreign Bodies in the Eye

(1) Examine the affected eye.

(2) Numb the eye with Tetracaine.
Place 2 drops in the affected eye. (See Additional Medications for Wilderness EMS.)
(3) Evert the eyelid.
(4) Remove any foreign particles from the eyelid or conjunctiva with a moist cotton applicator or equivalent.
(5) Irrigate the eye with clean water to remove particles from the cornea.

c) Nosebleeds
(1) Apply direct pressure to the nostrils for 10 minutes, with the patient sitting forward.
(2) Reassess.
(3) If still bleeding, hold the nostrils for another 10 minutes.
(4) Reassess.
(5) If bleeding persists and evacuation time is greater than two hours:
(a) Pack the nose with gauze pad or equivalent.
(b) Leave the gauze in place for no more than 2 days.

d) Blunt Abdominal Injury
(1) Assess orthostatic vital signs.
(2) Evacuate immediately if patient's orthostatic vital signs are unstable, or patient has an acute abdomen.

ALERT 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
Evacuate immediately if patient has:
(1) an inability to void, or
(2) severe leg weakness, or
(3) severe pain

g) Wounds
(1) Contusions
(a) For the first 24-48 hours, RICE (Rest, Ice, Compression, Elevation).
(b) After 36 - 48 hours apply heat (if available) and continue rest.

(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.

ALERT 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.

WILDERNESS EMERGENCY MEDICAL
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(5) Clean the area.
(6) Cover the wound with povidone-iodine or bacitracin ointment and a dressing.
(7) Keep the area clean.

i) Impaled Objects
(1) Whenever possible, you should consult with a Base Station Physician; if you cannot contact a Base Station Physician, the highest trained WEMS provider at the scene must make a decision whether to stabilize or to remove the object.
(2) Whenever possible, stabilize the object by following the Maryland Medical Protocols for EMS Providers for your level of certification.
(3) If the object cannot be stabilized for evacuation:
(a) Use appropriate BSI.
(b) Prepare for object removal.
(c) Consult medical direction.
(d) Slowly remove the object, gently but firmly pulling opposite the direction the object entered.
(e) Stop your attempt and stabilize the object in place if you encounter any resistance.
(f) If ALS provider, administer Ancef 1 gram IV q 6-hours. (See Additional Medications for Wilderness EMS.)
(g) Frequently reassess the patient.

j) Orthopedic Injury
(1) Spasms, cramps, or stiffness
(a) Apply heat and gently stretch the affected area.
(b) Administer Aspirin or Tylenol 650 mg q.i.d.
(2) Muscle Strains and Ligament Sprains
(a) For the first 24-48 hours, RICE. After 36-48 hours, apply heat if available.
(b) For spasms or cramps or stiffness, use gentle stretching after applying heat. Administer Aspirin or Tylenol 650 mg q.i.d.
(3) Probable Sprains
Patients with probable sprains may need to be splinted and evacuated; some may be taped and walk out; while others may be splinted or taped and continue with the task.
(4) Closed Fractures
(a) Indications for Realignment
(i) To correct or at least improve a sensory or vascular deficit secondary to the fracture.
(ii) To align severely deformed long bone fractures to allow splinting with adequate immobilization.
(iii) To facilitate patient packaging for evacuation.
(b) Do not try to reduce (set) the fracture or force all the bone fragments back into anatomic alignment.
(c) Administer Morphine Sulfate 2-10 mg IV, in 2 mg increments every 5 minutes as needed for pain.

(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.

ALERT 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.

ALERT 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.

ALERT 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.)

ALERT 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.

ALERT 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:
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.

ALERT IF THE ROUTE OUT INVOLVES SOME DIFFICULT CLIMBING, OR IF THE PATIENT IS ONLY SEMICONSCIOUS, DO **NOT** PUT THE TOOTH IN THE MOUTH. PLACE THE TOOTH IN HANK'S SOLUTION.

(e) Evacuate the patient.
(f) Administer Aspirin or Tylenol 650 mg q.i.d.
(2) If the tooth is NOT completely dislodged from the socket (i.e. loose):
(a) Apply dental splint.
(b) Administer Aspirin or Tylenol 10-15 mg/kg.
n) Compartment Syndrome
(1) Evacuate immediately.
(2) If the patient cannot be evacuated immediately, consult medical direction and request that a surgeon be transported to the scene.

## D. MEDICAL EMERGENCIES

1. Environmental Emergencies
a) Heat Emergencies
(1) Heat Cramps
Treat with gentle stretching and oral rehydration.
(2) Dehydration
(a) Assess mucous membranes.
(b) Assess orthostatic vital signs.
(c) Assess patient's temperature, if able, to rule out heat stroke.

ALERT 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: Hypothermia
   (1) Specific Treatment
   Prevent Further Heat Loss.
      (a) If possible, remove the patient from the environment.
      (b) Remove wet clothing so the patient is dry.
      (c) Apply a wind/vapor/moisture barrier (the WEMS provider should take extra care in covering the patient's head, feet, and hands).
      (d) Insulate the patient from the environment.
   (2) Mild Hypothermia
      (a) Core Temperature between 93.2 and 96.8 F (34 -36 C)
      (b) Rewarm. Give adequate food and drink as able.
   (3) Moderate - Severe Hypothermia
      (a) Core Temperature between 86 and 93.2 F (30 - 34 C)
      (b) Add as much heat as possible using:
         (i) Warm IVs
         (ii) Warm fluids by mouth to patients with normal LOC
         (iii) Heat packs at the lateral neck, armpits, and groin

ALERT DO NOT DELAY EVACUATION TO REWARM THE PATIENT.

      (c) Provide fluids and food calories if able.

ALERT MONITOR CLOSELY FOR FLUID OVERLOAD.

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

(6) Advanced Life Support Management of the Hypothermic Patient
(a) If the core temperature is greater than 86 F (30 C), follow standard protocols for resuscitation.
(b) If the core temperature is less than 86 F (30 C), rewarm the patient before attempting to defibrillate.
(c) Follow standard protocol for criteria for airway control.

ALERT
DO NOT USE ATROPINE IN A HYPOTHERMIC PATIENT.
DO NOT USE EXTERNAL PACING ON A HYPOTHERMIC PATIENT.

(7) Frostbite and Immersion Foot
(a) Superficial Frostbite
Rewarm the affected part.
(b) Deep Frostbite
(i) Treat Hypothermia first if present.
(ii) Rewarm the affected part if rewarming can be maintained.
(iii) Protect the patient from further exposure.

c) Bites/Stings
(1) Snake Bites

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

c) Vomiting and Diarrhea
Rehydrate orally or by IV if signs and symptoms of shock are evident.

3. Difficulty Breathing
a) For known asthmatic patients, assist patient with their own inhalers.
If BLS provider with specific training in administration of albuterol, assist the patient.
b) For patients exhibiting serious sign and symptoms, administer 0.3 mg SQ epinephrine 1:1000. A BLS provider with specific training may administer SQ epinephrine.

4. Cardiac Arrest
Follow WEMS protocols as they may apply to existing environmental conditions.

## E. INTRAVENOUS THERAPY

1. WEMS personnel will be trained to initiate and maintain intravenous (IV) lines in the WEMS class, if not already practicing that skill.

2. Examples of patients who need IV therapy are as follows:
a) Any patient with unstable orthostatic vital signs
b) Patients with uncontrolled external bleeding
c) Patients with significant blood loss
For WEMS purposes, significant blood loss is defined as greater than or equal to 1.0 Liter(s) as estimated by the on-scene WEMS personnel.
d) Patients with signs/symptoms of shock
For WEMS purposes, signs/symptoms of shock include, but are not limited to the following:
(1) Tachycardia
(2) Tachypnea
(3) Pale skin
(4) Cool/moist skin
(5) Weak thready pulse
(6) Dry mouth
(7) Hypotension
e) Unconscious patients
f ) Any patient requiring IV medication
g) Any patient requiring immediate evacuation
h) Any time that medical command requests IV therapy

# Additional Medications for Wilderness EMS

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

## 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