



2010

**Standards of Care**

Effective January 1, 2010

## TABLE OF CONTENTS

Authorization / Verification  
Protocol Development and Update Procedure  
Preface and Statement of Philosophy  
Definitions  
Levels of Care  
ALS Agency Definition  
ALS Criteria  
Medical Control and Hospital Communication Requirements

### **SECTION 1**

Routine Medical Care .....	1.0
Radio / Phone Failure .....	1.1
On-Scene Medical Personnel .....	1.2
Do Not Resuscitate Orders .....	1.3
Termination of Resuscitation .....	1.4
Obvious Death .....	1.5

### **SECTION 2**

Airway Management - ADULT .....	2.0
Airway Management - PEDIATRIC .....	2.1
Airway Obstruction - ADULT .....	2.2
Airway Obstruction - PEDIATRIC .....	2.3
Altered Mental Status .....	2.4
Anaphylaxis / Allergic Reaction .....	2.5
Apparent Life Threatening Event (ALTE) .....	2.6
Avulsed Tooth Reimplantation .....	2.7
Behavioral Emergencies .....	2.8
Burns .....	2.9
Chest Pain / Threatened Myocardial Infarction .....	2.10
Chest Trauma .....	2.11
Conducted Energy Weapons .....	2.12
Croup .....	2.13
Diabetic Emergencies .....	2.14
Fluid Challenge / Replacement .....	2.15
Head Trauma .....	2.16
Hyperthermia / Heat Exhaustion / Heat Stroke .....	2.17
Hypotension / Shock .....	2.18
Hypothermia .....	2.19A
Hypothermic Cardiac Arrest .....	2.19B
Nausea / Vomiting .....	2.20
Near Drowning .....	2.21
Neonatal Resuscitation .....	2.22
Obstetric Emergencies .....	2.23
Pain Management .....	2.24
Poisoning / Overdose .....	2.25
Pulmonary Edema / CHF .....	2.26
Rapid Sequence Intubation (RSI) .....	2.27
Re-establishing Patient Medication IV .....	2.28
Respiratory Distress / Bronchospasm .....	2.29
Sedation .....	2.30
Seizures .....	2.31
Stroke .....	2.32
Suspected Spinal Injuries .....	2.33
Vascular Access .....	2.34
Ventilator Management – Emergent Prehospital .....	2.35
Ventilator Management – Stable Outpatient .....	2.36

### **SECTION 3 – ADULT CARDIAC LIFE SUPPORT**

Cardiac Arrest – General Procedures .....	3.0
Ventricular Fibrillation / Pulseless Ventricular Tachycardia .....	3.1
Post-Conversion of VF / VT .....	3.2
Asystole / Pulseless Electrical Activity .....	3.3
Bradycardia .....	3.4
Unstable Tachycardia .....	3.5
Stable Narrow Complex Tachycardia .....	3.6
Stable Wide Complex Tachycardia .....	3.7

### **SECTION 4 - PEDIATRIC CARDIAC LIFE SUPPORT**

Cardiac Arrest – General Procedures .....	4.0
Ventricular Fibrillation / Pulseless Ventricular Tachycardia .....	4.1
Post-Conversion of VF / VT .....	4.2
Asystole / Pulseless Electrical Activity .....	4.3
Bradycardia .....	4.4
Unstable Tachycardia .....	4.5
Stable Narrow Complex Tachycardia .....	4.6
Stable Wide Complex Tachycardia .....	4.7

### **SECTION 5 – BLS PHARMACOLOGY**

Activated Charcoal .....	5.1
Albuterol .....	5.2
Aspirin .....	5.3
Epinephrine .....	5.4
Nitroglycerin .....	5.5
Oral Glucose .....	5.6
Oxygen .....	5.7

### **SECTION 6 – ALS PHARMACOLOGY**

Activated Charcoal .....	6.1
Adenosine (Adenocard) .....	6.2
Albuterol .....	6.3
Amiodarone (Cordarone) .....	6.4
Aspirin .....	6.5
Atropine Sulfate .....	6.6
Calcium Chloride .....	6.7
Dextrose .....	6.8
Diphenhydramine (Benadryl) .....	6.9
Dopamine Hydrochloride .....	6.10
Epinephrine .....	6.11
Etomidate (Amidate) RSI ONLY .....	6.12
Glucagon .....	6.13
Ipratropium (Atrovent) .....	6.14
Lidocaine (Xylocaine) .....	6.15
Magnesium Sulfate .....	6.16
Metoprolol .....	6.17
Midazolam (Versed) .....	6.18
Morphine Sulfate .....	6.19
Naloxone (Narcan) .....	6.20
Nitroglycerin .....	6.21

## **SECTION 6, continued**

Oxygen .....	6.22
Promethazine (Phenergan).....	6.23
Sodium Bicarbonate .....	6.24
Succinylcholine (Anectine) RSI ONLY .....	6.25
Vasopressin (Pitressin).....	6.26
Vecuronium (Norcuron) RSI ONLY .....	6.27

## **APPENDIX**

Glasgow Coma Scale – ADULT
Glasgow Coma Scale – PEDIATRIC
Trauma Triage Criteria – ADULT
Trauma Triage Criteria – PEDIATRIC
Normal Weights, Vitals – PEDIATRIC
Airway Equipment Sizes – PEDIATRIC
APGAR Chart
Rule of 9's
Area Hospital Information
Dopamine Infusion Chart
Medication and Dosage Sheet

## AUTHORIZATION / VERIFICATION

The Regional Emergency Medical Advisory Committee (REMAC) of the Monroe-Livingston Regional Emergency Medical Services Council (MLREMSC) and the Monroe-Livingston Regional EMS Medical Director attest that these Prehospital Emergency Medical Care Standards are reasonable and consistent with standard medical practices in Livingston and Monroe Counties in the State of New York.

These protocols constitute standards for physician supervision for the Advanced Life Support Systems in the Counties of Monroe and Livingston in the State of New York, as required by Article 30, subsection 31 of the State of New York Public Health Law, as well as the requirements for medical direction specified in Part 800 of the Codes and Regulations of the State of New York.

The Monroe-Livingston Regional Emergency Medical Advisory Committee further attests that these protocols constitute the standard of care to be observed by all EMS providers when practicing within the Monroe-Livingston Regional Emergency Medical Services System.

The protocols contained herein are effective as of January 1, 2010.



Jeremy T. Cushman, MD, MS, EMT-P, FACEP  
System Medical Director, Monroe-Livingston Region



Rollin J. "Terry" Fairbanks, MD, MS, EMT-P, FACEP  
Chair, Monroe-Livingston REMAC

## PROTOCOL DEVELOPMENT

These protocols have been developed by the Protocol Sub-Committee and presented for a period of public comment before being approved collectively by the Monroe-Livingston Regional Emergency Medical Advisory Committee (REMAC).

### Protocol Sub-Committee Members

Nicole Acquisto, Pharm. D  
Sheri Adam, EMT-P  
Robert Breese, EMT-P  
Kevin Clarke, EMT  
Jeremy Cushman, MD (Chair)  
Elizabeth Darrow, EMT-P  
Rollin J. (Terry) Fairbanks, MD  
Chris Forsyth, EMT-P

Dick Garrett, EMT-P  
A. Zachary Hettinger, MD  
Marc Lampell, MD  
Bryan McKinley, EMT-P  
Richard Race, EMT-P  
Manish Shah, MD  
Terry Taylor, EMT-P  
Bruce Thompson, MD

### REMAC Members

Sheri Adam, EMT-P  
Robert Breese, EMT-P  
Charles Cavallaro, MD  
Jeremy Cushman, MD  
Tim Czapranski, EMT-P  
Liz Darrow, EMT-P  
Eric Davis, MD (Honorary)  
Stephanie Elsen, MD  
Rollin J. (Terry) Fairbanks, MD (Chair)  
Tim Frost, EMT-P  
A. Zachary Hettinger, MD  
John Hilmi, MD  
Julie Jordan, EMT-P  
Bill Joyce, EMT

David Kluge, MD (Honorary)  
Michael Kuder, EMT-P  
Marc Lampell, MD  
Jan Lloyd, EMT  
Joe Meath, EMT-P  
George Nasra, MD  
Kevin O'Gara, MD  
Amy Pollard  
Erik Rueckmann, MD  
Manish Shah, MD  
Bill Sheahan, EMT-P  
Bruce Thompson, MD  
Mark Tornstrom, EMT-P  
Steven Wolfe, MD

## PROTOCOL UPDATE PROCEDURE

These protocols will be reviewed and updated as necessary. New procedures or updates to old procedures will be distributed throughout the system through provider agencies and to individual ALS providers when feasible. Pages should be replaced or added as future modifications occur. All updates/changes must first be approved by the Monroe-Livingston Regional Medical Advisory Committee (REMAC). Suggestions for changes or additions to the protocols may be made by contacting:

Monroe-Livingston Regional Program Agency  
601 Elmwood Avenue, Box 655  
Rochester, NY 14642  
(585) 463-2900  
[MLREMS@urmc.rochester.edu](mailto:MLREMS@urmc.rochester.edu)

## PREFACE

This document represents the Standards of Prehospital Care of the Monroe-Livingston Emergency Medical Services System. This document has been approved by the Monroe-Livingston Regional Emergency Medical Advisory Committee (REMAC) as the standard of care and is to be followed at all times by all EMS providers practicing in Monroe and Livingston Counties. Furthermore, they are designed to act as standing orders within the guidelines under radio and phone failure.

Protocols are listed in an algorithm format, and lengthy discussion of signs/symptoms, pathophysiology, and technique have been purposely excluded to allow for efficient use. The protocols assume the provider is already familiar with emergency medical care up to the level of their certification, and the emergency situations contained in the document. Many of the Adult and Pediatric Protocols are contained in the same Patient Care Section; however pediatric-specific medication dosages are denoted by the teddy bear icon: . If a medication dosage does not have the teddy bear icon next to it, it is not to be given to a pediatric patient and is meant for adult patients only.

A section on Monroe Livingston Regional policies and procedures relating to the provision of medical care has been included in this document. This allows for a common location of all documents that reflect patient care in the region.

An additional section to this document is the Specialty Care Transport Protocols which are to be used only by those providers credentialed as Specialty Care Transport Paramedics within the Monroe-Livingston EMS System. While published as a separate document due to its specialized nature, it is an integral part of the protocols that are used in this system.

An additional section to this document is the HAZMAT Protocols which are to be used only by those providers credentialed as Tox Medics within the Monroe-Livingston EMS System. While published as a separate document due to its specialized nature, it is an integral part of the protocols that are used in this system.

Additional appendices are included for reference purposes.

## STATEMENT OF PHILOSOPHY

No protocol can be written to cover every situation that a provider may encounter while practicing prehospital medicine, nor are protocols a substitute for the judgment and experience of the provider. Providers are expected to utilize their best clinical judgment and deliver care and procedures according to what is reasonable and prudent for specific situations, however, it will be expected that any deviations from protocol be documented.

Advanced providers should be prepared to administer additional treatments beyond what is called for in these protocols when directed to do so by a duly designated Medical Control Physician, and such additional treatment/procedures do not conflict with or exceed the scope of the advanced provider's training.

Any order given to an advanced provider by any Physician (Medical Control Physician or otherwise), which directly contradicts or lies outside the advanced provider's scope of training must be respectfully declined.

## DEFINITIONS

The following definitions are used throughout this document:

Adult	Person at least 12 yrs old or of such physical development and/or size to dictate treatment as an adult
AED	Automatic External Defibrillator
ALS	Advanced Life Support
AMI	Acute Myocardial Infarction
BG	Blood Glucose
BLS	Basic Life Support
CFR	Certified First Responder
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
CVA	Cerebrovascular Accident
DNR	Do Not Resuscitate
ECG	Electrocardiogram
EMS	Emergency Medical Services
EMT	Emergency Medical Technician – Basic
EMT-CC	Emergency Medical Technician – Critical Care
EMT-I	Emergency Medical Technician – Intermediate
EMT-P	Emergency Medical Technician – Paramedic
ET	Endotracheal
ETT	Endotracheal Tube
GCS	Glasgow Coma Scale
ILS	Intermediate Life Support
IM	Intramuscular
IO	Intraosseous
IV	Intravenous
mL	Milliliter
MOLST	Medical Orders for Life Sustaining Treatment
MVC	Motor Vehicle Collision
Neonate	Same as a Newborn
Newborn	A patient prior to their first hospital discharge
NYS	New York State
PCR	Prehospital Care Report
Pediatric	Person who does not qualify as an adult
REMAC	Regional Emergency Medical Advisory Committee
RSI	Rapid Sequence Intubation
SCT	Specialty Care Transport

## LEVELS OF CARE

This document is designed for use by Emergency Medical Personnel certified at varying levels of care. The levels are as follows:

**CFR:** A first responder certified by New York State. Follows specific NYS Certified First Responder protocols and may provide ONLY the following additional skills in the Monroe-Livingston Region as indicated in the following protocols under ALL LEVELS, if agency is authorized to perform and if previously trained by a NYS certified instructor:

- Blood pressure
- Spinal immobilization
- Administration of oral glucose

**EMT-B:** A technician certified by New York State as an Emergency Medical Technician trained in the use of a semi-automatic defibrillator and other assessment and treatment skills per the NYS EMT curriculum. If trained, may include skills such as Epi-Pen, Albuterol, or blood glucose level determination.

**EMT-I:** A technician certified by New York State as an Emergency Medical Technician - Intermediate. Includes skills in airway management, and IV fluid administration in addition to the skills of an EMT-B. EMT-I's may NOT intubate patients, but may place an alternative airway device.

**EMT-CC:** A technician certified by New York State as an Emergency Medical Technician - Critical Care. Includes skills in advanced airway management, IV fluid administration, cardiac monitoring/defibrillation, and medication usage/administration. EMT-CCs may NOT intubate pediatric patients.

**EMT-P:** A technician certified by New York State as an Emergency Medical Technician - Paramedic. Includes skills in advanced airway management, IV fluid administration, cardiac monitoring/defibrillation, and medication usage/administration and additional training in physiology and pathophysiology.

**Although providers are certified at one of the above levels, the standard of care to which they practice on a call is related to the level of care provided by the agency for which they are responding and are not responsible for interventions or assessments higher than the agency's level.**

## ALS AGENCY DEFINITION

An ALS agency in the Monroe-Livingston Region is one that can fulfill all levels of care specified within these Standards of Care with the exception of Rapid Sequence Induction which is an optional regional program. All ALS agencies must be able to provide narcotic pain relief and benzodiazepines for sedation or seizure control in order to be considered an ALS agency in the Monroe-Livingston Region after April 30, 2010. Failure to do so will prevent the agency from practicing above the ILS level.

## ALS CRITERIA

Dispatch centers should utilize nationally recognized Emergency Medical Dispatch protocols that have been reviewed with their Medical Director to recommend Advanced Life Support (ALS) on any potentially serious illness or injury. First Responders or BLS/ILS crews should request ALS, or begin transport to the nearest hospital (if hospital closer than ALS or if ALS can meet en route) should they identify the need for such a resource.

## MEDICAL CONTROL AND HOSPITAL COMMUNICATIONS REQUIREMENTS

Medical Control may be contacted at any time by any level if there is a question or concern, or if the provider would like additional guidance.

Follow the hospital's local policy for pre-arrival notification for circumstances not described herein.

Providers may not practice beyond the "STOP" line for their level of certification, even with Medical Control Authorization

Medical Control is indicated prior to the medication/procedure anytime the telephone logo appears next to the procedure or medication:



All levels must consult Medical Control



BLS providers must consult Medical Control; EMT-CC, EMT-P Standing Order



EMT-CC must consult Medical Control; EMT-P Standing Order



EMT-P must consult Medical Control

### ABSOLUTE ONLINE

Protocols below the "ABSOLUTE ONLINE" line require On-line physician direction for any level, no exception for radio/phone failure

# **Monroe-Livingston Regional EMS Protocols**

## **Section 1**

## 1.0 ROUTINE MEDICAL CARE

1. Determine if patient has capacity to make decisions. For patients without capacity, EMS providers should perform care under the concept of implied consent. Patients without capacity cannot refuse medical treatment.

### **Capacity Assessment Criteria:**

- a. Ability to clearly demonstrate awareness of person, place, period of time and problem
- b. Ability to clearly demonstrate "decisional capacity" by expressing understanding of the situation, being able to explain their decision to consent or refuse in rational terms, and demonstrating an understanding of the risks and benefits of a decision or action
- c. Not suicidal and not a threat of harm to others

2. Appropriate equipment to provide oxygenation, ventilation and patient assessment should be brought to the patient, along with an AED or cardiac monitor and the means (stairchair, backboard, or stretcher) to appropriately move the patient from the scene to the ambulance. Equipment should be specific for the size and age of the patient. ALS should also bring medications and advanced airway equipment as appropriate.
3. At least one full set of vital signs should be taken on all patients. If the patient refuses, document at least the patient's respiratory rate and quality, and any other assessment parameters such as skin color, neurologic assessment and GCS.
4. Serial vital signs including pulse oximetry and pain scale should be completed every 15 minutes for non-critical patients and every 5 minutes for critical patients whenever possible. Document vital signs and patient response after any medication administration. If patient care or other extenuating circumstances do not allow for this frequency, the reason should be documented on the PCR.
5. Oxygen therapy, suction, and ventilatory assistance as needed per protocol and to the provider's training level. Apply appropriate oxygen delivery device (nasal cannula or non-rebreather mask) and flow rate to maintain  $\text{SpO}_2 \geq 96\%$ . If unable to obtain accurate pulse oximeter reading, apply non-rebreather mask with appropriate flow rate. If patient has history of COPD or is on home oxygen, continue home oxygen flow rate and delivery device unless contraindicated by patient's presentation.
6. Trauma patients meeting New York State Major Trauma Criteria (see Appendix) should be transported to the nearest regional trauma center unless the patient has an unmanageable airway or is in cardiac arrest, in which case the patient should be transported to the nearest emergency department.
7. Contact with the receiving hospital should be made per receiving hospital guidelines and as soon as possible in the following circumstances:
  - a. Patients meeting trauma triage criteria
  - b. Patients with evidence of an acute stroke or myocardial infarction
  - c. Patients in cardiopulmonary or respiratory arrest
  - d. Any unstable patient
8. Should the ALS provider not have the ability to call Medical Control, another provider or dispatcher should contact the receiving hospital to notify the physician/staff of a patient's unstable condition.
9. Timely transport to the receiving hospital should occur in all cases. Use of lights and sirens on such calls should be at the discretion of the provider in charge, and should be based on the stability of the patient, the need for stabilizing procedures such as airway management or drug administration at the scene, the need for procedures/medications available only at the hospital, etc. The provider in charge should also consider the possibility of increased risk to patient and crew in deciding on use of lights and sirens.

**Protocol continued on next page**

## 1.0 ROUTINE MEDICAL CARE (continued)

10. Crew safety during transport is a high priority. All crew and patients should be secured by a seat belt while the vehicle is in motion. Patient care providers should only move freely to provide critical patient care interventions such as CPR, airway management, and medication administration. All patient care equipment should be secured by a strap, clip, or mount or placed within a cabinet.
11. When possible, transport pediatric patients in car seats appropriate for age.
12. Provide patient care consistent with NYS BLS Protocols and for the patient's specific complaint using the appropriate protocol included herein.
13. The patient care interaction and all procedures performed and medications given must be documented in the PCR.
14. Blood glucose determination is **mandatory** for patients with diabetes, seizure disorder, syncope, and any patient with altered mental status when cared for by an ALS provider. It is recommended for all other patient presentations as time and patient condition allows. Blood Glucose monitoring can only be done using a Blood Glucometer. Chemstrips are not allowed.

### **EMT STOP**

15. Establish vascular access as appropriate.
16. Establish an alternate advanced airway as appropriate.

### **EMT-I STOP**

17. Establish an advanced airway as appropriate.
18. Monitor ECG on appropriate patients including all patients with potential cardiac problems. A 12 lead ECG is required for patients with potential myocardial infarction, angina, syncope, or other appropriate problems as specified in protocol. A copy of the ECG strip(s) must be attached to the PCR. An AED may not be used as an ECG monitor.

## **1.1     RADIO / PHONE FAILURE**

Situations may occur where communications with Medical Control cannot be established due to one or more of the following:

1. The crew does not have cellular service and no telephones or radios are available at the scene
2. No physician is available at the Medical Control base station
3. EMS providers are operating as part of a mutual aid disaster response outside of the Monroe-Livingston region

In the event of the above, all protocols listed in this document become standing orders for use by the EMT-I, EMT-CC or EMT-P with the exception of those orders so identified as "Absolute Online". Absolute Online orders may only be performed by a direct verbal order from a physician and may not be performed on standing orders under any circumstances.

Any instance of radio/phone failure must be documented. Further, the event must be reported to the Agency Director of Operations, the Agency Medical Director, and the Monroe-Livingston Program Agency by the next business day.

## 1.2 ON SCENE MEDICAL PERSONNEL

### PATIENT'S PERSONAL PHYSICIAN

If the patient's personal physician is on the scene, they may assume responsibility for the patient. The physician wishing to assume responsibility for the patient must:

1. Write all orders for the EMS provider on the PCR.
2. Sign for their orders on the PCR.
3.  If the physician refuses to sign, Medical Control is to be contacted.

Unless the physician accompanies the patient to the hospital, standard operating procedures and standing orders will prevail if the patient's condition deteriorates and/or other procedures are required. If the patient's personal physician accompanies the patient to the hospital, he/she continues to assume full responsibility for all orders and patient care decisions. The EMS provider will decline any orders that are contrary to, or exceed the level of their training.

### BYSTANDER PHYSICIAN

A bystander physician wishing to assume responsibility for a patient may do so only after approval from the Medical Control Physician. If a bystander physician wishes to assume responsibility for the patient, they must:

1. Write all orders for the EMS provider on the PCR.
2. Sign for their orders on the PCR.
3. Accompany the patient to the hospital.

If the physician does not agree to accompany the patient to the hospital, standard operating procedures and standing orders will prevail both on scene and during transport. If the physician accompanies the patient to the hospital, he/she continues to assume full responsibility for all patient care decisions. The EMS provider will decline any orders that are contrary to or exceed the level of their training. The EMS provider should make reasonable effort to verify the credentials and qualifications of the bystander physician prior to involving them in patient care. If doubt exists, Medical Control should be contacted and system protocols shall dictate patient care.

If approval from Medical Control cannot be obtained, the bystander physician may not assume responsibility for the patient, and the EMS provider will follow system protocols.

### REGISTERED NURSE, PHYSICIANS ASSISTANT, LICENSED PRACTICAL NURSE, ETC.

Non-physician medical personnel may assist with patient care under direction of the EMS provider, but may not be in charge of, or assume responsibility for patient care.

### OTHER PRE-HOSPITAL CARE PROVIDERS

Off-Duty EMS personnel and On-Duty personnel from a lower scope of practice agency may assist with patient care under the direction of the EMS providers on scene but may not be in charge of, or assume responsibility for patient care.

## 1.3 DO NOT RESUSCITATE ORDERS

The following procedure is to be used in determining course of action for all patients. For conscious, alert patients, their wishes are to be followed according to standard consent procedures. For unconscious patients, the following steps should be followed:

1. Determine presence of valid DNR at the scene:
  - a. Signed New York State approved document, bracelet, or necklace;
  - b. Properly documented nursing home or hospital DNR form;
  - c. Properly completed Medical Orders for Life Sustaining Treatment (MOLST) form.
2. If DNR document, bracelet or necklace is not present - begin standard treatment per protocol
3. If DNR document, bracelet or necklace is present, and is valid for the patient's condition, check presence of pulse:

**If pulse is present:** Provide comfort measures such as oxygen, airway suctioning, and transport as requested by patient, family, or patient's private physician. If additional care is specified on a properly completed MOLST form, follow those instructions.

**If pulse not present:** Contact local police, who will contact the Medical Examiner/Coroner

## 1.4 TERMINATION OF RESUSCITATION

### CRITERIA

- For patient's meeting Do Not Resuscitate criteria, refer to Do Not Resuscitate Protocol (1.3).
- For patients with obvious death, refer to Obvious Death Protocol (1.5).
- Patient's must meet **all** of the following requirements for termination of resuscitative efforts to occur:
  - Age 18 or older
  - Non-traumatic, non-hypothermic
  - ECG is asystole confirmed in three leads, ventricular standstill, or pulseless idioventricular rhythm with a rate < 10 beats per minute
  - Cardiac arrest protocols have been followed for at least 25 minutes, including successful intubation or advanced alternate airway, IV/IO access, adequate CPR, and appropriate pharmacologic therapy
  - There has been no return of a perfusing cardiac rhythm at any time during at least 25 minutes of resuscitative measures
  - Patient is not in a public place
  - Appropriate emotional support by family, neighbors, clergy, police, or EMS crewmembers is available at the scene if the family is present

### ABSOLUTE ONLINE

1. Follow cardiac arrest protocols for at least 25 minutes.
2. Assure **all** of the above criteria have been met.
3.  Obtain authorization from Medical Control to terminate resuscitative efforts.
4. Terminate resuscitative efforts.
5. Contact Medical Examiner /Coroner through police officer, telephone, or other appropriate means. Do not remove endotracheal tubes, king airways or IV/IO tubing. The patient may be covered, and may be moved back onto a bed or sofa if appropriate.

**TRANSPORT TO THE HOSPITAL SHOULD BE INITIATED IF ANY OF THE ABOVE CRITERIA ARE NOT MET, OR IF THE FAMILY OR THE PATIENT'S PRIVATE PHYSICIAN (if contacted) DISAGREE WITH TERMINATION OF EFFORTS AT THE SCENE.**

**PATIENTS ALREADY MOVED TO AN AMBULANCE ARE NOT ELIGIBLE FOR TERMINATION OF RESUSCITATION IN THE FIELD, AND MUST BE TRANSPORTED TO THE HOSPITAL.**

## 1.5 OBVIOUS DEATH

### CRITERIA

- CPR and ALS treatment are to be withheld only if the patient is obviously dead or has a valid Do Not Resuscitate order, refer to Do Not Resuscitate Protocol (1.3).
- If the patient has no pulse and meets one or more of the following criteria for obvious death, CPR and ALS therapy need not be instituted:
  - Body decomposition
  - Rigor mortis with warm air temperature
  - Dependent lividity
  - Injury not compatible with life (i.e. decapitation, burned beyond recognition, massive open or penetrating trauma to the head or chest with obvious organ destruction)
- All cases of hypothermia should receive full resuscitative efforts, refer to Hypothermia Protocol (2.19A or B).

1. Verify apnea and pulselessness
2. Verify that the patient meets obvious death criteria as defined above

If doubt exists, start resuscitation immediately. Once initiated continue resuscitation efforts until one of the following occurs:

- Resuscitation efforts meet criteria for Field Termination Protocol (1.4).
- Patient care responsibilities are transferred to the transporting provider or the destination hospital staff.
- Return of spontaneous pulse.



Medical Control must be contacted in the following circumstances before following the Obvious Death Protocol:

- If a bystander or first responder has initiated CPR or Automatic External Defibrillation prior to EMS arrival and any of the obvious death criteria are present.
- If the patient was submerged for greater than one hour in any water temperature

# **Monroe-Livingston Regional EMS Protocols**

## **Section 2**

### **Patient Care**

## **2.0 AIRWAY MANAGEMENT - ADULT**

1. Establish a patent BLS airway.
  - Manually open airway as needed
    - Head tilt / chin lift (non-trauma)
    - Modified jaw thrust (trauma)
2. Suction as needed.
3. Oropharyngeal or nasopharyngeal airway as needed unless contraindicated.
4. If ventilation status is inadequate, use positive pressure ventilation utilizing BVM with high concentration oxygen to ventilate at a rate of 10-12 breaths per minute. Support spontaneous ventilations at an appropriate rate.

### **EMT STOP**

5. If in respiratory/cardiac arrest, establish an advanced airway utilizing an alternative airway device. Verify placement and continuously monitor with waveform capnography.
6. Ventilate to maintain EtCO<sub>2</sub> 38-42 mmHg.

### **EMT-I STOP**

7. If necessary, establish an advanced airway:
  - Orotracheal intubation (using manual in-line neck stabilization for trauma) may be attempted twice with an attempt being defined as placing a laryngoscope blade in the oropharynx. The patient must be ventilated between attempts.
  - If unable to intubate, continue use of BLS airway adjuncts or use alternate airway device.
  - Early use of an alternative airway device is encouraged.
8. Following intubation, ventilate patient with bag valve device and 100% oxygen. Auscultate for bilateral breath sounds and absence of epigastric sounds. Verify placement and continuously monitor with waveform capnography.
9. Secure endotracheal tube and ventilate to maintain EtCO<sub>2</sub> 38-42 mmHg.

### **EMT-CC STOP**

10. If unable to establish patent airway and unable to ventilate using BLS techniques or alternate airway device, perform needle or surgical cricothyrotomy. Verify and manage as indicated above. Medical Control must be advised after performing procedure.

## 2.1 AIRWAY MANAGEMENT - PEDIATRIC



1. Establish a patent airway.
  - Manually open airway as needed
  - Head tilt / chin lift (non-trauma)
  - Modified jaw thrust (trauma)
2. Suction as needed.
3. Oropharyngeal or nasopharyngeal airway as needed unless contraindicated.
4. If ventilation status is inadequate, use positive pressure ventilations utilizing BVM with high concentration oxygen to ventilate at a rate of 12-20 breaths per minute. Support spontaneous ventilations as necessary.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

5. **If necessary**, establish an advanced airway:

- Orotracheal intubation (using manual in-line neck stabilization for trauma) may be attempted twice with an attempt being defined as placing a laryngoscope blade in the oropharynx. The patient must be ventilated between attempts.
- If unable to intubate, continue use of BLS airway adjuncts or use alternate airway device.
- Early use of an alternative airway device is encouraged.

6. Following intubation, ventilate patient with bag valve device and 100% oxygen. Auscultate for bilateral breath sounds and absence of epigastric sounds. Verify placement and continuously monitor with waveform capnography.
7. Secure endotracheal tube and ventilate to maintain EtCO<sub>2</sub> 38-42 mmHg.
8. If unable to establish patent airway and unable to ventilate using BLS techniques, perform needle cricothyrotomy. Verify and manage as indicated above. Medical Control must be advised after performing procedure.

## 2.2 AIRWAY OBSTRUCTION - ADULT

### Conscious patient

**Adequate air exchange** (able to cough, speak, or breathe)

1. Reassure patient and place in position of comfort.
2. Encourage coughing. Clear oropharynx as needed.
3. Administer high flow oxygen.

**Inadequate air exchange** (cannot cough, speak, or breathe)

4. Administer continuous abdominal thrusts (Heimlich Maneuver; chest thrusts on pregnant patient) until adequate air exchange is restored or the patient loses consciousness.

### Unconscious patient

5. Manually open airway, attempt to ventilate with 2 breaths. If unable to ventilate, reposition and reattempt to ventilate.
6. Administer CPR.
7. Suction and finger sweep only if object visible.
8. Repeat this sequence from #5 as needed and begin timely transport.

**EMT STOP**

**EMT-I STOP**

9. Attempt direct laryngoscopy and removal of foreign object with Magill forceps.

**EMT-CC STOP**

10. If unable to oxygenate and ventilate by any other means, perform needle or surgical cricothyroidotomy. Verify and manage per Adult Airway Management Protocol (2.0). Contact Medical Control following all cricothyroidotomy attempts.

## 2.3 AIRWAY OBSTRUCTION - PEDIATRIC



### **Conscious patient:**

Airway should not be unnecessarily stimulated or examined in the situation of possible epiglottis or croup.

**Adequate air exchange** (able to cough, speak, breathe, or cry)

1. Reassure patient and place in position of comfort.
2. Encourage coughing. Clear oropharynx as needed. DO NOT PERFORM BLIND FINGER SWEEPS.
3. Administer high flow oxygen.

**Inadequate air exchange** (cannot cough, speak, breathe, or cry)

**4. Age <1 yr:**

Administer 5 back slaps with head lower than body

Administer 5 chest thrusts

Repeat as necessary

**Age >1 yr:**

Administer continuous abdominal thrusts (Heimlich maneuver) until adequate air exchange is restored, or patient loses consciousness.

### **Unconscious patient:**

5. Manually open airway, attempt to ventilate with 2 breaths. If unable to ventilate, reposition and reattempt to ventilate.
6. Administer CPR.
7. Suction and finger sweep only if object visible.
8. Repeat this sequence from #5 as needed and begin timely transport.

**EMT STOP**

**EMT-I STOP**

9. Attempt direct laryngoscopy and removal of foreign object with Magill forceps.
10. If initial efforts to dislodge object are unsuccessful, begin timely transport and continue efforts enroute.

**EMT-CC STOP**

11. If not seen supraglottically, attempt to push the object with right mainstem intubation.
12. If object seen supraglottically, and if unable to oxygenate and ventilate by any other means, perform needle cricothyroidotomy. Verify and manage per Pediatric Airway Management Protocol (2.1). Contact Medical Control following all cricothyroidotomy attempts.

## 2.4 ALTERED MENTAL STATUS

### CRITERIA

- Decreased level of consciousness from all causes should be treated using protocol below.
- An ALS evaluation (including BG, SPO<sub>2</sub>, and ECG) should be performed on all patients whose mental status is decreased and on all patients over the age of 35 who have had a syncopal episode.

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms, hemodynamic status, medical history, possibility of poisoning, etc.
4. Consider need for spinal immobilization as appropriate.
5. Assess Blood Glucose (BLS if available) and refer to Diabetic Emergencies Protocol (2.14) if BG < 80 mg/dl.
6. All patients with an altered mental status should have timely transport to the hospital.
7. Consider other possible causes of decreased level of consciousness and refer to the appropriate protocol:
  - head trauma - refer to Head Trauma Protocol (2.16)
  - postictal - refer to Seizure Protocol (2.31)
  - meningitis or other infectious processes – refer to agency infectious disease plan
  - hypoxia – refer to Airway Management Protocols (2.0-2.3)
  - stroke – refer to Stroke / CVA Protocol (2.32)
  - overdose – refer to Poisoning / Overdose Protocol (2.25)

## 2.5 ANAPHYLAXIS / ALLERGIC REACTION

### CRITERIA

- Respiratory distress (wheezing, stridor, or use of respiratory accessory muscles)
- Tongue, oropharynx, or uvular swelling
- Hives, itching, or flushing
- Signs of shock
- Auscultation of unusual/abnormal breath sounds (wheezing, stridor), or markedly decreased movement of air

1. Routine medical care including oxygen saturation if available.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms, and hemodynamic status.
4. If symptoms of shock, airway swelling or respiratory distress are present and:
  - The patient has their own anaphylactic emergency kit, the provider may assist the patient in administering the kit's contents **or**
  - If the BLS agency has completed registration as an EpiPen agency, the provider has been trained in its use and an auto injector Epinephrine device (0.3 mg IM) is available, the provider may administer the device's contents.

 If the patient has not had an epinephrine autoinjector previously prescribed, Medical Control must be contacted before BLS may administer.

 Use EpiPen Jr./Pediatric auto-injector (0.15 mg IM) for children under 30 kg (66 lbs).

5. Begin timely transport. If Epinephrine has been given, ALS must transport with the patient, but do not delay transporting the patient while waiting for ALS.

### EMT STOP

6. If evidence of shock, establish vascular access and administer fluid challenge per protocol (2.34, 2.15).

### EMT-I STOP

**Protocol continued on next page**

## 2.5 ANAPHYLAXIS / ALLERGIC REACTION, continued

**Allergic Reaction without Signs of Anaphylaxis** (Localized symptoms or hives with no respiratory distress or signs of shock)

7. Diphenhydramine (Benadryl) 50 mg IV/IO (May be given IM if IV/IO not available)

 Diphenhydramine 2 mg/kg IV/IO (Max 25 mg) (May be given IM if IV/IO not available)

**Anaphylaxis** (Respiratory distress or signs of shock)

8. Epinephrine 1:1000 0.3 mg IM, repeat every 5 minutes as needed

 Epinephrine 1:1000 0.01 mg/kg IM (Max 0.3 mg), repeat every 5 minutes as needed

**NOTE:** Never administer Epinephrine 1:1000 via IV/IO route.

9. Diphenhydramine (Benadryl) 50 mg IV/IO (if not already given, may be given IM if IV/IO not available)

 Diphenhydramine 2 mg/kg IV/IO (Max 25 mg) (if not already given, may be given IM if IV/IO not available)

10. If wheezing present:

Albuterol 5 mg and Ipratropium Bromide (Atrovent) 0.5 mg by nebulizer. May be mixed and given simultaneously and may be given via bag-valve mask if necessary

 Albuterol 2.5 mg and Ipratropium Bromide (Atrovent) 0.5 mg by nebulizer. May be diluted with NS to 5 mL. May be given via bag-valve mask if necessary

11.  If patient with profound shock and poor perfusion:

Epinephrine 1:10,000 0.5 mg slow IV/IO

 Epinephrine 1:10,000 0.01 mg/kg (Max 0.3 mg) slow IV/IO

### EMT-CC STOP

12. If Epinephrine not effective, or if patient on beta-blocker:

Glucagon 1 mg IV/IO, may repeat once (Adult only)

13. If hypotension persists, consider vasopressor therapy per Hypotension / Shock Protocol (2.18)

## 2.6 APPARENT LIFE THREATENING EVENT (ALTE)



### CRITERIA

- An episode in an infant or child less than 2 years old which is frightening to the observer and is characterized by one or more of the following:
  - Apnea (central or obstructive)
  - Skin color change: cyanosis, erythema (redness), pallor, plethora (fluid overload)
  - Marked change in muscle tone
  - Choking or gagging not associated with feeding or a witnessed foreign body aspiration
  - Seizure-like activity

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3.  Timely transport to the emergency department. If the parent or guardian refuses medical care or transport, the provider must contact Pediatric Medical Control. BLS cannot cancel ALS for ALTE.

**EMT STOP**

**EMT-I STOP**

4. Place patient on cardiac monitor.
5. Consider initiating IV access per protocol (2.34).

### NOTE

Most patients will appear stable and exhibit a normal physical exam. However, this episode may be a sign of underlying serious illness or injury and further evaluation by medical staff is strongly recommended. The provider must explain the potential risks of refusal to the caretaker on scene. In the event that the legal guardian is not with the patient and transport is being refused, it is recommended that the legal guardian be contacted.

## 2.7 AVULSED TOOTH REIMPLANTATION

### CRITERIA

- Only reimplant permanent teeth
- Best chance for success is when reimplantation occurs less than 5 minutes from injury
- Do not reimplant if the alveolar bone / gingiva are missing or if the root is fractured
- Do not reimplant if the patient is immunosuppressed or reports having cardiac issues that require antibiotics prior to procedures
- Do not reimplant if the patient requires spinal immobilization
- If not candidate for reimplantation, place tooth in interim storage media (low fat milk, patients' saliva, or saline) and keep cool. Avoid tap water storage but do not allow the permanent tooth to dry.

1. Routine medical care
2. Assure airway patency and administer oxygen per protocol
3. Assess signs, symptoms, hemodynamic status, and medical history
4. Consider need for spinal immobilization as appropriate (if spinal immobilization needed, do not reimplant)
5. Patients with an altered mental status should not be considered candidates for dental reimplantation
6. Hold the tooth by the crown
7. Quickly rinse the tooth with saline before reimplantation but do not brush off or clean tooth of tissue
8. Rinse and suction the clot from the socket
9. Reimplant tooth firmly into socket with digital pressure
10. Have the patient hold tooth in place using gauze and bite pressure
11. Report to hospital staff the efforts made to reimplant tooth

## 2.8 BEHAVIORAL EMERGENCIES

### CRITERIA

Any patient who demonstrates potentially violent behavior regardless of underlying diagnosis, who continues to resist against appropriately applied restraints, and needs facilitation of physical restraint.

### CAUTION

Agitation may signal a physiologic deterioration of the patient and accompany hypoxia, hypoglycemia, cerebral edema, or other medical problems. Treatment of medical disorders should always be done prior to any chemical restraint.

1. Assess mental, emotional, and physical status thoroughly including all other potential causes of aggressive behavior. Other causes should be treated first, which may be sufficient to resolve the aggressive behavior.
2. Attend to medical or trauma needs as per protocol.

No patient will be transported without law enforcement presence if his or her emotional or mental status poses a threat to patient or crew safety.

Follow 'Management of Violent and Potentially Violent Behavior' procedures (Policy 9.3). If unable to manage with physical restraints, consider chemical restraints below.

**EMT STOP**  
**EMT-I STOP**

3. If patient is at immediate risk of harming themselves or others:

Midazolam (Versed) up to 2.5 mg IV/IM. Contact Medical Control following administration.

### ABSOLUTE ONLINE

4. If patient remains immediate risk of harming themselves or others after first dose:

Midazolam (Versed) 2.5 mg IV/IM (repeat doses per Medical Control)

## 2.9 BURNS

1. Remove patient from source of burn – heat source, chemicals, electricity source etc. Precautions should be taken to prevent injury to the rescuers. Only trained personnel should perform high-risk rescue procedures as appropriate. Decontamination measures should be taken as appropriate.
2. Assure airway patency and administer high flow oxygen.
3. Stop burning process by application of water, except in case of elemental metal burn. Dry chemicals should be brushed away as much as possible before water is applied. In most cases 5-10 minutes is sufficient, although longer periods may be needed for hot grease, asphalt or chemicals. Burns from sodium metal, potassium metal, phosphorus, etc. should not be flushed with water, but instead should be covered with dry sterile dressings to prevent both air and water from making contact with the area. Remove jewelry and clothing as appropriate.
4. Apply dry sterile dressings. Take other measures to keep the patient warm as needed.
5. Timely transport with early notification to emergency department if patient unstable, possibility of airway obstruction exists, or extensive burns. Transport to burn center for:
  - Burns compromising patient's airway
  - Burns of face, hands, feet, joints, perineum or genitalia
  - Circumferential burns
  - 20% total of 2<sup>nd</sup> / 3<sup>rd</sup> degree burns
  - 5% 3<sup>rd</sup> degree burns
  - Significant chemical burns

### EMT STOP

6. Establish IV Access (Vascular Access Protocol 2.34). Two large bore IVs or an IO are preferable, but time should not be wasted at the scene to obtain IV access. Consider fluid bolus per Fluid Challenge / Replacement Protocol (2.15), if extensive burns and/or if blood pressure is unstable.

### EMT-I STOP

7. Treat pain; see Pain Management Protocol (2.24)

## 2.10 CHEST PAIN / THREATENED MYOCARDIAL INFARCTION

### CRITERIA

Patient with non-traumatic chest pain or other indications of possible Myocardial Infarction (shortness of breath, nausea, diaphoresis, etc)

1. Routine medical care.
2. If systolic BP > 120 mmHg, may assist patient with taking own nitroglycerin tablets.  
If systolic BP remains > 120 mmHg, one tablet may be taken sublingually every 3-5 minutes up to total of 3 doses.

### CAUTION

Avoid Nitroglycerin in patients who have taken erectile dysfunction medication (Viagra™, Levitra™, or Cialis™) in the past 72 hours

3. Aspirin (if not contraindicated by allergy or active bleeding):  
4 tablets 81 mg each should be chewed and swallowed for total dose of 324 mg.

### EMT STOP

4. Establish IV according to Vascular Access Protocol (2.34).

### EMT-I STOP

5. When possible, perform 12-lead ECG prior to administration of nitroglycerin.
6. Evaluate 12-lead ECG for evidence of ST Elevation Myocardial Infarction (STEMI). This requires:
  1. ECG has good baseline with minimal artifact **AND**
  2. Computer interpretation of a "suspected acute myocardial infarction"



If 12-lead ECG reveals evidence of STEMI as defined above, contact Medical Control of a STEMI Center\* and advise of a "STEMI Alert." Provide appropriate clinical information and review the ECG findings with the Medical Control Physician.

7. If systolic BP > 90 mmHg, HR > 50 and <130 bpm and there are no signs of right ventricular involvement:  
Nitroglycerin 0.4 mg SL every 3-5 minutes as long as pain continues and systolic BP remains > 90 mmHg
8. If systolic BP < 90 mmHg, HR < 50 or >130, contact Medical Control before giving nitroglycerin.
9. If signs of right ventricular involvement:
  1. Avoid Nitroglycerin
  2. If systolic BP < 90 mmHg and lung sounds are clear - Fluid Challenge / Replacement Protocol (2.15)

### EMT-CC STOP

10. If systolic BP remains < 90 mmHg after fluid challenge AND patient is symptomatic for shock



Dopamine HCl 5 mcg/kg/min to Maximum 10 mcg/kg/min IV/IO titrated to maintain systolic BP > 90 mmHg using a rate-limiting device. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.

11. If BP > 90 mmHg systolic and inadequate response to above:



Morphine 5 mg slow IV

**Protocol continued on next page**

## **2.10 CHEST PAIN / THREATENED MYOCARDIAL INFARCTION, continued**

### **\*NOTE**

STEMI Centers are facilities with 24-hour cardiac catheterization capabilities and include:

1. Rochester General Hospital
2. Unity Hospital – Park Ridge
3. University of Rochester Medical Center – Strong Memorial Hospital

IMPORTANT CONSIDERATIONS FOR TRANSPORT TO A STEMI CENTER:

1. A patient in cardiac arrest should be taken to the nearest emergency department regardless of ECG findings.
2. Patients may be brought to a code red STEMI center if 12-lead ECG indicates a STEMI.
3. Patients with unstable vital signs and evidence of STEMI should still be diverted to the cardiac catheterization capable facility. If this results in a significant delay in reaching definitive care, this should be related to Medical Control to determine the best receiving facility for the patient.
4. If no STEMI, routine care and transport to the nearest appropriate Emergency Department.

## **2.11 CHEST TRAUMA**

1. Routine medical care.
2. Assure airway patency and administer high flow oxygen.
3. Stabilize but do not remove penetrating objects. Use occlusive dressing to seal sucking wounds on 3 sides only – leave open on 4<sup>th</sup> side. Stabilize flail segments.
4. If signs/symptoms of tension pneumothorax present:

Remove occlusive dressing from sucking wound (if present).

5. Timely transport with early notification to hospital

### **EMT STOP**

6. Notify Medical Control as soon as possible (at least 5-10 min prior to arrival).
7. If symptoms of cardiac tamponade present:

Give continuous wide-open Normal Saline IV/IO.

### **EMT-I STOP**

8. Monitor pulse oximeter and ECG.
9. If signs/symptoms of tension pneumothorax present:  
Perform needle decompression thoracostomy

## 2.12 CONDUCTED ENERGY WEAPONS

### CRITERIA

Conducted Energy Weapons (also referred to as Electronic Control Devices, Conducted Energy Devices, etc) are used by law enforcement as an alternative to ballistic devices and other physical force in order to gain compliance with a non-cooperative person. These devices send an electrical charge of up to 50,000 volts per pulse with 12 to 20 pulses per second up to five seconds per cycle. The electrical current is about 2.1-3.5 milliamps. The delivered energy is between 0.7 to 1.76 joules. The number of discharges and the duration of discharges can be controlled by the operator. The discharge can either be through probes fired from the device with a range of up to 35 feet or with a contact discharge where the device is held against the subject. Either method will work through clothing. Either method uses electricity to cause the skeletal muscles between the probes to contract and release rapidly preventing voluntary control of the affected muscles. The device may cause a brief altered mental status, but subjects regain normal mentation and muscle control almost immediately, although some subjects may take up to a minute to recover.

1. Assure patient is appropriately restrained and not a danger to care providers.
2. Assess patient for problems and treat as per appropriate protocol. The device does not cause an altered mental status. Any altered level of consciousness must be assessed and treated in accordance with the Altered Mental Status Protocol (2.4).
3. Assess patient for high-risk criteria. Most patients who have been exposed to a CED will be in police custody and treatment decisions should be a cooperative venture. Presence of one or more of the following risk factors indicates need for an ALS response and transport to an Emergency Department is encouraged:
  - Known cardiac history including pacemaker/implantable defibrillator
  - Known seizure disorder
  - Pregnancy
  - Altered mental status
  - Extended physical struggle including multiple discharges or cycles
4. The barbs that contact the patient have an end that is similar to a fishhook and may imbed as much as 1.5 cm. To remove the probe, stabilize the soft tissue around area with a gloved hand and remove the probe by pulling outward. If there is resistance when removing the probe, leave the probe in place and transport to the Emergency Department. Clean the area and dress appropriately.



## 2.13 CROUP

### CRITERIA

- History consistent with upper respiratory infection
- Difficulty / inability to speak or presence of stridor

1. Routine medical care.
2. Assure airway patency and administer humidified high flow oxygen.

### CAUTION

If possibility of epiglottitis, airway should not be stimulated or examined and Medical Control should be contacted before other treatment is undertaken.

3. Timely transport.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

4. If patient exhibits stridor at rest:



Epinephrine 1:1000 nebulized:

Age	Dose	Maximum	Note
<1	0.5 mL/kg	2.5 mL	Mix with 3mL Normal Saline
1-4	2.5 mL		Mix with 3mL Normal Saline
≥5	5 mL		Mix with 3mL Normal Saline

5. If patient is unable to ventilate adequately, refer to Airway Obstruction Protocol (2.3).

## 2.14 DIABETIC EMERGENCIES

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms, medical history, and blood glucose (BG), if available.
4. If patient has BG < 80 mg/dL, appears hypoglycemic, or if you are unsure if patient is hypoglycemic:  
If patient is able to speak coherently, offer any form of available sugar (non-diet soda, candy, orange juice, granular sugar, or glucose gel).
5. All patients on oral hypoglycemic medications or long-acting insulin, who have been treated for potential hypoglycemia, should be transported.
6. Treatment should **not** be withheld from patients with a stroke-like presentation, as this is likely due to hypoglycemia.

### EMT STOP

7. Establish intravenous access per Vascular Access Protocol (2.34)
8. Assess blood glucose (BG)
9. If BG > 300 mg/dL and patient with symptoms  
Consider fluid bolus per Fluid Challenge / Replacement Protocol (2.15)

### EMT-I STOP

10. If BG < 80 mg/dL and patient symptomatic:  
D50W 12.5-25 gm IV/IO  
 D25W 0.5-1 gm/kg IV/IO for patients <5 kg  
 D50W 0.5-1 gm/kg IV/IO for patients  $\geq$ 5 kg
11. Reassess BG and repeat D50W as needed.
12. If unable to establish IV access:  
Glucagon 1 mg IM (once)  
 Glucagon 0.1 mg/kg IM (Max 1 mg) (once)
13. If level of consciousness does not improve, consider Altered Mental Status Protocol (2.4)

## 2.15 FLUID CHALLENGE / REPLACEMENT

### CRITERIA

- Medical hypovolemia due to dehydration:
  - history consistent with decreased fluid intake and/or increased fluid loss
  - decreased skin turgor or sunken eyeballs
  - sinus tachycardia not clearly explained by other causes
  - orthostatic changes: either patient becomes dizzy when standing, or pulse increases by >20 bpm
- Shock due to trauma or other causes (see appropriate protocol)

### EMT STOP

1. Start IV/IO of 0.9% Normal Saline (NS) per Vascular Access Protocol (2.34)
2. If lung sounds are clear, infuse 500 mL NS
  -  Infuse 20 mL/kg NS (Max 500 mL)
3. Reassess patient (including vital signs and lung sounds)
4. Repeat procedure once to maintain appropriate systolic blood pressure for age, unless pulmonary edema develops.
5.  If patient undergoes renal dialysis, Medical Control authorization prior to additional fluid challenge is required.

## **2.16 HEAD TRAUMA**

1. Routine medical care.
2. Spinal immobilization. Patient's head should not be lower than the body.
3. Assure airway patency and administer oxygen per protocol.
4. If BVM ventilation needed, ventilations should be slow and steady at a constant rate of 10 breaths per minute.
5. Timely transport with early notification to emergency department.

### **EMT STOP**

6. Establish vascular access; see Vascular Access Protocol (2.34). Adjust rate as follows:

If isolated head trauma – IV/IO at KVO

If multiple trauma – follow Fluid Challenge / Replacement Protocol (2.15)

## 2.17 HYPERTHERMIA / HEAT EXHAUSTION / HEAT STROKE

### CRITERIA

- Body temperature  $> 40.6^{\circ}\text{C}$  ( $105^{\circ}\text{F}$ ). Do not use tympanic thermometers.
- Infants and children, and frail, elderly, or chronically ill adults may show symptoms of hyperthermia at lower temperatures than listed above. Patients on anticholinergic medications (Benadryl, Ditropan, Detrol, haloperidol, amitriptyline, nortriptyline, etc) are prone to hyperthermia due to an inability to perspire.
- May be accompanied by CNS dysfunction (delirium, psychoses, coma, seizures), absence of sweating, pallor, tachycardia, hypotension, cramping or tingling, nausea /vomiting, headache, dizziness.

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms.
4. Remove patient from hot environment. Remove clothing.
5. Cool patient using whatever means immediately available:
  - sprinkle or spray with fine water mist
  - air conditioned ambulance, or fanning

### CAUTION

Rapid cooling may cause shivering and vomiting  
Wet sheets without air circulation will retain heat rather than dissipate it  
Do not use alcohol to lower temperature  
Do not delay transport to the hospital

6. Continue to monitor body temperature.

### EMT STOP

7. If hypotensive or dehydrated, proceed with Fluid Challenge / Replacement Protocol (2.15)
8. If decreased level of consciousness, proceed with Altered Mental Status Protocol (2.4)
9. If patient has seized, or is seizing, proceed with Seizure Protocol (2.31)

## 2.18 HYPOTENSION / SHOCK

### CRITERIA

- Inadequate tissue perfusion as evidenced by one or more of the following:
  - poor peripheral pulses, or capillary refill > 2 sec
  - altered mental status
  - cyanosis, pallor, diaphoresis, cool skin
  - dizziness, light-headedness, nausea or vomiting
  - tachycardia (in conjunction with one or more other symptoms and suggestive history)

**SHOCK MAY BE PRESENT EVEN IN THE PRESENCE OF A NORMAL BLOOD PRESSURE, PARTICULARLY IN CHILDREN AND YOUNG ADULTS**

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms, and medical history.
4. Consider treatable causes:
  - Anaphylaxis - see Anaphylaxis Protocol (2.5)
  - Dysrhythmia - see appropriate Protocol (Section 3 or 4)
  - Hypoglycemia - see Diabetic Emergency Protocol (2.14)
  - Hypovolemia - see #5-6 below
  - Hypoxia - see Airway Management Protocol (2.0, 2.1)
  - Neurogenic or septic shock - see # 5-7 below
  - Trauma - see appropriate Trauma Protocol (Chest – 2.11, Head – 2.16)
5. Timely transport in supine position, or shock position if appropriate. Keep the patient warm by passive measures including warm ambulance compartment temperature, but avoid hyperthermia.

### EMT STOP

6. Establish vascular access and administer fluid challenge per protocol if lung sounds are clear (Protocols 2.34 and 2.15).

### EMT-I STOP

### EMT-CC STOP

7. If no improvement, and no history suggestive of hypovolemia:



Dopamine HCl 5 mcg/kg/min to Maximum 10 mcg/kg/min IV/IO titrated to maintain systolic BP > 90 mmHg using a rate-limiting device. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.

## 2.19A HYPOTHERMIA

### CRITERIA

- Body temperature < 35 °C (95 °F)
- Do not use tympanic thermometers.

1. Routine medical care.
2. Move out of cold environment. Gently remove wet clothing, cover with blankets and otherwise protect from further heat loss.
3. Assure airway patency and administer oxygen per protocol (with warm moist air if possible).
4. Maintain horizontal position.
5. Avoid rough handling during patient movement.
6. Timely transport (goal of <15 minute scene time).
7. Monitor temperature; assess cardiopulmonary status, and presence of other factors such as trauma, drug usage, etc. Heart rates should be assessed for at least 1 full minute.
8. If temp is 30-35°C (86 - 95°F), gentle re-warming measures may be instituted (heated ambulance).
9. Assess BG (BLS if available). If hypoglycemic, see Diabetic Emergencies Protocol (2.14).

### EMT STOP

10. Establish vascular access with warmed Normal Saline; see Vascular Access Protocol (2.34).

## 2.19B HYPOTHERMIC CARDIAC ARREST

1. Institute CPR.

### NOTE

Pharmacological and electrical interventions are often ineffective in severe hypothermia, and should be used only with extreme caution.

2. Defibrillate once if shock advised.

### EMT STOP

3. Establish vascular access refer to Vascular Access Protocol (2.34).

### EMT-I STOP

4. Intubation should be performed with minimal manipulation.
5. First round medication (vasoconstrictor and antiarrhythmic) administration as per usual arrest protocols for temps > 30°C (86°F). No medications are to be given if patient's temperature is below 30°C (86°F).
6.  Contact Medical Control for all additional medication and defibrillation orders based on body temperature.

## 2.20 NAUSEA / VOMITING

### CRITERIA

Patient with uncontrolled nausea/vomiting and no evidence of head injury:

1. Attempt to treat cause of the nausea.

**EMT STOP**

**EMT-I STOP**

2. If nausea unrelieved by other interventions:

Promethazine (Phenergan) 6.25-12.5 mg diluted in 50 mL NS and given over 10 minutes.

3. If dystonic reaction (torticollis/stiff neck, back spasm, agitation) occurs, give:

Diphenhydramine (Benadryl) 25 mg IM/IV (May repeat once).

## 2.21 NEAR-DROWNING

1. Routine medical care.
2. Assure airway patency, and administer oxygen per protocol.

### NOTE

Heimlich maneuver is contraindicated for the removal of water from the lungs.

3. If patient is pulseless and apneic, refer to Cardiac Arrest Protocols (3.0, 3.1, 4.0 and 4.1).
4. Initiate spinal immobilization precautions and trauma care as appropriate; see Spinal Immobilization Protocol (2.33).
5. Treat hypothermia (even in warm water drowning or warm environmental conditions) - see Hypothermia Protocol (2.19A).
6. All patients should be transported for evaluation.
7. Unless contraindicated, transport patient in lateral recumbent position.

## 2.22 NEONATAL RESUSCITATION



### CRITERIA

- The primary concerns of newborn resuscitation are adequate oxygenation, airway patency, and warmth.
- Signs of inadequate oxygenation include:
  - Quiet, not crying
  - No response to tactile stimulation
  - Diffuse, dark cyanosis over entire body (Initial cyanosis should "pink up" rapidly)
  - Respiratory rate < 20 rpm
  - Pulse rate < 100 bpm
  - Flaccid, non-moving extremities
- Supplemental oxygenation (when needed) may be provided by holding mask near or on face:

1. Suction mouth then nose as soon as head is visible. Do not bulb syringe back of throat. If meconium is present, suction with bulb syringe or catheter as soon as head is delivered, if possible.
2. Keep baby at level of vagina until umbilical cord is cut. Cord should be clamped and cut 30-45 seconds after birth.
3. Dry baby, warm with blankets, provide tactile stimulation. Environment should be warm.
4. **If respirations < 30 rpm or heart rate < 100 bpm**  
Ventilate with 100% oxygen using neonatal or small child bag-valve mask at a rate of 40-60 breaths per minute.
5. **If heart rate < 60 bpm**  
Begin chest compressions at rate of 120 per minute utilizing a compression/ventilation ratio of 3:1. Begin timely transport.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

6. If thick meconium is present and respiratory distress, HR<100 bpm, or poor muscle tone is present, or if unable to maintain airway, consider endotracheal intubation for suctioning. The trachea should be suctioned before any bag valve ventilation attempts.

May need to re-intubate with clean tube after suctioning

7. Establish intravenous access if no clinical improvement. Intraosseous or peripheral IV is preferred.



Medical Control must authorize cannulation of the infant's umbilical vein with an intracath, Insert only 1-2 cm.

8. If continued heart rate < 60 bpm and adequacy of ventilation and oxygenation is assured:

Epinephrine 1:10,000 0.01 mg/kg (0.1 mL/kg) IV/IO (Max 1 mg per dose)

9. Consider Naloxone (Narcan) 0.1 mg/kg IV/IO (Max 2 mg)

10. Consider fluid bolus 20 mL/kg normal saline IV/IO, see Fluid Challenge / Replacement Protocol (2.15)

- 11.

Consider repeat doses of Epinephrine at above dose every 5 min

## 2.23 OBSTETRIC EMERGENCIES

1. Routine medical care. Administer oxygen per protocol.
2. Assess signs, symptoms, and obstetric history.
3. If delivery imminent:
  - Allow baby to deliver spontaneously.
  - Support infant, but do not attempt to retard or hasten delivery.
  - Begin timely transport with ALS transport/intercept if possible, but do not delay transport to wait for ALS.
  - Contact Medical Control as necessary for instructions and destination.
  - For routine deliveries, preference hospital affiliated with maternal Ob/Gyn physician
4. Suction mouth and nares of infant upon delivery of the head. Check for nuchal cord.
5. Clamp cord in two places 8-12" from infant; cut cord between clamps.
6. Assess infant and proceed with neonatal resuscitation - see Neonatal Resuscitation Protocol (2.22)
7. Do not wait for delivery of placenta to begin transport. If the placenta delivers spontaneously, bring to hospital in plastic bag. Do not pull on cord under any circumstances.
8. After delivery of placenta, massage uterus as needed for control of maternal hemorrhage.
9. If mother is hypotensive, refer to Hypotension/Shock Protocol (2.18) as needed.

## 2.24 PAIN MANAGEMENT

### CRITERIA

- Pain (>4 out of 10) due to burns, amputation, or isolated extremity (including hip/shoulder) fracture / dislocation without evidence of head or spinal injury.
- May also be used for other pain management, if ordered by Medical Control and if other pain management techniques are insufficient.

1. Routine medical care. If pain is secondary to a burn, refer to Burn Protocol (2.9).
2. Assure airway patency. Administer oxygen per protocol.
3. Apply pain relief measures such as splinting, positioning, ice packs, etc. as appropriate.

### EMT STOP

### EMT-I STOP

4. Morphine 5 mg IM or slow IV/IO (if SBP >100 mmHg).  Medical control authorization is required for any other indication, or any repeat doses.  
 Morphine 0.1 mg/kg (Max 5 mg) IM or slow IV/IO if SBP normal for age.  Medical control authorization is required for any other indication, or any repeat doses.

### ABSOLUTE ONLINE

5. If pain persists and if BP > 100 mmHg systolic and RR > 8 rpm:

Morphine 0.1 mg/kg every 10 minutes IM or slow IV/IO

 Morphine 0.1 mg/kg (Max 5 mg per dose) every 10 minutes IM or slow IV/IO

### NOTE:

IV is preferred route for burn patients due to inconsistent absorption associated with IM route.

## 2.25 POISONING / OVERDOSE

### CRITERIA

- Suspected or actual overdose of patient's prescribed medications - accidental or intentional.
- Suspected or actual ingestion/injection of non-prescribed medications - accidental or intentional.
- Exposure to potentially toxic substance - ingestion, inhalation, dermal contact, etc.

1. Routine medical care with transport in left lateral recumbent position if oral ingestion.
2. Assure airway patency and administer oxygen per protocol.

### CAUTION

If carbon monoxide inhalation or inhalation injury, patient must be on 100% oxygen

3. Assess signs, symptoms, hemodynamic status, type, time and amount of poisoning. If possible, bring poison container to hospital.
4. Poison control may be contacted for management advice, however all treatment orders must come from on-line Medical Control.
5.  If orally ingested poison less than one hour old in an alert patient who is able to protect their airway **AND** if directed by Medical Control:

Sorbitol-free Activated Charcoal 50 gm PO

 Sorbitol-free Activated Charcoal 2 gm/kg PO (Max 50 gm)

### EMT STOP

### EMT-I STOP

6. If potential opiate overdose with respiratory depression:

Naloxone (Narcan) 0.4 mg IV/IO/IM. May repeat to support respiratory efforts

OR

Naloxone (Narcan) 0.8 mg via Mucosal Atomization Device, may repeat to support respiratory efforts

 Naloxone 0.1 mg/kg IV/IO/IM titrated to support respiratory efforts (Max 0.4 mg). May repeat to support respiratory efforts.

### NOTE

Remove any transdermal narcotic delivery device from patients receiving Naloxone and bring to the Emergency Department for proper disposal.

### EMT-CC STOP

**Protocol continued on next page**

## 2.25 POISONING / OVERDOSE, continued

7. If potential calcium channel blocker overdose with hypotension (SBP < 90 mmHg) or symptomatic bradycardia (HR < 60 bpm) then:

10% Calcium Chloride 1000 mg slow IV/IO

 Contact Medical Control

8. If potential Tricyclic antidepressant or aspirin overdose with QRS > 0.10 seconds or SBP < 90 mmHg then:

Sodium Bicarbonate 100 mEq slow IV/IO

 Contact Medical Control

9. If potential beta-blocker overdose with hypotension (SBP < 90 mmHg) or symptomatic bradycardia (HR < 60 bpm) then:

Glucagon 2 mg IV/IO/IM

 Glucagon 0.1 mg/kg IV/IO/IM (Max 2 mg)

## 2.26 PULMONARY EDEMA / CHF

### CRITERIA

- Dyspnea/Tachypnea
- Rales/wheezing
- Pink, frothy sputum may be present or absent

1. Routine medical care.
2. Assess signs, symptoms and hemodynamic status.
3. Position patient with head elevated (High Fowlers).
4. Initiate oxygen therapy.
5. If inadequate respirations or decreased level of consciousness, consider use of BVM.
6. Begin timely transport.

### EMT STOP

### EMT-I STOP

7. If systolic BP > 90 mmHg:  
Nitroglycerin 0.4 mg SL every 3-5 minutes as long as systolic BP > 90 mmHg

8. Consider CPAP

### EMT-CC STOP

9. If patient has respiratory failure, altered mental status, or inadequate ventilations consider intubation.
10. If systolic BP < 90 mmHg:



Dopamine HCl 5 mcg/kg/min to Maximum 10 mcg/kg/min IV/IO titrated to maintain systolic BP > 90 mmHg using a rate-limiting device. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.

## 2.27 RAPID SEQUENCE INTUBATION

### RSI PARAMEDIC ONLY

**This procedure requires two advanced providers (EMT-P or EMT-CC) authorized to perform endotracheal intubation and administer medications. One provider must be a paramedic who has been credentialed to perform this procedure by the System Medical Director.**

The following indication for Rapid Sequence Intubation is standing order for the RSI Credentialed Paramedic. Absolute On-Line Medical Direction is required for performance of this procedure outside of this indication (eg: potential airway compromise, smoke inhalation, combativeness that threatens airway or spinal cord stability, etc).

#### STANDING ORDER INDICATION

Inability to tolerate laryngoscopy and **ALL** of the following:

1. GCS ≤8
2. Oxygen saturation less than 90% with 100% supplemental oxygen (via non-rebreather, CPAP, or BVM)
3. Transport time to the nearest appropriate Emergency Department >10 minutes

#### CONTRAINDICATIONS

1. Patient <40 kg (88 lbs)
2. Obvious facial, neck, and/or spinal deformity that would prevent establishing an airway
3. Full or significant partial thickness burns greater than 48 hours old
4. Paralysis from spine injury greater than 48 hours old
5. Degenerative neurological diseases (ALS, muscular dystrophy, myasthenia gravis, etc.)
6. End-stage renal disease requiring dialysis

#### PROCEDURE

1. Prepare equipment
2. Pre-oxygenate with 100% oxygen
3. Pre-treat
  - a. Atropine 0.5 mg IV/IO push for signs or symptoms of symptomatic bradycardia
  - b. Lidocaine (Xylocaine) 1.5 mg/kg IV/IO for suspected elevated intracranial pressure
4. Sedate
  - a. Etomidate (Amidate) 0.3 mg/kg IV/IO push
5. Paralyze
  - a. Succinylcholine (Anectine) 1.5 mg/kg IV/IO push
  - b. A second dose of Succinylcholine (Anectine) 0.5 mg/kg IV/IO push may be given if initial dose ineffective
6. Intubate
  - a. Orotracheal intubation (using manual in-line neck stabilization for trauma) may be attempted up to two times with an attempt being defined as placing a laryngoscope blade in the oropharynx. The patient must be ventilated between attempts. The patient's SpO<sub>2</sub> must be continuously monitored during each attempt.
  - b. If unable to intubate after two attempts, place an alternative airway device.
7. Confirm Placement
  - a. Following intubation or placement of an alternative airway device, ventilate patient with bag valve device and 100% oxygen.
  - b. Auscultate for bilateral breath sounds, absence of epigastric sounds, confirm placement with waveform capnography.
8. Monitor
  - a. Continuously monitor placement with continuous waveform capnography.
  - b. Ventilate to achieve EtCO<sub>2</sub> 38-42 mmHg.
  - c. Treat and manage other conditions per appropriate protocol.

## 2.27 RAPID SEQUENCE INTUBATION, continued

### POST INTUBATION MANAGEMENT

The following post-intubation sedation and analgesia protocols are standing order for the RSI Credentialled Paramedic. They may be used for patients having just undergone RSI, or for patients who were successfully orotracheally intubated without paralytics and now require sedation.

#### Sedation

Midazolam (Versed) 2.5 mg IV/IO (Use with caution if systolic blood pressure < 90 mmHg)

Repeat dose(s) with Medical Control authorization

#### Analgesia

Morphine 5 mg slow IV/IO (Use with caution if systolic blood pressure < 90 mmHg)

Repeat dose(s) with Medical Control authorization

### ABSOLUTE ONLINE

#### Paralysis

Indicated only to facilitate ventilation, must use in conjunction with sedation and analgesia:

Vecuronium (Norcuron) 0.1 mg/kg IV

## 2.28 RE-ESTABLISHING PATIENT MEDICATION IV

### CRITERIA

- Adult or Pediatric patient with life-sustaining IV treatment which cannot be discontinued for a brief time without major consequences (See list of allowed drugs below)
- IV/Central line infiltrated or pulled out with no other means of rapid IV access

1. Routine medical care as appropriate and transport to appropriate hospital. Bring bag of patient medication to hospital if available and alert Medical Control that patient is en route.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

2. If drug is on list of allowable drugs, re-establish peripheral IV and hook directly to patient's existing IV medication line. Do not use extension tubing or saline lock.
3.  If drug not on list of allowable drugs, determine compatibility with saline (if available) and contact Medical Control for authorization

### CAUTION

Avoid use of line established for patient medication for administering EMS medications to avoid compatibility issues.

List of allowed drugs include

Allowed Med	Type & Use	Urgency	Compatibility
Flolan (epoprostenol)	Potent vasodilator in pulmonary hypertension	Emergent (2-5 min half life)	Incompatible with saline
Remodulin (treprostинil)	Potent vasodilator in pulmonary hypertension	Urgent (2-4 hour half life)	Compatible with saline

## 2.29 RESPIRATORY DISTRESS / BRONCHOSPASM

### CRITERIA

- Oxygen saturation < 92%
- Cyanosis
- Respiratory rate < 8 rpm or > twice normal for age
- Use of accessory muscles for respiration
- Auscultation of adventitious breath sounds (wheezing, stridor), or markedly decreased air movement

1. Routine medical care including ensuring airway patency and administering high flow oxygen.
2. Assess signs, symptoms and hemodynamic status including vital signs, ability to speak in sentences, presence of accessory muscle use or wheezing.
3. If patient has own inhaler / nebulizer, may assist patient to use the device.
4. If patient is between 1 and 65 years of age ***and***
  - has physician diagnosed asthma with previously prescribed use of Albuterol, ***and***
  - agency approved for Albuterol use with a provider trained in Albuterol administration:

Albuterol 5 mg by nebulizer, if available, may repeat x1 if ALS still en route or not available

 Albuterol 2.5 mg by nebulizer, if available, may repeat x1 if ALS still en route or not available

### CAUTION



Medical Control should be contacted first (BLS Only) if patient has cardiac history (CHF, angina, arrhythmias, previous AMI, etc)

5. Timely transport with ALS if available. (ALS can not release to BLS for transport after medication administration.)

### EMT STOP

### EMT-I STOP

6. Albuterol 5 mg by nebulizer, may give via bag-valve mask if necessary.

 Albuterol 2.5 mg diluted with NS to 5 mL by nebulizer, may give via bag-valve mask if necessary.
7. Ipratropium Bromide (Atrovent) 0.5 mg once by nebulizer. (May mix with Albuterol to give simultaneously)

 Ipratropium Bromide 0.5 mg by oxygen powered nebulizer. (May mix with Albuterol to give simultaneously)
8. Repeat Albuterol 2.5 mg – 5 mg PRN up to total 30 mg/hr.

 Repeat Albuterol 2.5 mg – 5 mg PRN up to total 30 mg/hr.
9. Consider CPAP (Adult Only).

### EMT-CC STOP

**Protocol continued on next page**

## 2.29 RESPIRATORY DISTRESS / BRONCHOSPASM, continued

10.  For severe respiratory distress, not responding to other therapy:  
Epinephrine: 1:1000 0.3 mg IM  
 Epinephrine 1:1000 0.01 mg/kg IM (Max 0.3 mg)
11.  Consider Magnesium Sulfate 2 gm IV in 100 mL NS over 10 minutes. Do not administer if the patient is suspected to have renal failure.  
 Magnesium Sulfate 50 mg/kg IV (Max 2 gm) in 100 mL NS over 10 minutes
12. If a patient is not responding to therapy (if change in mental status, SpO<sub>2</sub> still < 90% on oxygen, or with persistent cyanosis) consider intubation. Intubation should be a last resort in severe asthma patients.
13.  Repeat Epinephrine 1:1000 0.3 mg IM repeated up to 2 times at 15 minute intervals  
 Repeat Epinephrine 1:1000 0.01 mg/kg IM (Max 0.3 mg) repeated up to 2 times at 15 minute intervals

## 2.30 SEDATION

### CRITERIA

Any adult or pediatric patient who requires a painful therapeutic procedure or whose condition is interfering with their clinical management including:

- Synchronized cardioversion
- Transcutaneous pacing
- Post-intubation sedation

### CONTRAINdications

- Known history of hypersensitivity or other adverse reactions to the required medications
- Clinical condition or vital signs contraindicate the use of sedative medications

### NOTE

For extremely agitated or combative patients, refer to Behavioral Emergencies Protocol (2.8)

#### EMT STOP

#### EMT-I STOP

1. Routine Medical Care

2. Assess ECG rhythm, hemodynamic status, and stability of patient.

3. SpO<sub>2</sub> and end-tidal waveform capnography must be in place. Closely monitor respiratory/ ventilatory status and treat per Airway Management Protocol (2.0, 2.1).

#### 4. Synchronized Cardioversion

Morphine 5 mg slow IV/IO once (Additional doses per Medical Control, must contact Medical Control after use)



Morphine 0.1 mg/kg slow IV/IO (Max 5 mg)  
(Additional doses per Medical Control, must contact Medical Control after use)

**AND**

Midazolam (Versed) 2.5 mg IV/IO (Additional doses per Medical Control, must contact Medical Control after use)



Midazolam 0.05 mg/kg (Max 2.5 mg)  
(Additional doses per Medical Control, must contact Medical Control after use)

**OR**

Etomidate (Amidate) 0.1 mg/kg IV/IO

(Adults only by RSI Paramedic if available, must contact Medical Control after use)

#### 5. Transcutaneous Pacing (Adult Only)

Morphine 5 mg slow IV/IO once (Additional doses per Medical Control, must contact Medical Control after use)

**AND**

Midazolam (Versed) 2.5 mg IV/IO once

(Additional doses per Medical Control, must contact Medical Control after use)

#### 6. Post Intubation Sedation (Adult patients only, RSI Providers must use Rapid Sequence Intubation Protocol (2.27)

Use with caution in patients with systolic blood pressure < 90 mmHg:



Morphine 5 mg slow IV/IO once,  
(Additional doses per Medical Control, must contact Medical Control after use)

**AND**

Midazolam (Versed) 2.5 mg IV/IO once  
(Additional doses per Medical Control, must contact Medical Control after use)

## 2.31 SEIZURES

1. Routine medical care.
2. Assure airway patency and administer oxygen per protocol.
3. Assess signs, symptoms, and medical history.
4. Consider possible causes:
  - Existing seizure disorder
  - Toxic ingestion - see Poisoning / Overdose Protocol (2.25)
  - Head Injury - see Head Trauma Protocol (2.16)
  - Hypoglycemia - see Diabetic Emergencies Protocol (2.14)
  - Eclampsia (if maternity patient beyond 20 weeks or up to 6 weeks after delivery)
5. If seizing, begin timely transport.
6. Assess BG (BLS, if available; mandatory for ALS) - If hypoglycemic, see Diabetic Emergencies Protocol (2.14).

### EMT STOP

7. Establish IV Access; see Vascular Access Protocol (2.34)

### EMT-I STOP

8. If active tonic-clonic seizure ongoing:

Midazolam (Versed) 2.5 mg IV/IO/IM once (Must contact Medical Control after use)

 Midazolam 0.05 mg/kg IV/IO/IM (Max 2.5 mg, must contact Medical Control after use)



All levels must call Medical Control prior to administration if Diastat was given prior to arrival.

### EMT-CC STOP

9. If maternity patient over 20 weeks gestation OR up to 6 weeks post partum AND no history of seizures:

Magnesium Sulfate 5 gm in 100mL NS over 5 minutes IV/IO

May follow with Midazolam (as above) if seizure refractory

## ABSOLUTE ONLINE

10. If additional seizure control needed, contact Medical Control for repeat dose.
11. For eclamptic patient 2 gm additional Magnesium Sulfate (for a total of 7 gm) may be requested from Medical Control.

## 2.32 STROKE

1. Routine medical care with evaluation of the **Cincinnati Stroke Scale**, which includes:

- Facial droop during smile  
Normal = equal smile  
Abnormal = one side moves less
- Arm drift (arms held straight for 10 seconds with eyes closed)  
Normal = no movement or equal movement  
Abnormal = 1 arm drifts or cannot lift arm against gravity
- Speech ("You can't teach an old dog new tricks")  
Normal = correct words/ no slurring  
Abnormal = slurred words / wrong words / no speech

Determine the time at which the patient's symptoms began (abnormal speech, extremity weakness, numbness, paralysis, facial droop, etc.)

2. Assure airway patency and administer oxygen per protocol.
3. Consider other causes for altered mental status – refer to Altered Mental Status Protocol (2.4).
4. Assess blood glucose (BLS if available). If hypoglycemic, refer to Diabetic Emergencies Protocol (2.14).  
*Do not withhold treatment for hypoglycemic patients who present with stroke-like symptoms*
5. Timely transport. If patient fulfills following criteria, contact Medical Control of a Stroke Center\* and advise of a "Stroke Alert" by providing appropriate clinical information to the Medical Control Physician:
  - One or more abnormal findings on Cincinnati Stroke Scale (see above) **AND**
  - Symptoms for < 2 hours **AND**
  - Blood Glucose >80 mg/dl

**EMT STOP**  
**EMT-I STOP**

6. Initiate vascular access, refer to Vascular Access Protocol (2.34), ECG, and SpO<sub>2</sub> monitoring.

### **NOTE:**

A Stroke Center is a NYS Department of Health designated Stroke Center and includes:

1. Lakeside Memorial Hospital
2. Rochester General Hospital
3. Unity Hospital – Park Ridge
4. University of Rochester Medical Center – Highland Hospital
5. University of Rochester Medical Center – Strong Memorial Hospital

### **IMPORTANT CONSIDERATIONS FOR TRANSPORT TO A STROKE CENTER:**

1. Patients may be brought to a code red facility if they meet Stroke Alert criteria.
2. Patients with unstable vital signs should still be diverted to a Stroke Center. If this results in a significant delay in reaching definitive care, this should be related to Medical Control to determine the best receiving facility for the patient.
3. If no Stroke Alert, routine care and transport to the nearest appropriate Emergency Department.

## 2.33 SUSPECTED SPINAL INJURIES

1. Patients with mechanism capable of producing spinal injuries meeting **any** of the following criteria must immediately receive spinal immobilization:

### Age

Patients  $\leq$  8 or  $\geq$  65 years old

### Medical History

Patient's with Down Syndrome

History of degenerative bone disorders

History of spinal tumors

History of spina bifida

### Mechanism of Injury

Death of passenger in same compartment

Falls greater than standing height

Vehicle-pedestrian collision

Patient ejection

Collision  $>20$  mph with 12 inches deformity to vehicle

Motorcycle crash

Vehicle versus bicycle  $>5$  mph

Axial load (diving injury, spearing tackle)

Vehicle rollover

### Physical Findings

HR  $< 50$  or  $> 120$  bpm

RR  $< 10$  or  $> 28$  bpm

Penetrating injuries to trunk, head, neck, chest, abdomen or groin

Burns  $\geq 15\%$  BSA or facial/airway burns

Amputation (except digits)

SBP  $< 90$  mmHg

GCS  $< 15$

Two or more proximal long bone fractures

Flail Chest

Trauma of two or more body systems

2. Patients not meeting any of the above criteria should be assessed for the following. If **any** are present, the patient must receive spinal immobilization.

- Altered Mental Status for any reason, including possible intoxication from alcohol or drugs (signs of poor judgment, GCS  $< 15$  or AVPU other than A).
- Complaint of neck and/or spine pain or tenderness.
- Weakness, tingling, or numbness of the trunk or extremities at any time since the injury.
- Deformity of the spine not present prior to this incident.
- Distracting injury or circumstances (i.e. anything producing an unreliable physical exam or history).

3. Provide routine care per relevant protocol.

### **NOTE:**

Once spinal immobilization has been initiated (i.e. extrication collar placed on patient) spinal immobilization **MUST** be completed and may not be removed in the prehospital setting.

## 2.34 VASCULAR ACCESS

### EMT STOP

1. Locate appropriate peripheral intravenous insertion site. Whenever possible, do not place IV on side of injured arm or chest, side of mastectomy, or side of stroke or paralysis unless no other site is available.
2. Start IV as appropriate. Limit attempts at the scene.
  - Trauma patients should have at least one 14g or 16g IV catheter.
  - Medical patients should have at least one 18g or 20g IV catheter.
  - Any patient with signs of shock should have two large bore (14g or 16g) catheters placed.



For pediatric patients, the largest appropriate size catheter should be used based on the patient's clinical presentation as suggested above.

3. Consider intraosseous access if IV not readily attainable in unstable patients.

If adult patient is conscious, consider Lidocaine 2% 30mg (1.5 mL) slow IO push after placement and before fluid administration.



For pediatric patients requiring immediate intravenous access (cardiac arrest), consider immediate IO placement.

4. If patient does not require fluid therapy, consider placement of a saline lock.
5. If patient requires fluid therapy, refer to Fluid Challenge / Replacement Protocol (2.15).

### EMT-I STOP

### EMT-CC STOP

External jugular IV access permitted in cases of actual or imminent cardiopulmonary arrest when no other suitable peripheral IV site is immediately available.

Hickman catheters or other indwelling IV access ports (not renal shunts) should be used in cases of actual or imminent cardiopulmonary arrest when no other access is available.

### ABSOLUTE ONLINE

Use of renal shunt for IV access must receive Medical Control approval.

## 2.35 VENTILATOR MANAGEMENT – EMERGENT PREHOSPITAL

### PARAMEDIC ONLY

#### CRITERIA

A patient who requires manual ventilation in the prehospital environment who has received emergent endotracheal intubation or who has a pre-existing tracheostomy tube and meets the following criteria:

- At least 10 minutes of patient contact expected
- Weight  $\geq$  40 kg
- Systolic blood pressure  $\geq$  90
- Able to ventilate without difficulty

1. Provide routine medical care. ECG monitoring, continuous SpO<sub>2</sub>, and continuous waveform capnography are required throughout all transports.
2. Confirm patient's ventilatory and hemodynamic stability with BVM ventilations with FiO<sub>2</sub> @ 1.0 (100%) for at least two minutes prior to being placed on the ventilator.
3. If the patient is not spontaneously breathing, set the device for Assist/Control (A/C), Rate 10-12, FiO<sub>2</sub> 1.0 (100%), with a tidal volume of 5-6 mL/kg. (Lean body mass should be utilized for this calculation).
4. Adjust the ventilator settings to achieve an SpO<sub>2</sub>  $\geq$  96% and EtCO<sub>2</sub> 38-42. Set PEEP at 5 cmH<sub>2</sub>O and may adjust up to 10 cmH<sub>2</sub>O.
5. If the patient is spontaneously breathing and the device is capable, consider Pressure Support with a rate of 0 and initial PEEP of 5 cm H<sub>2</sub>O.
6. If patient becomes hypoxic, hypercarbic, or has increased work of breathing, discontinue the ventilator and perform BVM ventilations per Airway Management Protocol (2.0 or 2.1). Evaluate the patient for the following:
  - Dislodged airway or circuit
  - Obstruction in airway, kink in circuit or requires suctioning
  - Pneumothorax
  - Equipment failure due to loss of power, circuit failure, or loss of oxygen
7. Sedation as per the Sedation Protocol (2.30)
8.  Adjustment of PEEP > 10 cm H<sub>2</sub>O or use of ventilator modes other than those listed, (e.g., A/C pressure, SIMV volume/pressure, etc.) requires Medical Control.

## 2.36 VENTILATOR MANAGEMENT – STABLE OUTPATIENT

### PARAMEDIC ONLY

#### CRITERIA

A patient on a ventilator in an outpatient setting with no acute cardiac or respiratory complaints who is requesting ambulance transport:

1. Provide routine medical care. ECG monitoring, continuous SpO<sub>2</sub>, and continuous waveform capnography are required throughout all transports.
2. If a Respiratory Therapist (RT) is accompanying the patient, that provider will manage the ventilator.
3. If no RT is accompanying the patient, the paramedic will manage the ventilator utilizing the patient's existing settings and circuit unless patient has separate transport ventilator or circuit.
4. The paramedic may increase the ventilator's FiO<sub>2</sub>, if required by the patient and allowed by the device.
5. If patient becomes hypoxic, hypercarbic, or has increased work of breathing, and the ventilator is NOT managed by an RT, discontinue the ventilator and perform BVM ventilations per Airway Management Protocol (2.0 or 2.1). Evaluate patient for the following:
  - Dislodged airway or circuit
  - Obstruction in airway, kink in circuit, or requires suctioning
  - Pneumothorax
  - Equipment failure due to loss of power, circuit failure, or loss of oxygen

If any of these are found and are able to be corrected easily without significant delay, patient may be reconnected to ventilator after problem is resolved.

# **Monroe-Livingston Regional EMS Protocols**

## **Section 3**

### **Adult Cardiac Life Support**

### **3.0 CARDIAC ARREST – GENERAL PROCEDURES**

1. Verify patient is pulseless and apneic.
2. Initiate or continue CPR. CPR is to be continued at all times, except during defibrillation and /or interruptions < 10 seconds for patient transfer.
3. Assure airway patency and begin use of BVM. Provide initial BLS airway management, including Oropharyngeal or Nasopharyngeal Airway.
4. Apply AED or SAED if available. If switching to a different AED/monitor you may use previously applied patches if compatible with new unit.
5. Follow prompts provided by AED/SAED device.
6. Utilize ALS, or initiate timely transport toward ALS (ALS intercept or hospital if closer). If ALS not available, no more than 3 shocks should be delivered at the scene. Defibrillation should not be performed in a moving ambulance.
7. Advise receiving hospital ASAP.

#### **EMT STOP**

8. If AED not already applied, defibrillate PRN after CPR of at least 5 cycles (about 2 minutes).
9. Obtain vascular access; refer to Vascular Access Protocol (2.3).
10. Secure definitive airway, refer to Airway Management Protocol (2.0). If BLS airway is sufficient to maintain chest rise, continue until additional time or resources are available.

Remove Bag Valve device whenever transferring patient, moving patient in and out of ambulance, or other times when Bag Valve device may dislodge the device. Reassess airway patency after any movement of patient.

#### **EMT-I STOP**

11. Give medications as listed in the following specific arrhythmia / dysrhythmia protocols.

#### **NOTE:**

 Should IV/IO access not be available, Epinephrine, Atropine, and Lidocaine may be administered via ETT under direct, on-line Medical Control.

#### **NOTE:**

AED's and manual defibrillators may use the manufacturer's default setting for defibrillation/cardioversion. Should there not be a manufacturer recommended setting the energy setting referenced in the Standards of Care shall prevail.

### 3.1 VENTRICULAR FIBRILLATION & PULSELESS V-TACH

1. Follow Adult Cardiac Arrest - General Procedures Protocol (3.0)

**EMT STOP**

**EMT-I STOP**

2. Defibrillate once at 200 joules biphasic energy dose (360 joules Monophasic)

**If converts to another rhythm** - see appropriate protocol for that rhythm

**If converts to adequate pulse** - see Post Conversion Protocol (3.2)

3. Establish IV/IO access and attempt to secure airway (per protocols 2.34 and 2.0)

4. Epinephrine 1:10,000 1 mg (10mL) IV/IO

**OR**

Vasopressin 40 units IV/IO as replacement for first or second dose of epinephrine

5. Defibrillate once at 200 joules biphasic energy dose or 360 monophasic

6. **If no conversion:**

Amiodarone (Cordarone) 300 mg diluted in a minimum of 20mL of normal saline IV/IO

7. Defibrillate once at 200 joules biphasic energy dose (360 joules Monophasic)

8. **If no conversion:**

Continue defibrillations at 200 joules biphasic (360 joules Monophasic) energy dose as long as VF or pulseless VT continues, alternating shocks with medication doses:

Repeat Epinephrine every 3-5 minutes between shocks

Repeat Amiodarone once at 150 mg diluted in a minimum of 20mL of normal saline IV/IO

After 2<sup>nd</sup> dose of Amiodarone, give Lidocaine (Xylocaine) 1.5 mg/kg IV/IO push

Repeat Lidocaine at 0.75 mg/kg IV/IO push

Administer each medication during a period of 2 minutes of CPR and follow with a defibrillation attempt

9. If Torsades de Pointes or hypomagnesemic state suspected, consider



Magnesium Sulfate 2 gm diluted in 10mL of normal saline IV/IO push

## 3.2 POST-CONVERSION OF VF / VT

### CRITERIA

Post-conversion treatment of VF or VT should only be started if the patient has regained a pulse of adequate rate, and has a supraventricular rhythm. If not, refer to other cardiac protocols as appropriate. All antiarrhythmics are contraindicated if ventricular escape rhythm is present.

1. Routine medical care.

**EMT STOP**

**EMT-I STOP**

2. If conversion results from defibrillation without any drug therapy:

Amiodarone (Cordarone) 150 mg diluted in a minimum of 50mL of NS given IV/IO over 10 minutes

3. If Amiodarone was the drug resulting in conversion from VF/VT, no additional antiarrhythmic is required.

4. If Lidocaine (Xylocaine) was the drug resulting in conversion from VF/VT:

Repeat Lidocaine at 0.75 mg/kg IV/IO every 10 minutes up to a total cumulative dose of 3 mg/kg.

5.  If more than above listed doses are needed because of length of transport time, contact Medical Control.

6. Following conversion, the patient should be reassessed and a 12 lead ECG should be performed.

### **3.3 ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)**

1. Follow Cardiac Arrest - General Procedures Protocol (3.0)

**EMT STOP**

**EMT-I STOP**

2. Confirm asystole in 2 leads:

**If possibility of fine VF exists, treat patient as for VF, refer to VF / Pulseless VT Protocol (3.1)**

3. Do not pace bradysystolic arrests.

4. Establish IV/IO access and attempt to secure airway (per protocols 2.34, 2.0)

5. Epinephrine 1:10,000 1 mg (10mL) IV/IO

**OR**

Vasopressin 40 units IV/IO (as replacement for first or second dose of Epinephrine)

6. For asystole and PEA rates less than 60:

Atropine 1 mg (10mL) IV/IO, may repeat every 3-5 minutes alternating with Epinephrine throughout arrest up to total Atropine dose of 0.04 mg/kg.

7. Repeat Epinephrine 1:10,000 1 mg IV/IO every 3-5 minutes throughout arrest.

8. Consider and treat possible causes:

- Hypoxia – Airway Management Protocol (2.0)
- Hypovolemia – Fluid Challenge / Replacement Protocol (2.15)
- Hypothermia – Hypothermia Protocol (2.19B)
- Hyperkalemia – Consider Sodium Bicarbonate 1 mEq/kg IV once and Calcium Chloride 200 mg IV once
- Hydrogen ion problem (metabolic acidosis) – Consider Sodium Bicarbonate 1 mEq/kg IV once
- Hypoglycemia – Diabetic Emergencies Protocol (2.14)
- Tension Pneumothorax – Chest Trauma Protocol (2.11)
- Cardiac Tamponade – Chest Trauma Protocol (2.11)
- 'Tablets' or other poisoning / overdose – Poisoning / Overdose Protocol (2.25)
- Thrombosis – coronary or pulmonary embolism – Timely transport

9. If no change in patient status - consider Termination of Resuscitation Protocol (1.4)

## 3.4 BRADYCARDIA

### CRITERIA

- Bradycardia may be absolute (HR <60 bpm) or relative, which is a rate slower than expected for the patient's condition. Bradycardia may be normal status for patient on beta blockers or with an athletic life style.
- Treatment listed to be used only if one or more of these conditions exist:
  - altered mental status
  - severe chest pain
  - lightheadedness, dizziness, nausea
  - systolic BP <90 mmHg, or relative hypotension for patient
  - frequent PVCs

1. Routine medical care

### EMT STOP

2. If patient is hypotensive and the lungs are clear, see Fluid Challenge / Replacement Protocol (2.15)

### EMT-I STOP

If patient is in 2<sup>nd</sup> degree type II or 3<sup>rd</sup> degree AV heart block, or if patient is unstable, go to step 4.

3. Atropine 0.5 mg (5 mL) IV/IO

If Atropine is ineffective, repeat every 3 - 5 min up to 0.04 mg / kg Maximum

4. If Atropine is not effective, if patient is unstable, if patient has heart transplant or denervated heart, or if patient is in 2nd degree type II or 3<sup>rd</sup> degree AV heart block:



Transcutaneous external pacemaker, begin at 60 bpm and 60 mA and adjust to capture

If pacemaker captures, consider sedation and pain control; refer to Sedation Protocol (2.30)

### EMT-CC STOP

5. If pacemaker fails to capture and Atropine is not effective, or if symptomatic hypotension continues with pacing:



Dopamine HCl 5 mcg/kg/min to Maximum 10 mcg/kg/min IV/IO titrated to maintain systolic BP > 90 mmHg using a rate-limiting device. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.

## 3.5 UNSTABLE TACHYCARDIA (WIDE OR NARROW COMPLEX)

### CRITERIA

- **Stable Tachycardia** - Asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- **Unstable Tachycardia** - HR > 150 bpm with CHF, mental status change, chest pain, hypotension, or shock symptoms (poor peripheral pulses, cool distal extremities, diaphoresis)

1. Routine medical care.

**EMT STOP**

**EMT-I STOP**

2. Assess ECG rhythm, hemodynamic status, and stability of patient. If patient is in Polymorphic VT and is unstable, treat as in Pulseless Ventricular Tachycardia, refer to VF / Pulseless VT Protocol (3.1).
3. Consider sedation before cardioversion; refer to Sedation Protocol (2.30)
4. Synchronized cardioversion: 50-100 joules biphasic energy dose (100-200 joules monophasic)
5. If inadequate response from 1<sup>st</sup> cardioversion:  
Synchronized cardioversion: 150 joules biphasic energy dose (300 joules monophasic)
6. If inadequate response from 2<sup>nd</sup> cardioversion:  
Synchronized cardioversion: 200 joules biphasic energy dose (300 joules monophasic)
7. If inadequate response from 3<sup>rd</sup> cardioversion:



Contact Medical Control.

## 3.6 STABLE NARROW COMPLEX TACHYCARDIA

### CRITERIA

- Supraventricular is defined as non-sinus, narrow complex tachycardia with HR usually > 160 bpm.
- If ECG complex > 0.12 seconds, refer to Wide Complex Tachycardia Protocol (3.7), especially if patient > 50 years of age, or has a history of previous MI, coronary artery disease, or CHF.
- Stable Narrow Complex Tachycardia protocol - asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- Unstable Narrow Complex Tachycardia protocol - HR >150 bpm with CHF, mental status change, chest pain, hypotension, or shock symptoms (poor peripheral pulses, cool distal extremities, diaphoresis)

1. Routine medical care.

### EMT STOP

### EMT-I STOP

2. Assess ECG rhythm, hemodynamic status, and stability of patient. Unless emergent cardioversion, obtain 12 lead ECG prior to any rhythm management:
  - If unstable, refer to **UNSTABLE TACHYCARDIA Protocol (3.5)**
  - If supraventricular tachycardia, go to Step 3
  - If atrial flutter or atrial fibrillation, go to Step 6

3. Valsalva or other vagal maneuver. (No eyeball pressure/massage).

4. If inadequate response from vagal maneuver:

Adenosine (Adenocard) 6 mg rapid IV push

5. If inadequate response from 1st dose:

Adenosine 12 mg rapid IV push, May repeat x1

(If inadequate response from Adenosine in narrow complex tachycardia with signs of CHF, go to step 7.)

### EMT-CC STOP

6. If atrial flutter / atrial fibrillation OR if inadequate response from Adenosine in narrow complex tachycardia with no signs of CHF:

Metoprolol 5 mg slow IV push, may repeat every 5 minutes to Max 15 mg or HR < 120 bpm

7. If patient unresponsive to previous interventions or if patient has signs of CHF:

Amiodarone (Cordarone) 150 mg diluted in a minimum of 50mL of NS given IV over 10 minutes

### NOTE

If patient becomes **UNSTABLE** (See criterion above), refer to **Unstable Tachycardia Protocol (3.5)**.  
If patient has a recent history of cocaine use, do not use Metoprolol.

## 3.7 STABLE WIDE COMPLEX TACHYCARDIA

### CRITERIA

- If patient has wide complex tachycardia and is pulseless, refer to VF/ Pulseless VT Protocol (3.1)
- Stable VT protocol - Asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- Unstable VT protocol – HR >150 bpm with altered mental status changes, chest pain, hypotension, shock symptoms (cap refill > 2 sec, poor peripheral pulses, cool distal extremities, diaphoresis).

1. Routine medical care.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

2. Assess hemodynamic status & stability of patient - **If unstable; refer to UNSTABLE TACHYCARDIA Protocol (3.5).** Unless emergent cardioversion, obtain 12 lead ECG prior to any rhythm management.
3. Establish Vascular Access per Vascular Access Protocol (2.34).
3. If monomorphic VT or non-Torsades polymorphic VT (normal baseline QT interval), or Wolff-Parkinson-White with aberrancy:  
Amiodarone (Cordarone) 150 mg diluted in a minimum of 50mL NS and given IV over 10 minutes
4. If polymorphic VT (long baseline QT interval):  
Magnesium Sulfate 2gm in 100 mL NS given over 10 min – contraindicated if the patient has suspected renal failure
5. If inadequate response and possibility of SVT with aberrant conduction, refer to Stable Narrow Complex Tachycardia Protocol (3.6).

### NOTE:

If patient becomes **UNSTABLE** (See criterion above), refer to **Unstable Tachycardia Protocol (3.5).**

# **Monroe-Livingston Regional EMS Protocols**

## **Section 4**

### **Pediatric Cardiac Life Support**

## 4.0 PEDIATRIC CARDIAC ARREST – GENERAL PROCEDURES



1. Verify patient is pulseless and apneic.
2. Initiate or continue CPR. CPR is to be continued at all times, except during defibrillation and /or interruptions < 10 seconds for patient transfer.
3. Assure airway patency and begin use of BVM. Provide initial BLS airway management, including Oropharyngeal or Nasopharyngeal Airway.
4. Apply AED or SAED if available. If switching to a different AED/monitor you may use previously applied patches if compatible with new unit.

**If patient  $\geq$  age 8** - automatic external defibrillator may be used as appropriate.

**If patient < age 8 and greater than 1 year of age** - Use pediatric cables if available.

5. Follow prompts provided by AED/SAED device.
6. Utilize ALS, or initiate timely transport toward ALS (ALS intercept or hospital if closer). If ALS not available, no more than 3 shocks should be delivered at the scene. Defibrillation should not be performed in a moving ambulance.

### **EMT STOP**

7. Obtain Vascular access, refer to Vascular Access Protocol (2.34)

### **EMT-I STOP**

8. If AED /SAED not already applied quick look using manual monitor and defibrillate PRN after CPR of at least 10 cycles (about 2 minutes). Apply limb leads and pads in between shock sequences as appropriate.
9. Secure definitive airway (per protocol 2.1). If BLS airway is sufficient to maintain chest rise, continue until additional time or resources are available.

Remove Bag Valve device whenever transferring patient, moving patient in and out of ambulance or other times when Bag Valve device may dislodge the device. Reassess airway patency after any movement of patient.

10. Give medications as listed in the following specific arrhythmia / dysrhythmia protocols.

### **NOTE:**



Should IV/IO access not be available, Epinephrine, Atropine, and Lidocaine may be administered via ETT with direct on-line medical control.

## 4.1 VENTRICULAR FIBRILLATION / PULSELESS V-TACH



1. Follow Pediatric Cardiac Arrest, see General Procedures Protocol (4.0)

**EMT STOP**  
**EMT-I STOP**

2. Defibrillate once at 2 J/kg energy dose (Max 100 joules biphasic, 200 joules monophasic)

**If converts to another rhythm** – refer to appropriate protocol for that rhythm  
**If converts to adequate pulse** – refer to Post Conversion Protocol (4.2).

3. Defibrillate once at 4 J/kg dose (Max 200 joules biphasic, 360 joules monophasic)

4. Establish IV/IO access and attempt to secure airway (per protocols 2.34 and 2.1).

5. Epinephrine 1:10,000 0.01 mg/kg (0.1mL/kg, Max 1mg) IV/IO

6. Defibrillate once at 4 J/kg (Max 200 joules biphasic, 360 joules monophasic)

7. **If no conversion:**



Amiodarone (Cordarone) 5 mg/kg diluted in a minimum of 20mL NS and given IV/IO push (Max 300mg)

8. Defibrillate once at 4 J/kg (Max 200 joules biphasic, 360 joules monophasic)

9. **If no conversion:**

Continue defibrillations at 4 J/kg (Max 200 joules biphasic, 360 joules monophasic) as long as VF or pulseless VT continues, alternating shocks with medication doses:

Repeat Epinephrine every 3-5 minutes between shocks

Repeat Amiodarone (Cordarone) 5 mg/kg diluted in a minimum of 20mL NS and given IV/IO push, once (Max 150 mg)

After 2<sup>nd</sup> dose of Amiodarone, give Lidocaine (Xylocaine) 1mg/kg IV/IO

Repeat Lidocaine at 1 mg/kg IV/IO once

Deliver each medication administration during a period of 2 minutes of CPR and coordinate with a defibrillation attempt

**EMT-CC STOP**

10. If Torsades de Pointes or hypomagnesemic state suspected consider

Magnesium Sulfate 50 mg/kg diluted in a minimum of 10mL NS and given IV/IO push (Max 2 gm)

## 4.2 POST-CONVERSION OF VF or VT



### CRITERIA

Post-conversion treatment of VF or VT should only be started if the patient has regained a pulse of adequate rate, and has a supraventricular rhythm. If not, refer to other cardiac protocols as appropriate. All antiarrhythmics are contraindicated if ventricular escape rhythm is present.

1. Routine medical care.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

### ABSOLUTE ONLINE

2. If conversion results from defibrillation without any drug therapy:

Amiodarone (Cordarone) 5 mg/kg diluted in a minimum of 50mL NS and given IV/IO over 20 minutes (Max 150 mg)  
Slow IV/IO push or drip

3. If Amiodarone (Cordarone) was the drug resulting in conversion from VT, no additional antiarrhythmic is required.

4. If Lidocaine (Xylocaine) was the last drug resulting in conversion from VF/VT:

Repeat Lidocaine at 1 mg/kg IV/IO every 10 minutes up to a total of 3 mg/kg

5. If more than above listed doses are needed because of length of transport time, contact Medical Control

6. Following conversion, the patient should be reassessed and a 12 lead ECG should be performed.

## 4.3 ASYSTOLE / PULSELESS ELECTRICAL ACTIVITY (PEA)



1. Follow General Procedures Protocol (4.0)

**EMT STOP**

**EMT-I STOP**

2. Confirm asystole in 2 leads:

**If possibility of fine VF exists, treat patient as for VF, refer to VF / Pulseless VT Protocol (4.1)**

3. Establish IV/IO access and attempt to secure airway (per protocols 2.34 and 2.1)

4. Epinephrine: 1:10,000 0.01 mg/kg (0.1 mL/kg) (Max dose 1mg) IV/IO

5. Repeat Epinephrine every 3-5 minutes throughout arrest using above dose

6. Consider and treat cause

- Hypoxia – Airway Management Protocol (2.1)
- Hypovolemia – Fluid Challenge / Replacement Protocol (2.15)
- Hypothermia – Hypothermia Protocol (2.19B)
- Hyperkalemia – Consider Sodium Bicarbonate 1 mEq/kg IV once and Calcium Chloride 5 mg/kg IV once
- Hydrogen ion problem (metabolic acidosis) – Consider Sodium Bicarbonate 1 mEq/kg IV once
- Hypoglycemia – Diabetic Emergencies Protocol (2.14)
- Tension pneumothorax – Chest Trauma Protocol (2.11)
- Cardiac Tamponade – Chest Trauma Protocol (2.11)
- 'Tablets' or other poisoning / overdose – Poisoning / Overdose Protocol (2.25)
- Thrombosis – coronary or pulmonary embolism – Timely transport

## 4.4 BRADYCARDIA



### CRITERIA

- Bradycardia may be absolute or relative, which is a rate slower than expected for the patient's condition and is almost always the result of hypoxia in children.
- Treatment listed to be used only if one or more of these conditions exist:
  - altered mental status
  - severe chest pain
  - lightheadedness, dizziness, nausea
  - systolic BP <80 mmHg, or relative hypotension for patient's expected normal
  - frequent PVCs

1. Routine medical care and begin timely transport. For newborns, refer to Neonatal Resuscitation Protocol (2.22).
2. Assure airway patency and administer high flow oxygen. Bag-valve mask assisted ventilation should always be done for children < 8 yrs of age with bradycardia with poor perfusion.
3. Administer chest compressions if, despite ventilation and oxygenation, pulse remains < 60 bpm with poor perfusion.

### EMT STOP

### EMT-I STOP

4. If evidence of poor perfusion potentially due to hypovolemia with no signs or history of heart disease, see Fluid Challenge / Replacement Protocol (2.15)
5. If continued pulse < 60 bpm and evidence of poor perfusion despite assurance of adequate ventilation / oxygenation:



Epinephrine: 1:10,000 0.01 mg/kg (0.1 mL/kg), (Max dose 1mg) IV/IO

### EMT-CC STOP

6. If continued pulse < 60 bpm and evidence of poor perfusion after Epinephrine despite assurance of adequate ventilation / oxygenation:

Atropine 0.02 mg/kg IV/IO (Min 0.1 mg, Max 1mg)

7. If inadequate response:

Epinephrine at above doses IV/IO every 3-5 minutes

8. If inadequate response:

Atropine once 5 minutes after initial dose:

0.02 mg/kg IV/IO (Min 0.1 mg, Max 1mg)

Maximum total Atropine dose – 0.04 mg/kg

- 9.

If inadequate response, consider Pacing.

## 4.5 UNSTABLE TACHYCARDIA (WIDE OR NARROW COMPLEX)



### CRITERIA

- **Stable Tachycardia** - Asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- **Unstable Tachycardia** - HR > 150 bpm with CHF, mental status change, chest pain, hypotension, or shock symptoms (poor peripheral pulses, cool distal extremities, diaphoresis)

1. Routine medical care.
2. Assure airway patency and administer high flow oxygen.
3. Timely transport.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

4. Consider sedation; refer to Sedation Protocol (2.30)
5. Synchronized cardioversion 0.5 j/kg biphasic energy dose (Max 50j; 1 j/kg monophasic, Max 200j)  
Consider the use of pediatric paddles if patient  $\leq$  10kg, or use anterior-posterior placement of paddles if body area is small (or when pediatric paddles are not available).
6. If inadequate response from 1<sup>st</sup> cardioversion:  
 Synchronized cardioversion: 1 j/kg biphasic energy dose (Max 100j; 2 j/kg monophasic, Max 300j)
7. If inadequate response from 2<sup>nd</sup> cardioversion:  
 Synchronized cardioversion: 2 j/kg biphasic energy dose (Max 200j; 4 j/kg monophasic, Max 360j)
8. If inadequate response from 3<sup>rd</sup> cardioversion:  
 Contact Medical Control

## 4.6 STABLE NARROW COMPLEX TACHYCARDIA



### CRITERIA

- Supraventricular is defined as non-sinus, narrow complex tachycardia with HR usually > 160 bpm.  
If ECG complex > 0.12 seconds, refer to Wide Complex Tachycardia Protocol (4.7)
- Stable Narrow Complex Tachycardia protocol - Asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- Unstable Narrow Complex Tachycardia protocol - HR >150 bpm with CHF, mental status change, chest pain, hypotension, or shock symptoms (poor peripheral pulses, cool distal extremities, diaphoresis)

1. Routine medical care.
2. Assure airway patency and administer high flow oxygen.
3. Timely transport.

### EMT STOP

### EMT-I STOP

4. Assess hemodynamic status & stability of patient - **If unstable; refer to UNSTABLE TACHYCARDIA Protocol (4.5).**
5. Valsalva maneuver (application of ice water bag over the face (do not block the airway), 'blowing on thumb' or into straw may work on child)
6. Establish vascular access, refer to Vascular Access Protocol (2.34)

### EMT-CC STOP

7. If inadequate response from Valsalva:



Adenosine (Adenocard) 0.1 mg/kg rapid IV push (Max 6 mg)

8. If inadequate response from Adenosine:

Repeat Adenosine 0.2 mg/kg rapid IV push (Max 12 mg), may repeat once

9. If inadequate response from 3rd dose of Adenosine:

Refer to Stable Wide Complex Tachycardia Protocol (4.7).

### NOTE:

**If no response to above and patient becomes UNSTABLE, refer to Unstable Tachycardia Protocol (4.5).**

## 4.7 STABLE WIDE COMPLEX TACHYCARDIA



### CRITERIA

- If patient has wide complex tachycardia and is pulseless, refer to VF / Pulseless VT Protocol (4.1)
- Stable VT protocol - Asymptomatic or minor symptoms (palpitations, heart racing, etc.)
- Unstable VT protocol – HR >150 bpm with altered mental status changes, chest pain, hypotension, shock symptoms (cap refill > 2 sec, poor peripheral pulses, cool distal extremities, diaphoresis).

1. Routine medical care.
2. Assure airway patency and administer high flow oxygen.

**EMT STOP**

**EMT-I STOP**

**EMT-CC STOP**

3. Assess hemodynamic status & stability of patient - **If unstable; refer to UNSTABLE TACHYCARDIA Protocol (4.5)**

4. Establish vascular access; refer to Vascular Access Protocol (2.34).



Amiodarone (Cordarone) 5mg/kg diluted in a minimum of 50 mL NS IV/IO given over 20 min, (Max 150 mg)

### NOTE:

If no response to above or if patient becomes **UNSTABLE**, refer to **Unstable Tachycardia Protocol (4.5)**

# **Monroe-Livingston Regional EMS Protocols**

## **Section 5**

### **BLS Pharmacology**

## **5.1 ACTIVATED CHARCOAL (WITHOUT SORBITOL)**

### **a) Indications**

Poisoning by mouth

### **b) Adverse Effects**

May indirectly induce vomiting and cause nausea

### **c) Precautions**

Does not absorb all drugs and toxic substances

### **d) Contraindications**

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

### **e) Preparations**

- (1) 25 grams/125 mL bottle
- (2) 50 grams/250 mL bottle

### **f) Dosage**

- (1) Adult:

Administer 50 grams

- (2) Pediatric:

Administer 2 grams/kg (Max 50gm)

## 5.2 ALBUTEROL (PROVENTIL, VENTOLIN)

### a) Indications

- (1) Signs and symptoms of respiratory distress
- (2) Bronchospasm/wheezing associated with Asthma

### 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

- (1) Known hypersensitivity
- (2) Albuterol not prescribed for the patient

### e) Preparations

2.5mg/3mL (0.083%) solution

### f) Dosage

- (1) Adult:  
5 mg via nebulizer may repeat once
- (2) Pediatric:  
2.5 mg via nebulizer may repeat once

## 5.3 ASPIRIN

**a) Indications**

Non-traumatic chest pain

**b) Adverse Effects**

- (1) Heartburn
- (2) Nausea and vomiting
- (3) Wheezing

**c) Precautions**

GI bleeding and upset

**d) Contraindications**

Known hypersensitivity

**e) Preparations**

81 mg tablets

**f) Dosage**

- (1) Adult:  
324 mg chewed (4 tablets)
- (2) Pediatric:  
Not Indicated

## 5.4 EPINEPHRINE AUTO-INJECTOR

### a) Indications

Moderate to severe allergic reaction with respiratory distress, shock or airway swelling

### 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 or cardiac patients

### d) Contraindications

None in the presence of anaphylaxis

### e) Preparations

Epinephrine Auto-injector only (Patient prescribed or EMS service authorized)

- (1) Adult: 0.3 mg (EpiPen)
- (2) Pediatric: 0.15 mg (EpiPen Jr.)

### f) Dosage

- (1) Patients greater than 30 kg (66lbs):

Adult Auto-injector: 0.3 mg IM

- (2) Patients less than 30 kg (66lbs):

Pediatric Auto-injector: 0.15 mg IM

## 5.5 NITROGLYCERIN

### 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 120 mmHg systolic
- (2) Heart rate less than 60 bpm
- (3) Medication not prescribed for the patient
- (4) Pediatric patient
- (5) Any patient having taken medication for erectile dysfunction (e.g., Viagra™, Levitra™, or Cialis™) within the past 72 hours. Medical consultation is required to override this contraindication.

### e) Preparations

0.4 mg sublingual tablet

### f) Dosage

- (1) Adult:
  - One tablet sublingually
  - (a) Repeat in 3 to 5 minutes if chest pain persists
  - (b) Maximum of three doses (a combination of patient-administered and EMT-B-administered)
- (2) Pediatric:
  - Not Indicated

## 5.6 ORAL GLUCOSE

**a) Indications**

(1) Altered mental status with patent airway and known diabetic history

**b) Adverse Effects**

Not clinically significant

**c) Precautions**

Patient without gag reflex may aspirate.

**d) Contraindications**

Inability to speak

**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.

## 5.7 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) Nasal cannula should not be used with more than 6 lpm.
- (4) Non-rebreather face masks must be supplied with a minimum 12 lpm.

### d) Contraindications

None

### e) Dosage

- (1) Adult:  
Administer per protocol
- (2) Pediatric:  
Administer per protocol

# **Monroe-Livingston Regional EMS Protocols**

## **Section 6**

### **ALS Pharmacology**

## ALS Medication Requirements

The drugs listed below are items identified in the Monroe/Livingston Standards of Care for the treatment of Adult and Pediatric Patients. These items are provided for replacement by participating Hospitals in the Region.

This list does not address controlled substances, which are also included in the Standards, but are obtained by individual agencies, under agreement with a provider Hospital.

This list does not address medications included in the Specialty Care Transport Unit, HazMat / ToxMedic, or RSI Standards of Care, which are obtained by agencies using those specific protocols.

Generic Name	Trade Name	Desired Unit	Box Total
Adenosine	Adenocard	6 mg Preloaded Syringe	5
Albuterol Sulfate 0.083%	Albuterol	2.5 mg/3 ml Solution for Inhalation	9
Amiodarone HCl	Cordarone	150 mg Vial	3
Aspirin	Aspirin	81 mg Tablet	8
Atropine Sulfate	Atropine Sulfate	1 mg Preloaded Syringe	4
Calcium Chloride 10%	Calcium Chloride 10%	1 gm Preloaded Syringe	1
Dextrose 25%	Dextrose 25%	2.5 gm Preloaded Syringe	1
Dextrose 50%	Dextrose 50%	25 gm Preloaded Syringe	2
Diphenhydramine	Benadryl	50 mg Vial	1
Dopamine Hydrochloride	Intropin	1,600 mcg/mL Solution	1
Epinephrine 1:1000	Epinephrine 1:1000	30 mg Multidose Vial	1
Epinephrine 1:10,000	Epinephrine 1:10,000	1 mg Preloaded Syringe	8
Glucagon	Glucagon	1 mg Kit	2
Ipratropium Bromide 0.02%	Atrovent	0.5 mg/2.5 ml Solution for Inhalation	2
Lidocaine	Lidocaine	100 mg Preloaded Syringe	4
Magnesium Sulfate 50%	Magnesium Sulfate 50%	5 gm Vial	2
Metoprolol Tartrate	Metoprolol	5 mg Vial	3
Naloxone Hydrochloride	Narcan	2 mg Preloaded Syringe	2
Nitroglycerin	Nitroglycerin	0.4 mg Tablet Multidose Bottle (25)	1
Promethazine HCl	Phenergan	25 mg Ampule	1
Sodium Bicarbonate 8.4%	Sodium Bicarbonate 8.4%	50 mEq Preloaded Syringe	2
Vasopressin	Vasopressin	20 Unit Vial	2

## 6.1 ACTIVATED CHARCOAL (WITHOUT SORBITOL)

### a) Pharmacology

Variable drug or toxin absorption when ingested

### b) Pharmacokinetics

Absorbs poisons and prevents toxins from entering body systems

### c) Indications

Poisoning by mouth

### d) Contraindications

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

### e) Adverse Effects

Not clinically significant

### f) Precautions

Does not adsorb all drugs and/or toxic substances

### g) Dose

- (1) Adult:

Administer 50 grams

- (2) Pediatric:

Administer 2 grams/kg (Max 50gm)

## 6.2 ADENOSINE (ADENOCARD)

### a) Pharmacology

- (1) Naturally occurring purine nucleoside
- (2) Used to treat narrow complex tachycardia, PSVT
- (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

### 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 dipyridomole (persantine), digitalis, calcium channel blockers, and benzodiazepines such that the dose of adenosine should be reduced for patients on these medications
- (3) Be prepared for up to 40 seconds of asystole

### g) Dosage

#### (1) Adult:

- 6 mg rapid IV bolus followed by a rapid flush
- Give 12 mg if no response within 2 minutes
- Give an additional 12 mg if no response within another 1 to 2 minutes

#### (2) Pediatric:

- 0.1 mg/kg rapid IV bolus followed by a rapid flush (Max 6 mg)
- Give 0.2 mg/kg if no response within 2 minutes (Max 12 mg)
- Give an additional 0.2 mg/kg if no response within another 2 minutes (Max 12 mg)

## 6.3 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) Main effect is bronchodilation.
- (5) 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

- (1) Tachycardia
- (2) Palpitations
- (3) Peripheral vasodilatation
- (4) Tremors and nervousness
- (5) Headache
- (6) Sore throat
- (7) PVCs
- (8) 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:  
5 mg by nebulizer may repeat up to 30 mg/hr
- (2) Pediatric:  
2.5 mg by nebulizer may repeat up to 30 mg/hr

## 6.4 AMIODARONE (CORDARONE)

### a) Pharmacology

Class III antiarrhythmic prolongs action potential and refractory period with some Class Ia, II, and IV effects

### b) Pharmacokinetics

Onset within 30-180 minutes, half life of 58 days

### c) Indications

- (1) Ventricular Fibrillation/Pulseless Ventricular Tachycardia
- (2) Post Conversion of Ventricular Fibrillation/Pulseless Ventricular Tachycardia
- (3) Stable Ventricular Tachycardia
- (4) Stable Supraventricular Tachycardia refractory to Adenosine, Diltiazem and Metoprolol

### d) Contraindications

- (1) Iodine hypersensitivity
- (2) Cardiogenic shock
- (3) Bradycardia
- (4) Hypotension
- (5) 2<sup>nd</sup> or 3<sup>rd</sup> Degree AV Block
- (6) Pregnancy (relative contraindication)

### e) Adverse Effects

- (1) AV conduction abnormalities
- (2) Hepatotoxicity
- (3) Prolonged QT interval
- (4) VFib / V-Tach
- (5) Dizziness

### f) Precautions

- (1) Requires dilution and slow administration

### g) Dosage

- (1) Cardiac Arrest
  - (a) Adult:  
300 mg diluted in a minimum of 20mL NS and given slow IV/IO, may repeat at 150 mg once
  - (b) Pediatric:  
5 mg/kg diluted in a minimum of 20mL NS and given slow IV/IO (Max 300 mg), may repeat at 5 mg/kg IV/IO once (Max 150 mg)
- (2) Post conversion of VF-VT
  - (a) Adult  
150 mg diluted in a minimum of 50mL NS and given IV/IO over 10 minutes
  - (b) Pediatrics  
5 mg/kg diluted in a minimum of 50mL NS and given IV/IO, Maximum 150 mg, over 10 minutes (Max 150mg)
- (3) Stable refractory narrow complex tachycardia
  - (a) Adult:  
150 mg diluted in a minimum of 50mL NS and given IV/IO over 10 minutes
  - (b) Pediatric:  
Not indicated
- (4) Stable Wide Complex Tachycardia
  - (a) Adult  
150 mg diluted in a minimum of 50mL NS and given IV/IO over 10 minutes
  - (b) Pediatric  
5 mg/kg diluted in a minimum of 50 mL NS and given over 20 minutes (Max 150mg)

## 6.5 ASPIRIN

### a) Pharmacology

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

### b) Pharmacokinetics

Blocks platelet aggregation

### c) Indications

Chest pain when acute myocardial infarction is suspected.

### d) Contraindications

- (1) Known hypersensitivity
- (2) Active bleeding

### e) Adverse Effects

- (1) Heartburn
- (2) Nausea and vomiting
- (3) Wheezing

### f) Precautions

GI bleeding and upset

### g) Dosage

- (1) Adult:  
324 mg chewed
- (2) Pediatric:  
Not Indicated

## 6.6 ATROPINE SULFATE

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

- (1) Symptomatic bradycardia
- (2) Asystole, idioventricular rhythm
- (3) Organophosphate poisoning
- (4) Nerve agents

### d) Contraindications

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

### e) Adverse Effects

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

### f) Precautions

Not clinically significant

### g) Dosage

#### (1) Adult:

- (a) Asystole: Administer 1 mg IV/IO repeated every 3-5 minutes to a total of 0.04 mg/kg
- (b) Bradycardia: Administer 0.5 mg IV/IO repeated every 3-5 minutes to a total dose of 0.04 mg/kg

#### (2) Pediatric Cardiac Arrest:

Administer 0.02 mg/kg IV/IO repeated every 3-5 minutes (minimum dose 0.1 mg; Maximum single dose 1 mg; Maximum total dose 0.04mg/kg)

## 6.7 CALCIUM CHLORIDE (10% Solution)

### a) Pharmacology

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

### b) Pharmacokinetics

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

### 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:
  - (a) Cardiac Arrest with suspected hyperkalemia – 1 gram IV
  - (b) Calcium Channel Blocker Overdose – 1 gram slow IV, reassess with Medical Control for additional doses
- (2) Pediatric:
  - Administer 20 mg/kg (0.2 mL/kg) slow IV/IO, Maximum dose 1 gram or 10 mL.

## 6.8 DEXTROSE

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

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

### d) Contraindications

Known hyperglycemia

### e) Adverse Effects

May worsen hyperglycemia (high blood sugar)

### f) Precautions

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

### g) Dosage

#### (1) Adult:

Administer D50W 25 grams/50 mL IV/IO

#### (2) Pediatric:

- (a) For patients  $< 5$  kg - D25W 0.5-1 gm/kg IV/IO
- (b) For patients  $\geq 5$  kg - D50W 0.5-1 gm/kg IV/IO

## 6.9 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 hypersensitivity

### e) Adverse Effects

- (1) Drowsiness
- (2) Loss of coordination
- (3) Blurred vision
- (4) Headache
- (5) Hypotension
- (6) Tachycardia
- (7) Palpitations
- (8) Thickening of bronchial secretions leading to chest tightness
- (9) 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 50 mg slow IV or IM

- (2) Pediatric:

Administer 1 mg/kg slow IV/IO or IM, Maximum single dose 25 mg

## 6.10 DOPAMINE HYDROCHLORIDE (INTROPIN)

### a) Pharmacology

- (1) Alpha and beta adrenergic receptor stimulator
- (2) Dopaminergic receptor stimulator
- (3) Precursor of norepinephrine
- (4) At low doses, less than 2 mcg/kg/min
  - (a) Dilates renal and mesenteric blood vessels
  - (b) Venoconstricts
  - (c) Arterial resistance varies
- (5) At moderate doses, 2-6 mcg/kg/min
  - Beta1 stimulating effect on heart, results in increased cardiac output
- (6) High dose, 6-10 mcg/kg/min
  - Exhibits alpha1 effects; peripheral vasoconstriction including renal and mesenteric vessels, increases left and right ventricular preload
- (7) Doses greater than or equal to 10 mcg/kg/min
  - Alpha1 stimulating effects may reverse mesenteric and renal artery dilatation resulting in decreased blood flow, causing increased preload due to effects on venous system

### b) Pharmacokinetics

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

### c) Indications

- (1) Cardiogenic shock
- (2) Septic shock
- (3) Anaphylactic shock

### 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.
- (4) To be infused with rate limiting device only.

### 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 5-10 mcg/kg/min IV drip titrated to BP > 90 systolic or Medical Control selected BP, a rate-limiting device must be used when administering this medication. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.
- (4) Pediatric
  - Not indicated

## 6.11 EPINEPHRINE 1:10,000 / 1:1,000

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

- (1) Cardiac arrest
- (2) Moderate to severe allergic reaction/anaphylaxis
- (3) IV epinephrine should be reserved for cardiac arrest patients and for impending cardiac arrest due to anaphylactic shock.
- (4) Bronchial asthma
- (5) Respiratory Stridor (Suspected Croup)

### d) Contraindications

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

### e) Adverse Effects

- (1) Tachydysrhythmias (supraventricular and ventricular)
- (2) Hypertension
- (3) May induce early labor in pregnant women
- (4) Headache
- (5) Nervousness
- (6) Decreased level of consciousness
- (7) Rebound edema may occur 20-30 minutes after administration to croup patients

### f) Precautions

- (1) Do not mix with sodium bicarbonate (unstable)
- (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) IV epinephrine (1:1,000) should not be administered to any patient with a pulse.

**Medication Information, continued on next page**

## 6.11 EPINEPHRINE 1:10,000/1:1,000, continued

### g) Dosage

- (1) Cardiac Arrest
  - (a) Adult:  
Administer 1 mg (1:10,000) IV every 3-5 minutes
  - (b) Pediatric:  
Administer 0.01 mg/kg (1:10,000) IV/IO, Max 1mg/dose; repeat every 3-5 minutes
  - (c) Neonate:  
Administer 0.01 mg/kg (1:10,000) IV/IO, Max 1mg/dose; repeat every 5 minutes
- (2) Bradycardia
  - (a) Adult:  
Not indicated.
  - (b) Pediatric:  
Administer 0.01 mg/kg (1:10,000) IV/IO, Max 1mg/dose; repeat every 3-5 minutes as needed
  - (c) Neonate:  
Administer 0.01 mg/kg (1:10,000) IV/IO, Max 1mg/dose; repeat every 3-5 minutes as needed
- (3) Anaphylactic Shock/Asthma
  - (a) Adult:  
Administer 0.3 mg (1:1,000) IM, repeat every 15 minutes as needed
  - (b) Pediatric:  
Administer 0.01 mg/kg (1:1,000) IM, repeat every 5 minutes as needed (Max 0.3 mg)
  - (c) FOR ANAPHYLACTIC SHOCK ONLY  
Consider Epinephrine (1:10,000) 0.01 mg/kg slow IV/IO with Medical Control (Max 0.5mg)
- (4) Croup
  - (a) Adult:  
Not indicated
  - (b) Pediatric:  

Age	Dose	Maximum	Note
<1	0.5 mL/kg	2.5 mL	Mix with 3mL Normal Saline
1-4	2.5 mL		Mix with 3mL Normal Saline
≥5	5 mL		Mix with 3mL Normal Saline

## **6.12 ETomidate (Amidate) - RSI ONLY**

### **a) Pharmacology**

Hypnotic

### **b) Pharmacokinetics**

A short-acting nonbarbiturate hypnotic agent without analgesic properties

### **c) Indications**

- (1) Pre-sedation of responsive patients prior to administration of neuromuscular blocking agents
- (2) Pre-sedation of responsive patients prior to cardioversion

### **d) Contraindications**

Known hypersensitivity to Etomidate

### **e) Adverse Effects**

- (1) Respiratory depression or apnea
- (2) Hypotension (infrequent)
- (3) Involuntary myoclonus
- (4) Adrenal suppression

### **f) Precautions**

- (1) The effects of Etomidate can be accentuated by CNS depressants, such as narcotics and alcohol.
- (2) Myoclonic movements are common and should not be confused with fasciculations due to a depolarizing neuromuscular blocking agent or seizure activity.

### **g) Dosage**

#### **(1) Adult:**

Administer 0.3 mg/kg IV over 30 seconds for induction.

Administer 0.1 mg/kg IV over 30 seconds for cardioversion.

#### **(2) Pediatric**

Not indicated

## 6.13 GLUCAGON

### a) Pharmacology

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

### b) Pharmacokinetics

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

### c) Indications

- (1) Unconscious patients who are highly suspected of being hypoglycemic where IV access is unobtainable
- (2) Unconscious combative patients where IV access is unobtainable due to venous collapse or altered mental status
- (3) Beta Blocker Overdose
- (4) Allergic Reaction with patient on Beta Blocker medications and inadequate response to routine treatment

### 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:  
1mg IM

(b): Pediatric  
0.1mg/kg IM (Max 2 mg)

- (2) For suspected beta-blocker overdose

(a) Adult:  
2 mg IV or IO/IM

(b) Pediatric:  
0.1 mg/kg IV or IO/IM

## 6.14 IPRATROPIUM (ATROVENT)

### a. Pharmacology

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

### b. Pharmacokinetics

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

### c. Indications

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

### d. Contraindications

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

### e. Adverse Effects

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

### f. Precautions

- (1) Use with caution 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 albuterol.

### g) Dosage

#### (1) Adult:

Single administration ONLY, 0.5 mg by nebulizer in combination with Albuterol 5 mg

#### (2) Pediatric:

Single administration ONLY, 0.5 mg by nebulizer in combination with Albuterol 2.5 mg

## 6.15 LIDOCAINE (XYLOCAINE)

### a) Pharmacology

- (1) Suppresses ventricular ectopy
- (2) Elevates VT and VF threshold

### b) Pharmacokinetics

Extremely rapid (within minutes) onset following IV administration and lasts approximately 10-20 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

### d) Contraindications

- (1) AV blocks
- (2) Known hypersensitivity
- (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 IV.

### g) Dosage

- (1) Adult Cardiac Arrest:
  - Administer 1.5 mg/kg IV/IO followed by 0.75 mg/kg every 8-10 minutes as needed, up to 3 mg/kg.
- (2) Pediatric Cardiac Arrest:
  - Administer 1 mg/kg IV/IO followed by 1 mg/kg every 8-10 minutes to a Maximum of 3 mg/kg.
- (3) Rapid Sequence Intubation:
  - Administer 1.5 mg/kg IV/IO for pretreatment in patients with suspected elevated intracranial pressure

## 6.16 MAGNESIUM SULFATE

### a) Pharmacology

- (1) Anti-inflammatory
- (2) Electrolyte

### b) Pharmacokinetics

Immediate onset

### c) Indications

- (1) Torsades de Pointes
- (2) Eclamptic seizures
- (3) Acute respiratory distress

### d) Contraindications

- (1) AV Heart block
- (2) Hypotension

### e) Adverse Effects

- (1) Hypotension
- (2) CNS depression
- (3) Flushing
- (4) Sweating
- (5) AV Heart block

### f) Precautions

Use with caution in patients with impaired renal function

### g) Dosage

- (1) Torsades de Pointes

- (a) Adult

Administer 2 grams diluted in 10mL NS slow IV/IO

- (b) Pediatric

50 mg/kg diluted in 10mL NS (Max 2 grams) slow IV/IO

- (2) Polymorphic Stable Wide Complex Tachycardia

- (a) Adult

2 gm IV/IO diluted in 50mL of NS and given over 10 min

- (b) Pediatric

Not indicated

- (3) Eclampsia

- (a) Adult

Magnesium Sulfate 4 gm in 100mL NS over 5 minutes IV/IO

- (b) Pediatric

Not indicated

- (4) Asthma

- (a) Adult

Administer 2 grams diluted in 100 mL NS over 10 minutes IV/IO

- (b) Pediatric

Administer 50 mg/kg (Max 2 grams) diluted in 100 mL NS over 10 minutes IV/IO

## 6.17 METOPROLOL

### a) Pharmacology

- (1) Antagonizes beta-1 adrenergic receptors

### b) Pharmacokinetics

- (1) Intravenously administered
- (2) Effects within 3-5 minutes after administration
- (3) Duration of action is 30-60 minutes.

### c) Indications

- (1) For rate control of atrial flutter or atrial fibrillation

### d) Contraindications

- (1) Known hypersensitivity
- (2) Uncompensated congestive heart failure
- (3) 2<sup>nd</sup> or 3<sup>rd</sup> degree heart block
- (4) Cardiogenic shock
- (5) Blood pressure below 100 mmHg systolic
- (6) Heart rate less than 60 bpm
- (7) Recent/suspected cocaine use

### e) Adverse Effects

Hypotension, bradycardia, bronchospasm, nausea, vomiting, and dizziness

### f) Precautions

May cause hypotension

### g) Dosage

- (1) Adult:

5 mg slow IV push every 5 minutes to Maximum dose of 15 mg or HR <120 bpm

- (2) Pediatric:

Not indicated

## 6.18 MIDAZOLAM (VERSED)

### a) Pharmacology

- (1) Sedative
- (2) Hypnotic

### b) Pharmacokinetics

A short-acting benzodiazepine with strong hypnotic and amnesiac properties

### c) Indications

- (1) Sedation of responsive patients prior to cardioversion or transcutaneous pacing
- (2) Sedation of combative patients who threaten both their and providers' safety
- (3) Sedation of intubated patients with ventilatory difficulty secondary to bucking or combativeness
- (4) Active seizures

### d) Contraindications

- (1) Hypotension
- (2) Acute narrow-angle glaucoma
- (3) Known hypersensitivity to Midazolam

### e) Adverse Effects

- (1) Respiratory depression or apnea
- (2) Hypotension
- (3) Amnesia

### f) Precautions

The effects of Midazolam can be accentuated by CNS depressants, such as narcotics and alcohol

### g) Dosage

- (1) Adult:  
Administer 2.5-5 mg slow IV/IO/IM
- (2) Pediatric:  
Administer 0.05 mg/kg slow IV/IO/IM (2.5 mg Max)

## 6.19 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
- (5) Sedative for transcutaneous pacing

### d) Contraindications

- (1) Head injury
- (2) Undiagnosed abdominal pain
- (3) Multiple trauma
- (4) COPD with compromised respiratory effort
- (5) Hypotension
- (6) Known hypersensitivity morphine, codeine, oxycodone or hydromorphone

### 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) Naloxone 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 and elderly patients.

### g) Dosage

- (1) Adult:  
Administer 5 mg slow IV, repeat doses with medical control authorization
- (2) Pediatric:  
Administer 0.1 mg/kg slow IV/IO (Max 5 mg), repeat doses with medical control authorization

## **6.20 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 mg IV/IM; repeat as necessary to maintain respiratory activity (Max 2mg)

#### **(2) Pediatric:**

Administer 0.1 mg/kg IV/IM; repeat as necessary to maintain respiratory activity (Max 2mg)

## 6.21 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) Anti-anginal and vasodilation effects within 1-2 minutes after administration. Half-life is 1-4 minutes.
- (3) Duration of action is less than 5 minutes.

### c) Indications

- (1) For treatment of angina
- (2) Congestive heart failure, acute pulmonary edema

### d) Contraindications

- (1) Known hypersensitivity
- (2) Pediatric patient under the age of 12
- (3) Any patient having taken medication for erectile dysfunction (e.g., Viagra™, Levitra™, or Cialis™) within the past 72 hours. Medical Control is required to override this contraindication.
- (4) Asymptomatic hypertension
- (5) Blood pressure below 90 mmHg systolic
- (6) Heart rate less than 60 bpm

### 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
  - (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

## 6.22 OXYGEN

### a) Pharmacology

- (1) Increases oxygen content of the blood
- (2) Improves tissue oxygenation

### b) Pharmacokinetics

Changing the percentage of inspired oxygen results in an increased blood and tissue level equilibration within 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) Nasal cannula should be supplied with no more than 6 lpm.
- (4) Non-breather face masks must be supplied with a minimum 12 lpm.

### g) Dosage

- (1) Adult:  
Administer per protocol
- (2) Pediatric:  
Administer per protocol

## 6.23 PROMETHAZINE (PHENERGAN)

### a) Pharmacology

First generation H1 antagonist with antiemetic, sedative and antipsychotic properties

### b) Pharmacokinetics

Onset within 5-15 minutes, duration 3-6 hours

### c) Indications

- (1) Nausea
- (2) Vomiting

### d) Contraindications

- (1) Nursing mothers
- (2) Pediatric patients
- (3) Suspected head injury

### e) Adverse Effects

- (1) Extrapyramidal symptoms (Dystonic reaction) - Administer Diphenhydramine 25 mg IV/IM
- (2) Coma
- (3) Convulsions
- (4) Cardio-respiratory impairment
- (5) Dizziness

### f) Precautions

Use with caution in patients with

- (1) Impaired hepatic function
- (2) Cardiovascular disease
- (3) Asthma
- (4) COPD
- (5) Glaucoma
- (6) Leukopenia
- (7) Seizures
- (8) Sulfa allergy

### g) Dosage

#### (1) Adult:

Administer 6.25 - 12.5 mg diluted in 50 mL NS given IV over 10 minutes, may repeat with Medical Control

#### (2) Pediatric:

Not indicated

## 6.24 SODIUM BICARBONATE

### a) Pharmacology

Alkaline solution used to correct 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 adequate ventilation assured
- (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) Incompatible with epinephrine
- (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 1-2 mEq/kg (50-100mEq) IV/IO
- (3) Pediatric:  
Administer 1 mEq/kg IV/IO

## 6.25 SUCCINYLCHOLINE (ANECTINE) – RSI ONLY

### a) Pharmacology

Depolarizing neuromuscular blocking agent

### b) Pharmacokinetics

Onset of action within 30-60 seconds, duration 5-7 minutes

### c) Indications

To achieve paralysis to facilitate endotracheal intubation in patients as per RSI 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) Apnea
- (2) Bradycardia
- (2) Prolonged paralysis

### f) Dosage/Route

#### (1) Adult:

Administer 1.5 mg/kg rapid IV, if relaxation is inadequate after 2-3 minutes, a repeat dose of 0.5 mg/kg rapid IV may be given

#### (2) Pediatric:

Not indicated

## 6.26 VASOPRESSIN (PITRESSIN)

**a) Pharmacology**

Endogenous vasopressor

**b) Pharmacokinetics**

Onset in minutes, duration 30-60 min

**c) Indications**

Cardiac arrest

**d) Contraindications**

None for cardiac arrest

**e) Adverse Effects**

Not clinically significant

**f) Precautions**

None in Cardiac Arrest

**g) Dosage**

(1) Adult:

Administer 40 units IV/IO (may replace either 1<sup>st</sup> or 2<sup>nd</sup> dose of Epinephrine)

2) Pediatric:

Not indicated

## **6.27 VECURONIUM (NORCURON) – RSI ONLY**

### **a) Pharmacology**

Non-depolarizing neuromuscular blocking agent

### **b) Pharmacokinetics**

Onset 2-3 minutes with duration of 30-60 minutes

### **c) Indications**

For paralysis in cases of ventilatory difficulty secondary to bucking or combativeness in intubated patients

### **d) Contraindications**

- (1) Non-intubated patients
- (2) Known hypersensitivity

### **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.

### **g) Dosage**

- (1) Adult:  
Administer 0.1 mg/kg IV

- (2) Pediatric:  
Not indicated

# **Monroe-Livingston Regional EMS Protocols**

# **Appendix**

## Adult GCS Score

<b>Eye Opening Response</b>	Spontaneous-open with blinking at baseline	4 points
	Opens to verbal command, speech, or shout	3 points
	Opens to pain, not applied to face	2 points
	None	1 point
<b>Verbal Response</b>	Oriented	5 points
	Confused conversation, but able to answer questions	4 points
	Inappropriate responses, words discernible	3 points
	Incomprehensible speech	2 points
	None	1 point
<b>Motor Response</b>	Obeys commands for movement	6 points
	Purposeful movement to painful stimulus	5 points
	Withdraws from pain	4 points
	Abnormal flexion, decorticate posture	3 points
	Extensor response, decerebrate posture	2 points
	None	1 point

## Pediatric GCS Score

<b>Eye Opening Response</b>	Spontaneous-open with blinking at baseline	4 points
	Opens to verbal command, speech, or shout	3 points
	Opens to pain, not applied to face	2 points
	None	1 point
<b>Verbal Response</b>	Smiles or coos appropriately	5 points
	Crying and irritable	4 points
	Cries to pain	3 points
	Moans or grunts to pain	2 points
	No response	1 point
<b>Motor Response</b>	Moves spontaneously or purposefully	6 points
	Withdraws from touch	5 points
	Withdraws from pain	4 points
	Abnormal flexion, decorticate posture	3 points
	Extensor response, decerebrate posture	2 points
	None	1 point

# Adult Trauma Triage Criteria

**The patient should be taken to a trauma center should they meet any one of the following criteria.  
Medical Control consultation is required to transport to a non-trauma center.**

## PHYSICAL FINDINGS

1. Glasgow Coma Scale is less than 14
2. Respiratory rate is less than 10 or more than 29 breaths per minute
3. Pulse rate is less than 50 or more than 120 beats per minute
4. Systolic blood pressure is less than 90 mmHg
5. Penetrating injuries to head, neck, torso or proximal extremities
6. Two or more suspected proximal long bone fractures
7. Flail chest
8. Spinal cord injury or limb paralysis
9. Amputation (except digits)
10. Suspected pelvic fracture
11. Open or depressed skull fracture

## MECHANISM OF INJURY

1. Ejection or partial ejection from an automobile
2. Death in the same passenger compartment
3. Extrication time in excess of 20 minutes
4. Vehicle collision resulting in 12 inches of intrusion in to the passenger compartment
5. Motorcycle crash >20 MPH or with separation of rider from motorcycle
6. Falls from greater than 20 feet
7. Vehicle rollover (90 degree vehicle rotation or more) with unrestrained passenger
8. Vehicle vs. pedestrian or bicycle collision above 5 MPH

## HIGH RISK PATIENTS

If a patient does not meet the above criteria for Major Trauma, but has sustained an injury and has one or more of the following criteria, they are considered a "High Risk Patient". Consider contacting medical control and transporting to a Trauma Center:

1. Bleeding disorders or patients who are on anticoagulant medications
2. Cardiac disease and/or respiratory disease
3. Insulin dependent diabetes, cirrhosis, or morbid obesity
4. Immunosuppressed patients (HIV disease, transplant patients and patients on chemotherapy treatment)
5. Age >55

Source: NYS EMT-B Protocols (2004) T-6 p1

## Pediatric Trauma Triage Criteria

**The patient should be taken to a trauma center should they meet any one of the following criteria.  
Medical Control consultation is required to transport to a non-trauma center.**

### PHYSICAL FINDINGS

1. Pulse greater than normal range for patient's age (see pediatric appendix)
2. Systolic blood pressure below normal range (see pediatric appendix)
3. Respiratory status inadequate (central cyanosis, respiratory rate low for the child's age, capillary refill time greater than two seconds)
4. Glasgow coma scale less than 14
5. Penetrating injuries of the trunk, head, neck, chest, abdomen or groin
6. Two or more proximal long bone fractures
7. Flail chest
8. Burns that involve 15% or more of the body surface (10% if associated with other injuries or the child is less than five years old) or facial/airway burns
9. Combined system trauma that involves two or more body systems, injuries or major blunt trauma to the chest or abdomen
10. Spinal cord injury or limb paralysis
11. Amputation (except digits)

### MECHANISM OF INJURY

1. Death in the same passenger compartment
2. Fall more than 10 feet
3. Vehicle-pedestrian collision
4. Patient ejected from the vehicle
5. Vehicle collision >20 MPH resulting in 12 inches of deformity to the vehicle
6. Vehicle rollover
7. Motorcycle crash
8. Vehicle vs. bicycle collision >5 MPH

**Source: NYS EMT-B Protocols (2004) T-7 p1**

## Normal Pediatric Weights and Vital Signs

AGE	WEIGHT (lbs)	WEIGHT (kg)	SYSTOLIC BP	HEART RATE	RESP. RATE
Birth	8	3.5	60-80	110-160	30-60
6mo.	15	7	70-100	100-140	30-50
1 yr.	22	10	80-115	100-140	25-35
2 yr.	29	13	80-115	90-110	20-30
3 yr.	33	15	80-115	90-110	20-30
4 yr.	37	17	80-115	80-100	20-30
5 yr.	42	19	80-115	80-100	20-30
6 yr.	48	22	80-115	80-100	20-30
7 yr.	55	25	80-115	70-90	15-25
8 yr.	62	28	85-115	70-90	15-25
9-10	66	30	90-130	70-90	10-20
11-12	81	37	95-135	70-90	10-20

## Pediatric Airway Equipment Sizes

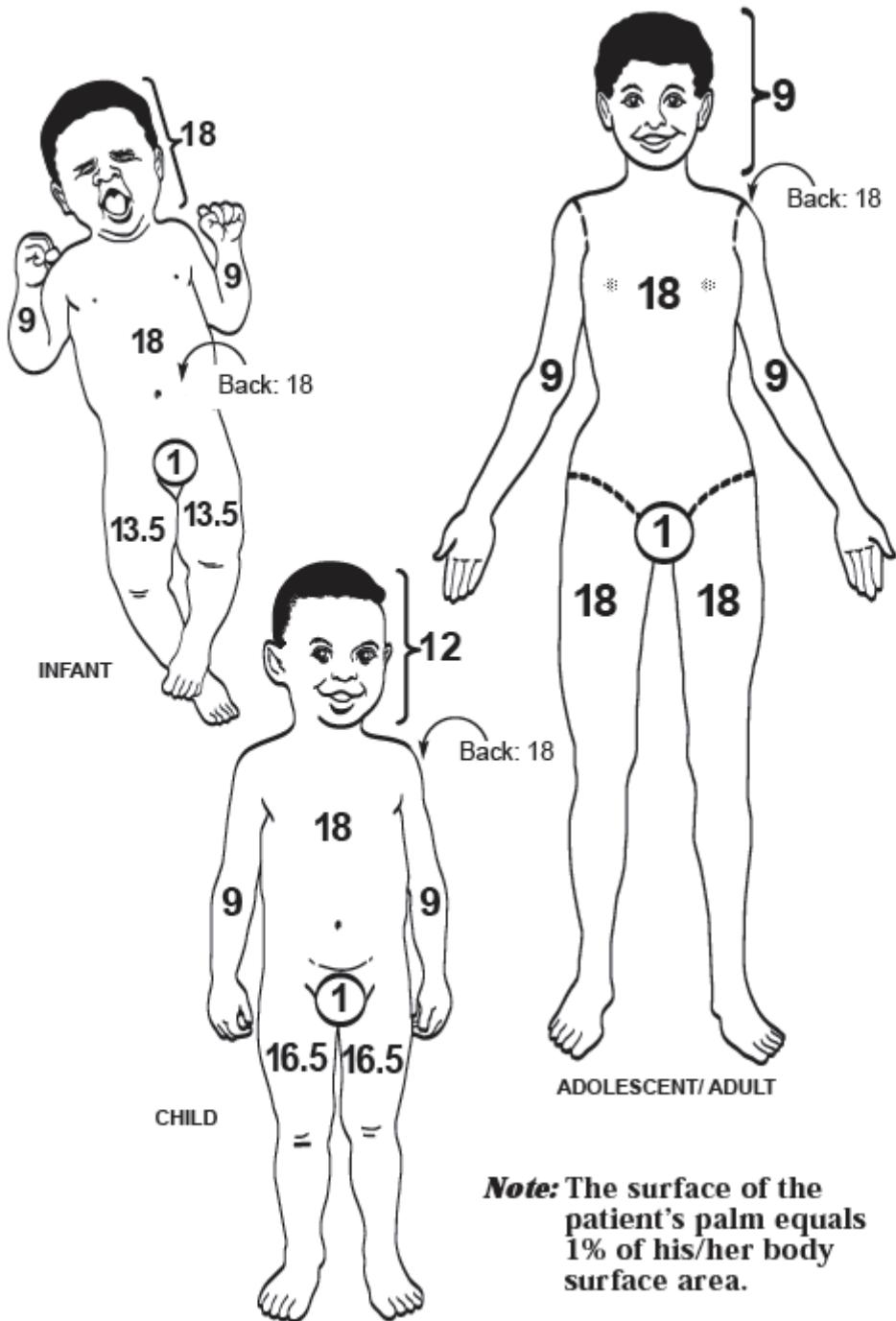
AGE	LARYNGOSCOPE	ETT (mm)	SUCTION CATH.
Preemie	Miller 0	2.5-3.0 uncuffed	6 French
Term infant	Miller 0-1	3.0-3.5 uncuffed	6 French
6 months	Miller 0-1	3.5-4.0 uncuffed	8 French
1 year	Miller 1	4.0-4.5 uncuffed	8 French
2 years	Miller 2	4.5 uncuffed	8 French
4 years	Miller 2	5.0 uncuffed	10 French
6 years	Miller 2	5.5 uncuffed	10 French
8 years	Miller 2, Mac 2	6.0 cuffed	10 French
10 years	Miller 2, Mac 2	6.5 cuffed	12 French
12 years	Mac 3	7.0 cuffed	12 French
Adolescent	Mac 3, Miller 3	7.0-8.0 cuffed	12 French

## APGAR Chart

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

\*Nasal or Oral Suction Catheter Stimulus

## Rule of Nines



## Area Hospital Information

Regional Medical Control Hospitals - **BOLD**

Hospital	Disposition Code	Phone Number	Frequency
Clifton Springs	341	315-462-7816	155.340
F.F. Thompson	342	585-396-6820	155.175
Lakeside	273	585-395-6095 x 4282	155.340
Newark-Wayne	584	585-359-2120	155.340
Noyes Memorial	251	585-335-4240	155.340
<b>Rochester General</b>	<b>276</b>	<b>585-338-3367</b>	<b>155.340</b>
Soldiers and Sailors	612	315-531-2500	155.340
<b>Unity (Park Ridge)</b>	<b>275</b>	<b>585-723-7070</b>	<b>155.340</b>
<b>URMC/Highland</b>	<b>272</b>	<b>585-341-6444</b>	<b>155.340</b>
<b>URMC/Strong Memorial Adult</b>	<b>278</b>	<b>585-271-2769</b>	<b>155.340</b>
<b>URMC/Strong Memorial Pediatrics</b>	<b>278</b>	<b>585-756-3430</b>	<b>155.340</b>

## Dopamine Infusion Chart

Mix 400 mg Dopamine HCl in 250 mL Normal Saline or D5W to achieve base concentration of 1,600 mcg/mL

Use 60 gtt/ml administration set. A rate-limiting device must be used when administering this medication. Use Y-site secondary tubing for dopamine running into free-flowing normal saline primary tubing. Do not use a primary line for dopamine to prevent extravasation.

Choose desired infusion concentration and follow row to the column indicating patients weight, the number is the gtt/min

Weight	Kilograms	40 kg	50 kg	60 kg	70 kg	80 kg	90 kg	100 kg	110 kg	120 kg	130 kg	140 kg	150 kg
	Pounds	88 lbs	110 lbs	132 lbs	154 lbs	176 lbs	198 lbs	220 lbs	242 lbs	264 lbs	286 lbs	308 lbs	330 lbs
Desired Infusion	5 mcg/kg/min	8	9	11	13	15	17	19	21	23	25	27	29
	10 mcg/kg/min	15	19	23	26	30	34	38	42	46	50	54	58

## Monroe -Livingston Regional EMS Standards of Care Medication and Dosage Sheet

Protocol	Medication	Adult	Pediatric	Notes
2.5 Allergic Reaction Anaphylaxis	Epi 1:1,000 (EpiPen)	0.3 mg IM	0.15 mg IM (<30kgs)	
	Diphenhydramine	50 mg IV/IO	2 mg/kg IV/IO (Max 26 mg)	IM ok if no IV/IO
	Epi 1:1,000	0.3 mg IM	0.01 mg/kg IM (Max 0.3 mg)	May repeat q 5 min, NEVER give IV/IO
	Albuterol & Isoproterenol	5 mg & 0.5 mg nebs	2.5 mg & 0.5 mg nebs (dilute to 6 ml)	
	Epi 1:10,000	0.6 mg Slow IV/IO	0.01 mg/kg Slow IV/IO (Max 0.3 mg)	Only used in profound shock and poor perfusion
	Glucagon	1 mg IV/IO		If patient is on a beta-blocker and non-responsive to epi
2.6 Behavioral Emergencies	Midazolam	up to 2.6 mg IV/IM		Must contact medical control after use, addnl doses absolute online
2.10 Chest Pain RV Failure Refractory pain	Aspirin	324 mg PO		
	Nitroglycerin	0.4 mg SL		every 3-5 min prn, if SBP > 90 mmHg; HR>50<130
	Fluid Challenge	500 ml NS IV/IO		
	Dopamine	5 to 10 mcg/kg/min IV		Titrate to SBP > 90 mmHg with Medical Control
2.13 Croup	Morphine	5 mg slow IV/IO		With Medical Control
	Epi 1:1,000		age <1 0.6mL/kg max 2.6mL age 1-4 2.6mL age ≥ 5 6mL	With Medical Control for all ages Mix with 3ml. Normal Saline for all ages
2.14 Diabetic BG > 300mg/dl Diabetic BG < 80mg/dl	Fluid Challenge	500 ml NS IV/IO		
	D50	12.5-25 gm IV/IO	0.6-1 gm/kg IV/IO (Use for Peds > 6kg)	Repeat as needed
	D25		0.6-1 gm/kg IV/IO (Use for Peds < 6 kg)	Repeat as needed
2.15 Fluid Challenge	Glucagon	1 mg IM	0.1 mg/kg IM (Max 1 mg)	
	0.9% Saline	500 ml NS IV/IO	20 ml/kg IV/IO (Max 600 ml)	With Medical Control for Dialysis patients
2.18 Hypotension/Shock	Fluid Challenge	500 ml NS IV/IO		
	Dopamine	5 to 10 mcg/kg/min IV		Titrate to SBP > 90 mmHg with Medical Control
2.20 Nausea/Vomiting Dystonic Rx	Promethazine	8.25 mg to 12.5 mg IV		Dilute in 50 mL NS over 10 min
	Diphenhydramine	25 mg IM/IV		May repeat x1
2.22 Neonatal Resuscitation	Epi 1:10,000		0.01 mg/kg IV/IO (0.1 ml/kg) (Max 1 mg)	Repeat q 5 min with Medical Control
	Naloxone		Consider 0.1 mg/kg IV/IO (Max 2 mg)	
	0.9% Saline		Consider 20 ml/kg IV/IO	
2.24 Pain Management	Morphine	5 mg IM, slow IV/IO	0.1 mg/kg IM, slow IV/IO (Max 5 mg)	Repeat dose with Med Ctrl; Absolute <0.1 mg/kg (max 5 mg peds) every 10 min
	Activated Charcoal	50 gm PO	2 gm/kg (Max 50 gm)	With Medical Control
	Opiate w/ resp dep	Naloxone	0.4 mg IV/IM/IO OR 0.8 mg via MAD	May repeat to support respiratory efforts
2.25 Poisoning/Overdose	Foss Ca+ Channel	10 % Calcium Chloride	1000 mg slow IV/IO	Contact medical control
	Foss TCA or ASA	Sodium BiCarb	100 mEq Slow IV/IO	Contact medical control
	Foss Beta Blocker	Glucagon	2 mg IV/IO/IM	With Medical Control
2.26 Pulmonary Edema/ CHF Systolic SBP< 90mmHg	Nitroglycerin	0.4 mg SL		Repeat q 3-5 min if SBP > 90 mmHg
	Dopamine	5 to 10 mcg/kg/min IV		Physician Consult
2.27 RSI	Pretreatment	Atropine	0.6 mg IV/IO	For symptomatic bradycardia
		Lidocaine	1.6 mg/kg IV/IO	For suspected elevated intracranial pressure
	Sedation	Etomidate	0.3 mg/kg IV/IO	
		Buccinylcholine	1.6 mg/kg IV/IO	A second dose of 0.5 mg/kg may be given if 1st dose ineffective
	Paralytics			With caution SBP <90, Repeat doses with Medical Control
	Post RSI-sedation	Midazolam	2.5 mg IV/IO	With caution SBP <90, Repeat doses with Medical Control
2.28 Post RSI-analgesia	Morphine	5 mg slow IV/IO		With caution SBP <90, Repeat doses with Medical Control
	Post RSI-paralysis	Vecuronium	0.1 mg/kg IV	Absolute Online & Pt must have received sedation and analgesia
2.29 Resp Distress/Bronchospasm	Albuterol	5 mg neb	2.5 mg neb	May repeat up to a total of 30 mg/hr
	Isoptropium Bromide	0.6 mg neb	0.6 mg neb	May mix with albuterol and give simultaneously
	Epi 1:1,000	0.3 mg IM	0.01 mg/kg IM (Max 0.3 mg)	With Medical Control, May repeat up to 2 times q 15 min
	Magnesium Sulfate	2 gm IV	50 mg/kg IV (Max 2 gm)	With Medical Control, Dilute in 100 ml NS over 10 min

Monroe -Livingston Regional EMS Standards of Care Medication and Dosage Sheet

Protocol	Medication	Adult	Pediatric	Notes
2.31	Seizure	Midazolam	2.6 mg IV/IM/M	0.05 mg/kg IV/IO/IM (Max 2.6 mg)
	Eclampsia	Magnesium Sulfate	5 gm IV/IO	Dilute in 100mL over 5 minutes, Additional 2gm-Absolute Online
2.34	Vascular Access	Lidocaine	30 mg (1.5 mL) Slow IO	Prior to Infusing NS or meds
3.1, 4.1	V-Fib/Pulseless VT	Epi 1:10,000	1 mg IV/IO	0.01 mg/kg IV/IO (Max 1 mg)
		Vasopressin	40 units IV/IO	Give as a replacement for 1st or 2nd dose of Epinephrine
		Amlodarone	300 mg slow IV/IO	Dilute in min 20 mL NS, may repeat-(Adult)-150mg, (Peds)-5 mg/kg (max 150mg)
	No conversion w/ Amlodarone	Lidocaine	1.6 mg/kg IV/IO	May repeat-(Adult)-0.75 mg/kg, (Peds)-1 mg/kg
	Torsades de Pointes	Magnesium Sulfate	2 gm IV/IO	Dilute in 10 mL of NS
3.2, 4.2	Post-Conv	Defib,no meds	Amlodarone	160 mg slow IV/IO
		Fr Amlodarone	No add'l medications	6 mg/kg slow IV/IO (Max 160 mg)
		Fr Lidocaine	0.76 mg/kg IV/IO	Dilute in min 50 mL of NS over 10 minutes (Adult), over 20 min (Peds)
			1 mg/kg IV/IO	every 10 minutes (Max 3 mg/kg total)
3.3, 4.3	Aystole/ PEA	Epi 1:10,000	1 mg IV/IO	0.01 mg/kg IV/IO (Max 1 mg)
		Vasopressin	40 units IV/IO	Give as a replacement for 1st or 2nd Epinephrine
		Atropine	1 mg IV/IO	Repeat q 3-5 min (Max 0.04 mg/kg total)
	Hyperkalemia	Sodium BiCarb AND	1 mEq/kg IV/IO	
		10% Calcium Chloride	200 mg IV/IO	
	Metabolic Acidosis	Sodium BiCarb	1 mEq/kg IV/IO	
3.4, 4.4	Bradycardia	Hypotensive	Fluid Challenge	500 mL NS IV/IO
			Atropine	0.02 mg/kg IV/IO (Min 0.1 mg, Max 1 mg)
			Dopamine	5-10 mcg/kg/min
			Epinephrine 1:10,000	0.01 mg/kg IV/IO (Max 1 mg)
3.6, 4.6	Stable Narrow Complex Tachy	Adenosine	8 mg rapid IV	0.1 mg/kg rapid IV (Max 6mg), must call med control
		Metoprolol	5 mg slow IV	May repeat q5 (Adult) 12 mg x 2; (Peds) 0.2 mg/kg x 2
		Signs of CHF	Amlodarone	May repeat q 5 min, (Max 15 mg or HR < 120 bpm)
3.7	Stable WCT	Monomorphic VT	Amlodarone	160 mg IV
		Polyomorphic VT	Magnesium Sulfate	5 mg/kg slow IV/IO (Max 160 mg) with med control
			2 gm IV/IO	Dilute in 100 mL of NS over 10 minutes, contra-Ind-Renal Failure