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

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Executive Director
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## 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 (formerly Carroll County General Hospital) |
| 238 | Carter Community Mental Health & Retardation Center |
| 755 | Central Industrial Medical Center |
| 276 | Chambersburg Hospital, PA |
| 284 | Charlestown Area Medical Center |
| 241 | Chemtrec 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 |

## 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

## MARYLAND TRAUMA AND SPECIALTY REFERRAL CENTERS (Continued)

### Specialty Referral Centers

***Perinatal Referral Centers***

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

# 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).

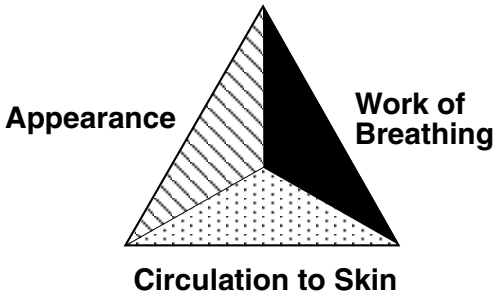
2. If appropriate, begin triage and initiate Mass Casualty Incident (MCI) procedures.

## 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 |
| ≤ 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.

## 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.


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.


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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## 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.


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.

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   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.

## 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.

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   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.

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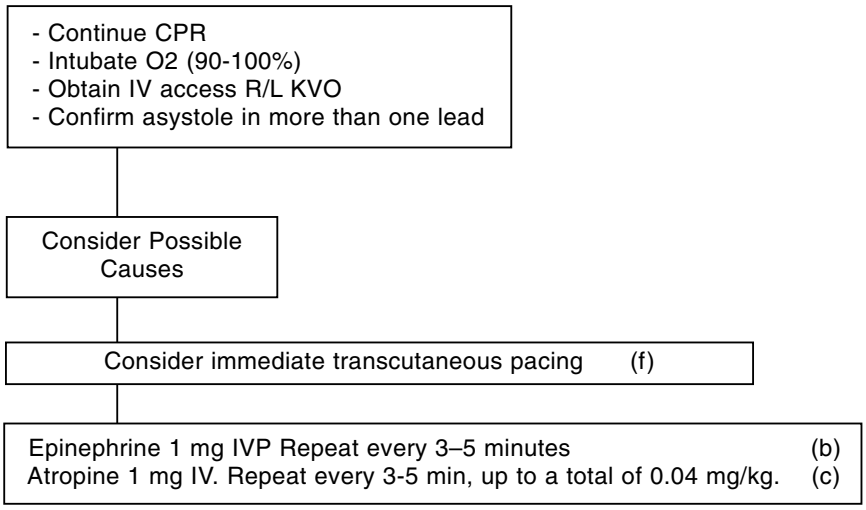
   h) Identify rhythm and treat according to appropriate algorithm.

## 4. ADULT ASYSTOLE ALGORITHM




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

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

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

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

## 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. 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.

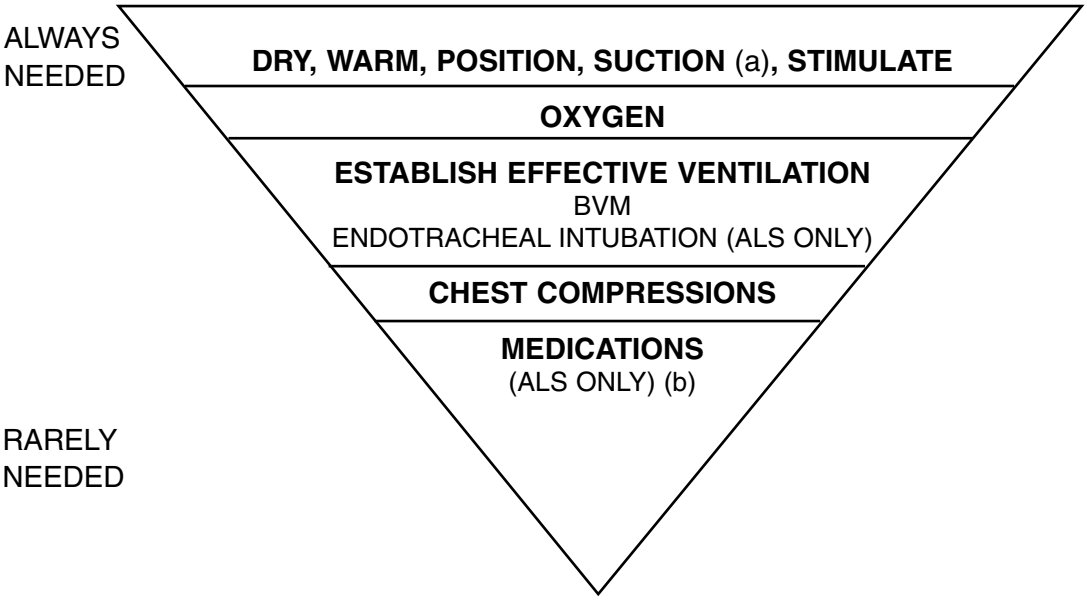
   b) If after 30 seconds the brachial pulse is still less than 60, begin newborn CPR.

   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


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.


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.

## 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.

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.

---

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 mcg.
- **For a patient 2 years of age or greater**, administer albuterol 2.5 mg and atrovent 500 mcg.

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.

## 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.


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

STROKE TREATMENTS ARE TIME SENSITIVE.

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

## 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

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

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.

---

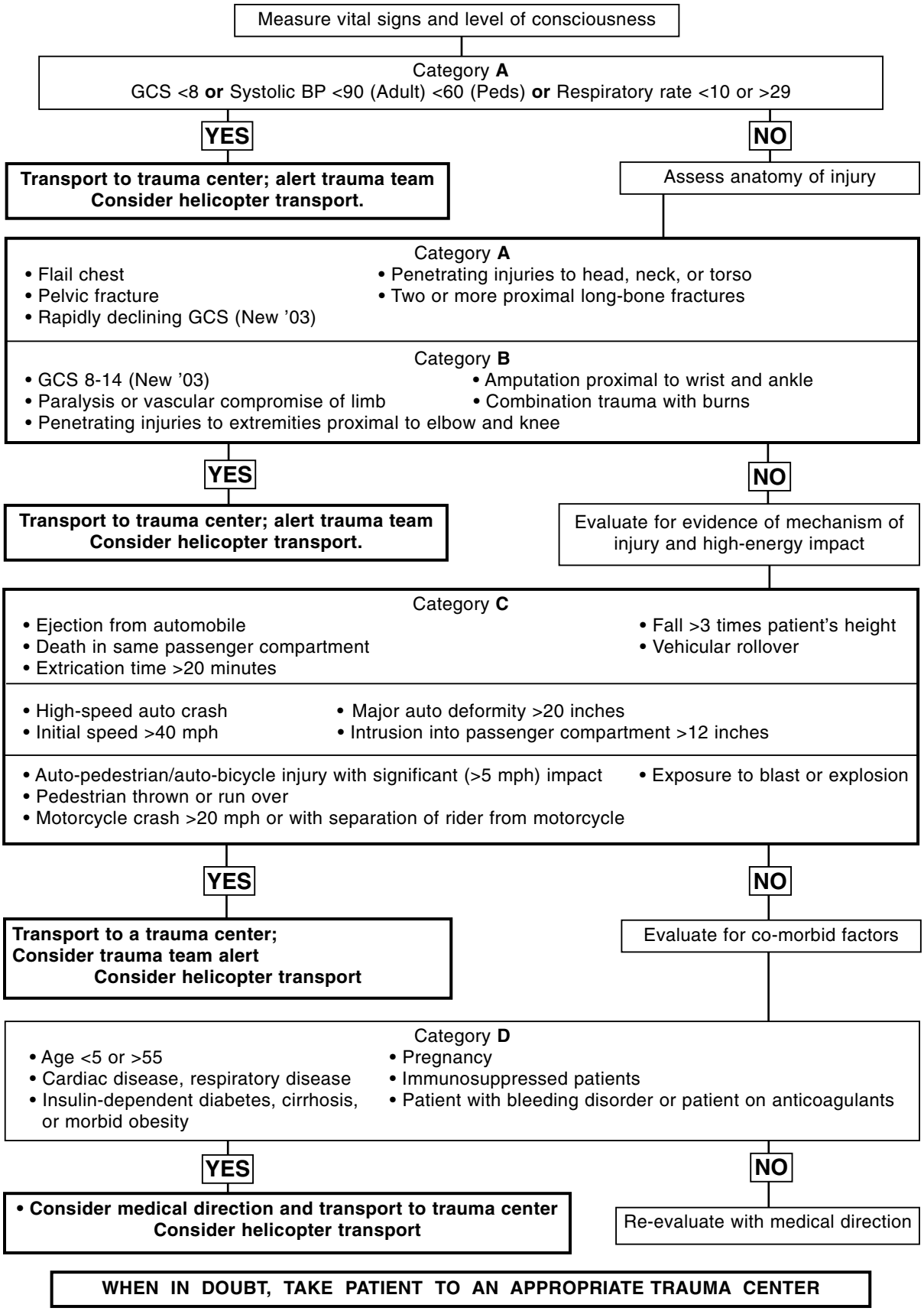
k) Initiate IV/IO.

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.

## RR. TRAUMA DECISION TREE



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**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.

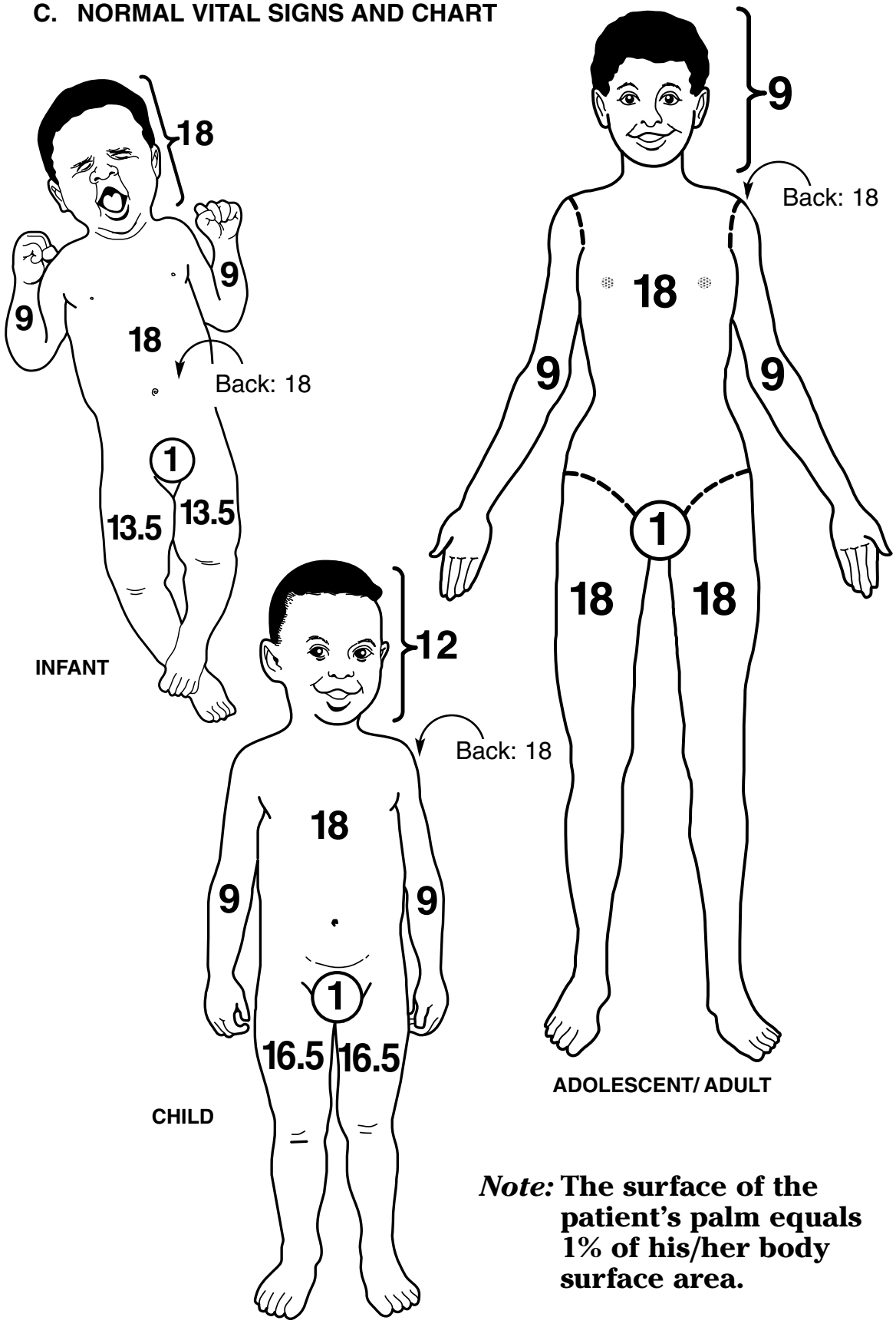
**NTG**: Nitroglycerin.

**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)

## 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 |

(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.

(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.

**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.

## 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.

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(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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## 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.

## 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

## 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; elevate legs.

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

## 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

## 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

# 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.