QUINCY AREA EMS

SEMSV

Policy and Procedure Manual

REVISED
10:10 am, Mar 13, 2017
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Date</th>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/17/16</td>
<td>ACKN 01</td>
<td>Acknowledgement Page</td>
</tr>
<tr>
<td>3/28/16</td>
<td>SCOP 01</td>
<td>Scope of Practice/Protocol Intent for Procedures and Techniques</td>
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</tbody>
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## GENERAL POLICIES

<table>
<thead>
<tr>
<th>Date</th>
<th>Document</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SEM</td>
<td>General Policies Index</td>
</tr>
<tr>
<td>10/10</td>
<td>SEM 1</td>
<td>Aeromedical Crew Member Requirements</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 1-F</td>
<td>Aeromedical Crew Credential Checklist</td>
</tr>
<tr>
<td>3/15</td>
<td>SEM 1A-F</td>
<td>Air Medical Entrance Application</td>
</tr>
<tr>
<td>4/10</td>
<td>SEM 2</td>
<td>Aeromedical Crew Member Continuing Education</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 2-F-1</td>
<td>Annual Aeromedical Crew Member Continuing Education</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 2-F-2</td>
<td>Skills Maintenance Log</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 3</td>
<td>SEMSV Medical Director</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 4</td>
<td>Equipment/Medication Verification</td>
</tr>
<tr>
<td>4/15</td>
<td>SEM 5</td>
<td>Air Medical Equipment List</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 6</td>
<td>SEMSV Medication List</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 7</td>
<td>SEMSV Staffing</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 8</td>
<td>Aeromedical Service Area and Response</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 9</td>
<td>SEMSV Notification of Lapse in Service</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 10</td>
<td>Aeromedical Communications</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 11</td>
<td>SEMSV Patient Care Reviews and Evaluation</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 12</td>
<td>Pilot Credentials</td>
</tr>
<tr>
<td>1/06</td>
<td>SEM 13</td>
<td>Flight EMTP and PHRN Relicensure Requirements</td>
</tr>
<tr>
<td>5/08</td>
<td>SEM 14</td>
<td>TNS Recertification Guidelines</td>
</tr>
<tr>
<td>4/10</td>
<td>SEM 15</td>
<td>Change of Address Form</td>
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## Administrative Protocols

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<td>9/6/16</td>
<td>ADM 001</td>
<td>On-line Medical Control/Patient Report or Clinical Contingency</td>
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<tr>
<td>2/2/16</td>
<td>ADM 002</td>
<td>Control of Emergency Medical services at the Scene of an emergency</td>
</tr>
<tr>
<td>2/2/16</td>
<td>ADM 003</td>
<td>Pre-hospital Trauma triage Considerations</td>
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<td>2/2/16</td>
<td>ADM 004</td>
<td>Determination of Death/Termination of ACLS</td>
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<td>Do not Resuscitate Orders in the Field</td>
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<td>Hazardous Materials Response</td>
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<td>Mass Casualty/disaster Responses</td>
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<td>Medical Effects of Altitude &amp; Altitude Limitations</td>
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<tr>
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<td>ADM 010</td>
<td>Patient Destination Determination</td>
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<td>2/2/16</td>
<td>ADM 011</td>
<td>EMTALA (Emergency Medical Transfer and Labor Act)</td>
</tr>
<tr>
<td>2/2/16</td>
<td>ADM 012</td>
<td>Rendering Care to Company Employees</td>
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## Medication Formularies

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<td>Albuterol sulfate (Proventil, Ventolin)</td>
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<td>Clopidogrel Bisulfate (Plavix)</td>
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Medication Formularies (continued)
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<td>RX 041</td>
<td>Procainamide HCL (Pronestyl)</td>
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<tr>
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<td>Sodium Chloride 0.9%</td>
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<td>Succinylcholine Chloride (Anectine)</td>
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<td>RX 047</td>
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</tr>
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</table>

3/28/16 APP C Appendix C: Procedure List

**Cardiac Protocols**

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
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<td>CAR 001</td>
<td>Adult Cardiac Arrest Algorithm</td>
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<td>CAR 002</td>
<td>Adult Post cardiac Arrest Care</td>
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<td>CAR 003</td>
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<td>CAR 006</td>
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<td>CAR 008</td>
<td>Hypothermia-Post Resuscitation</td>
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**Environmental Protocols**

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<th>Date</th>
<th>ENV</th>
<th>Procedure</th>
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<tbody>
<tr>
<td>2/2/16</td>
<td>ENV 001</td>
<td>Hypothermia (Adult and Pediatric)</td>
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<td>ENV 002</td>
<td>Frostbite Injury (Adult and Pediatric)</td>
</tr>
<tr>
<td>2/2/16</td>
<td>ENV 003</td>
<td>Heat Emergencies (Adult and Pediatric)</td>
</tr>
<tr>
<td>2/2/16</td>
<td>ENV 004</td>
<td>Near Drowning (Adult and Pediatric)</td>
</tr>
<tr>
<td>2/2/16</td>
<td>ENV 005</td>
<td>Envenomation (Stings/Bites)</td>
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## Medical Protocols

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<thead>
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<td>MED 001A</td>
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<td>MED 001B</td>
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<td>MED 001C</td>
<td>Stroke (Hemorrhagic – Interfacility)</td>
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<td>Airway obstruction – Pediatric and Adult</td>
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<td>MED 003</td>
<td>Anaphylaxis/Allergic Reaction – Pediatric and Adult</td>
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<td>MED 004</td>
<td>Thoracic Aneurysm</td>
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<td>Ruptured Abdominal Aneurysm</td>
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<td>MED 006</td>
<td>Diabetic Ketoacidosis – Adult and Pediatric (Interfacility Only)</td>
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<td>MED 007</td>
<td>Symptomatic Hypertension/Hypertensive Emergency</td>
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<td>Respiratory Distress – Adult (Asthma/COPD)</td>
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<td>MED 009</td>
<td>Seizures – Adult, Pediatric</td>
</tr>
<tr>
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<td>MED 010</td>
<td>Toxicologic Emergencies – Ingestion/Exposure/Overdose</td>
</tr>
<tr>
<td>6/2/16</td>
<td>MED 011</td>
<td>Adult Sepsis</td>
</tr>
<tr>
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<td>MED 012</td>
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## Obstetrical Protocols

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<td>Complications of Pregnancy: Preterm Labor</td>
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<td>OB 003</td>
<td>Complications of Pregnancy: Hypertensive Disorders (Preeclampsia/Eclampsia/Pregnancy Induced Hypertension)</td>
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<td>Pediatric Penetrating Trauma</td>
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## Physician Position Statements

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<td>Rapid Sequence Intubation (RSI)</td>
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<td>King airway Device (Adult or Pediatric)</td>
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<td>Post Intubation Management (PIM)</td>
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<td>6/2/16</td>
<td>PRO 012</td>
<td>Mechanical Ventilation</td>
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<td>PRO 013A</td>
<td>Lung Protective Strategy for Ventilated Adults</td>
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<td>Non-Invasive Positive Pressure Ventilation (Patients &gt; 12 years)</td>
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<td>Transportation of Patients with Chest Tubes</td>
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<td>Needle Thoracostomy</td>
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<td>Initiation of Tranexamic Acid (TXA) Protocol</td>
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<td>Head Injury/Traumatic Brain Injury</td>
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<td>Acute Eye Injuries – Adult and Pediatric</td>
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<td>Resource hospital Over-rides</td>
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<td>SEM OP-11</td>
<td>Major EMS Incident</td>
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<td>Start Triage-Adult</td>
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<td>SEM OP-12</td>
<td>Durable Power of Attorney for Healthcare</td>
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<td>Duty to Perform Services without Discrimination</td>
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<td>SEM OP-20</td>
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<td>Professional conduct/code of Ethics</td>
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<td>SEM OP-22</td>
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<td>Preparedness to a System Wide Crisis</td>
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<td>SEM OP-23-F</td>
<td>Worksheets for System Wide Crisis</td>
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**Problem Solving**

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<td>SEM PS-1.3</td>
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<td>9/10</td>
<td>SEM PS-2</td>
<td>Suspension</td>
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<td>SEM PS-3</td>
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<td>9/10</td>
<td>SEM PS-3-F</td>
<td>Event Report</td>
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<td>Suspected chemical Abuse on Duty</td>
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<td>Notice of Corrective Action/Record of Disciplinary Action</td>
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**Quality Assurance**

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<td>SEM QA-2</td>
<td>Quality Assurance Guidelines and Standards</td>
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<td>SEM QA-2-F</td>
<td>Case Audit Form</td>
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<td>SEM QA-3</td>
<td>Blood Glucometer</td>
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QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: ACKN 01
Title: Medical Director Acknowledgement
Effective Date: August 2005
Revision Date: 9-06, 1-07, 9-07, 10-08, 10-09, 9-10, 2-12, 4-13, 7-14, 3-16
Reviewed: 3-16

ACKNOWLEDGEMENTS

Approved by Medical Director
December 2016

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director
Scope of Practice
Protocol Intent for Procedures and Techniques

It is the intent of Air Evac EMS, Inc. and the Medical Director that all procedures referred to herein or normally practiced by clinical partners at Air Evac EMS, Inc., be practiced by:

a) Emergency Medical Technicians, Advanced Emergency Medical Technicians, and Emergency Medical Technician Paramedics perform skills and techniques only as defined by the State Board/Bureau/Agency/Unit of Emergency Medical Services, as within their individual scopes of practice.

All clinical partners function as a team in their approach to the patient’s care and in their performance of critical care procedures and techniques.
AEROMEDICAL CREW MEMBER REQUIREMENTS

I. Each aeromedical crew member functioning within the Quincy Area EMS System shall meet the following requirements:

A. Valid Illinois EMT-P, RN, or physician license.

B. Each crew member shall be current in, or obtain within six months of hire:

1. Advanced Cardiac Life Support (ACLS)
2. Basic Trauma Life Support (BTLS) or Prehospital Trauma Life Support (PHTLS)
3. Pediatric Advanced Life Support (PALS) or Emergency Nursing Pediatric Course (ENPC)
4. Air Evac Prehospital NRP
5. Trauma Nurse Specialist or Trauma Nurse Care Curriculum (TNCC) (RN only)

C. Complete an initial training and orientation program that meets or exceeds requirements found in 515.940, of the Illinois Administrative Code.

1. Didactic component to be met by completion of an approved aeromedical crew course approved by the SEMSV Medical Director prior to being scheduled as a member of the flight crew.
2. Clinical modules are to be used in conjunction with initial didactic training. All clinical modules must be completed within six months of joining the system. Until all clinical modules are completed, the probationary flight crew member will only be scheduled with flight crew staff who have completed all modules satisfactorily.

a) Flight RN’s/paramedics currently employed in any of the clinical areas listed below who can demonstrate proficiency in that clinical area by providing documentation from an immediate supervisor, will be considered as having completed the module.

b) Clinical sheets are to be utilized for each clinical area. Clinical objectives are listed on each sheet. A qualified representative from each hospital clinical area should precept and sign the sheet indicating which objectives were met. In the prehospital setting, an approved field evaluator may precept and sign the sheet.

c) Advanced Airway Clinical Module

(1) Purpose: Provides information regarding management of the difficult airway as well as an opportunity to improve intubation skills.

(2) Clinical:

(a) Preferred method: Surgery rotation with anesthesia staff or in field intubations. (10 successful intubations on live patients)

(b) Acceptable method: Intubations can be completed on cadavers

(c) If unable to complete a or b above, the MEDI mannequin can be used under the direct supervision of the Medical Director
d) Obstetric clinical module  
(1) Purpose: Provides information regarding assessment and management of obstetrical patients as well as an opportunity to improve on and practice patient assessment and patient management before, during and after delivery.  
(2) Clinical rotation in OB department (5 deliveries)

e) Critical care clinical module  
(1) Purpose: Provides an opportunity to enhance patient assessment and patient management skills as well as to make use of equipment found in the critical care setting.  
(2) Clinical ICU 16 hours and Emergency Department 16 hours.

f) Prehospital clinical module (ALS ambulance)  
(1) Purpose: provides the opportunity to assess and manage the patient in the prehospital environment as well as the opportunity to interact with the prehospital providers.  
(2) Clinical: 5 ALS runs

g) Pediatric clinical module (ALS ambulance)  
(1) Purpose: provides the opportunity to assess and increase knowledge regarding the management of the critical child.  
(2) Clinical: 8 hours

h) Emergency Care  
(1) Purpose: provides the opportunity to assess and manage the patient in the emergency room setting.  
(2) Clinical: 16 hours

D. All aeromedical crew members shall be required to join the Quincy Area EMS System by completing the following:

1. Submit a system application  
2. Submit a letter of recommendation from the EMS Medical Director or EMS System Coordinator from your current or last EMS System of participation.  
3. Successful completion of the Quincy Area EMS System aeromedical exam (80% minimum score).
**QUINCY AREA EMS SYSTEM**

**AIR MEDICAL ENTRANCE APPLICATION**

☐ EMT-P    ☐ RN

For items that do not apply, please indicate by writing N/A

<table>
<thead>
<tr>
<th>Name (Last)</th>
<th>(First)</th>
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<th>Date of Birth</th>
<th>Social Security Number</th>
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<td>(Zip Code)</td>
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<td>Current Place of Employment</td>
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**AEROMEDICAL TRAINING**

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<th>Instructor</th>
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**PREVIOUS FLIGHT EXPERIENCE**

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<tr>
<td>Supervisor Name</td>
<td>Supervisor Telephone</td>
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**EDUCATION/TRAINING (EMT-P ONLY)**

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<th>Date Training Completed</th>
<th>EMS Medical Director Name</th>
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<tr>
<td>Program Coordinator of Training Program or Person &amp; Title to Contact Regarding Training</td>
<td></td>
<td>Telephone Number</td>
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</table>

Current EMT-P License held
☐ Illinois ☐ Missouri ☐ Iowa ☐ National Registry

**PREVIOUS EMS EXPERIENCE**

<table>
<thead>
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<th>Agency</th>
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<tr>
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<td>EMS System Coordinator</td>
<td>Contact Person</td>
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<td>Address (Street)</td>
<td>(City)</td>
<td>(Zip Code)</td>
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**EDUCATION (ONLY)**

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<th>Location</th>
<th>Degree Received</th>
<th>Date of completion</th>
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**PREVIOUS NURSING EXPERIENCE**

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PROFESSIONAL REFERENCES

1. Name ____________________________ Telephone Number ____________________________
   Address (Street) ______________________ (City) ______________________ (Zip Code) __________

2. Name ____________________________ Telephone Number ____________________________
   Address (Street) ______________________ (City) ______________________ (Zip Code) __________

Name of Providing Agency within the Quincy Area EMS System who will be your sponsor and with whom you will be functioning:

BACKGROUND INFORMATION

Have your prior designed privileges of certification in emergency medicine ever been revoked, suspended, reduced or not renewed at all? Yes ☐ No ☐

Have you ever been convicted of a felony? Yes ☐ No ☐

Have you been placed into a disciplinary process related to your EMT certification/or licensure level? Yes ☐ No ☐

If the answers to the above sections are “YES”, please explain.

Provider shall have a primary affiliation with an EMS system. Your primary affiliation is with: ____________________________

Are you affiliated with any other EMS System? Yes ☐ No ☐

If yes, document any other EMS system: ____________________________________________________________________________

EQUAL OPPORTUNITY CLAUSE

The program will make no discrimination because of sex, race, age, creed, national origin, ancestry, or political affiliation. Any area on this application that refers to the preceding is not required information.

In making application for acceptance into the Quincy Area EMS System, I agree to:

1. Receive, read, and abide by the rules and regulations of the Quincy Area EMS System as they are established and may be amended from time to time.
2. Release from liability all representatives of the Quincy Area EMS System for acts performed in good faith and without malice in connection with evaluation of my application and credentials, as well as all individuals or organizations providing information to the hospital in good faith and without malice concerning my competence, ethics, character or other qualifications.
3. I authorize the EMS System Coordinator, EMS Medical Director and/or designees to contact previous employers, EMS System staff and others as appropriate for the purpose of securing reference information concerning my involvement in the field of emergency medical services.
4. I authorize that a criminal background may be conducted.

I have read and I am familiar with the policies and procedures contained in the Quincy Area EMS Policy Manual:

Our policy manual is located: ____________________________

Print Name: ____________________________ Date: ____________________________

PLEASE NOTE: Falsification of any of the above information will result in automatic denial of application.

____________________________  ____________________________
SIGNATURE DATE

Revised: 3/01, 3/05, 1/06, 4/15
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE
AIR MEDICAL CREW CREDENTIAL CHECKLIST

Name ___________________________       Hire Date: ________________

☐ System application

☐ System aeromedical exam score: ____________

☐ Letter of Recommendation

☐ Illinois license       Exp. ______
☐ Missouri license:     Exp. ______
☐ Iowa license:         Exp. ______
☐ BLS (CPR)             Exp. ______
☐ ACLS                  Exp. ______
☐ BTLS/PHTLS            Exp. ______
☐ PALS                  Exp. ______
☐ NRP                   Exp. ______
☐ TNS/TNCC (RN ONLY)    Exp. ______
☐ Other                 Exp. ______

☐ Initial Training Program       Date: _____  Location: ___________________

☐ Initial Clinical Rotations      Date: _____  Location: ___________________

☐ Advanced Airway Module (10 intubations) Date Completed: ________________
☐ Obstetrical Module (5 deliveries)    Date Completed ________________
☐ ICU (16 hours)                     Date Completed ________________
☐ ER (16 hours)                      Date Completed ________________
☐ Prehospital ALS Module (5 ALS runs) Date Completed: ________________
☐ Pediatric Critical Care Module (8 hours) Date Completed: ________________
☐ Invasive procedures lab            Date: ______ Location: ______
☐ Skills-equipment checkoff         Date Completed:__________________

Date all requirements complete: __________________________

SEMSV Medical Director or EMS System Coordinator ________________________

10/1/01, re: 2/02, 1/06
I. Each System aeromedical crew member functioning within the Quincy Area EMS System shall complete at least sixteen hours continuing education in topics pertaining to aeromedical, eight hours of which may include quality assurance reviews.

A. Didactic topics include but are not limited to:
   1. Aviation safety issues
   2. State EMS Rules regarding ground and air transport
   3. Altitude physiology/stressors of flight
   4. Critical care courses
   5. Emergency care courses
   6. Hazardous materials recognition and response
   7. Infection control
   8. Stress recognition and management
   9. Survival training
   10. Equipment reviews consistent with program scope and mission

B. Clinical and lab include but are not limited to:
   1. Emergency/trauma care
   2. Critical care (adult, pediatric, neonatal)
   3. Invasive procedure labs
   4. Labor and delivery
   5. Prehospital experience

II. Skill maintenance program (after clinical requirements met)

A. Intubation: provide documentation of the following each quarter:
   1. 4 live successful intubations every six (6) months (Jan-June) and (July-Dec).
      This can be accomplished in O.R., on flights, on ground crews or METI human patient simulator
   2. 1 live, mannequin or cadaver intubation per quarter on each of the following age ranges:
      a) birth to 12 months
      b) 12 months to 6 years
      c) 6 years and older
   3. Documentation must be completed on form SEM 2-F-2 with signatures from a nurse or paramedic lead or educator in the comment sections for mannequin or cadaver intubations. On all live intubations, a copy of the Patient Care Form or signed clinical sheet must accompany the form.

B. Invasive procedures lab to be completed annually. Oversight/education to be provided by a supervisory level flight nurse.
C. Demonstrate proficiency in IV insertion, cardiac rhythm identification by providing quarterly documentation of all skills performed for the past quarter to the EMS Office.

D. Must be completed on form SEM 2-F.2 no later than 7 days after the end of month. Supporting documents must be signed and attached to form.

II. System recertification every 2 years

A. On the odd years, all members will complete a change of address form (SEM-15) to confirm or update address

B. On the odd years, all members will update all licensing and certificates.

C. Complete form SEM 2-F.1 at the end of each two year period and forward to the EMS Office.

D. A skill may be chosen by EMS Medical Director on odd years. Each crewmember will be required to complete the skill station.

III. Any aeromedical crew member found to not meet the above requirements will be removed from the roster and not allowed to function in the System until such time as the requirements are met.
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE

ANNUAL AEROMEDICAL CREW MEMBER CONTINUING EDUCATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Hire Date</th>
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16 Hours Continuing Education (attach certificates, documentation of attendance/clinical sheets)

1. 
2. 
3. 
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9. 
10. 

Skills Maintenance Program (submit clinical sheet, copy of PCR form or other documentation of completion)

- 5 Intubations (Jan-Mar) – 2 live, 1 each on manikin: infant, child, adult
- 5 Intubations (Apr-June) 2 live, 1 each on manikin: infant, child, adult
- 5 Intubations (July-Sept) 2 live, 1 each on manikin: infant, child, adult
- 5 Intubations (Oct-Dec)  2 live, 1 each on manikin: infant, child, adult

- Invasive Procedures Lab Date: ________________

Skill Sheets

- Skill sheets submitted (Jan – Mar)
- Skill sheets submitted (Apr – June)
- Skill sheets submitted (July – Sept)
- Skill sheets submitted (Oct – Dec)

System Recertification Every 2 Years

- Written Exam Score: ___________

Reviewed 1/06
# QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
## POLICY AND PROCEDURE

### SKILLS MAINTENANCE LOG

<table>
<thead>
<tr>
<th>Name:</th>
<th>Month</th>
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<table>
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<tr>
<th>Date</th>
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<th>Skills Performed (use code below)</th>
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### INTUBATIONS

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<th>Number of Attempts</th>
<th>Successful Yes OR No</th>
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1. Endotracheal Intubation
2. Nasal Intubation
3. Digital Intubation
4. Sternal IO
5. Needle Cricothyrotomy
6. Melker Cricothyrotomy
7. Ventilator
8. BVM
9. Suction
10. Combitube
11. Suction
12. IV Access
13. Intraosseous Needle Placement
14. Medication Administration
15. CPR
16. Defibrillation
17. Pacing
18. Rhythm Interpretation
19. Other
20. LMA

1/04, re: 1/05
Reviewed 1/06
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE

SEMSV MEDICAL DIRECTOR

I. Definition: A physician who has been appointed by the SEMSV program who has the responsibility and authority for total management of the SEMSV program subject to the requirements of the Quincy Area EMS System. He/she is responsible for setting the standards of and coordinating the activities of the SEMSV aeromedical program.

II. Duties:

A. Create policies/procedures to be utilized by aeromedical crews in the field and interhospital settings.

B. Review credentials of all potential aeromedical crew members and designate approval for them to function with the System.

C. Oversee continuing education training and maintenance of records.

D. Sets minimum standards for credentials and continuing education for aeromedical crews, working in accordance with the rules and regulations set forth by the Illinois Department of Public Health.

E. Medical legal responsibility for RNs and paramedics functioning as a part of the aeromedical program.

F. Oversee quality assurance and improvement activities for the aeromedical program.

G. Act as a resource for professionals, administration and the public with regard to the aeromedical program.

III. Qualifications:

A. A physician who is a graduate of an approved accredited medical school licensed by the State of Illinois.

B. Educational experience in those areas of medicine that are commensurate with the mission statement of the medical service (or will utilize specialty physicians as consultants when appropriate.)

C. Training and experience in Advanced Cardiac Life Support (ACLS) such as the American Heart Association’s ACLS course or equivalent education.

D. Training and experience in Pediatric Advanced Life Support such as the American Heart Association’s PALS course or equivalent education.

E. Training and experience in Advanced Trauma Life Support (ATLS), such as the American College of Surgeons ATLS course or equivalent education.
F. Experience and knowledge in inflight treatment modalities.

G. Experience and knowledge in altitude physiology.

H. Experience and knowledge in infection control as it relates to airborne and intra-facility transportation.

I. Experience and knowledge in stress management techniques.

J. Demonstrate leadership and initiative.

K. Demonstrate a willingness to further his own education in areas of emergency care and aeromedical transport.

L. Demonstrate the ability to teach and instruct nursing and paramedic crew members.

IV. Interaction with the System EMS Medical Director

A. If the Medical Director positions are filled by two different persons, they shall collaborate on policies, procedures, quality assurance and improvement activities as well as disciplinary measures.
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE

EQUIPMENT/MEDICATION VERIFICATION

I. Purpose: To verify that all required equipment/medications are available on the aircraft.

A. Weekly inspections and inventory
   1. Checklists
      a) A daily checklist that will include all equipment on Policy SEM 5 and all medications listed on Policy SEM 6 will be completed. Copies of the checklist will be maintained and forwarded to the EMS Office if requested.
   2. Deficiencies:
      a) Identified deficiencies are to be immediately corrected.
      b) If correction is beyond the capability of the duty crew, the deficiency will be noted on a written report and deferred to the appropriate authority for correction.
      c) Variances will be documented and an EMS System Event Report (PS-3.1F) will be filed with the EMS System Coordinator.

B. Oxygen: All oxygen tank levels are to be checked daily by the on duty flight crew. Tank levels will be documented on a written report.

C. Medications:
   1. Medications will be checked for outdates on the 1st and the 15th of each month.
   2. Medications will be replaced if they will outdate prior to the next check.
   3. Narcotics:
      a) A narcotic count will be performed at each change of shift by the nurse coming on duty with the nurse going off duty.
      b) Variances will be documented and an EMS System Event Report (PS-3.1F) will be filed with the EMS System Coordinator.

Kelly Cox, M.D., SEMSV Medical Director
re: 2/02, 9/03, 5/04
Reviewed 1/06
The following equipment is required for medical helicopters functioning within the Quincy Area EMS System. All medical equipment/supplies are to be secured and/or restrained in the aircraft.

**Communications:**
- Equipment for internal communications and external communications to Medical Control, flight operations center, air traffic control and law enforcement. Documented flight communications every 15 minutes.
- Illinois Patient Care Report forms or *electronic PCR*
- Protocol manual (*paper or electronic*)

**Cardiac Equipment**
- Cardiac monitor with defibrillation, synchronized cardioversion, 12 lead EKG, and transcutaneous pacing capabilities. *(adjustable for all ages)*
- Extra batteries for monitor
- Monitoring electrodes for adult and pediatric
- Pacing pads or Quick Combo pads

**Airway/Oxygenation Equipment**
- Oropharyngeal airways – pediatric - adult
- Nasopharyngeal airways – pediatric - adult
- Laryngoscope handle and blades suitable for infant through adult
- Endotracheal tubes in sizes 2.5 – 4.5 uncuffed with stylets
- Endotracheal tubes in sizes 5.0 – 7.5 cuffed with stylets
- Endotracheal tube holders: pediatric and adult
- Two sources of oxygen – one must be portable (with regulators capable of achieving up to at least 15 LPM)
- Oxygen extension tubing
- Nasal cannulas: infant, pediatric, adult
- Non-rebreather masks: infant, pediatric, adult
- Pocket mask with one way valve
- Bag valve masks: pediatric and adult
- Mechanical ventilator
- Two suction sources: one must be portable
- Rigid tonsil tip suction catheters
- Flexible suction catheters in sizes 10Fr – 18 Fr
- Suction extension tubing
- Magill forceps
- Needle cricothyotomy kit *or* 10 ga angiocath
- Surgical cricothyotomy kit *(adult and ped)*
- King *Airway* 2, 2.5, 3, 4, 5 *w/60cc leur lock syringe*
- LMA’s sizes 1-3
- Pneumo kit
- Trach mask
- Stat cap or equivalent
- *Meconium device*
- *Bougie*
**IV Therapy Equipment**
- Intravenous pump with adjustable rates for appropriate age groups
- IV fluids
- IV angiocaths/over the needle catheters (24 up to 14 gauges)
- IV butterfly set
- IV administrations sets
- Saline lock sets
- Tourniquets
- IV veniguards or tape
- IV pressure bags (2 min.)
- Three way stopcocks
- IV fluid warmer
- EZ-IO infusion device – Adult & Peds minimum
- Umbilical kit (uvc)

**Assessment Equipment**
- Stethoscope
- Blood pressure cuffs in sizes infant, pediatric, adult and large adult
- Automatic blood pressure monitor
- Invasive pressure monitor
- Pulse oximeter (for all ages)
- End tidal CO2 monitor (electronic or chemical – for all ages)
- Doppler (dual capacity to hear fetal heart tones/blood pressure
- Glucometer/test strips

**Dressing/Splints/Immobilization Equipment**
- 4X4 gauze pads
- Trauma dressings
- ABD pads
- Bandage rolls
- Vaseline gauze
- Triangular bandages
- Tape
- Splints suitable for upper and lower extremities
- Traction splint
- Cervical collars: pediatric and adult sizes
- Cervical spine immobilization equipment
- Burn sheets

**Medication Administration Equipment**
- Drug box: to include all medications on medication list
- Needles: variety, including filter needles
- Syringes: 1cc, 3cc, 10cc or 12cc, 20cc
- Carpuject/Tubex
- Sharps container
- Broselow tape or pediatric dosing/sizing chart (newest version)
- Alcohol prep pads
- Bandaids
- Nebulizer kits
Other

- Emesis bags or basins
- BSI equipment: gloves, goggles, face shields or masks
- Nasogastric tubes: (12, 14, 16 & 18 Fr)
- 60 cc slip tip syringe
- Water based lubricant
- Scissors/Shears
- Restraints
- Ear plugs
- OB kit
- Bulb syringe
- Survival kit: (Should include two sources of heat/fire, shelter/blanket, food and water supply, two forms of signaling devices, knife and fishing kit.)
- Electrical power source provided by an inverter or appropriate power source of sufficient output to meet the requirements of the complete specialized equipment package without compromising the operation of any electrical aircraft equipment.
- If the patient weighs less than 60 lbs (27kg) an appropriate (for height and weight) restraint device shall be used, which shall be secured by a devise approved by the Federal Aviation Administration (14 CRF 135).
- Stretcher: large enough to carry the 95th percentile adult, full length in supine position, rigid enough to support CPR and has the capability of raising the head 30°
- CAT tourniquet

Date of System Inspection: ________________________________________________________________

System Representative Signature: __________________________________________________________

6/01, 11/04, 9/05, 11/05, 1/06, 8/06, 7/09, 4/15
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<tr>
<td>Adenosine</td>
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<td>Aspirin</td>
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<td>Atropine</td>
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<td>Brethine (Terbutaline)</td>
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<td>Glucagon</td>
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<td>Labetalol (Trandate)</td>
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<td>Lasix (Furosemide)</td>
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QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE

SEMSV STAFFING

I. Purpose: to ensure appropriate aeromedical staffing of the aircraft.

II. Medical crew staffing pattern: All medical staff must meet the requirements found in SEM-1.

   A. Normal aeromedical crew staffing pattern will consist of 1 RN and 1 paramedic. Due to staffing issues; one RN and one PHRN will be permitted.

   B. A copy of the monthly aeromedical crew and pilot schedules will be submitted to the SEMSV Medical Director prior to the 1st day of each month for verification of appropriate staffing.

III. Pilot staffing pattern: four pilots will be dedicated per helicopter, excluding relief support.

   A. A copy of the monthly duty schedule for pilots will be submitted to the SEMSV Medical Director prior to the 1st day of each month for verification of appropriate staffing.

   B. The pilot must be physically present at the aircraft base to assure timely response.

IV. Crew quarters

   A. The pilot and medical crew will be provided with adequate space to carry out assigned duties as well as separate sleeping quarters.

Kelly Cox, M.D., SEMSV Medical Director

10/01
re: 9/03; 3/05
Reviewed 1/06
AEROMEDICAL SERVICE AREA AND RESPONSE

I. Seventy nautical miles around each base location.

II. Out of state response
   A. All scene responses to other states will be conducted in accordance with the laws, rules and regulations of that state as authorized through legal licensure in that state.
   B. All inter-facility transfers will be conducted in accordance with the laws, rules and regulations of that state as authorized through legal licensure in that state.

III. Back-Up:
   A. In the event a request for a flight is received when the primary SEMSV is unable to respond due to weather, maintenance or prior commitment to another transport, the following procedure will be followed:
      1) Aeromedical dispatch will notify the requesting agency of the primary SEMSV’s status.
      2) Aeromedical dispatch will advise the requesting agency of the next closest and available SEMSV as well as its ETA.
      3) Aeromedical dispatch will ask the requesting agency if they are requesting the alternate SEMSV to respond. If the answer is affirmative, aeromedical dispatch will take appropriate action on the request.

IV. Standby
   A. Upon aeromedical dispatch being notified that the SEMSV “MAY” be requested to respond to an emergency, the appropriate information shall be forwarded to the aeromedical crew.
      1) Aeromedical dispatch response:
         a) Aeromedical dispatch should advise the person/agency requesting standby of the importance of canceling this status as soon as possible.
         b) If a cancellation is not received or changed to a response status within thirty minutes of notification, aeromedical dispatch shall contact the requesting person/agency for an update on status of the emergency.
         c) If the aeromedical crew is placed on standby and an actual flight request is received, the flight request takes priority. Aeromedical dispatch must then notify the person/agency that had requested standby that the SEMSV will be responding to another confirmed flight request.
   B. Crew response
      1) The crew will prepare the aircraft for immediate launch and will proceed to launch should it be reasonable to do so.
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM
POLICY AND PROCEDURE

SEMSV NOTIFICATION OF LAPSE IN SERVICE

I. Purpose: to ensure notification of the appropriate persons/departments when the primary SEMSV aircraft is unavailable in excess of 24 hours.

II. Notification:

A. System Notification
   1) The on duty crew will notify the EMS System Coordinator, SEMSV Medical Director and the EMS Administrative Director when the aircraft will be out of service in excess of 24 hours. The following information must be provided:
      a) Reason
      b) Expected date of return to service
      c) Provisions made for a replacement vehicle

B. IDPH, Division of EMS and Highway Safety Notification
   1) The EMS System Coordinator will provide the information listed in A)1)abc via fax or e-mail to the Region 3 Coordinator.
   2) A copy of the e-mail or fax will be maintained on file in the System EMS Office.

Kelly Cox, M.D., SEMSV Medical Director
I. Accessing aeromedical dispatch:

A. Any agency or individual may access aeromedical dispatch through telephone number 1-800-247-3822.

B. Two way communications between the aircraft crew and aeromedical dispatch will be accommodated through standard wireless phone service when appropriate and/or direct radio communications on appropriate frequency.

II. Accessing Medical Control, receiving and referring agencies:

A. Designated Medical Control is Blessing Hospital. The flight crew is required to contact Medical Control when any of the following conditions exist:

1) Any variance from Standing Medical Orders or Standard Operating Procedures is considered.
2) A decision regarding where a patient is to be transported is required. (O-4)
3) Intervention by the Resource Hospital is indicated. (O-5)
4) A major EMS incident is declared.
5) A second and simultaneous request is received and a determination must be made as to which call to accept.
6) A physician is at the scene requesting medical responsibility for a patient (O-3)
7) A patient refusing care is incapable of making a rational or informed decision to refuse (O-6)
8) A patient is reported to have no blood pressure and/or no pulse and/or no respirations.
9) The patient meets the criteria for a mandatory notification of the trauma surgeon from the field, i.e., sustained hypotension on two consecutive measurements five minutes apart and/or cavity penetration of the torso or neck (O-22)

B. Alternate Medical Control Includes Illini Community Hospital in Pittsfield, Memorial Medical Center in Springfield, St. Johns Hospital in Springfield, and Heartland Regional Medical Center in Marion.

C. Communications between the aircraft crew and Medical Control, receiving and referring agencies will be via standard wireless phone service when appropriate and/or direct radio communication on MERCI frequency 155.340.

D. All radio communications and/or communications to the Resource Hospital on the dedicated phone line are taped and maintained for a minimum of three years.
SEMSV PATIENT CARE REVIEWS AND EVALUATION

I. SEMSV patient care reviews will be performed in accordance with the Quincy Area EMS System Plan. The review process including the criteria for review and all subsequent documentation shall be consistent with those policies in the Quincy Area EMS System plan approved by the Illinois Department of Public Health for such purposes.

II. Reviews will be conducted by the EMS System Coordinator. An assignment of appropriate, inappropriate or undetermined will be made for each review. Those reviews determined to be appropriate will be closed with no further action required. Those reviews found to be inappropriate or undetermined will be forward to the EMS Medical Director for final determination and disposition.

III. Actions taken based upon the final determination will be ordered by the EMS System Medical Director in include any of the following:

A. Remediation
B. Coaching/Counseling
C. Discipline
D. Commendation
E. No Action Indicated
F. Inclusion in Quarterly System Case Presentations

Kelly Cox, M.D., EMS Medical Director

2/02, 1/06
PILOT CREDENTIALS

I. Purpose: to ensure all pilots meet the requirements set forth below.

II. All pilots must meet the following criteria and have the following available upon request from the SEMSV Medical Director or his designee.

A. Documentation of compliance with subparts E and F of Air Taxi Operations and commercial Operators (14 CFR 134)

B. Documentation of a minimum 2000 rotorcraft flight hours as a pilot in command.

C. Documentation of factory school or equivalent ground and flight schooling.

D. Documentation of 5 hours of day and night area flight orientation of which two hours must be at night.

E. Documentation of special terrain flight orientation.

F. Documentation of training in the following:
   1) Judgment and decision making
   2) Local routine operating procedures, including day and night operations
   3) Flight by reference to instruments, including IMC recovery
   4) Regional area weather phenomena
   5) Area terrain hazards
   6) Scene procedures
   7) EMS System and SEMSV Program Communications requirements
   8) Orientation to each hospital/prehospital health care system affiliated with the SEMSV Program
   9) Crew Resource management training

G. The following documentation must be submitted to the EMS Office
   1) Pilot license
   2) Medical Certificate
   3) FAA form 8410-3
   4) I.O.E./Line Check
   5) Completion of Company Training Requirements (form 7/24/01)
   6) Pilot Annual Resume
   7) Flight Training Attendance Record (TR-7)
   8) Pilot Flight Duty Time (FAR 15.263/267/271)
I. Purpose: To maintain status as a fully licensed EMT-P and/or PHRN authorized to participate in the Quincy Area EMS System, and to remain eligible for relicensure every four years, the following requirements must be met.

II. Participation in 30 hours of approved continuing medical and aeromedical education per year. (120 hours in a 4 year period)

A. 16-hours in the 4 year period must be pediatric related programs.

B. 16-hours/4year period must be in topics pertaining to aeromedical, eight hours of which may include quality assurance reviews.
   1) Didactic topics include but are not limited to:
      a) Aviation safety issues
      b) State EMS Rules regarding ground and air transport
      c) Altitude Physiology/Stressors of flight
      d) Critical care issues
      e) Emergency care courses
      f) Hazardous materials recognition and response
      g) Infection Control
      h) Stress recognition and management
      i) Survival training
      j) Equipment reviews consistent with program scope and mission.

C. Other hours may be obtained by attendance at approved seminars, courses, or other educational programs, i.e. ACLS, BTLS, PHTLS, PALS, etc. (see Policy CET-1)

D. No more than 25% of total hours may be in the same subject.

III. Maintain current certification/credentials and provide documentation of each upon rectification for each of the following:

A. Paramedic or PHRN license

B. BLS

C. ACLS

D. BTLS/PHTLS

E. PALS/ENPC

F. NRP

G. TNS/TNCC (PHRN and RN only)
IV. Successful completion of a written and practical evaluation administered by the EMS office every 2 years.

A. The practical exam will consist of an ALS skill chosen by the EMS Medical Director.
B. A minimum score of 80% will be required for the written evaluation.

V. Demonstrate and maintain a high level of proficiency in all practical skills.

A. Paramedics/PHRN’s having low numbers of ALS patients and/or whose experiences indicate a below standard skill level may be required to participate in additional educational programs and/or clinical hours at the discretion of the EMS Medical Director. Clinical hours could include any of the following:
1) Surgery: Successful completion of a predetermined amount of intubations.
2) Emergency Department: Successful completion of a pre-determined amount of successful IV’s.
3) ALS ambulance: Successful completion of a pre-determined number of ALS calls.

VI. An EMT-P or PHRN whose license has expired but is within 60 days of the license expiration, may submit all relicensure material as required and a fee of $50.00 in the form of a certified check or money order. If all material is in order and there is no disciplinary action pending against the EMT-P/PHRN, the Department will relicense.

VII. Any EMT-P or PHRN whose license has expired for a period of more than 60 days shall be required to reapply for licensure, complete the training program and pass the test, and pay the fees required for initial licensure.

VIII. Any EMT-P or PHRN that is also functioning with a ground service will be required to meet any additional requirements for relicensure.

__________________________
Kelly Cox, M.D.
SEMSV Medical Director
TNS RECERTIFICATION GUIDELINES

To obtain recertification as a Trauma Nurse Specialist (TNS), the TNS will comply with the following guidelines:

I. Complete a TNS CE Summary Sheet by Category form
   A. List EACH trauma related CEUs obtained during the licensure period on the form under the appropriate category.
   B. Attach documentation to support EACH listing on the CE Summary Sheet. CEUs submitted without proper documentation will be denied.
   C. CE Summary Sheet forms may be obtained from the TNS Course Coordinator (TNSCC) or on-line at traumanurse.info
   D. Note: some Categories have MAXIMUM allowable hours. Hours submitted over maximum allowable hours for that category will be denied.
   E. Some courses do not carry TNS credit (i.e. INSTRUCTOR COURSES). Please consult the TNSCC for guidance.
   F. Seminar/Conferences containing medical and trauma topics will be awarded trauma CEUs according to the Seminar/Conference agenda and not the total CEUs listed on the certificate of completion. (Hours will be denied unless an agenda is provided.)

II. Submit completed/signed Child Support Statement with ALL information required by IDPH.

III. Submit required hours for renewal to the TNS Course Coordinator at least 40 days prior to expiration date.
   A. Number of hours required for renewal is listed on the renewal form.
   B. Incomplete CE Summary Sheet forms will be returned.
   C. $10.00 late fee will be assessed for packets submitted less than 14 days from date of TNS certification expiration.
   D. Late forms submitted will be subject to IDPH late fees as applicable.

Kelly Cox, MD, EMS Medical Director
CHANGE OF ADDRESS FORM

Purpose: To assure that proper communication by mail can be completed, all members of the Quincy Area EMS System must notify the EMS Office within 10 days of a change of address using the form below.

Complete the checklist below and submit to the Quincy Area EMS System Coordinator within 10 days of address change.

Date submitted: ______________

1. Name: ________________________
   (Last)  (Maiden *if applicable)  (First)  (Middle)

   Date of Birth: ____________  Sex: M  F  # of Years in EMS: _____

   Old Address: ________________________
   (Street)  (City)  (State)  (Zip)

   New Address: ________________________
   (Street)  (City)  (State)  (Zip)

   Phone #: ________________________
   (Home #)  (Work #)  (Cell phone #)  (Pager #)  (Fax #)

   Email: ________________________
   (Home email)  (Work email)

2. Provider Level:  EMTP  PHRN  ECRN  RN

   License #: ________________________  Expiration Date: ________________________

   Driver’s License #: ________________________  State: ________________________

   Social Security #: ________________________

3. Agency #1: ________________________  Agency #2: ________________________
QUINCY AREA EMS SYSTEM
SEMSV ADMINISTRATIVE PROTOCOLS

On-line Medical Control Patient Report or Clinical Contingency .........................ADM 001
Control of Emergency Medical Services at the Scene of an Emergency ..............ADM 002
Pre-hospital Trauma triage Considerations ............................................................ADM 003
Determination of Death/Termination of ACLS .....................................................ADM 004
Do not Resuscitate Orders in the Field ................................................................ADM 005
Hazardous Materials Response .............................................................................ADM 006
Neonatal Transports ............................................................................................ADM 007
Mass Casualty/disaster Responses ........................................................................ADM 008
Medical Effects of Altitude & Altitude Limitations ..............................................ADM 009
Patient Destination Determination ........................................................................ADM 010
EMTALA (Emergency Medical Transfer and Labor Act) .......................................ADM 011
Rendering Care to Company Employees ..............................................................ADM 012

Re: 1/2017
Purpose:
To define which actions need direct on-line medical control as it pertains to patient care.

Policy:
Written protocols or on-line medical control will guide patient care. All telephone/radio orders from Medical Control will be communicated directly to the Air Evac EMS, Inc. medical crewmembers.

1. **Primary (scene) flight:**
   a. Upon arrival at the scene, the patient will be assessed for any life threatening conditions, treated, and loaded into the helicopter.
   b. Medical Control will be established if advice on treatment or medication needed varies from the standard Air Evac EMS, Inc. protocols.
   c. All conversations with medical control must be through Air Evac EMS, Inc. Communication Center to assure these requests and orders are on a recorded line.

2. **Interfacility Transfer Flight:**
   a. The transferring physician is legally responsible for the patient until they are received by another physician. All transferring physician orders will be documented.
   b. In the event communications are not possible with the transferring physician, or significant concerns exist regarding the safety of transport:
      1. Refer to Company patient care protocols as applicable
      2. Air Evac Medical Direction may be obtained via the Central Communications Center
   c. All conversations with a physician must be through the Air Evac EMS, Inc. Communication Center to assure that these requests and orders are on a recorded line.

3. Medical Control must be established and orders must be received in order to terminate a code in a pre-hospital setting.

**Initiating Call to Provide Patient Report to a Receiving Facility.**
1. It is preferred that radio reports are called directly to the receiving facility by the flight crews in order to prevent the loss of information from third party relaying the information. In the event that radio contact cannot be established directly with the receiving facility, contact must be established with CenComm for the radio report relay.
2. Initial contact between the medical crew and the receiving hospital should occur approximately 20 minutes prior to arrival at designated destination or in accordance with local/regional and state guidelines.

3. Update of patient information needs to occur approximately 10 minutes prior to arrival with final patient update 2 minutes prior to arrival at designated destination.

**Clinical Contingency:**
In the event that the patient condition is considered imminently critical to the patient’s life or limb, there is no Air Evac EMS, Inc. medical protocol that adequately addresses the issue and a delay in medical control physician contact for guidance occurs, the following should be done:

1. Provide necessary, life saving care within the scope of professional practice and training, utilizing competent clinical judgment as expected by the Air Evac EMS, Inc. Medical Directors.
2. Continue attempts to establish communications with medical control via the Air Evac EMS Communications Center. A medical director is available to flight crews 24/7.
3. Please notify your Regional Educator if such a situation occurs.

**Notes:**
These protocols act as standing orders for procedures that may be performed by licensed medical crewmembers. These protocols do not limit the activity of a medical crewmember who is in direct contact with the medical control physician. Certain procedures and medications require physician consultation prior to performance of the procedure or administration of the medication. These procedures are noted in the individual protocols.

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One of the most difficult situations for the flight crew is that created by the arrival of a physician at the scene. A different set of responsibilities exists when that physician knows and has established a previous doctor-patient relationship with the patient as opposed to when no such relationship exists. Physicians who are part of the EMS system such as the service's medical advisor or on-line medical control physician are generally responsible for patient care.

**Physician Without Previous Doctor-Patient Relationship**

1. For a fully licensed physician who is not a part of the EMS system to assume control at the scene of an emergency, all of the following must take place:
   a. Proof of the physician's identity and current licensure must be provided to the senior flight crewmember.
   b. The on-line medical control physician must be notified and agree to relinquish control to the on-scene physician. This can usually best be accomplished by having the medical control physician speak directly with the physician at the scene.
   c. The physician at the scene must agree to sign his or her orders.

2. If control of the emergency is given to the on-scene physician, then the physician can only issue orders within the scope of training and practice of the flight crew.

3. Any orders or procedures outside of the flight crew's scope of practice will have to be carried out personally by the on-scene physician.

**Physician with Previous Doctor-Patient Relationship**

1. As a general rule, it is desirable that the flight crews called to the scene of an emergency, even within a physician’s office, perform an assessment and manage the patient just as would be done in any other location.

2. If the physician wishes to take control of the patient's management, he or she may do so if communication is established between on-line medical control and the physician at the scene.

3. If control of the emergency is assumed by the on-scene physician then:
   a. The physicians' license number will be recorded on the run report.
   b. Orders within the scope of training and practice of the flight crew will be carried out.
   c. Orders outside the scope of training and practice of the flight crew will be personally carried out by the on-scene physician.
   d. The on-scene physician will sign his or her orders.
e. The on-scene physician must accompany the patient in the ambulance to the hospital unless released by the on-line medical control physician.

Notes:
In a disaster or multi-casualty situation, then the on-scene physician should use his best judgment about whether or not to accompany the patient to the hospital. It may be appropriate to stay at the scene and tend to the patients remaining. Generally these decisions should be made in consultation with the medical control physician.

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12/2016
In cases of significant trauma, transport to a trauma center should be considered. Individual circumstances may demand flexibility and judgment on the part of the responsible medical crew. These guidelines are not to be construed as mandatory or all-inclusive.

Time, distance, patient condition, and regional and/or state guidelines, are extremely important variables to consider when triaging injured patients to hospitals.
1. Advanced cardiac life support must be started on all patients who are found apneic and pulseless, UNLESS:
   a. The emergency care providers are presented with a valid Do Not Resuscitate order as defined in the Do Not Resuscitate protocol, OR
   b. There is an injury that is obviously incompatible with life. Examples are decapitation or burned beyond recognition, OR

2. Once started, resuscitation efforts must be continued until the resuscitation is terminated by a physician.

3. When all of the following circumstances exist, advanced cardiac life support may be stopped prior to hospital arrival:
   a. There must be good contact between the flight crew unit and the medical control physician.
   b. There must have been early, successful endotracheal intubation and medication administration.
   c. There has NOT been any restoration of spontaneous circulation with a spontaneous palpable pulse for at least one five-minute period at any time during the resuscitation.
   d. The patient does NOT have spontaneous respiration, eye opening, motor response, or other continued neurologic activity at the time stopping resuscitation is contemplated.
   e. The cardiac rhythm is NOT persistent or recurrent ventricular fibrillation or ventricular tachycardia. If persistent or recurrent ventricular fibrillation or ventricular tachycardia is present, then resuscitative efforts should be continued until hospital arrival.
   f. All flight crews and the medical control physician must be in agreement concerning termination of ACLS.
   g. The cause of the cardiac arrest must be something other than drowning, hypothermia, acute airway obstruction, overdose, electrocution, or lightning strike.
   h. The medical control physician has determined that the patient is suffering from a terminal condition and should not be resuscitated and he orders that the resuscitation be terminated.

Notes:
1. The purpose behind the termination of ACLS in the field is to keep flight crew units in-service for emergencies instead of transporting non-salvageable patients under ACLS. This protocol provides a method for terminating ACLS in hopeless cases.
2. Rigor mortis takes a variable amount of time to begin depending upon the physical condition of the deceased prior to death as well as the temperature of the environment. The face and neck begin to stiffen between two and five hours after death. After seven to nine hours, rigor mortis will affect the arms and chest. By twelve hours after death rigor mortis is usually firmly established. Post-mortem lividity (the pooling of blood at the dependent portions of the body) will occur unless the victim has suffered a large blood loss. About one to two hours after death, lividity will begin and peak at about six hours.

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In the event any DNR order is presented to a Flight crew, first determine if:

1. **A valid E.M.S. D.N.R. Form EXISTS and is in effect.**
   a. If the flight crew believes the **E.M.S. DNR order** is valid, there is no need to commence CPR. Medical control contact is not mandatory in this setting, however contact may be initiated at the Flight crew’s discretion.
   b. If the flight crew has any question of validity, **medical control MUST be contacted**. The flight crew need not comply with the DNR (and may commence CPR), while contacting medical control, unless and until a physician has verbally authorized compliance. Such authorization shall be documented by the flight crews in the run report.

2. **A valid E.M.S. D.N.R. Form DOES NOT EXIST.**
   a. Start CPR, if indicated per the “Determination of death / Termination of ACLS” protocol.
   b. All home care Do Not Resuscitate (DNR) orders must be dated and signed by the patient and at least two witnesses.
      i) Home care DNRs shall not expire unless the document specifies a time for expiration. If the patient lacks capacity to make informed health care decisions on the date the DNR would expire, then the DNR shall continue in effect until the patient regains the capacity to make informed health care decisions for himself.
   c. DNRs set forth in long-term care facility medical records shall be signed by the attending physician and dated.
      i) DNRs set forth in long-term care facility medical records shall not expire unless the document specifies a time for expiration. If the patient lacks capacity to make informed health care decisions on the date the DNR would expire, then the DNR shall continue in effect until the patient regains the capacity to make informed health care decisions for himself.
   d. A DNR may be honored in accordance with the provisions of this protocol where it is determined that the patient is in a terminal condition and the patient is no longer capable of making informed decisions.
   e. A DNR may not be honored where the patient is pregnant, where withholding CPR would terminate the pregnancy, and where it is probable that the fetus will develop to the point of live birth if treatment is provided.
   f. A DNR signed by both parents of a minor child or by the spouse of a patient in a terminal condition who is no longer able to make informed decisions, and signed by two witnesses, may be honored.
   g. If the flight crew believes a DNR is valid, there is no need to commence CPR while waiting for physician orders. If the flight crew has any doubt, the flight crew need not comply with the DNR (and may commence CPR) unless and until a physician has
verbally authorized compliance. Such authorization shall be documented by the flight crews in the run report.

3. In the case of any doubt or reservation as to the validity or authenticity of any DNR, and absent authorization by a base hospital physician, EMS medical director, family physician or physician on the scene to withhold CPR, the flight crew shall provide CPR to the patient and shall document the reasons for not complying with the DNR.

4. In the event resuscitation is initiated on a patient and then a DNR order of any type is subsequently identified, resuscitation may be terminated in compliance with that DNR upon specific verbal authorization from a base hospital physician, EMS medical director, family physician, or physician on the scene. Documentation shall include the events that happened set forth in chronological order, including the authorization to stop CPR in the field. In the event a DNR is identified after a patient has been intubated, the tube shall not be removed in the prehospital setting. If the initial resuscitation has restored cardiac rhythm, the patient should be transported to the nearest appropriate medical facility with no further procedures or pharmacological measures undertaken, except by authorization from the base hospital physician, medical advisor, or attending physician. Communication with a physician should be established.

5. Physical DNR documents shall be attached, if at all possible, to the medical record.

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12/2016
Protocol: ADM 006
Title: Hazardous Materials Response
Effective Date: 8-05
Revision Date: 1-07  Revision Number: 1
Reviewed: 3-16

Prehospital:
1. Pre-Arrival
   a. Dispatch should notify crew of possible hazardous material involvement.
   b. Attempts should be made to identify the substance.
   c. Dispatch should attempt to provide the crew with pre-arrival information through Poison Control or CHEMTREC.
   d. The crew should review information in the Emergency Response Guide if possible.
   e. Contact should be made as early as possible with ground units to obtain landing instructions.
   f. Flight crew should ensure that the landing zone is upwind, uphill and a significant distance from the source of the hazardous materials.
   g. NO ONE on the ground should be permitted to approach the aircraft as all persons should be considered contaminated until proven otherwise.

2. On scene
   a. The crew should make immediate contact with the Incident Commander or his designee to determine the specific type of incident.
   b. Prior to the medical crew receiving the patient, the patient must be decontaminated by the HazMat team at the incident. The medical crew should work collectively with the incident commander to assure adequate decontamination occurs prior to crew acceptance of the patient. DO NOT transport belongings, clothing or other potentially contaminated articles with the patient.
   c. The crew/transport vehicle will be properly protected as determined by the crew, the incident commander, the HazMat team and using all other available information. All protection will be in place prior to receiving the patient.
   d. Keep in mind that even minor contaminations (gas, diesel, etc.) have serious implications when in a confined space such as an aircraft.
   e. An attempt should be made to obtain MSDS forms, bills of lading, etc. that provide information on the specific material involved.
   f. The crew will not at any time, enter an area designated anything other than “safe” by the Hazmat team on scene.
   g. If the situation begins to change, affecting crew safety, the aircraft and crew should immediately depart and orbit away from the area until a safe area is reestablished.
   h. Ensure prior to departure that no crewmember, piece of equipment or aircraft is considered contaminated.
Inter-facility:

1. Pre-arrival
   a. The crew should be notified of possible Hazmat involvement
   b. The crew should contact the sending facility as soon as possible to obtain landing instructions as this may differ from the normal.
   c. The crew should attempt to gain as much information en route about the offending agent through Poison Control, CHEMTREC, etc.

2. On Scene:
   a. Prior to entry the crew should ensure that the sending facility and sending department are not considered contaminated.
   b. The crew should ensure that the patient has been decontaminated according to OSHA and CHEMTREC specifications prior to approaching the patient.
   c. The crew should ensure that there are printed information sheets on the known agent, specifying agent type, decontamination considerations, affect on the human body and treatment guidelines. These forms are to be transported with the patient and crew and a copy left with the receiving facility. A copy of these should also accompany the patient’s chart and be kept with the base paperwork.
   d. The crew should contact the receiving facility prior to departure to ensure that they are aware of the patient’s condition and are prepared for possible isolation of the patient.
   e. The crew has the right to refuse transport if at any time their safety or well-being is in question.
   f. A patient who has been contaminated with an unknown substance is not a candidate for air transport.

3. Any special medication or treatment required should be obtained from the sending facility, if available, with written orders for use from the sending physician.

4. Post Departure
   a. If at any time the crew begins to feel effects of possible contamination, the aircraft is to be immediately landed.
   b. If the patient deteriorates en route, extreme caution should be used when a decision to divert to another facility is made. Any facility diverted to should be given an early warning of the patient’s condition and mechanism of injury (hazmat) and be allowed to decide if they are able to accept and stabilize that patient.
   c. The receiving facility should be notified as early as possible of arrival
   d. Instructions as to patient isolation should be obtained prior to arrival.

The aircraft should be placed out of service and thoroughly cleaned post-transport, regardless of patient decontamination status.

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Neonatal transports are defined, by Air Evac EMS, Inc., as any infant delivered full term that is less than 28 days of age, has not been discharged from the hospital and are in need of an interfacility transport for cardiac anomalies or any disease process that requires the use of an isolette.

**We DO NOT transfer neonatal patients as defined in this protocol.**

**Note:**
Infants that have been discharged from the hospital and have since returned and are in need of transport are considered Pediatric Transports.

In the event the size, age, or condition of the patient presents a concern of capability to complete the mission, the flight may be declined.

**Reminder:**
Any primary requests will be transported regardless of size, age, or condition.
Protocol: ADM 008
Title: Mass Casualty/ Disaster Response
Effective Date: 8-05
Revision Date: N/A Revision Number: N/A
Reviewed: 3-16

Prehospital Response with Incident Command in Place

1. **Pre-arrival**
   a. Dispatch should obtain appropriate frequency for contact, as this may be different in a large incident than in ordinary response.
   b. Radio call sign should be obtained for the Incident Commander or Transport Office that the crew is to report to.
   c. The crew should ensure that their landing zone is a designated landing zone, rather than simply a location nearest the patient.

2. **On Scene**
   a. Upon landing, the crew should immediately report to the Incident Commander or his designee (Transport Officer, Triage Office, etc.)
   b. Upon landing, the crew should assign one individual to guard the landing zone and block any unauthorized approach to the aircraft.
   c. Upon landing, the crew should immediately attempt to obtain an estimated number of casualties and number of air ambulances needed, as this number could have easily changed since the initial call was made to dispatch.
   d. Prior to departure, the crew should inform the Transport Officer of their ETA to the closest appropriate facility, and enquire as to whether they should immediately return to the scene for additional transports.
   e. The Crew should assure that the receiving facility has been notified of:
      - The mass-casualty or disaster
      - The transport of their patient to that facility

3. **Post Departure**
   a. At the earliest possible time, the crew should contact the receiving facility with patient report and obtain instructions for landing and unloading, as this may greatly differ from the norm in a disaster.
   b. Contact should be made by the crew or by dispatch after arrival at the receiving facility to ensure that the casualty count has not changed, and that the return of the aircraft to the scene is/is not needed.
   c. If the aircraft is to return to the scene, an effort should be made to update the Incident Commander on the aircraft’s return ETA.

**Prehospital Response with No Incident Command in Place**

1. **Pre-Arrival**
   a. The crew should attempt by all means possible to gain communication with any ground units on scene.
   b. If units are on scene, but no specific command structure is evident, the crew should specifically request to speak to the incident commander to prompt the organization of a command structure.
c. If no designated landing zone is established:
   ▪ The crew should use their best judgment as to land or orbit the scene.
   ▪ If landing is necessary, it should be sufficiently far enough from the scene to prevent unauthorized approach of the aircraft.
   ▪ As quickly as possible, the landing zone should be secured, and someone assigned to prevent unauthorized approach to the aircraft.

2. **On Scene**
   a. The crew should divide, quickly covering as much of the area as possible to initiate triage and attempt to prompt the creation of a command structure.
   b. As soon as number and severity of injuries are evident, dispatch should be notified and instructed to relay information to the appropriate emergency response agencies, and to the necessary hospitals and respond further air ambulances as needed.
   c. As soon as anyone of authority (fire chief, EMS supervisor, etc.) arrives, as report on number and severity of injuries should be made and command turned over to this individual.
   d. As guided by incident command or crew triage, the most severely injured and readily accessible patients should be transported by air.

3. **Post Departure**
   a. See Post Departure in Section 1.

**Inter-facility Transfer During Mass Casualty**

1. **Pre-arrival**
   a. Obtain landing and loading instructions from the sending hospital as early as possible.

2. **On-scene**
   a. Ensure that no further air ambulance response is needed.
   b. Ensure that the receiving facility is aware of the transfer.
   c. Ensure that no relevant COBRA laws will be violated
   d. Provide the sending facility with an ETA to the receiving facility and ensure that a return of the aircraft to the sending facility will/will not be needed.

3. **Post Departure**
   a. See Post Departure in Section 1
Preflight assessment of all patients should include the consideration for any potential problems arising from the effects of altitude on human physiology. Anticipate problems before they arise. A few extra minutes on the ground ensuring proper and safe preparation of a patient for air transport will enhance the safety of the flight and in return prevent the development of untoward patient complications.

**Altitude Limitations:**

Higher altitudes have an increased adverse effect on the following group of patients. Transport altitude should be maintained at the lowest safe and appropriate level, preferably less than 2000ft AGL. The specific altitude level decision should be made in conjunction with the pilot who has the final decision on altitude.

1. Ischemic cardiovascular disease
2. Pulmonary compromise or failure
3. Pneumothorax
4. Anemia or hemorrhage
5. Dysbarism
6. Air embolism
7. Pregnancy
8. Head Injuries

**Medical Effects of Altitude**

1) The effects of altitude on the body’s systems should always be considered during air transport. These effects can affect the flight crew as well as the patient.

2) General symptoms include fatigue, insomnia, anorexia, thirst, drowsiness, dehydration and altered mental status.

3) Cardiac/respiratory symptoms include chest pain, breathlessness or Cheyne-Stokes respirations, cyanosis, dysrhythmias, pulmonary edema, blood pressure alterations and increases in HR and RR.

4) Musculoskeletal symptoms include weakness, stiffness and poor coordination.

5) Gastrointestinal symptoms include nausea, vomiting, diarrhea, abdominal cramps, indigestion and gas.

6) Neurological symptoms include headache, visual changes, confusion, psychosis, hallucinations, dizziness and memory loss.

7) ENT symptoms include sinus pain or bleeding, tooth pain during decompression, as well as “ear squeeze.”
Stressors of Flight

1) Decrease in partial pressure of gases: Barometric pressure (total pressure of all gases in the air) decreases as altitude increases.
   a. Decreases in the barometric pressure can lead to hypoxia. Factors include altitude, rate of ascent, duration of exposure, and individual tolerance. (i.e., illness, fatigue, hypoglycemia, alcohol, drugs and smoking.)
   b. Flight Considerations
      i. A thorough respiratory assessment prior to lift off is essential. Assess breath sounds, color, tidal volume, capillary refill rate, use of accessory muscles, LOC and the presence of cyanosis.
      ii. Supplemental oxygen should be applied to maintain SpO2 94-99%.
      iii. All cardiac patients have the potential for compromised cardiac output and will be susceptible to hypoxia from high altitude.
      iv. Supplemental oxygen should be considered in patients with eye injuries. An increase in altitude will produce dilation of the retinal vessels and will lead to an increase in vascular volume with a resultant increase in the intraocular pressure.
      v. Head injured patients are susceptible to increased ICP associated with hypoxia.
      vi. Supplemental oxygen should be considered in obstetric patients with fetal distress and/or premature labor.

2) Boyle’s Law: The pressure and volume of an enclosed gas are inversely proportional. Therefore, with an increase in altitude, which causes a decrease in barometric pressure, a mass of gas will expand.
   a. Patient Considerations
      i. Pneumothorax
         1. In multiple trauma patients, consider chest x-ray prior to flight to evaluate for a pneumothorax. The amount of air in the pleural space will increase with altitude and should therefore be evacuated prior to air transport with chest tube insertion whenever possible.
      ii. Bowel Obstruction
         1. Gas within the stomach and in the intestinal tract will expand. OG/NG tubes should be inserted and left open to air. If gas is trapped within the intestine between two points of obstruction, altitude must be maintained at a low level.
      iii. Skull fracture
         1. Be alert to the development of complications associated with free air inside the skull and keep altitude to a minimum.
      iv. Congested sinuses
         1. Maintain low altitudes with slow ascents and descents. Flight crewmembers should not fly with a cold or any type of ear problem.
      v. Plugged Eustachian tubes
         1. Attempt to relieve with the valsalva maneuver or by swallowing, yawning or tensing the muscles in the throat.
vi. Bends
1. Described as the release of excess nitrogen from the blood. Gases are distributed throughout the body in proportions that depend on partial pressure of the inert gas and its solubility in water, body solutions and fat. These bubbles of nitrogen will enlarge with altitude. Altitude must be kept at or below 500 feet; 100% oxygen is required.

vii. Air splints
1. The gas volume within the splint or pants will increase with ascending altitude and decrease with descending altitude. The increased pressure can result in a tourniquet effect. Monitor blood pressure, proximal and distal pulses, sensation, movement, pain and capillary refill.

viii. Colostomy
1. Air expansion stimulates GI motility. Deflate bag frequently during transport.

ix. IV bottles
1. With glass bottles, air expansion will significantly affect the drip rate. It is advisable to use plastic bags when able. Always keep the drip chamber half full. Utilization of pressure bags is helpful when decreased pressure prevents a steady flow.

x. Dental work
1. Due to the possibility of trapped air, crewmembers should not fly for 24 hours post dental procedures.

xi. Endotracheal tube, Foley catheters:
1. If the balloons or cuffs on any of these devices are filled with air they could undergo changes similar to those outlined for air splints as listed above. Monitor their pressure to ensure a physiologic seal.

3) Vibration
a. Consistent vibration is a reality in helicopter EMS operations.
   i. Vibration may interfere with non-invasive blood pressure monitor functions and the ability to palpate pulses.
   ii. Traction devices cannot have dangling weights

4) Decreases in humidity
a. When the atmospheric pressure decreases, the air becomes drier. In colder temperatures, the moisture content in the air is lower. As the relative humidity decreases:
   i. ET tubes will plug more easily, especially in pediatric patients with small diameter tubes.

5) Drug Potentiation
a. CNS depressants and narcotics are potentiated at higher altitudes because of hypoxia.
   b. Antihistamines make the patient and flight crew more susceptible to hypoxia
   c. Alcohol will make a patient more susceptible to disorientation and hypoxia. Remember that it takes an additional supply of oxygen to metabolize alcohol and alcohol commonly acts as a respiratory depressant.
6) Noise
   a. Hearing protection is required for the crew and patient due to the aircraft’s interior and exterior noise level.

7) Nausea
   a. Flying may cause the patient to develop airsickness with symptoms of headache, stomach awareness, pallor, perspiration, nausea and vomiting.

8) Thermal Effects
   a. Temperature decreases with altitude
      i. Consider the chill factor associated with increase in altitude.
      ii. Thermoregulation interventions should be implemented to maintain normothermia.

9) Fatigue
   a. Fatigue can be described as the sum total of all “stressors of flight.”
   b. Fatigue increases in illness, poor nutrition and times of too little rest. It is imperative for the flight crew to keep in good physical health based on these factors.

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12/2016
Purpose:
To determine the appropriate destination of patients.

Protocol:
Patients will be transported to the appropriate facility from a pre-hospital setting.

1. Pre-Hospital Patients
   transport destination will be determined by one of the following in priority order:
   a. Transport to hospital of patient choice if it is appropriate for patient’s care.
   b. If the pre-hospital caregivers have established medical control, transport patient to that hospital unless instructed otherwise by the hospital.
   c. If the pre-hospital caregivers have established no medical control, the flight crew/team will transport patient to closest appropriate facility.
   d. Transport patient to closest appropriate facility.
   e. Follow state guidelines for determining destination where established.
   f. Other pre-hospital patient categories.

2. Neonates
   a. If viability of infant is questionable and mother is in need of medical attention as well, attempt to transfer infant to hospital that could accommodate both mother and infant.
   b. If mother is not in need of medical attention, she will not be allowed to accompany the patient on the Air Evac EMS, Inc. Helicopter.

3. Burns
   a. Follow ATLS guidelines to determine if patient should go to a burn center, (i.e. >20% BSA 2°)
   b. Children 16 and under go to closest pediatric trauma center or burn center.
   c. Patients over 16: go to closest trauma center or burn center.

4. Trauma Code
   a. Closest trauma center if less than 20 minutes transport, if greater, take to the closest facility.

5. Medical Code
   a. Closest appropriate facility.
6. Hospital to Hospital Transports are as follows:
   a. Follow appropriate COBRA guidelines and regulations.
   b. Do not depart from the referring institution without a receiving institution and receiving physician notified. Assist the referring institution in determining a receiving facility if necessary.

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12/2016
EMTALA is a federal law which imposes legal duties upon hospitals, Hospital-owned ground/air ambulance and hospital-owned off campus facilities granting every person the right to emergency care.

**Interfacility Transfers**

A. A patient with an emergency medical condition (EMC), must have a medical screening exam and be stabilized at the referring facility, within the capabilities of that facility, including the provision of relevant specialty on-call services, and ancillary services.

B. If the patient is unstable at the time of transfer, the transfer may proceed at the patient’s request or upon certification by the physician that the benefits of transfer outweigh the risks.

C. There must be an accepting physician and availability at the receiving facility prior to leaving the transferring facility.

**NOTE:** A prearranged landing zone with a ground ambulance on a hospital helipad is acceptable as long as no assistance is requested from the hospital. If the patient receives treatment for stabilization, the patient becomes a patient of that emergency department and an appropriate Hospital to Hospital transfer must be arranged/
Administering care to another crew member must be done in the appropriate manner so as not to jeopardize patient care, your license/certification, or your employment.

In an effort to allow you to provide the necessary medical treatment, and reduce the risk to you and the organization, there are some steps that need to be followed in the event that you need to render medical care to a co-worker:

1. If you are in flight when another crew member becomes ill, notify the pilot immediately so that it can be determined whether or not it is necessary to land the aircraft and obtain ground transport for the sick crew member.

2. If a crew member’s medical condition is not an emergent one, the employee should contact their Program Director and take themselves out of service to seek appropriate medical attention.

3. If there is a patient onboard the aircraft when a crew member becomes ill, notify the pilot and dispatch immediately to determine the best way to safely transport the patient and sick employee. The following may be considered:
   a. Abort the flight and transport the patient and sick employee by ground; or
   b. If there are additional crew members available nearby, make an emergency landing and arrange to exchange crew so that both the sick employee and the patient can be transported safely.

4. If the sick employee’s condition is emergent, take care of them as you deem appropriate and safe under the circumstances.
   a. Once you initiate care, you must create a patient care report in Golden Hour so there is proper documentation of the care you delivered.
   b. Follow the appropriate patient care protocols for the condition you are addressing. Notify your medical director of the situation.
   c. Finally, you must immediately notify your Program Director of this action so he/she can make a determination on how to proceed with the ill crew member.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol:  APP A (RX 001 – RX 047)
Title:  Medication Formulary
Effective Date:  9-15
Revision Date:  N/A  Revision Number:  
Reviewed:  9-15

This page is intentionally left blank. Formulary pages follow.

Antony Wollaston, MD  Christopher R Solaro, MD, PHD
EMS Medical Director  Associate Medical Director

12/2016
### Protocol: APP B

**Title:** Approved Abbreviations

**Effective Date:** 3-08

**Revision Date:** 1-09, 3-16, 6-16, 8-16

**Revision Number:** 4

**Reviewed:** 8-16

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Name</th>
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<tbody>
<tr>
<td>AEL</td>
<td>Air Evac Lifeteam</td>
</tr>
<tr>
<td>AICD</td>
<td>Automatic Implantable Cardioverter-defibrillator</td>
</tr>
<tr>
<td>ATV</td>
<td>All-Terrain Vehicle</td>
</tr>
<tr>
<td>AV Paced</td>
<td>Atrial/ Ventricular Paced</td>
</tr>
<tr>
<td>BP</td>
<td>Blood Pressure</td>
</tr>
<tr>
<td>BVM</td>
<td>Bag Valve Mask</td>
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<tr>
<td>CAMTS</td>
<td>Commission on Accreditation of Medical transport Systems</td>
</tr>
<tr>
<td>Cap Wedge</td>
<td>Capillary Wedge Pressure</td>
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<tr>
<td>CENCOM</td>
<td>Central Communications</td>
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<tr>
<td>C-Collar</td>
<td>Cervical Collar</td>
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<tr>
<td>Ci</td>
<td>Cardiac Index</td>
</tr>
<tr>
<td>CID</td>
<td>Cervical Immobilization Device</td>
</tr>
<tr>
<td>cm H2O</td>
<td>Centimeter of Water</td>
</tr>
<tr>
<td>CPR</td>
<td>Cardio Pulmonary Resuscitation</td>
</tr>
<tr>
<td>CSM</td>
<td>Circulation, sensation, movement</td>
</tr>
<tr>
<td>CT</td>
<td>Computerized Tomography</td>
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<tr>
<td>CVP</td>
<td>Central Venous Pressure</td>
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<tr>
<td>DOB</td>
<td>Date of Birth</td>
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<tr>
<td>EBL</td>
<td>Estimated Blood Loss</td>
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<td>ECG</td>
<td>Electrocardiography</td>
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<td>ED</td>
<td>Emergency Department</td>
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<td>Elec</td>
<td>Electrical</td>
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<td>EMS</td>
<td>Emergency Medical Services</td>
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<td>ETCO2</td>
<td>End-tidal CO2</td>
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<tr>
<td>ETT</td>
<td>Endotracheal Tube</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
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<tr>
<td>--------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Final DP</td>
<td>Final Diastolic Pressure</td>
</tr>
<tr>
<td>FiO2</td>
<td>Fractional Inspired Oxygen</td>
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<tr>
<td>GAMUT</td>
<td>Ground and Air Medical Quality in Transport</td>
</tr>
<tr>
<td>GCS</td>
<td>Glasgow Coma Scale</td>
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<tr>
<td>GU</td>
<td>Genitourinary</td>
</tr>
<tr>
<td>HH Nebulizer</td>
<td>Hand-held Nebulizer</td>
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<tr>
<td>Hx</td>
<td>History</td>
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<tr>
<td>I/O</td>
<td>Intake and Output</td>
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<tr>
<td>I:E</td>
<td>Inspiratory/Expiratory Ratio</td>
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<tr>
<td>IABP</td>
<td>Intra Aortic Balloon Pump</td>
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<tr>
<td>IBW</td>
<td>Ideal Body Weight</td>
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<tr>
<td>ICP</td>
<td>Intracranial Pressure</td>
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<td>Initial DP</td>
<td>Initial Diastolic Pressure</td>
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<td>IV</td>
<td>Intravenous</td>
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<tr>
<td>IVF</td>
<td>Intravenous Fluid</td>
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<tr>
<td>JVD</td>
<td>Jugular Vein Distention</td>
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<tr>
<td>KED</td>
<td>Kendrick Extrication Device</td>
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<tr>
<td>KG</td>
<td>Kilogram</td>
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<tr>
<td>KVO</td>
<td>Keep Vein Open</td>
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<td>Lic. No.</td>
<td>License Number</td>
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<tr>
<td>LMP</td>
<td>Last Menstrual Period</td>
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<tr>
<td>LR</td>
<td>Lactated Ringers</td>
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<tr>
<td>MAP</td>
<td>Mean Airway Pressure</td>
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<td>MCM</td>
<td>Medical Crew Member</td>
</tr>
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<td>Med</td>
<td>Medication</td>
</tr>
<tr>
<td>MRI</td>
<td>Magnetic Resonance Imaging</td>
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<tr>
<td>NEMSIS</td>
<td>National EMS Information System</td>
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<tr>
<td>NGT</td>
<td>Nasogastric Tube</td>
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<tr>
<td>NIH</td>
<td>National Institute of Health</td>
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<tr>
<td>NS</td>
<td>Normal Saline</td>
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<tr>
<td>ORX3</td>
<td>Oriented</td>
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<tr>
<td>PEEP</td>
<td>Positive end-expiratory pressure</td>
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<tr>
<td>PELA</td>
<td>Pre-approved Landing Area</td>
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<tr>
<td>Abbreviation</td>
<td>Description</td>
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<td>--------------</td>
<td>-------------</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>PIP</td>
<td>Peak Inspiratory Pressure</td>
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<tr>
<td>PMH</td>
<td>Past Medical History / Previous Medical History</td>
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<tr>
<td>Pplat</td>
<td>Plateau Pressure</td>
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<tr>
<td>ppm</td>
<td>Parts per million</td>
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<tr>
<td>PTA</td>
<td>Prior to Arrival</td>
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<tr>
<td>Pulse Ox</td>
<td>Pulse Oximeter</td>
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<tr>
<td>RASS</td>
<td>Richmond Agitation Sedation Scale</td>
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<tr>
<td>Resp</td>
<td>Respiration</td>
</tr>
<tr>
<td>RN</td>
<td>Registered Nurse</td>
</tr>
<tr>
<td>RSI</td>
<td>Rapid Sequence Intubation</td>
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<tr>
<td>RTS</td>
<td>Revised Trauma Score</td>
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<tr>
<td>SPO2</td>
<td>Pulse Oximetry Oxygen Saturation</td>
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<td>SSN</td>
<td>Social Security Number</td>
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<td>SVT</td>
<td>Supraventricular Tachycardia</td>
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<tr>
<td>TBSA</td>
<td>Total Body Surface Area</td>
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<tr>
<td>TCO2</td>
<td>Transcutaneous measurement of carbon dioxide</td>
</tr>
<tr>
<td>TV</td>
<td>Tidal Volume</td>
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<tr>
<td>UTV</td>
<td>Utility Task Vehicle</td>
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**Units Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>IU</td>
<td>International Dose</td>
</tr>
<tr>
<td>IU/hr</td>
<td>International Dose per hour</td>
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<tr>
<td>TKO</td>
<td>To Keep Open</td>
</tr>
<tr>
<td>U/cc</td>
<td>Units per cubic centimeter</td>
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<tr>
<td>U/kg</td>
<td>Units per kilogram</td>
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<tr>
<td>U/kg/hr</td>
<td>Units per kilogram per hour</td>
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<tr>
<td>U/min</td>
<td>Units per minute</td>
</tr>
<tr>
<td>amp</td>
<td>Ampule</td>
</tr>
<tr>
<td>cc</td>
<td>Cubic Centimeter</td>
</tr>
<tr>
<td>cc/hr</td>
<td>Cubic Centimeter per hour</td>
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<tr>
<td>cc/kg</td>
<td>Cubic centimeter per kilogram</td>
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<tr>
<td>cc/min</td>
<td>cubic centimeter per minute</td>
</tr>
<tr>
<td>g</td>
<td>gram</td>
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<tr>
<td>g/hr</td>
<td>gram per hour</td>
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<tr>
<td>g/kg</td>
<td>gram per kilogram</td>
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<tr>
<td>g/kg/hr</td>
<td>gram per kilogram per hour</td>
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<tr>
<td>g/min</td>
<td>gram per minute</td>
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<tr>
<td>gm PE</td>
<td></td>
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<tr>
<td>gm/day</td>
<td>grams per day</td>
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</tbody>
</table>
gtts   drops
gtts/min  drops per minute
mEq  milliequivalent
mEq/hr  milliequivalent per hour
mEq/kg  milliequivalent per kilogram
mEq/kg/hr  milliequivalent per kilogram per hour
mEq/kg/min  milliequivalent per kilogram per minute
mEq/min  milliequivalent per minute
mEq/ml  milliequivalent per milliliter
mEq/ml/hr  milliequivalent per milliliter per hour
mcg  microgram
mcg/day  microgram per day
mcg/hr  microgram per hour
mcg/kg  microgram per kilogram
mcg/kg/hr  microgram per kilogram per hour
mcg/kg/min  microgram per kilogram per minute
mcg/min  microgram per minute
mg  milligram
mg/hr  milligram per hour
mg/kg  milligram per kilogram
mg/kg PE  milligram per kilogram Phenytoin Sodium Equivalents
mg/kg/day  milligram per kilogram per day
mg/kg/dose  milligram per kilogram per dose
mg/kg/hr  milligram per kilogram per hour
mg/kg/min  milligram per kilogram per minute
mg/min  milligram
ml  milliliter
ml/hr  milliliter per hour
ml/kg/day  milliliter per kilogram per day
ml/kg/hr  milliliter per kilogram per hour
nebul  nebulized
oz  ounce
ppm  parts per million
tbsp  tablespoon
tsp  Teaspoon

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: APP C
Title: Approved Procedure List
Effective Date: 12-05
Revision Date: 8-08, 3-16  Revision Number: 2
Reviewed: 3-16

Procedures that may be performed without Medical Control include, but are not limited to, the following:

1. Intravenous Cannulation
2. Intraosseous Infusions
3. Needle and Surgical Cricothyrotomy
4. RSI – Rapid Sequence Intubation
5. Chest Decompression
6. Airway management to include:
   a. Nasopharyngeal Airway (NPA)
   b. Oropharyngeal Airway (OPA)
   c. Bag Valve Mask (BVM)
   d. Neonatal, pediatric and adult Oral Intubation
   e. Laryngeal Mask Airway (LMA)
   f. King Airway
7. Ventilator Management
8. Umbilical Vein Catheterization
9. Invasive pressure line set up and monitoring

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Formulary Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetaminophen (Tylenol)</td>
<td>RX 001</td>
</tr>
<tr>
<td>Acetylsalicylic acid aspirin (Bayer)</td>
<td>RX 002</td>
</tr>
<tr>
<td>Adenosine (Adenocard)</td>
<td>RX 003</td>
</tr>
<tr>
<td>Albuterol sulfate (Proventil, Ventolin)</td>
<td>RX 004</td>
</tr>
<tr>
<td>Amidorone (Cordarone, Nexterone)</td>
<td>RX 005</td>
</tr>
<tr>
<td>Atropine Sulfate</td>
<td>RX 006</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>RX 007</td>
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<tr>
<td>Calcium Gluconate</td>
<td>RX 008</td>
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<tr>
<td>Clopidogrel Bisulfate (Plavix)</td>
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<tr>
<td>Dextrose (50/o as D50 and 25/o as D25)</td>
<td>RX 010</td>
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<tr>
<td>Diazepam (Valium)</td>
<td>RX 011</td>
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<tr>
<td>Dilitazem (Cardizem)</td>
<td>RX 012</td>
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<tr>
<td>Diphenhydramine (Benadryl)</td>
<td>RX 013</td>
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<tr>
<td>Dopamine (Intropin)</td>
<td>RX 014</td>
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<tr>
<td>Epinephrine 1:1000 &amp; 1:10,000</td>
<td>RX 015</td>
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<tr>
<td>Etomidate (Amidate)</td>
<td>RX 016</td>
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<tr>
<td>Fentanyl (Sublimaze)</td>
<td>RX 017</td>
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<tr>
<td>Flumazenil (Romazicon)</td>
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<tr>
<td>Furosemide (Lasix)</td>
<td>RX 019</td>
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<tr>
<td>Glucagon</td>
<td>RX 020</td>
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<tr>
<td>Glucose (oral)</td>
<td>RX 021</td>
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<tr>
<td>Haloperidol (Haldol)</td>
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<td>Hydralazine (Aparesoline)</td>
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<td>Hydromorphone (Dilaudid)</td>
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<td>Hydroxocobalamin (Cyanokit)</td>
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<tr>
<td>Ipratropium Bromide (Atrovent)</td>
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<td>Ketamine HCL (Ketalar)</td>
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<td>Labetalol (Normodyne, Trandate)</td>
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<tr>
<td>Lidocaine 2/o Intravascular (Xylocaine)</td>
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<tr>
<td>Lorazepam (Ativan)</td>
<td>RX 030</td>
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</table>
Magnesium Sulfate .......................................................................................................... RX 031
Methylprednisolone (Solu-Medrol) ................................................................................... RX 032
Midazolam (Versed) .......................................................................................................... RX 033
Morphine Sulfate ............................................................................................................. . RX 034
Naloxone (Narcan) ............................................................................................................. RX 035
Nitroglycerin (Nitrolingual®, Nitromist®, Nitrostat®,
Nitroquick®, Tridil(IV infusion), Nitro-Bid®, Dermal) ........................................................ RX 036
Norepinephrine (Levophed) ............................................................................................... RX 037
Ondanetrol (Zofran) ........................................................................................................... RX 038
Phenylephrine 2o/o (Neosynephrine) ................................................................................... RX 039
Pralidoxime Chloride (2PAM) ........................................................................................... RX 040
Procainamide HCL (Pronestyl) .......................................................................................... RX 041
Sodium Bicarbonate ........................................................................................................... RX 042
Sodium Chloride 0.9% ....................................................................................................... RX 043
Succinylcholine Chloride (Anectine) ................................................................................. RX 044
Tranexamic Acid (Cyklokapron) ....................................................................................... RX 045
Vasopressin (Pitressin) ........................................................................................................ RX 046
Vecuronium..................................................................................................................... ... RX 047

Re: 1/2017
Acetaminophen (Tylenol)
Paramedic-Registered Nurse

Class
Non-narcotic analgesic, antipyretic

Action/Pharmacodynamics
Inhibits prostaglandin synthesis in the eNS and blocks pain impulses through peripheral action. Acts centrally on hypothalamic heat-regulating center producing peripheral vasodilation

Indications
Pain control, fever control

Contraindications
Active alcoholism, liver disease, viral hepatitis

Side Effects
Hypersensitivity reaction, Toxicity-Anorexia, nausea, vomiting, diaphoresis, fatigue, RUQ tenderness, elevated liver function tests

Pharmacokinetics
Route: PO/Rectal  Onset: 15-30 min  Peak: 1-1.5 hrs.  Duration: 4-6 hrs.

Dosage
Adult 325-650 mg Q 4-6 hrs or 1 gm 3-4 times/day  Maximum: 4 g/day
Pediatric (<12 yrs) 10-15 mg/kg q 6-8 hrs.  Maximum: 5 doses/24 hrs.

How Supplied
Elixir 160 mg/Sml
Tablet 500 mg
Suppository 130 mg
Acetylsalicylic acid, aspirin (Bayer)
Paramedic-Registered Nurse

Class
Anti-Platelet

Action/Pharmacodynamics
Inhibits platelet aggregation (and thereby, further clot formation).
This action results in an overall increase in survival from acute myocardial infarction.

Indications
Chest Pain - Uncertain Etiology
Acute Coronary Syndrome

Contraindications
Active gastrointestinal bleeding
History of aspirin allergy including angioedema and/or anaphylaxis
History of asthma with aspirin-induced exacerbation

Side Effects
Typically none from single EMSdosing. Rare instances of nausea or allergic reaction could be encountered. Treat allergic reaction per Protocol MED018
Anaphylaxis/Allergic Reactions.

Pharmacokinetics
Absorption in stomach and small intestine, with onset of action within 30 minutes and duration of action for several hours.

Dosage
Chest Pain - Uncertain Etiology - Adult
Acute Coronary Syndrome - Adult
324 OR 325 mg chewed by patient (hold if taken 324+mg within 6 hours

How Supplied
81 mg tablets
325 mg tablets
**Adenosine (Adenocard)**
**Paramedic - Registered Nurse**

**Class** Antiarrhythmic

**Action/Pharmacodynamics**
Slows impulse formation in SAnode and conduction time through AVnode.

**Indications**
Treatment of paroxysmal supraventricular tachycardia including Wolff-Parkinson-White.

**Contraindications**
Atrial fibrillation or flutter, second- or third-degree AVblock or sick sinus syndrome, ventricular tachycardia

**Side Effects**
Facial flushing, dyspnea, headache, nausea, light-headedness, chest pressure. May produce short-lasting heart block or asystole

**Pharmacokinetics**
Cardiac agent, diagnostic aid

**Dosage**

**Rapid IV Bolus**
Adults: 6 mg over 1-2 sec., if no effect 12 mg over 1-2 sec.; may repeat 12 mg in 1-2 min if no response
Children < 50 kg: 0.1 mg/kg (maximum 6 mg) over 1-2 sec., if no effect 0.2 mg/kg (maximum 12 mg) over 1-2 sec.; may repeat 0.2 mg/kg in 1-2 min if no response

**How Supplied**
Vial 3 mg/rnl
Albuterol sulfate (Proventil, Ventolin)
Paramedic-Nurse

Class Bronchodilator
Action/Pharmacodynamics
Stimulates beta2-adrenergic receptors, bronchial smooth muscle relaxation
Indications
Relief of bronchospasm due to reversible obstructive airway disease
Contraindications
With caution-HTN, cardiovascular disease, hyperthyroidism, diabetes mellitus
Side Effects
Headache, nausea, restlessness, nervousness, tremors, dizziness, insomnia, dry irritated mouth or throat
Pharmacokinetics
Inhalation Onset: 5-15 min. Peak: 2-4 hrs. Duration: 2-5 hrs.
Dosage-Nebulization
Adults: 2.5-05 mg via SVN; repeat as needed
Pediatric <12 years): 1.25 mg via SVN; repeat as needed
How Supplied
SOLN(NonINJ): 2.5 mg/ml,
AMIODORONE (CORDARONE, NEXTERONE)
Paramedic-Registered Nurse

Class III Anti-Dysrhythmic (Vaughn William Classification)
Action/Pharmacodynamics
Prolongs the cardiac action potential's refractory period, slowing conduction through the heart. Amiodarone also has secondary actions in the other three classifications of anti-dysrhythmics. Amiodarone blocks sodium channels (class I) which can prevent cardiac action potentials. It is a non-competitive anti-sympathetic (class II) which slows cardiac action potentials. Amiodarone also slows conduction through the cardiac atrioventricular (AV) node (class IV). In sum, all of these actions lead to slowing of conduction and prolongation of refractoriness in the cardiac conduction system.

Indications
Ventricular Fibrillation/Pulseless Ventricular Tachycardia (4G)
Tachycardia - Stable (SF)
Wide-Complex Tachycardia of Uncertain Type or
Monomorphic Ventricular Tachycardia (if heart rate ≥ 150 beats per minute with systolic BP ≥ 100 mmHg in adults)
Narrow-Complex Tachycardia (if heart rate ≥ 150 beats per minute with systolic BP ≥ 100 mmHg in adults) **OLMOrder Only
Tachycardia - Unstable (sG)
Post-Cardioversion of Ventricular Tachycardia
Premature Ventricular Contractions (sK)
Symptomatic Premature Ventricular Contractions (with BP < 100 mmHg in adults due to frequent non-conducted ventricular impulses and in absence of 2nd/3rd degree AVblocks)

Contraindications
2nd/3rd degree AVblocks (may induce asystole)
Bradydysrhythmias (may induce symptomatic hypotension)

Side Effects
Hypotension is the most common side effect, requiring treatment in less than 20% of patients (transient effect). Bradycardia and AV block may also result, requiring treatment in less than 10% of patients (transient effect). In a very rare circumstance, as with all anti-dysrhythmics which can have pro-dysrhythmic effects, torsades may result from excessive prolongation of the cardiac action potential. When indicated by protocol, the benefits of amiodarone administration exceed these risks of side effects.

Pharmacokinetics
Onset of action within 60 seconds after IV administration, with effects lasting up to 20-25 minutes.

Dosage
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)
(refractory to initial defibrillation attempt) 300 mg IVIOP. Repeat at 150 mg IVIOP in 5 minutes to maximum cumulative dose of 450 mg. Epinephrine 1 mg (1:10,000) IVIOP is to be given with every amiodarone administration.
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric
(refractory to initial defibrillation attempts) 5 rug/kg IVP/IOP in single dose.
Epinephrine 0.01 rug/kg (1:10,000, 0.1 mL/kg) IVP/IOP is to be given with every
amiodarone administration.
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult
(post return of sustained spontaneous circulation) 150 mg over 10 minutes (15
mg/minute or 0.3 mL/minute very slow IVP/IOP) If maximum cumulative
dose of 450 mg has not been achieved.
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric
(post return of sustained spontaneous circulation)
Tachycardia - Stable - Pediatric
(wide-complex tachycardia of uncertain type or monomorphic ventricular
tachycardia; narrow-complex tachycardia)
Tachycardia - Unstable - Pediatric
Premature Ventricular Contractions - Pediatric
Tachycardia - Stable - Adult - (wide-complex tachycardia of uncertain type -
standing order; monomorphic ventricular tachycardia - standing order;
narrow complex - **OLMC order only)
Tachycardia - Unstable - Adult (post cardioversion of ventricular tachycardia)
Premature Ventricular Contractions - Adult 150 mg over 10 minutes (15
mg/minute or 0.3 mL/minute very slow IVP/IOP)

How Supplied
150 mg/3 mL in vial, ampule, or pre-filled syringe.
150 mg/100 mL pre-mixed infusion.
ATROPINE SULFATE
Paramedic-Registered Nurse

Class
Parasympatholytic

Action/Pharmacodynamics
Blocks parasympathetic impulses to the heart via the vagus nerve. Atropine increases the rate of cardiac sinoatrial (SA) node discharges, enhances conduction through the atrioventricular (AV) node, and by increasing heart rate, increases the cardiac output and blood pressure. Additionally, in the treatment of indicated poisonings (organophosphates) atropine reverses muscarinic effects of acetylcholine, including diaphoresis, diarrhea, urination, bronchorrhea (secretions from the lower respiratory tract), emesis, lacrimation (tearing), and salivation. Atropine produces dilation of pupils by blocking stimulation of the ciliary muscle surrounding the pupils.

Indications
Bradycardia
Poisonings - General Management (Organophosphate)

Contraindications
None absolute in indicated situations.

Side Effects
Tachycardia (either supraventricular or ventricular), hypertension, palpitations, blurred vision due to pupillary dilation, photophobia, dry mouth.

Pharmacokinetics
Typical onset within 60 seconds given IV. Effects can persist in excess of 1 hour.

Dosage
Bradycardia - Symptomatic & Systolic BP < 100 mmHg
(Sinus, First Degree, 2nd Degree Type I) - Adult
In Non-Acute Coronary Syndrome, 0.5 mg IVP/IOP.
May repeat every 5 minutes to cumulative maximum dose of 3 mg
Bradycardia - Symptomatic & Systolic BP < 70 + (2 x age in years) mmHg
(Sinus, First Degree, 2nd Degree Type I) - Pediatric
Unresponsive to Epinephrine, 0.02 mg/kg IVP/IOP; minimum dose 0.1 mg
Max. single dose 0.5 mg
May repeat once.
Poisonings - General Management (Organophosphate) - Adult 2 mg IVP/IOP.
Use IVP for more severe presentation.
Repeat every 3-5 minutes if symptoms progress
Poisonings - General Management (Organophosphate) - Pediatric 0.05 mg/kg
IVP/IOP/IIM. Use IVP for more severe presentation.
Minimum dose 0.1 mg.

How Supplied
1 mg/10 mL prefilled syringe
1 mg/1 mL vial
0.25 mg/5 mL prefilled syringe for pediatric use
CALCIUM CHLORIDE
Paramedic-Registered Nurse

Class Electrolyte

Action/Pharmacodynamics
Calcium causes a significant increase in myocardial contractility and in ventricular automaticity. It is used as an antidote for some electrolyte imbalances (e.g. stabilizing cardiac rhythm in the setting of hyperkalemia) and to minimize the side effects from calcium channel blocker overdose. The actions of calcium chloride are similar to those of calcium gluconate but, since it ionizes more readily, it is more potent than calcium gluconate.

Indications
Specific Causes of Cardiac Arrest (Hyperkalemia)
Poisonings - General Management (Calcium Channel Blocker Overdose)
Dialysis-Related Issues (Hyperkalemia)
Crush Injury Syndrome (Hyperkalemia Prophylaxis)

Contraindications
Calcium chloride is contraindicated in ventricular fibrillation unless known hyperkalemia, in known hypercalcemia, and in suspected digitalis toxicity. It should be used with caution in patients taking digoxin as it may precipitate toxicity. Safe use in pregnancy and in children has not been established, though in indicated conditions, benefits outweigh risks.

Side Effects
Paresthesia (tingling), syncope, sensations of heat waves (peripheral vasodilation), pain and burning at IV site, skin necrosis and sloughing (with extravasation), hypotension, bradycardia, cardiac dysrhythmias, cardiac arrest.

Pharmacokinetics
Onset nearly immediate when given IVP/IOP. The peak effect time frame and duration of effect is not well established.

Dosage
Specific Causes of Cardiac Arrest (Hyperkalemia) - Adult & Pediatric
Poisonings - General Management (Calcium Channel Blocker Overdose) - Adult & Pediatric
Dialysis-Related Issues (Hyperkalemia) - Adult & Pediatric
Crush Injury Syndrome (Hyperkalemia Prophylaxis) - Adult & Pediatric
10 mg/kg (10% solution) IVP/IOP, maximum dose of 1 gram

How Supplied
1 gram in a 10 mL prefilled syringe (100 mg/ml.)
(Always check concentration and dose per container at time of patient medication administration)
Calcium Gluconate
Paramedic-Registered Nurse

Class
Antacid, antihypocalcemic, antihyperkalemic, antihypermagnesemic, antihyperphosphatemic

Action/Pharmacodynamics
Replaces calcium in deficiency states

Indications
Acute hypocalcemia, hyperkalemia, hypermagnesemia, hyperphosphatemic

Contraindications
Calcium renal calculi, digoxin toxicity, hypercalcemia, hypercalciuria, sarcoidosis, ventricular fibrillation

Side Effects
Pain, rash, redness, burning at injection site, flushing, nausea, vomiting, diaphoresis, hypotension

Pharmacokinetics
variable

Dosage

Hyperkalemia: 1 GM (10 mL/10% solution) over 2 minutes.

Magnesium Toxicity: 1 GM [10 mL/10% solution over 3 minutes.

How Supplied
INJ Solution: 1 GM/10 mL
Class Antiplatelet

**Action/Pharmacodynamics**
Inhibits platelet aggregation by binding of enzyme adenosine phosphate (ADP) to platelet receptor

**Indications**
Treatment of Acute Coronary Syndrome; reduction of atherosclerotic events

**Contraindications**
Active bleeding, coagulation disorders, severe hepatic disease

**Side Effects**
Bruising, bleeding

**Pharmacokinetics**

<table>
<thead>
<tr>
<th>Onset</th>
<th>Peak</th>
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<td>1 hr.</td>
<td>2 hrs.</td>
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**Dosage**

**Acute Coronary Syndrome:** Adult-300 mg

**How Supplied**
Tablet 75 mg
DEXTROSE (50%/ as D50 and 25%/ as D25)
Paramedic-Registered Nurse

Class Carbohydrate
Action/Pharmacodynamics
Dextrose is the principal form of glucose (sugar) used by the body to create energy and support critical metabolic processes. Since serious brain injury can occur in prolonged hypoglycemia, the timely administration of glucose is essential in treating hypoglycemia (blood glucose < 50 mg/dL). Dextrose 50% IV is the treatment of choice for hypoglycemic patients of adult age or of pediatric age with weight at or exceeding 25 kg. Dextrose 25% IV is the treatment of choice for hypoglycemic patients of pediatric age with weight less than 25 kg.

Indications
Respiratory Arrest
Specific Cause of Cardiac Arrest
Altered Mental Status
Seizure
Syncope
Dystonic Reaction
Behavioral Disorder
Poisonings - General Management
Dialysis - Related Issues
Complications of Pregnancy
For all listed situations, indication is hypoglycemia (blood glucose < 50 mg/dL).

Contraindications
Hyperglycemia (blood glucose > 100 mg/dL)
Normoglycemia in the setting of suspected cerebral ischemia.

Side Effects
Warmth, pain, or burning at the injection site. D50 extravasation can cause tissue necrosis (requiring skin graft surgery), phlebitis, sclerosis, or thrombosis at the injection site.

Pharmacokinetics
Onset with 60 seconds after IVP with peak effect and duration of action dependent upon degree and cause of hypoglycemia. Usually effective duration in excess of 30 minutes.

Dosage
Dextrose (50% as D50 and 25% as D25)
Respiratory Arrest - Adult & Pediatric weight ≥ 25 kg
Specific Cause of Cardiac Arrest - Adult & Pediatric weight ≥ 25 kg
Altered Mental Status - Adult & Pediatric weight ≥ 25 kg
Seizure - Adult & Pediatric weight ≥ 25 kg
Syncope - Adult & Pediatric weight ≥ 25 kg
Dystonic Reaction - Adult & Pediatric weight ≥ 25 kg
Behavioral Disorder - Adult & Pediatric weight ≥ 25 kg
Poisonings - General Management - Adult & Pediatric weight ≥ 25 kg
Dialysis - Related Issues - Adult & Pediatric weight ≥ 25 kg
Complications of Pregnancy - Adult & Pediatric weight ≥ 25 kg
For hypoglycemia (blood glucose < 50 mg/dL):
Dextrose 50% (D50) 1 mL/kg IVP up to 50 mL
Respiratory Arrest - Pediatric weight < 25 kg
Specific Cause of Cardiac Arrest - Pediatric weight < 25 kg
Altered Mental Status - Pediatric weight < 25 kg
Seizure - Pediatric weight < 25 kg
Syncope - Pediatric weight < 25 kg
Dystonic Reaction - Pediatric weight < 25 kg
Behavioral Disorder - Pediatric weight < 25 kg
Poisonings - General Management - Pediatric weight < 25 kg
Dialysis - Related Issues - Pediatric weight < 25 kg
For hypoglycemia (blood glucose < 50 mg/dL)
Dextrose 25% (D25) 0.5 mL/kg IVP up to 50 mL

How Supplied
Prefilled syringes of D50 - 25 grams dextrose in 50 mL of water (0.5 gram/mL)
Prefilled syringes of D25 - 2.5 grams dextrose in 10 mL of water (0.25 gram/mL)
DIAZEPAM (VALIUM)
Paramedic- Registered Nurse

Class
Sedative; Anticonvulsant; Muscle Relaxant; Anxiolytic [Benzodiazepine]

Action/Pharmacodynamics
Intermediate-acting benzodiazepine with central nervous system depressant, anticonvulsant, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain. Diazepam has considerably more muscle relaxant properties than midazolam, though no substantial amnestic effects as with midazolam.

Indications
Medication Assisted Intubation
Post-intubation sedation - onset delay does not favor pre-intubation use
Seizure
(Midazolam preferred benzodiazepine due to faster onset of action)
Dystonic Reactions
Chemical Restraint
(Midazolam preferred benzodiazepine due to faster onset of action)
Poisonings - General Management
Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis
Head/Neck/Spine Injury
Heat Illness

Contraindications
Patients with intolerance to benzodiazepines, acute narrow-angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

Side Effects
Headache, euphoria, drowsiness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, hypotension, nausea, vomiting.

Pharmacokinetics
Onset is 3-5 minutes, IVP/IOP; 15-30 minutes IM with erratic absorption, mandating IM dosing only utilized as a last option in adults; peak effects in 15-45 minutes. Duration is 2+ hours IVP/IOP/IM; half-life can reach 20-50 hours.

Dosage
Medication Assisted Intubation (Post Intubation Sedation) - Adult
0.1 mg/kg to max 5 mg IVP/IOP, may repeat once if systolic BP > 100 mmHg
Seizure - Adult
Head/Neck/Spine Injury - Adult
Heat Illness - Adult
5 mg IVP/IOP or 10 mg IM for active seizure
May repeat once in 5 minutes if still seizing.
Seizure - Pediatric
Head/Neck/Spine Injury - Pediatric
Heat Illness - Pediatric
0.1 mg/kg to max 5 mg IVPJIOPlIM for active seizure
May repeat once in 5 minutes if still seizing.
Dystonic Reactions - Adult
5 mg IVP
Dystonic Reactions - Pediatric
0.1 mg/kg to max 5 mg IVPJIOPlIM
Chemical Restraint - Adult
5 mg IVPJIOPlOP or 10 mg IM
Chemical Restraint - Pediatric
0.1 mg/kg to max 5 mg IVPJIOPlIM
Poisoning - General Management (Suspected Stimulant Toxic) - Adult
2.5 mg - 5 mg IVP
Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric

**How Supplied**
10 mg[2 mL in vials, ampules, or pre-filled syringes.
DIL TIAZEM (CARDIZEM)
Paramedic- Registered Nurse

Class
Calcium Channel Blocker

Action/Pharmacodynamics
Diltiazem is a slow calcium channel blocker with pharmacologic actions similar to those of verapamil. It inhibits calcium ion influx through slow channels into cells of myocardial and arterial smooth muscle (both coronary and peripheral blood vessels). As a result, intracellular calcium remains at sub-threshold levels insufficient to stimulate cell excitation and contraction. Diltiazem slows SA and AV node conduction (antidysrhythmic effect) without affecting normal atrial action potential or intraventricular conduction.

Indications
Tachycardia - Stable
Sustained narrow-complex tachycardia> 150 bpm in adults with systolic BP ≥ 100 mmHg

Contraindications
Known hypersensitivity to diltiazem
2nd/3rd degree AV Blocks (may induce asystole)
Known Wolff-Parkinson-White Syndrome (may increase heart rate)
Known Sick Sinus Syndrome (may induce asystole)
Hypotension
Bradycardia
Safe use in pregnancy and in children has not been established.
Use with caution in CHF (especially if patient is also receiving a beta-blocker), conduction abnormalities, renal or hepatic impairment and the elderly due to exaggerated degree of effect.

Side Effects
Headache, fatigue, dizziness, dysrhythmias, 2nd/3rd degree AV block, bradycardia, CHF, hypotension, syncope, palpitations.

Pharmacokinetics
Onset is 3 minutes; peak effect in 7 minutes; duration is 1-3 hours; half-life is 2 hours.

Dosage
Tachycardia - Stable - Adult
Sustained narrow-complex tachycardia> 150 bpm in adults with systolic BP ≥ 100 mmHg
Usual adult dose is 0.25 mg/kg slow IV over 2 minutes

How Supplied
25 mg in 5 mL vial (5 mg/ml.)
DIPHENHYDRAMINE   (BENADRYL)    
Paramedic- Registered Nurse

Class
Antihistamine, Anticholinergic

Action/Pharmacodynamics
Diphenhydramine competes for H1- histamine receptor sites on effector cells, thus blocking histamine release. Histamine release creates some of the common signs and symptoms of an allergic response: pruritus (itching), mucus secretion, and capillary leaking, which contributes to the formation of urticaria (hives), erythematos skin, and mucosal edema. In the setting of a dystonic reaction, the balance of dopamine and choline must be changed within the brain. The most clinically feasible method of reversing a dystonic reaction, though inhibiting the enzyme acetylcholinesterase, is through the anti-cholinergic effect of a medication like diphenhydramine.

Indications
Dystonic Reactions
Acute Allergic Reactions
Bee/Wasp Stings

Contraindications
Known hypersensitivity to diphenhydramine. While rare, allergic reaction to diphenhydramine is possible and should be considered valid if stated or documented in a patient's medical history.

Side Effects
Drowsiness, dizziness, disturbed coordination.

Pharmacokinetics
Onset within 15 - 30 minutes; duration is approximately 6 hours.

Dosage
Dystonic Reactions - Adult
Acute Allergic Reactions- Adult
Bee/Wasp Stings - Adult
50 mg IM/IVP
Dystonic Reactions - Pediatric
Acute Allergic Reactions- Pediatric
Bee/Wasp Stings - Pediatric
1 rug/kg IM/IVP to maximum of 50 mg

How Supplied
50 mg/1 mL in vial, ampule, or pre-filled syringe.
DOPAMINE (INTROPIN)
Paramedic-Registered Nurse

Class: Vasoconstrictor

Action/Pharmacodynamics
Dose dependent. Higher doses (5+ meg/kg/min] increasingly stimulate alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in system blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation. Lower doses <5 meg/kg/min]. as may be encountered infrequently in interhospital transfers, produce mesenteric (intestinal) and renal vascular dilation to ensure continued perfusion to these organ systems in complicated medical illness that would otherwise sacrifice such circulation.

Indications
- Dyspnea - Congestive Heart Failure (Cardiogenic Shock)
- Post Cardiac Arrest Treatment (Cardiogenic Shock)
- Acute Coronary Syndrome (Cardiogenic Shock)
- Fever (Septic Shock)
- Dialysis-Related Issues

For all listed situations, indication is hypotension (adult = systolic < 100 mmHg) due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid bolusing is contraindicated (e.g. pulmonary edema).

Contraindications
Hypertension

Side Effects
Palpitations, tachycardia, chest pain, and hypertension if not titrated.

Pharmacokinetics
Onset of action within 5 minutes after IV/10 infusion initiated. Rapid metabolism, requiring ongoing IV/10 infusion to maintain clinical effects.

Dosage
- Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Adult
- Post Cardiac Arrest Treatment (Cardiogenic Shock) - Adult
- Acute Coronary Syndrome (Cardiogenic Shock) - Adult
- Fever (Septic Shock) - Adult
- Dialysis-Related Issues - Adult

For hypotension (shock) refractory to fluids or fluids contraindicated
5 - 20 meg/kg/minute - see dosage chart - titrate to a sys B/P ::=100 mmHg.

Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Pediatric
Post Cardiac Arrest Treatment (Cardiogenic Shock) - Pediatric
Fever (Septic Shock) - Pediatric
Dialysis-Related Issues - Pediatric

For hypotension (shock) refractory to fluids or fluids contraindicated

How Supplied
400 mg/10 mL vial to be mixed into 250 mL D5W. (1600 meg/nil, concentration)
OR pre-mixed dopamine infusion at 1600 meg/nil. concentration.
(Always check concentration and dose per container at time of patient medication administration)
Class
Vasoconstrictor, Bronchodilator (Catecholamine)

Action/Pharmacodynamics
Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increases in systemic blood pressure. Stimulates beta-1 receptors in the myocardium, producing increases in heart rate, myocardial contraction, and as a result, cardiac output. Stimulates beta-2 receptors in the lower respiratory tract smooth musculature, producing bronchodilation.

Indications
Dyspnea - Asthma (Severe & Refractory to Nebulization)
Asystole
Ventricular Fibrillation
Pulseless Electrical Activity
Bradycardia (Pediatric)
Acute Allergic Reactions (Anaphylaxis)
Snakebites (Anaphylaxis)
Beej/Wasp Stings (Anaphylaxis)

Contraindications
None absolute in indications above. Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks.

Side Effects
Restlessness, anxiety, generalized tremors, headache, dizziness, chest pain, palpitations, hypertension, premature ventricular contractions, tachycardia.

Pharmacokinetics
Onset of action within 2 minutes after IVPJIO; within 5-10 minutes after 1M. Duration of effect ranges from 3-5 minutes after IVPJIO to upwards of 30 minutes after 1M.

Dosage
Dyspnea - Asthma (Severe & Refractory to Nebulization) - Adult 1:1000 0.3 mg 1M
Dyspnea - Asthma (Severe & Refractory to Nebulization) - Pediatric 1:10000.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) 1M
Asystole - Adult
Ventricular Fibrillation
Pulseless Electrical Activity - Adult 1:10,000 1 mg IVPJIO
Repeat every 3 - 5 minutes while resuscitating cardiac arrest
Asystole - Pediatric
Ventricular Fibrillation
Pulseless Electrical Activity - Pediatric 1:10,000 0.01 mg/kg (0.1 mL/kg) IVPJIO
Repeat every 3 - 5 minutes while resuscitating cardiac arrest
Bradycardia - Symptomatic & Systolic BP < 70 + (2 x age in years) mmHg
(Sinus, First Degree, 2nd Degree Type I) - Pediatric 1:10,000 0.01 mg/kg (0.1 mL/kg) IVPJIO May repeat once.
Acute Allergic Reactions (Anaphylaxis) - Adult
Snakebites (Anaphylaxis) - Adult
Bee/Wasp Stings (Anaphylaxis) - Adult 1:1000 0.5 mg 1M
If anaphylaxis refractory to above 1M dose: 1:10,000 1 mg slow IV/IO over 3 minutes

Acute Allergic Reactions (Anaphylaxis) - Pediatric
Snakebites (Anaphylaxis) - Pediatric
Bee/Wasp Stings (Anaphylaxis) - Pediatric 1:1000 0.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) 1M
If anaphylaxis refractory to above 1M dose:
1:10,000 0.01 mg/kg slow IV/IO over 3 minutes

How Supplied
Epinephrine 1:1000 in 1 mg/mL ampules or 30 mg/30 mL vial
(Always check concentration and dose per container at time of patient medication administration)
Epinephrine 1:10,000 in 1 mg/10 mL prefilled syringes
(Always check concentration and dose per container at time of patient medication administration)
**Etomidate (Amidate)**

**Paramedic - Registered Nurse**

**Class**
Sedative - Hypnotic (non-narcotic/opiate; non-benzodiazepine; non-barbiturate)

**Action/Pharmacodynamics**
Etomidate is an intravenous hypnotic drug without analgesia. Etomidate is safe to use in patients with cardiac illness and patients with traumatic injuries. Etomidate has little to no effect upon myocardial metabolism, cardiac output, or peripheral circulation. Etomidate has been shown to reduce cerebral blood flow, cerebral oxygen consumption, and intracranial pressure - helpful in head injury situations.

**Indications**
Medication Assisted Intubation

**Contraindications**
Known hypersensitivity to etomidate.

**Side Effects**
1) Transient skeletal muscle movements, called myoclonus, have been reported in 10-80% of patients. Most of these movements are mild to moderate in severity. Rarely, these movements are severe in motion and force, though transient. Most movements are bilateral and can involve any part of the body. Results of electroencephalographic studies taken during periods when these muscle movements were observed have failed to reveal true seizure activity. 2) Transient venous pain at injection site, due to propylene glycol, a solvent in Etomidate preparations. 3) Nausea and/or vomiting. 4) Very rarely, hypoventilation and apnea, though Etomidate generally preserves the baseline respiratory activity. 5) Very rarely, hypotension and when seen, usually is due to too rapid IVP administration.

**Pharmacokinetics**
Rapid onset of action, seen as desired sedation within as little as 10-15 seconds, but nearly always within less than 1 minute. Duration of action, based upon a standard dose of 0.3 mg/kg (70 kg adult dose of 20 mg) is 5-15 minutes.

**Dosage**
Medication Assisted Intubation - Adult 0.3 mg/kg IVP/IOP over 15-30 seconds, given just prior to intubation.

**How Supplied**
40 mg/20 mL (2 mg/ml) vial or pre-filled syringe
**Fentanyl (Sublimaze)**
Paramedic-Registered Nurse

**Class**
Narcotic analgesic

**Action/Pharmacodynamics**
Stimulates central nervous system opiate receptors, producing systemic analgesia. On a milligram weight basis, fentanyl is 50-100 times more potent than morphine. Its duration of action is shorter than morphine or hydromorphone. An IV dose of 100 meg of fentanyl is roughly equivalent to an IV dose of 10 mg of morphine. Fentanyl has less emetic effects than other narcotic analgesics.

**Indications**
- Chest Pain - Uncertain Etiology
- Acute Coronary Syndrome
- Snakebites
- Abdominal Pain/Nausea/Vomiting/Diarrhea
- Pain Management (Acute Onset & Chronic Type)
- Eye Injury
- Dental Injury/Pain
- Chest/Abdomen/Pelvis Injury
- Extremity/Amputation Injury
- Compartment Syndrome
- Crush Injury Syndrome
- Burns
- Lightning/Electrical Injury
- Pelvic Pain

For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

**Contraindications**
- Hypotension
- Respiratory Depression
- Minor Degrees of Pain
- Pain Assessed as Factitious

**Side Effects**
Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP.

**Pharmacokinetics**
Onset of action nearly immediate after IV administration. Peak effects occur within 3 - 5 minutes. Duration of effect is 30 - 60 minutes, with a half-life of 6 - 8 hours.

**Dosage**
Chest Pain - Uncertain Etiology - Adult
Acute Coronary Syndrome - Adult 0.5 meg/kg slow IVP/IM/IN, maximum single dose of 50 meg. May repeat every 10 minutes to a maximum cumulative dose of 1.5 meg/kg or 125 meg, whichever is lesser
Snakebites - Adult
Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult
Pain Management (Acute Onset & Chronic Type) - Adult
Eye Injury - Adult
Dental Injury/Pain - Adult
Chest/Abdomen/Pelvis Injury - Adult
Extremity/Amputation Injury - Adult
Compartment Syndrome - Adult
Crush Injury Syndrome - Adult
Burns - Adult
Lightning/Electrical Injury - Adult
Pelvic Pain - Adult
For all listed situations, indication is acute pain control in an alert, hemodynamically stable patient.
1 meg/kg slow IVP/IM/IN, maximum single dose of 100 mcg
May repeat every 10 minutes to a maximum cumulative dose of 3 meg/kg or 250 mcg, whichever is lesser
Chest Pain - Uncertain Etiology - Pediatric
Snakebites - Pediatric
Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric
Pain Management (Acute Onset & Chronic Type) - Pediatric
Eye Injury - Pediatric
Dental Injury/Pain - Pediatric
Chest/Abdomen/Pelvis Injury - Pediatric
Extremity/Amputation Injury - Pediatric
Compartment Syndrome - Pediatric
Crush Injury Syndrome - Pediatric
Burns - Pediatric
Lightning/Electrical Injury - Pediatric
Pelvic Pain - Pediatric
For all listed situations, indication is acute pain control in an alert, hemodynamically stable patient.
Typical dose is 1 meg/kg up to 50 mcg per dose.

How Supplied
100 mcg/2 mL (50 mcg/ml.) ampule, vial, or pre-filled syringe
250 mcg/5 mL (50 mcg/ml.) ampule or vial
500 mcg/10 mL (50 mcg/ml.) vial
Flumazenil (Romazicon)
Paramedic- Nurse

Class
Benzodiazepine receptor antagonist

Action/Pharmacodynamics
Antagonizes effect of benzodiazepines on GABA receptor complex in CNS

Indications
Reversal of iatrogenic induced CNS depression from benzodiazepine administration

Contraindications
Seizures, TCP overdose, CHI, hx. of chronic benzodiazepine use

Side Effects
Agitation, anxiety, dry mouth, dyspnea, insomnia, palpitations, tremors, headache, blurred vision, dizziness, ataxia, nausea, vomiting, daphoresis

Pharmacokinetics
IV Onset: 1-2 min.  Peak: 6-10 min.  Duration: < 1 hr.

Dosage
Adult: 0.2 mg over 30 sec.; may repeat at 30-60 sec. intervals as needed Maximum dose 3 mg/hr,
Pediatric: 0.01 rug/kg: may repeat in 60 sec. intervals as needed Maximum dose
0.2 mg in per single dose to max of 3 mg/hr,

Typical Dose

How Supplied
Furosemide (Lasix)
Paramedic-Nurse

Class
Loop Diuretic

Action/Pharmacodynamics
Enhances excretion of sodium, chloride, potassium by direct action at ascending limb of loop of Henle.

Indications
CHF, chronic renal failure, acute pulmonary edema, hypertension

Contraindications
Anuria, hepatic coma, severe electrolyte depletion

Side Effects
Nausea, dyspepsia, abdominal complaints, electrolyte disturbances, dizziness, headache, blurred vision

Pharmacokinetics
IV Onset: 5 min. Peak: 20-60 min. Duration: 2 hrs.

Dosage
Initial: 40 mg over 1-2 min. or double the patient's oral dose. Do not exceed 40 mg/min. Maximum: 200mg

How Supplied
IN\}, Solution 10 mg/l mL
GLUCAGON
Paramedic-Registered Nurse

**Class** Hormone

**Action/Pharmacodynamics**
Glucagon is a hormone produced in the pancreas. When released in times of hypoglycemia, it causes a breakdown of glycogen (stored in the liver) to glucose and inhibits the subsequent synthesis of glycogen from circulating glucose. Both actions increase the blood levels of glucose. Given via the IM route, it is a useful drug in hypoglycemia when IV access is unsuccessful. Glucagon also increases heart rate, myocardial contractility and improves AV conduction in a manner similar to that produced by catecholamines. Its actions are independent of beta blockade and therefore may be useful via IV/10 administration by paramedics for reversing cardiovascular collapse effects of suspected beta blocker toxicity.

**Indications**
Respiratory Arrest
Specific Causes of Cardiac Arrest
Altered Mental Status
Seizure
Syncope
Dystonic Reactions
Behavioral Disorder
Poisonings - General Management
Complications of Pregnancy

For all listed situations, indication is hypoglycemia (blood glucose <50 mg/dl.) without ability to safely administer oral glucose (due to aspiration concern) and without ability to establish IV access in EMT-185, AEMT, and Paramedic Scopes of Practice. Additional indication for beta blocker toxicity with hypotension and bradycardia in Paramedic Scope of Practice.

**Contraindications**
None

**Side Effects**
Dizziness, headache, nausea/vomiting, hyperglycemia.

**Pharmacokinetics**
Onset 5 - 20 minutes; peak effects in 30 minutes; duration is 1 - 1.5 hours.

**Dosage**
Respiratory Arrest - Adult & Pediatric weight ≥ 25 kg
Specific Causes of Cardiac Arrest - Adult & Pediatric weight ≥ 25 kg
Altered Mental Status - Adult & Pediatric weight ≥ 25 kg
Seizure - Adult & Pediatric weight ≥ 25 kg
Syncope - Adult & Pediatric weight ≥ 25 kg
Dystonic Reactions - Adult & Pediatric weight ≥ 25 kg
Behavioral Disorder - Adult & Pediatric weight ≥ 25 kg
Poisonings - General Management - Adult & Pediatric weight ≥ 25 kg
Complications of Pregnancy - Adult & Pediatric weight < 25 kg
All indicate hypoglycemia without safe PO access and without IV access 1mg 1M
Respiratory Arrest - Pediatric weight < 25 kg
Specific Causes of Cardiac Arrest - Pediatric weight < 25 kg
Altered Mental Status - Pediatric weight < 25 kg
Seizure - Pediatric weight < 25 kg
Syncope - Pediatric weight < 25 kg
Dystonic Reactions - Pediatric weight < 25 kg
Behavioral Disorder - Pediatric weight < 25 kg
Poisonings - General Management - Pediatric weight < 25 kg
Complications of Pregnancy - Pediatric weight < 25 kg
All indicate hypoglycemia without safe PO access and without IV access 0.5 mg 1M
Specific Causes of Cardiac Arrest - Adult
Poisonings - General Management - Adult
Suspected beta blocker toxicity with arrest or hypotension/bradycardia
(Paramedic only) 1mg IV/IO; May be given 1M if no IV access obtainable
Specific Causes of Cardiac Arrest - Pediatric
Poisonings - General Management - Pediatric
Suspected beta blocker toxicity with arrest or hypotension/bradycardia
(Paramedic only) 0.5 mg IV/IO; May be given 1M if no IV access obtainable

**How Supplied**
1mg dry powder in vial with 1mL of diluting solute for reconstitution
GLUCOSE (ORAL)
Paramedic-Registered Nurse

Class Carbohydrate

Action/Pharmacodynamics
Increases blood sugar level.

Indications
- Altered Mental Status (Hypoglycemia)
- Syncope (Hypoglycemia)
- Dystonic Reaction (Hypoglycemia)
- Behavioral Disorder (Hypoglycemia)
- Dialysis-Related Issues (Hypoglycemia)
- Complications of Pregnancy (Hypoglycemia)

Contraindications
Unconscious or semi-conscious and unable to follow simple commands.
Care should be taken to prevent choking or aspiration of medication in semi-conscious patient.

Side Effects
None

Pharmacokinetics
Rapid oral absorption uptake to increase circulating blood sugar levels.
Onset of effect within several minutes of oral dosing. Duration of effect up to 30+ minutes, but patient should be advised to consume complex carbohydrates within minutes of restoration of normal blood sugar, unless otherwise contraindicated.

Dosage
- Altered Mental Status (Hypoglycemia) - Adult & Pediatric Weight < 25 kg
- Syncope (Hypoglycemia) - Adult & Pediatric Weight < 25 kg
- Dystonic Reaction (Hypoglycemia) - Adult & Pediatric Weight < 25 kg
- Behavioral Disorder (Hypoglycemia) - Adult & Pediatric Weight < 25 kg
- Dialysis-Related Issues (Hypoglycemia) - Adult & Pediatric Weight < 25 kg
- Complications of Pregnancy (Hypoglycemia) - Adult
  15 grams (1 tube) PO or SL for blood glucose < 50 mg/dl,
- Altered Mental Status (Hypoglycemia) - Pediatric Weight < 25 kg
- Syncope (Hypoglycemia) - Pediatric Weight < 25 kg
- Dystonic Reaction (Hypoglycemia) - Pediatric Weight < 25 kg
- Behavioral Disorder (Hypoglycemia) - Pediatric Weight < 25 kg
- Dialysis-Related Issues (Hypoglycemia) - Pediatric Weight < 25 kg
  7.5 grams (1/2 tube) PO or SL for blood glucose < 50 mg/dl,

How Supplied
15 grams of glucose for oral administration in a squeeze tube container.
(Always check concentration and dose per container at time of patient medication administration)
HALOPERIDOL  (HALDOL)
Paramedic- Registered Nurse

Class  Antipsychotic

Action/Pharmacodynamics
Haloperidol is a potent, long-acting antipsychotic agent. While its exact mechanism is unclear, it appears to block the dopamine receptors in the brain associated with mood and behavior. It exerts strong antiemetic effects and impairs central thermoregulation. It also produces weak central anticholinergic effects and transient orthostatic hypotension.

Indications
Chemical Restraint

Contraindications
Known hypersensitivity
Behavioral disorder etiology easily reversed (e.g. hypoglycemia)
Minor degrees of agitation
Parkinson's disease
Known seizure disorders (lowers seizure threshold)
CNS depressants, opiates, and alcohol may increase the CNS depression effect of haloperidol.

Use with caution in elderly or debilitated patients due to exaggerated effect. Safe use in pregnancy has not been established, though in the indicated setting, benefit outweighs risks.

Side Effects
CNS depression, seizure, dystonic reactions, dry mouth, blurry vision, bronchospasm, tachycardia, hypertension, hypotension, dysrhythmias, hyperpyrexia, diaphoresis, urinary retention.

Pharmacokinetics
Onset is within 10-20 minutes 1M; peak effect in 30-45 minutes; duration is 3+ hours, reported up to 35 hours.

Dosage
Chemical Restraint - Adult 5 mg 1M (use deep 1M injection in large muscle - lateral thigh if possible)
Chemical Restraint - Pediatric

How Supplied
5 mg/1 mL vial.
(Always check concentration and dose per container at time of patient medication administration)
HYDRALAZINE    (APRESOLINE)
Paramedic-Registered Nurse

Class
Anti-Hypertensive

Action/Pharmacodynamics
Reduces blood pressure via relaxation of arterial smooth muscle, resulting in vasodilation, decreasing peripheral resistance. Alters vascular smooth muscle cellular metabolism of calcium, leading to reduction of vascular muscle contraction.

Indications
Hypertensive Emergency
Complications of Pregnancy [Hypertensive Emergency]

Contraindications
Known hypersensitivity to hydralazine.
Cardiogenic shock
Mitral valvular rheumatic heart disease
Acute coronary syndrome
Safe use during pregnancy and children is not firmly established in pharmaceutical studies, though hydralazine has been used effectively in pregnancy and in pediatrics.

Side Effects
Dizziness, headache, transient paresthesias (e.g. scalp tingling), numbness, postural hypotension, angina, palpitations, tachycardia, syncope, pulmonary edema, dysrhythmias (tachycardias) following IV administration, dyspnea, nausea, vomiting.

Pharmacokinetics
Onset is within 10 minutes IV; peak effects between 10-80 minutes.

Dosage
Hypertensive Emergency - Adult
Complications of Pregnancy (Hypertensive Emergency) - Adult
10 mg Slow IV. May repeat 10 mg every 30 minutes as needed up to cumulative maximum dose of 30 mg.

Hypertensive Emergency - Pediatric
Typical pediatric dose is 0.5 mg/kg up to 0.9 mg/kg, with a max single dose 10 mg.

How Supplied
20 mg/L mL in a 1 mL vial
HYDROMORPHONE (DILAUDID)
Paramedic-Registered Nurse

**Class**
Narcotic analgesic

**Action/Pharmacodynamics**
Stimulates central nervous system opiate receptors, producing systemic analgesia. Modest vasodilation effects increase peripheral venous capacitance, and reduce venous return, myocardial workload, and myocardial oxygen demand. Hydromorphone is roughly 10 times more potent than morphine. An IV dose of 1 mg of hydromorphone is equivalent to an IV dose of 10 mg of morphine.

**Indications**
- Chest Pain - Uncertain Etiology
- Acute Coronary Syndrome
- Snakebites
- Abdominal Pain/Nausea/Vomiting/Diarrhea
- Pain Management (Acute Onset & Chronic Type)
- Eye Injury
- Dental Injury/Pain
- Chest/Abdomen/Pelvis Injury
- Extremity/Amputation Injury
- Compartment Syndrome
- Crush Injury Syndrome
- Burns
- Lightning/Electrical Injury
- Pelvic Pain

For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

**Contraindications**
- Hypotension
- Respiratory Depression
- Minor Degrees of Pain
- Pain Assessed as Factitious

**Side Effects**
Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP. Rapid IVP will lead to an accompanying histamine release, producing the nausea and/or vomiting often erroneously attributed to hydromorphone itself.

**Pharmacokinetics**
Onset of action within 5-10 minutes after IV administration. Duration of effect can reach 4 - 6 hours depending upon end-organ function.

**Dosage**
- Chest Pain - Uncertain Etiology - Adult
  - 0.25 mg slow IVP
- Acute Coronary Syndrome - Adult
  - 0.25 mg slow IVP
May repeat every 10 minutes to a maximum cumulative dose of 1 mg
Snakebites - Adult
Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult
Pain Management (Acute Onset & Chronic Type) - Adult
Eye Injury - Adult
Dental Injury/Pain - Adult
Chest/Abdomen/Pelvis Injury - Adult
Extremity/Amputation Injury - Adult
Compartment Syndrome - Adult
Crush Injury Syndrome - Adult
Burns - Adult
Lightning/Electrical Injury - Adult
Pelvic Pain - Adult
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient. 0.5 - 1 mg slow IV/IVP
May repeat every 10 minutes to a maximum cumulative dose of 2 mg
Chest Pain - Uncertain Etiology - Pediatric
Snakebites - Pediatric
Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric
Pain Management (Acute Onset & Chronic Type) - Pediatric
Eye Injury - Pediatric
Dental Injury/Pain - Pediatric
Chest/Abdomen/Pelvis Injury - Pediatric
Extremity/Amputation Injury - Pediatric
Compartment Syndrome - Pediatric
Crush Injury Syndrome - Pediatric
Burns - Pediatric
Lightning/Electrical Injury - Pediatric
Pelvic Pain - Pediatric
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient
Typical dose is 0.01 mg/kg up to 0.5 mg per dose.

How Supplied
2 mg/1 mL vial or pre-filled syringe
HYDROXOCOBALAMIN (CYANOKIT)
Paramedic-Registered Nurse

Class
Cyanide Antidote

Action/Pharmacodynamics
Hydroxocobalamin binds cyanide, forming cyanocobalamin for urinary excretion.

Indications
Cyanide

Contraindications
None in the setting of suspected cyanide toxicity.

Side Effects
Redness of skin and mucous membranes may be prominently noted. Additional side effects include headache, dizziness, restlessness, eye irritation, throat irritation, dyspnea, pulmonary edema, chest tightness, hypertension, tachycardia, palpitations, nausea, vomiting, diarrhea, abdominal pain, dysphagia, red urine, and hives.

Pharmacokinetics
Near immediate onset of action following IVPB initiation. Effect is seen for hours, with duration of action seen predominantly in the first 24 hours following Administration, but measurable for days.

Dosage
Cyanide - Adult 5 grams IVPB in 15 minutes
Cyanide - Pediatric
Safe use in children has not been firmly established, though in indicated clinical situation, benefit outweighs risk. Contact OLMG for consult and order. The pediatric dose used in most situations is 70 mg/kg IVPB in 15 minutes.

How Supplied
CYANOKIT® preparations include either one glass vial containing 5 grams of hydroxocobalamin as a dark red crystalline powder for reconstitution with 200 mL normal saline or a set of two glass vials, each containing 2.5 grams of hydroxocobalamin as a dark red crystalline powder for reconstitution with 100 mL normal saline per vial.

Follow full instructions accompanying CYANOKIT® for preparation and administration, including use of transfer spike for normal saline addition to the vial(s), rocking, but not shaking the vial for 60 seconds prior to administration, and administering the infusion from the vial(s).

(Always check concentration and dose per container at time of patient medication administration)
IPRATROPIUM BROMIDE (ATROVENT)
Paramedic-Registered Nurse

Class
Parasympatholytic Bronchodilator

Action/Pharmacodynamics
Atrovent is an anticholinergic agent, chemically related to atropine. Given in a nebulized form, it acts directly on the smooth muscle of the bronchial tree by inhibiting acetylcholine at receptor sites. By blocking parasympathetic action, it dilates the bronchial smooth muscle and decreases secretions. It also abolishes the vagally mediated reflex bronchospasm caused by inhaled irritants such as smoke, dust, and cold air and by a range of inflammatory mediators such as histamine.

Indications
Dyspnea - Asthma
Dyspnea - Chronic Obstructive Pulmonary Disease
Acute Allergic Reactions
Bee/Wasp Stings

Contraindications
Atrovent is contraindicated in patients with hypersensitivity to atropine. It should not be used as the sole pharmacologic treatment for acute bronchospasm. By protocol, atrovent is always administered in conjunction with albuterol.

Side Effects
Cough, reflex bronchospasm, hoarseness, nasal/oral dryness, bitter taste.

Pharmacokinetics
Absorption: 10% of inhaled dose reaches lower airway; approximately 0.5% of dose is systemically absorbed; onset within 5-15 minutes; peak effect in 1.5 - 2 hours; duration of effect is up to 4 - 6 hours; half-life is 1.5 - 2 hours.

Dosage
Dyspnea - Asthma - Adult & Pediatric weight z 15 kg
Acute Allergic Reactions - Adult & Pediatric weight z 15 kg
Bee/Wasp Stings - Adult & Pediatric weight z 15 kg
0.5 mg nebulized (with albuterol5 mg)
Dyspnea - Chronic Obstructive Pulmonary Disease - Adult
0.5 mg nebulized (with albuterol5 mg), may repeat twice
Dyspnea - Asthma - Pediatric weight < 15 kg
Acute Allergic Reactions - Pediatric weight < 15 kg
Bee/Wasp Stings - Pediatric weight < 15 kg
0.25 mg nebulized (with albuterol2.5 mg)

How Supplied
0.5 mg/2.5 mL nebulizer solution vials.
Ketamine HCL (Ketalar)
Paramedic-Nurse

Class
Rapid-acting general anesthetic

Action/Pharmacodynamics
Selectively blocks afferent impulses, interacts with CNS transmitter systems to produce anesthetic state

Indications
Induction, sedation, pain management

Contraindications
Aneurysms, angina, CHF, elevated ICP, HTN, psychotic disorders

Side Effects
Increased B/P and pulse. Emergences reaction

Pharmacokinetics

IV Anesthetic  Onset: 30 sec.  Duration: 5-10 min
IV Analgesic  Onset: 10-15 min

Dosage
Induction: mg/kg IV
Analgesia: 0.1 mg/kg to 0.5 mg/kg IV every 10 minutes as needed

How Supplied
INJ/Solution 50 mg/ml.
LABETALOL (NORMODYNE, TRANDATE)
Paramedic-Registered Nurse

**Class**
Anti-Hypertensive (Beta-1, Beta-2, and Alpha-1 Blocker)

**Action/Pharmacodynamics**
Adrenergic-receptor blocking agent that combines selective alpha activity and non-selective beta-adrenergic blocking actions. Both activities contribute to reduce blood pressure. Alpha blockade results in vasodilation, decreasing peripheral resistance. Beta blocking effects on sinus node, AV node, and ventricular muscle lead to slower heart rates, delay in AV conduction, and depression of cardiac contractility.

**Indications**
Hypertensive Emergency
Complications of Pregnancy (Hypertensive Emergency)

**Contraindications**
Asthma (due to beta-2 blockade)
Cardiogenic shock
Uncontrolled congestive heart failure
ZnV/Srd degree AV heart block
Sinus bradycardia.

Safe use during pregnancy and children is not firmly established in pharmaceutical studies, though labetalol has been used effectively in pregnancy and in pediatrics.

**Side Effects**
Dizziness, headache, transient paresthesias (e.g. scalp tingling), numbness, postural hypotension, angina, palpitations, bradycardia, syncope, pulmonary edema, dysrhythmias (bradycardias) following IV administration, dyspnea, bronchospasm.

**Pharmacokinetics**
Onset is 2-5 minutes IV; peak effects in 5-15 minutes; duration is 2-4 hours; half-life is 3-8 hours.

**Dosage**
Hypertensive Emergency - Adult
Complications of Pregnancy (Hypertensive Emergency) - Adult
20 mg Slow IVP. May repeat 40 mg every 10 minutes as needed up to cumulative maximum dose of 300 mg.

Hypertensive Emergency - Pediatric
Typical pediatric dose is 0.3 mg/kg up to 1 mg/kg, with a max single dose 20 mg.

**How Supplied**
100 mg in a 20 mL Multi-Dose Vial (5 mg/rnl.)
LIDOCAINE 20/0 INTRAVASCULAR (XYLOCAINE)
Paramedic- Registered Nurse

Class
Intraosseous Local Anesthetic & Antidysrhythmic

Action/Pharmacodynamics
As a local anesthetic, reduces nerve activation that carries painful stimulus from intraosseous fluid and/or medication administration. As an antidysrhythmic, suppresses ventricular automaticity, chemically converting ventricular tachycardia.

Indications
Tachycardia - Stable
Wide complex tachycardia, refractory to amiodarone
Vascular Access - Intraosseous

Contraindications
Narrow complex tachycardia
Second degree AVBlock-Type II (Classic Type)
Third degree AVBlock (Complete Heart Block)
Premature ventricular contractions with underlying bradycardias
No indication for 10 anesthetic [unresponsive patients]

Side Effects
None expected in indicated dosing. Erroneous use in high degree heart blocks can lead to complete ventricular suppression/cardiac arrest.

Pharmacokinetics
Onset of action within 3 minutes IVPIOP. Duration for 10-20 minutes.

Dosage
Tachycardia - Stable - Wide Complex Tachycardia - Adult
Refractory to Amiodarone
Up to 1 rug/kg, slow IVPIOP at < 50 mg/minute
Tachycardia - Stable - Pediatric
Vascular Access - Intraosseous (Local Anesthetic) - Adult & Pediatric
1 mg/kg up to 40 mg IOP

How Supplied
100 mg/5 mL (20 mg/rnl, of 2% lidocaine) prefilled syringe
LORAZEPAM (ATIVAN)
Paramedic-Registered Nurse

Class
Sedative; Anticonvulsant; Muscle Relaxant; Anxiolytic (Benzodiazepine)

Action/Pharmacodynamics
Long-acting benzodiazepine with central nervous system depressant, Anticonvulsant, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain. Ativan has less muscle relaxant properties than diazepam, though no substantial amnestic effects as with midazolam.

Indications
Medication Assisted Intubation
Post-intubation sedation - onset delay does not favor pre-intubation use
Seizure
(Midazolam preferred benzodiazepine due to faster onset of action)
Dystonic Reactions
Chemical Restraint
(Midazolam preferred benzodiazepine due to faster onset of action)
Poisonings - General Management
Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis
Head/Neck/Spine Injury
(Midazolam preferred benzodiazepine due to faster onset of action)
Heat Illness
(Midazolam preferred benzodiazepine due to faster onset of action)

Contraindications
Patients with intolerance to benzodiazepines, acute narrow-angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

Side Effects
Headache, euphoria, drowsiness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, hypotension, nausea, vomiting.

Pharmacokinetics
Onset is 5-10 minutes, IV/IO; up to 30 minutes 1M; peak effects in 2-3 hours.
Duration is 3-6+ hours IV/IO, 1M; half-life can reach 20-50 hours.

Dosage
Medication Assisted Intubation (Post Intubation Sedation) - Adult
0.1 mg/kg to max 2 mg IV/IO, may repeat once if systolic BP > 100 mmHg
Seizure - Adult
Heat Illness - Adult
2 mg IV/IO/IM for active seizure
May repeat once in 10 minutes if still seizing.
Seizure - Pediatric
Heat Illness - Pediatric
0.1 mg/kg to max 2 mg IVP/IOP /IM for active seizure
May repeat once in 5 minutes if still seizing.

Dystonic Reactions - Adult
2 mg IVP/IM

Dystonic Reactions - Pediatric
0.1 mg/kg to max 2 mg IVP/IM

Chemical Restraint - Adult
2 mg IVP/IOP /IM
May repeat once.

Chemical Restraint - Pediatric
0.1 mg/kg to max 2 mg IVP/IOP /IM

Poisoning - General Management (Suspected Stimulant Toxic) - Adult
1-2 mg IVP/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric

Head/Neck/Spine Injury - Adult
1 mg IVP/IM/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Head/Neck/Spine Injury - Pediatric
0.1 mg/kg IVP/IM/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

How Supplied
2 mg/L mL or 4 mg/L mL in vials, ampules, or pre-filled syringes.
MAGNESIUM SULFATE
Paramedic-Registered Nurse

**Class** Electrolyte

**Action/Pharmacodynamics**
As a bronchial smooth muscle relaxant, contributes to reduction of bronchospasm in asthma. As an anti-dysrhythmic, reverses low circulating magnesium levels associated with ventricular arrhythmias, particularly polymorphic ventricular tachycardia, commonly called torsades des pointes. It is the anticonvulsant of greatest benefit for eclampsia.

**Indications**
Dyspnea - Asthma
Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades)
Tachycardia - Stable (Torsades)
Childbirth - Complicated (Eclampsia)
Complications of Pregnancy (Eclampsia)

**Contraindications**
Hypotension or Known Renal Failure (when treating asthma)

**Side Effects**
None expected in indicated dosing. High doses (exceeding 4-6 grams) may cause sedation, muscle weakness, depressed reflexes, hypotension, bradycardia, and respiratory depression.

**Pharmacokinetics**
Onset of action typically within 1-2 minutes after IVPIOP. Effects persist for up to 30 minutes.

**Dosage**
Dyspnea - Asthma - (Severe & Refractory to Nebulization) - Adult
2 grams very slow IVP over 10 minutes
Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades) - Adult
1 gram IVP/IOP
Tachycardia - Stable (Torsades) - Adult
1 gram slow IVPIOP over 1 minute. May repeat once.
Tachycardia - Stable (Torsades) - Pediatric
Consult with Medical Command for use and dosing.
Childbirth - Complicated (Eclampsia)
Complications of Pregnancy (Eclampsia)
1 gram IVP/IOP. May repeat every 2-3 mins until seizure abates. Maximum cumulative dose is 4 grams

**How Supplied**
1 gram/2 mL (500 mg/rnl. in 50% solution) vials
5 grams/10 mL (500 mg/rnl. in a 50% solution) vials
5 grams/10 mL (50% mg/rnl, in a 50% solution) pre-filled syringes
METHYLPREDNISOLONE (SOLU-MEDROL)
Paramedic-Registered Nurse

Class Steroid

Action/Pharmacodynamics
Methylprednisolone is an intermediate-acting synthetic adrenal corticosteroid with glucocorticoid activity. It exerts anti-inflammatory effects in the setting of inflammatory-mediated illness.

Indications
Dyspnea - Asthma
Dyspnea - Chronic Obstructive Pulmonary Disease
Acute Allergic Reactions
Bee/Wasp Stings

Contraindications
Known hypersensitivity to methylprednisolone. In the setting of anaphylaxis, the only true contraindication is prior severe allergy (anaphylaxis) caused by methylprednisolone.

Side Effects
None expected immediately. May occasionally see any of the following effects with onset of action: euphoria, insomnia, confusion, psychosis, edema, hypertension, nausea/vomiting, hyperglycemia.

Pharmacokinetics
Onset of action within 4 - 6 hours, may have effect in excess of 24 hours.

Dosage
Dyspnea - Asthma - Adult
Dyspnea - Chronic Obstructive Pulmonary Disease - Adult
Acute Allergic Reactions - Adult
Bee/Wasp Stings - Adult
125 mg IVP. Give 1Mif no IV access obtainable.
Dyspnea - Asthma - Pediatric
Acute Allergic Reactions - Pediatric
Bee/Wasp Stings - Pediatric
2 mg/kg not to exceed 125 mg IVP. Give 1Mif no IV access obtainable.

How Supplied
Single Dose Vial- 125 mg Act-O-Vial™ System
MIDAZOLAM (VERSED)
Paramedic-Registered Nurse

Class
Sedative; Anticonvulsant; Amnestic; Muscle Relaxant, Anxiolytic (Benzodiazepine)

Action/Pharmacodynamics
Short-acting benzodiazepine with central nervous system depressant, anticonvulsant, anterograde amnestic, muscle relaxant, and anxiolytic effects. Like the other benzodiazepines, it has no effect on pain.

Indications
Medication Assisted Intubation (Pre & Post Intubation Sedation)
Post Cardiac Arrest Treatment (Hypothermia Induced Shivering Control)
Transcutaneous Pacing (Sedation)
Synchronized Cardioversion (Sedation)
Seizure
Dystonic Reactions
Chemical Restraint
Poisonings - General Management
Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis
Head/Neck/Spine Injury
Heat Illness

Contraindications
Patients with intolerance to benzodiazepines, acute narrow-angle glaucoma, shock, or coma. Caution with use in patients with COPD, chronic hepatic or renal failure, CHF, acute alcohol intoxication, and the elderly due to increased risk of respiratory depression.

Side Effects
Retrograde amnesia, headache, euphoria, drowsiness, weakness, excessive sedation, confusion, dizziness, blurred vision, diplopia, nystagmus, respiratory arrest, tachypnea, hypotension, nausea, vomiting.

Pharmacokinetics
Onset is 3-5 minutes, IV/IO, 6-14 minutes IN; up to 15 minutes IM (though clinically evident much faster); peak effects in 20-60 minutes. Duration is 2 hours IV/IO/IN; 1-6 hours IM; half-life is 1-4 hours.

Dosage
Medication Assisted Intubation (Pre & Post Intubation Sedation) - Adult
0.1 mg/kg to max 5 mg IV/IO, may repeat once if systolic BP > 100 mmHg
Post Cardiac Arrest Treatment (Hypothermia Induced Shivering Control) - Adult & Pediatric
0.1 mg/kg to max 5 mg IV/IO
Transcutaneous Pacing (Sedation) - Adult
2 - 5 mg IV based upon weight and hemodynamics (0.1 mg/kg to max 5 mg)
Synchronized Cardioversion (Sedation) - Adult
0.1 mg/kg to max 5 mg IV/IO/IN
Seizure - Adult
Heat Illness - Adult
0.1 rug/kg to max 5 mg IM/IVP/IN/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Seizure - Pediatric
Head/Neck/Spine Injury - Pediatric
Heat Illness - Pediatric
0.1 rug/kg to max 5 mg IM/IVP/IN/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Dystonic Reactions - Adult
2.5 mg IVP/IN
Dystonic Reactions - Pediatric
0.1 rug/kg to max 2.5 mg IM/IVP/IN

Chemical Restraint - Adult
0.1 rug/kg to max 5 mg IM/IVP/IN/IOP.
May repeat once.

Chemical Restraint - Pediatric
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP

Poisoning - General Management (Suspected Stimulant Toxic) - Adult
0.1 rug/kg to max 5 mg IVP/IN/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric
Head/Neck/Spine Injury - Adult
5 mg IM/IVP/IN/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

**How Supplied**
5 mg/1 mL in vials, ampules, or pre-filled syringes.
MORPHINE SULFATE
Paramedic-Registered Nurse

Class
Narcotic analgesic

Action/Pharmacodynamics
Stimulates central nervous system opiate receptors, producing systemic analgesia. Modest vasodilation effects increase peripheral venous capacitance, and reduce venous return, myocardial workload, and myocardial oxygen demand.

Indications
Chest Pain - Uncertain Etiology
Acute Coronary Syndrome
Snakebites
Abdominal Pain/Nausea/Vomiting/Diarrhea
Pain Management (Acute Onset &Chronic Type)
Eye Injury
Dental Injury/Pain
Chest/Abdomen/Pelvis Injury
Extremity/Amputation Injury
Compartment Syndrome
Crush Injury Syndrome
Burns
Lightning/Electrical Injury
Pelvic Pain
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.

Contraindications
Hypotension
Respiratory Depression
Minor Degrees of Pain
Pain Assessed as Factitious

Side Effects
Hypotension, respiratory depression, euphoria, dizziness. Nausea and/or vomiting are rarely seen if administration is slow IVP. Rapid IVP will lead to an accompanying histamine release, producing the nausea and/or vomiting often erroneously attributed to morphine itself.

Pharmacokinetics
Onset of action within 3-5 minutes after IV administration. Duration of effect can reach 4 hours depending upon end-organ function.

Dosage
Dosage: Chest Pain - Uncertain Etiology - Adult
Acute Coronary Syndrome - Adult
2 mgslow IVP
May repeat every 5 minutes to a maximum cumulative dose of 10 mg
Snakebites - Adult
Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult
Pain Management (Acute Onset & Chronic Type) - Adult
Eye Injury - Adult
Dental Injury/Pain - Adult
Chest/Abdomen/Pelvis Injury - Adult
Extremity/Amputation Injury - Adult
Compartment Syndrome - Adult
Crush Injury Syndrome - Adult
Burns - Adult
Lightning/Electrical Injury - Adult
Pelvic Pain - Adult
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.
2 - 4 mg slow IVP
May repeat every 5 minutes to a maximum cumulative dose of 10 mg
Chest Pain - Uncertain Etiology - Pediatric
Snakebites - Pediatric
Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric
Pain Management (Acute Onset & Chronic Type) - Pediatric
Eye Injury - Pediatric
Dental Injury/Pain - Pediatric
Chest/Abdomen/Pelvis Injury - Pediatric
Extremity/Amputation Injury - Pediatric
Compartment Syndrome - Pediatric
Crush Injury Syndrome - Pediatric
Burns - Pediatric
Lightning/Electrical Injury - Pediatric
Pelvic Pain - Pediatric
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.
Typical dose is 0.1 mg/kg up to 2 mg per dose.

How Supplied
2 mg/mL pre-filled syringe
4 mg/mL vial, ampule, or pre-filled syringe
8 mg/mL pre-filled syringe
10 mg/mL vial
10 mg/10 mL vial
NALOXONE (NARCAN)
Paramedic-Registered Nurse

Class
Narcotic antagonist

Action/Pharmacodynamics
The primary action of interest is reversal of respiratory depression associated with narcotic agents. Naloxone competes with and displaces narcotic substances from opiate receptors.

Indications
Respiratory Arrest
Specific Causes of Cardiac Arrest
Altered Mental Status
Syncope
Poisonings - General Management

Contraindications
Known or suspected narcotic substance use or abuse without cardiopulmonary compromise. Post-intubation in known or suspected narcotic substance use or abuse situations. Avoid whenever possible in known or suspected narcotic addicts. In these patients, use the smallest clinically effective dose possible (titrating administration slowly) to avoid acute narcotic withdrawal.

Side Effects
Agitation, anxiety, diaphoresis, tachycardia, nausea, vomiting, headache, hypertension, hypotension, seizures.

Pharmacokinetics
Onset of action within 2 minutes after IVP/IOP/IN administration with duration of effect up to 2 hours.

Dosage
Respiratory Arrest - Adult
Specific Causes of Cardiac Arrest - Adult
Altered Mental Status - Adult
Syncope - Adult
Poisonings - General Management - Adult
In Apnea/Agonal Breathing, 2 mg IVPIOP/IN.
May repeat once to maximum cumulative dose of 4 mg.
In Ineffective Breathing Activity, 0.5 mg IVPIOP/IN.
May repeat to a maximum cumulative dose of 4 mg.
Respiratory Arrest - Pediatric
Specific Causes of Cardiac Arrest - Pediatric
Altered Mental Status - Pediatric
Syncope - Pediatric
Poisonings - General Management - Pediatric
In Apnea/Agonal Breathing, 0.5 mg IVPIOP/IN.
May repeat to a maximum cumulative dose of 2 mg.
In Ineffective Breathing Activity, 0.5 mg IVPIOP/IN.
May repeat to a maximum cumulative dose of 2 mg.

**How Supplied**
- 0.4 mg/1 mL vial
- 0.4 mg/L mL prefilled syringe
- 2 mg/2 mL prefilled syringe
- 4 mg/10 mL vial
NITROGLYCERIN (NITROLINGUAL®, NITROMIST®, NITROSTAT®, NITROQUICK®, TRIDIL (IV INFUSION), NITRO-BID® - DERMAL)

Paramedic- Registered Nurse

Class
Anti-Anginal, Vasodilator, Anti-Hypertensive (Nitrate)

Action/Pharmacodynamics
Arterial and venous vasodilator through relaxing vascular smooth muscle. Reduces cardiac afterload resistance and cardiac preload volume respectively. Myocardial oxygen consumption/demand is decreased. Systemic blood pressure is decreased.

Indications
Dyspnea - Congestive Heart Failure
Chest Pain - Uncertain Etiology
Acute Coronary Syndrome
Hypertensive Emergency
Complications of Pregnancy (Hypertensive Emergency)

Contraindications
Hypotension
Asymptomatic Hypertension
Erectile Dysfunction Medications (**Requires OLMC Order Only)
Sildenafil (Viagra®) or Vardenafil (Levitra®) use within 24 hours
Tadalafil (Cialis®) use within 48 hours

Side Effects
The most serious side effect is hypotension, usually transient and responsive to supine positioning and intravenous fluid bolusing. Common, though non-serious, symptoms include headache due to vasodilation, blurred vision, and dizziness. Paramedics should exercise caution when applying trans dermal nitroglycerin ointment, avoiding contact with bare hands to avoid experiencing personal side effects, typically headache and dizziness.

Pharmacokinetics
Rapid vascular uptake within 3 minutes of sublingual dosing, with duration of effect up to 30 minutes. Rapid vascular effect within 1-3 minutes of intravenous dosing, with ongoing effect while continuous infusion. Vascular effect within 15-30 minutes of trans dermal dosing, with ongoing effect while continued trans dermal absorption.

Dosage
Dyspnea - Congestive Heart Failure - Adult
Acute Coronary Syndrome - Adult
0.4 mg sublingual spray or tablet if systolic BP > 100 mmHg. Single dose unless by Paramedic. May repeat 0.4 mg sublingual spray or tablet every 5 minutes if systolic BP >100 mmHg until chest pain and/or respiratory distress resolves.
Following initial sublingual use, may utilize intravenous infusion start at 10 meg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 meg/min.

Following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

Chest Pain - Uncertain Etiology - Adult

0.4 mg sublingual spray or tablet if systolic BP > 100 mmHg. Single dose unless by Paramedic. If chest pain improved with initial dose, 0.4 mg sublingual spray or tablet every 5 minutes until chest pain and/or respiratory distress resolves.

Following initial sublingual use, may utilize intravenous infusion start at 10 meg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 meg/min.

Following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

Hypertensive Emergency - Adult

Complications of Pregnancy (Hypertensive Emergency) - Adult

0.4 mg sublingual spray or tablet every 5 minutes until BP symptoms resolve or BP is reduced by 10%. In place of or following initial sublingual use, may utilize intravenous infusion start at 10 meg/min, titrate slowly to effect. Maximum infusion rate without Medical Command consult is 50 meg/min.

In place of or following initial sublingual use, may utilize transdermal application of 1½ inches ointment to chest wall.

How Supplied

Mix 50 mg into 250 mL D5W (200 mcg/mL).

- 10 meg/min using micro drip infusion set is 3 mL/hour rate
- 20 meg/min using micro drip infusion set is 6 mL/hour rate

Transdermal ointment in 2% nitroglycerin concentration

1½ inches = 22.5 mg of nitroglycerin
NOREPINEPHRINE (LEVOPHED)
Paramedic-Registered Nurse

**Class** Vasoconstrictor

**Action/Pharmacodynamics**
Stimulates alpha receptors in the peripheral vasculature, producing vasoconstriction-related increase in systemic blood pressure. Concurrent beta receptor stimulation may produce increases in heart rate and mild bronchodilation, though norepinephrine is a weaker beta stimulator than dopamine.

**Indications**
Dyspnea - Congestive Heart Failure (Cardiogenic Shock)
Post Cardiac Arrest Treatment (Cardiogenic Shock)
Acute Coronary Syndrome (Cardiogenic Shock)
Fever (Septic Shock)
Dialysis-Related Issues
For all listed situations, indication is hypotension (adult = systolic < 100 mmHg) due to cardiogenic, septic, or neurogenic shock either refractory to intravascular fluid boluses or in which intravascular fluid bolusing is contraindicated (e.g. pulmonary edema).

**Contraindications**
Hypertension

**Side Effects**
Few, though at higher doses, symptoms may include headache, palpitations, tachycardia, chest pain, and eventual hypertension. Bradycardia can result reflexively from an increase in blood pressure.

**Pharmacokinetics**
Onset of action within 5 minutes after IV/10 infusion initiated. Rapid metabolism, requiring ongoing IV/10 infusion to maintain clinical effects.

**Dosage**
Dyspnea - Congestive Heart Failure (CHF) - Adult
Post Cardiac Arrest Treatment - Cardiogenic Shock - Adult
Acute Coronary Syndrome - Adult
Fever - Septic Shock - Adult
Dialysis-Related Issues - Adult
For hypotension (shock) refractory to fluids or fluids contraindicated
Start at 2-4 meg/minute - see dosage chart - titrated to a systolic B/P ≥ 100 mmHg. Maximum infusion rate is 12 meg/minute,

Norepinephrine Infusion Adult Dosage Chart
rates reflect using a micro drip (60 drops/rnl.) set:
meg/min 2345678910 1112
drops/min 15 22 30 37455260 67 75 82 90

Dyspnea - Congestive Heart Failure (CHF) - Pediatric
Post Cardiac Arrest Treatment - Cardiogenic Shock - Pediatric
Fever - Septic Shock - Pediatric
Dialysis-Related Issues - Pediatric
For hypotension (shock) refractory to fluids or fluids contraindicated.

**How Supplied**
4 mg/4 mL ampule or vial.
Use only 2 mL in a 250 mL bag of D5W.
(8 mcg/mL concentration)
(Always check concentration and dose per container at time of patient medication administration)
ON DANETRON (ZOFRAN)
Paramedic- Registered Nurse

Class Antiemetic

Action/Pharmacodynamics
Ondansetron reduces the activity of the vagus nerve, which activates the vomiting center in the medulla oblongata, and also blocks serotonin receptors in the chemoreceptor trigger zone. It has little effect on vomiting caused by motion sickness.

Indications
Snakebites
Abdominal Pain/Nausea/Vomiting/Diarrhea
Fever
Pelvic Pain
For all listed situations, indication is for impending/active vomiting.

Contraindications
Known hypersensitivity to ondansetron
Current use of Apomorphine (Apokyn®), an anti-parkinsonian drug
Use with caution with patients currently using medications which effect QT interval (e.g. procainamide, amiodarone, tricyclic antidepressants, haloperidol)

Side Effects
Sedation, dystonic reactions (rare), hypotension, tachycardia, angina, torsades (rare).

Pharmacokinetics
NOT PROVIDED ON TEMPLATE

Dosage
Snakebites - Adult
Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult
Fever - Adult
Pelvic Pain - Adult
For all listed situations, indication is for impending/active vomiting.
4 mg oral dissolving tablet on tongue, may repeat once in 10 minutes
4 mg slow IVP over 60 seconds, may repeat once in 10 minutes
Snakebites - Pediatric
Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric
Fever - Pediatric
Pelvic Pain - Pediatric
For all listed situations, indication is for impending/active vomiting.
If age> 2 years, 4 mg oral dissolving tablet on tongue
0.1 mg/kg to max of 4 mg slow IVP over 60 seconds

How Supplied
4 mg/2 mL (2 mg/rnl.) vial.
4 mg rapid oral dissolving tablet (ODT)
PHENYLEPHRINE  20/0  (NEOSYNEPHRINE)
Paramedic-Registered   Nurse

Class
Topical Nasal Vasoconstrictor

Action/Pharmacodynamics
Phenylephrine is a direct-acting sympathomimetic amine. It stimulates alpha receptors in the blood vessels of the nasal mucosa which causes their constriction, thereby decreasing the risk of subsequent nasal bleeding.

Indications
Nasal Intubation
Epistaxis

Contraindications
None in the indicated settings.

Side Effects
Rare with single dose. It is rarely absorbed systemically from nasal instillation.

Pharmacokinetics
Onset of action is within seconds.

Dosage
Nasal Intubation - Adult
2 sprays in each nostril
Epistaxis - Adult & Pediatric
2 - 4 sprays in affected nostril(s) for control of epistaxis (with compression of nose immediately after administration)

How Supplied
Phenylephrine Nasal Spray 1% solution, 15 mL squeeze bottle for single patient use only.
PRALIDOXIME CHLORIDE (2PAM)
Paramedic- Registered Nurse

Class
Cholinesterase Reactivator

Action/Pharmacodynamics
Pralidoxime chloride reactivates cholinesterase (mainly outside the central nervous system) which has been inactivated by an organophosphate pesticide. The destruction of accumulated acetylcholine can then proceed and neuromuscular junctions will regain function. Pralidoxime chloride has its most critical effect in reversing paralysis of the muscles of respiration. Because Pralidoxime Chloride is less effective in relieving depression of the respiratory center, atropine is always required concomitantly to block the effect of accumulated acetylcholine at the site. Pralidoxime Chloride is short acting and repeated doses may be needed, especially when there is evidence of continuing toxicity.

Indications
Poisonings - General Management

Contraindications
None

Side Effects
Headache, dizziness, vision changes, loss of coordination, laryngospasm, tachycardia, palpitations.

Pharmacokinetics
With 1M auto injector use, effects may not be observed for up to 15 minutes. Beneficial effects can persist in excess of 1 hour.

Dosage
Poisonings - General Management - Adult & Pediatric > 12 years of age 600 mg 1M
May repeat every 15 minutes to cumulative maximum dose of 1800 mg.
In the setting of serious symptoms (cardiopulmonary distress), repeat doses in rapid succession.
Poisonings - General Management - Pediatric ≤ 12 years of age .Typical pediatric dose is 15 mg/kg 1Mper dose, max single dose 600 mg

How Supplied
600 mg/2 mL auto injector
Procainamide HCL (Pronestyl)
Paramedic-Nurse

Class Antiarrhythmic

Action/Pharmacodynamics
Increases electrical stimulation threshold of ventricles, His-Purkinje system. Decreases myocardial excitability, conduction velocity, depresses myocardial contractility.

Indications
Treatment of atrial fibrillation/flutter, PVC, PSVT, ventricular tachycardia

Contraindications
Complete & 2nd degree heart block, QT prolongation, torsades de pointes, myasthenia gravis, lupus

Side Effects
Transient hypotension, prolonged QT, dizziness, weakness, mental confusion

Pharmacokinetics
Half-life: 2.5-4.5 hrs.

Dosage
Loading: 15-18 mg/kg Maximum: 1-1.5 gm Do not administer faster than 25-50 mg/mln. Stop administration if: arrhythmia resolves, QRS widens by 50%, QT prolongation occurs, hypotension

How Supplied
INJ/Solution 100 mg/ml.
SODIUM BICARBONATE
Paramedic-Registered Nurse

Class
Alkalinizing agent

Action/Pharmacodynamics
 Raises the pH of blood by buffering excess hydrogen ions that are present in acidic states. The role of sodium bicarbonate is limited in cardiac arrest. Because ventilation is an effective tool in managing respiratory acidosis, sodium bicarbonate should rarely be administered for cardiac arrest, unless the arrest is suspected to be secondary to hyperkalemia, a preexisting metabolic acidosis, or a tricyclic antidepressant over ingestion.

Indications
- Specific Causes of Cardiac Arrest (Hyperkalemia)
- Poisonings - General Management (Tricyclic Antidepressant)
- Dialysis-Related Issues (Hyperkalemia)
- Crush Injury Syndrome (Hyperkalemia Prophylaxis)

Contraindications
- Known metabolic alkalosis.

Side Effects
Sodium bicarbonate may inhibit oxygen release secondary to a shift in oxyhemoglobin saturation. It also may produce a paradoxical acidosis that can depress cerebral and cardiac function. Severe soft tissue damage can occur in extravasated administrations.

Pharmacokinetics
Onset of effect is observed within 3-5 minutes after IVP/IOP administration.

Dosage
- Specific Causes of Cardiac Arrest - Hyperkalemia - Adult & Pediatric
- Poisonings - General Management - Tricyclic Antidepressants - Adult & Pediatric
- Dialysis-Related Issues - Hyperkalemia - Adult & Pediatric
- Crush Injury Syndrome - Hyperkalemia Prophylaxis - Adult & Pediatric
1 mEq/kg IVP/IOP with maximum dose of 50mEq

How Supplied
50 mEq/50 mL (1 mliq/rnl.) prefilled syringe.
(Always check concentration and dose per container at time of patient medication administration)
Sodium Chloride 0.9%
Paramedic-Nurse

Class
Crystalloid, electrolyte solution

Action/Pharmacodynamics
Controls water distribution, fluid and electrolyte balance.

Indications
Fluid resuscitation, diluent for IV medication administration.

Contraindications
Fluid overload, hypernatremia

Side Effects
Sensitivity to preservative

Pharmacokinetics

Dosage
variable

How Supplied
30 mL, 100mL, 250 ml, 500 ml, 1000mL
**Succinylcholine Chloride (Anectine)**

**Paramedic-Nurse**

**Class**
Depolarizing neuromuscular agent

**Action/Pharmacodynamics**
Acts on nicotine receptors, metabolized by butyrylcholinesterase

**Indications**
Paralysis for rapid sequence induction

**Contraindications**
Hyperkalemia, malignant hyperthermia, muscular dystrophy, myasthenia gravis, Gullian Barre; > 5 days: burns, spinal cord injuries, crush injuries, massive infection or prolonged immobilization

**Side Effects**
Bradycardia, trismus/masseter muscle spasm, fasciculation, hyperkalemia, prolonged neuromuscular blockade, malignant hyperthermia

**Pharmacokinetics**

- **Onset:** 60-90 sec.
- **Peak:** 2 min.
- **Duration:** 4-6 min.

**Dosage**
2mg/kg

**How Supplied**
INJ/Solution 20 mg/l mL
Tranexamic Acid (Cyklokapron)
Paramedic-Nurse

Class Antifibrinolytic

Action/Pharmacodynamics
Competitively inhibits the activation of plasminogen to plasmin

Indications
Excessive blood loss due to trauma

Contraindications
Use with caution in pts with: hx of blood clots, on hormonal contraceptives, kidney disease, pregnancy

Side Effects
Headache, fatigue, pain in joints, chest, back stomach. Swelling, tenderness, redness in extremities

Pharmacokinetics

    Onset: 5-15 min.    Duration: 3 hrs.

Dosage
1 gm diluted in 100 mL normal saline infused over 10 min.

How Supplied
INJ/Solution 100 mg/rnl,
Vasopressin (Pitressin)
Paramedic- Nurse

**Class**
Vasopressor, antidiuretic

**Action/Pharmacodynamics**
Increases reabsorption of water by renal tubules. Directly stimulates smooth muscle in GI tract.

**Indications**
Shock refractory ventricular fibrillation

**Contraindications**
None know.

**Side Effects**

**Pharmacokinetics**
*IV*  
*Duration:* 0.5-1 hr

**Dosage**
40 units 1 time bolus

**How Supplied**
INJ/Solution 20 units/nil,
Vecuronium
Paramedic-Nurse

Class
Non-depolarizing neuromuscular blocker

Action/Pharmacodynamics
Competitively bind acetylcholine receptor sites at the neuromuscular junction

Indications
Paralytic agent for rapid sequence intubation, ongoing paralysis for intubated patients

Contraindications
None

Side Effects
Skeletal muscle weakness with prolonged use

Pharmacokinetics
Onset: 2-3 min.  Duration: 30-40 min.

Dosage
IV/0.1 rug/kg

How Supplied
INJ/Solution 20 mg diluted in 20mL sodium chloride
Adult Cardiac Arrest Algorithm .......................................................... CAR-001
Adult Post Cardiac Arrest Care ............................................................ CAR-002
Adult Bradycardia Algorithm ............................................................... CAR-003
Adult Tachycardia Algorithm ............................................................... CAR-004
Cardiac Chest Pain ........................................................................... CAR-005
Cardiogenic Pulmonary Edema ............................................................ CAR-006
Cardiogenic Shock ........................................................................... CAR-007
Hypothermia-Post Resuscitation ......................................................... CAR-008
Intra-Aortic Balloon Pump Management-Air Evac EMS, Inc, Personnel Only ...... CAR-009
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Adult Cardiac Arrest Algorithm—2015 Update

1. Start CPR
   - Give oxygen
   - Attach monitor/defibrillator

2. Rhythm shockable?
   - Yes
     -VF/pVT
     3. Shock
     4. CPR 2 min
        - IV/IO access
     5. Rhythm shockable?
        - Yes
          - Shock
          6. CPR 2 min
             - Epinephrine every 3-5 min
             - Consider advanced airway, capnography
             7. Shock
             8. CPR 2 min
                - Amiodarone
                - Treat reversible causes
             9. Asystole/PEA
     - No
          - CPR 2 min
            - IV/IO access
            - Epinephrine every 3-5 min
            - Consider advanced airway, capnography
          10. Rhythm shockable?
               - Yes
                 - Shock
                 11. CPR 2 min
                     - Treat reversible causes
               - No
                 - CPR 2 min
                   - IV/IO access
                   - Epinephrine every 3-5 min
                   - Consider advanced airway, capnography
          12. Rhythm shockable?
               - Yes
                 - If no signs of return of spontaneous circulation (ROSC), go to 10 or 11
                 - If ROSC, go to Post-Cardiac Arrest Care
               - No
                 - Go to 5 or 7

CPR Quality
- Push hard (at least 2 inches [5 cm]) and fast (100-120/min)
- Minimize interruptions in compressions.
- Avoid excessive ventilation.
- Rotate compressor every 2 minutes, or sooner if fatigued.
- If no advanced airway, 30:2 compression-ventilation ratio.
- Quantitative waveform esophageography
  - If PETCO₂ <10 mm Hg, attempt to improve CPR quality.
  - Intra-arterial pressure
    - If relaxation phase (diastolic) pressure <20 mm Hg, attempt to improve CPR quality.

Shock Energy for Defibrillation
- Biphasic: Manufacturer recommendation (eg, initial dose of 120-200 J; if unknown, use maximum available. Second and subsequent doses should be equidistant, and higher doses may be considered.
- Monophasic: 360 J

Drug Therapy
- Epinephrine IV/IO dose:
  - 1 mg every 3-5 minutes
  - Amiodarone IV/IO dose: First dose: 300 mg bolus. Second dose: 150 mg.

Advanced Airway
- Endotracheal intubation or supraglottic advanced airway
- Waveform capnography or esophageal to confirm and monitor ET tube placement
- Once advanced airway in place, give 1 breath every 6 seconds (10 breaths/min) with continuous chest compressions

Return of Spontaneous Circulation (ROSC)
- Pulse and blood pressure
- Abrupt sustained increase in PETCO₂ (typically ≥40 mm Hg)
- Spontaneous arterial pressure waves with intra-arterial monitoring

Reversible Causes
- Hypervolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo-hyperkalemia
- Hypothermia
- Tension pneumothorax
- Tamponade, cardiac
- Toxins
- Thrombosis, pulmonary
- Thrombosis, coronary
Protocol: CAR 002  
Title: Adult Post Cardiac Arrest Care  
Effective Date: 12-11  
Revision Date: 4-16  
Revision Number: 1  
Reviewed: 4-16  

Adult Immediate Post-Cardiac Arrest Care Algorithm—2015 Update

1. Return of spontaneous circulation (ROSC)

2. Optimize ventilation and oxygenation
   - Maintain oxygen saturation ≥94%
   - Consider advanced airway and waveform capnography
   - Do not hyperventilate

3. Treat hypotension (SBP <90 mm Hg)
   - IV/IO bolus
   - Vasopressor infusion
   - Consider treatable causes

4. 12-Lead ECG: STEMI OR high suspicion of AMI
   - Yes
   - Coronary reperfusion
   - No
   - Follow commands?

5. Coronary reperfusion
   - Yes
   - Advanced critical care
   - No
   - Initiate targeted temperature management
   - Yes
   - Follow commands?

6. Follow commands?
   - Yes
   - Advanced critical care
   - No

7. \[\text{Initiate targeted temperature management}\]

8. \[\text{Follow commands?}\]

**Doses/Details**

- Ventilation/oxygenation:
  Avoid excessive ventilation.
  Start at 10 breaths/min and titrate to target PETCO₂ of 35-40 mm Hg.
  When feasible, titrate FiO₂ to minimum necessary to achieve Spo₂ ≥94%.

- **IV bolus:**
  Approximately 1-2 L normal saline or lactated Ringer’s

- **Epinephrine IV infusion:**
  0.1-0.5 mcg/kg per minute (in 70-kg adult: 7-35 mcg per minute)

- **Dopamine IV infusion:**
  5-10 mcg/kg per minute

- **Norepinephrine IV infusion:**
  0.1-0.5 mcg/kg per minute (in 70-kg adults 7-35 mcg per minute)

- **Reversible Causes:**
  - Hypovolemia
  - Hypoxia
  - Hydrogen ion (acidosis)
  - Hypo-/hyperkalemia
  - Hypothermia
  - Tension pneumothorax
  - Tamponade, cardiac
  - Toxins
  - Thrombosis, pulmonary
  - Thrombosis, coronary

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QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: CAR 003
Title: Adult Bradycardia Algorithm
Effective Date: 12-11
Revision Date: 4-16  Revision Number: 1
Reviewed: 4-16

Adult Bradycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically <50/min if bradyarrhythmia.
2. Identify and treat underlying cause
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxemic)
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry
   - IV access
   - 12-Lead ECG if available; don’t delay therapy
3. Persistent bradyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?
4. Monitor and observe
5. Yes
   - Atropine
     If atropine ineffective:
     - Transcutaneous pacing
     or
     - Dopamine infusion
     or
     - Epinephrine infusion
   - Consider:
     - Expert consultation
     - Transvenous pacing
6. Doses/Details
   - Atropine IV dose:
     First dose: 0.5 mg bolus;
     Repeat every 3-5 minutes;
     Maximum: 3 mg,
   - Dopamine IV infusion:
     Usual infusion rate is 2-20 mcg/kg per minute;
     Titrated to patient response;
     Taper slowly.
   - Epinephrine IV infusion:
     2-10 mcg per minute infusion;
     Titrated to patient response.

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11/2016
Protocol: CAR 004
Title: Adult Tachycardia Algorithm
Effective Date: 12-11
Revision Date: 4-16
Reviewed: 4-16

Adult Tachycardia With a Pulse Algorithm

1. Assess appropriateness for clinical condition. Heart rate typically ≥150/min if tachyarrhythmia.
2. Identify and treat underlying cause:
   - Maintain patent airway; assist breathing as necessary
   - Oxygen (if hypoxic)
   - ECG monitor to identify rhythm; monitor blood pressure and oximetry
3. Persistent tachyarrhythmia causing:
   - Hypotension?
   - Acutely altered mental status?
   - Signs of shock?
   - Ischemic chest discomfort?
   - Acute heart failure?
4. Synchronized cardioversion:
   - Consider sedation
   - If regular narrow complex, consider adenosine
5. Wide QRS? ≥0.12 second
   - IV access and 12-lead ECG if available
   - Consider adenosine only if regular and monomorphic
   - Consider antiarrhythmic infusion
   - Consider expert consultation
6. No
5. Yes
   - Synchronized cardioversion
   - Initial recommended doses:
     - Narrow regular: 50-100 J
     - Narrow irregular: 120-200 J
     - Wide regular: 100 J
     - Wide irregular: defibrillation dose (not synchronized)
   - Adenosine IV dose:
     - First dose: 6 mg rapid IV push; follow with NS flush
     - Second dose: 12 mg if required
   - Antiarrhythmic Infusions for Stable Wide-QRS Tachycardia
     - Procainamide IV dose:
       - 20-50 mg/min until arrhythmia suppressed, hypotension ensues, ORS duration increases >50%, or maximum dose 17 mg/kg given
       - Maintenance infusion: 1-4 mg/min
       - Avoid if prolonged QT or CHF
     - Amiodarone IV dose:
       - First dose: 150 mg over 10 minutes
       - Repeat as needed if VT recurs
       - Follow by maintenance infusion of 1 mg/min for first 6 hours
     - Sotalol IV dose:
       - 100 mg (1.5 mg/kg) over 5 minutes
       - Avoid if prolonged QT

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11/2016
Purpose:
To define assessment, management and treatment of patients with cardiac conditions, including ST-elevation myocardial infarction that require critical care transport.

Procedure:
1. If not already administered, give 160-325mg aspirin PO.
2. Obtain 12 lead EKG and transmit to appropriate receiving facility. Consider right side EKG if suspected right ventricular infarct. Notify receiving facility of Code STEMI as soon as possible.
3. If hypotensive with right ventricular infarct, administer normal saline bolus.
4. Administer nitroglycerine 0.4mg SL. May repeat x 2, every 5 minutes.
5. If chest pain persists, initiate a nitroglycerine infusion at 10mcg/min. Increase by 10mcg/min (up to 200mcg/min) every 3-5 mins until chest pain is relieved.
6. If a nitroglycerin infusion is not available, apply nitroglycerin ointment 1 inch to the patient’s chest.
7. If the patient becomes hypotensive, stop the nitroglycerin infusion or remove nitroglycerin paste and give the patient IV/IO crystalloid bolus up to 30 ml/kg.
8. For pain not relieved by nitroglycerin, may consider:
   a) morphine sulfate 0.05-0.1 mg/kg IV/IO (single max dose of 10mg), may repeat if needed
   b) fentanyl 0.5-1.5 mcg/kg IV/IO (single max dose 200mcg), may repeat if needed
9. Consider repeat 12 lead EKG for change in patient status and notify receiving facility as appropriate.

Considerations:
1. Nitroglycerin: contraindicated if use of PDE-5 inhibitor in past 24 hours, or tadalafil in past 48 hours, BP <90 mmHG or <30 mmHG below baseline or allergy. Use with extreme caution with inferior STEMI or right ventricular infarct.
2. Morphine Sulfate: contraindicated if BP <90 mmHG or allergy. Use with caution in unstable angina/NSTEMI.
3. Aspirin contraindications: allergy or active gastrointestinal hemorrhage.
4. DO NOT DELAY TRANSPORT TO OBTAIN 12 LEAD.
Purpose: To define assessment, management and treatment for patients in respiratory distress due to pulmonary edema that require critical care transport.

Procedure:

1. Position patient upright with head of bed elevated. Patients in moderate/severe distress should receive high flow oxygen if SpO2 <90%.
2. Obtain 12 Lead EKG.
3. Consider use of non-invasive positive pressure ventilation (CPAP/CPAP+PS) if indicated.
4. For impending respiratory failure, intubate patient and follow with appropriate ventilator management.
5. Administer furosemide 40mg slow IV/IO if the patient does not currently take a diuretic. If patient is taking furosemide, then double the patient’s normal oral dose. Maximum single dose and/or total dose of furosemide should not exceed 200mg.
6. If SBP >110 mmHg, administer:
   i. nitroglycerine 0.4mg sublingual, may repeat 2 times.
      OR
   ii. nitroglycerine drip 10mcg/min, increase by 10mcg/min every 3-5 mins (max dose 200mcg/min)
      OR
   iii. nitroglycerin paste (1 inch) to patient’s chest

   If patient becomes hypotensive, stop/remove the nitroglycerine.

7. If systolic blood pressure <90 mmHg, treat per cardiogenic shock protocol.

If treatments are ineffective, contact Medical Control for orders.
Purpose:

Treatment of shock caused by cardiac failure

Procedure:

1. Obtain 12 lead EKG and treat findings based on appropriate protocol.

2. If patient is hypotensive or showing signs of inadequate tissue perfusion, cautiously administer 250 ml IV/IO fluid challenge.

3. If patient remains poorly perfused after the initial fluid challenge, consider repeating 250 ml IV/IO fluid challenge and/or vasoactive therapy:

4. If SBP < 80 or MAP < 65, consider:
   a. Norepinephrine infusion at 5-10 mcg/min, titrate to goal of SBP $\geq 90$ or MAP $\geq 65$
   b. Epinephrine can be added as a second line vasopressor at 2-10 mcg/min, titrate to goal SBP $\geq 90$ or MAP $\geq 65$
Protocol: CAR 008  
Title: Hypothermia – Post Resuscitation  
Effective Date: 07-09  
Revision Date: 9-09  
Review Date: 4-16  
Revision Number: 1

Historical Findings:
- Pt $\geq$ 18 years of age for invasive cooling procedure
- Pt $\geq$ 5 days old for external cooling procedure

Inclusion Criteria:
Pt is intubated with ETT, King airway or combitube
Return of spontaneous circulation after cardiac arrest (VF, Pulseless VT ONLY)
Cardiac arrest is **NOT** due to multi-system trauma or non-compressible hemorrhage
Patient’s initial temp is $>34^0$C/ $93^0$ F
Adult patient SBP $\geq$ 100mmHg
Pediatric patient SBP $\geq$ 70 + (age in years x 2) mmHg
Cooling measures have been previously implemented by EMS or Transferring Hospital

Exclusion Criteria:
- Obviously pregnant patients (gravid uterus)
- ROSC after PEA or Asystolic rhythm

Protocol:
- Assure airway is patent and secured
- Maintain continuous cardiac, oxygen saturation and ETCO2 monitoring at all times.
- Ensure vascular access with a minimum of two large bore IV’s or IO
- Maintain ice/cold packs into patient’s axilla and groin and along the patient’s neck against the carotid arteries. (Do not compress) Place ice packs directly on the skin for maximum cooling. Ensure patient privacy.
- Medicate patient with Versed 2.5mg q 5 minutes for sedation and shivering (titrate for BP $\geq$100mmHg)
- Medicate patient with Vecuronium 0.1mg/kg for continued chemical paralysis
### IMPORTANT:
PARAMEDICS/NURSES MAY PROVIDE MECHANICAL CIRCULATORY SUPPORT DURING INTERFACILITY TRANSPORT ONLY IF THEY HAVE COMPLETED ADDITIONAL TRAINING IN THE USE OF INTRA-AORTIC BALLOON PUMPS, INCLUDING APPROPRIATE CONTINUING EDUCATION, AND ARE PROPERLY CREDENTIALED BY THE MEDICAL DIRECTOR TO OPERATE SUCH EQUIPMENT.

*Completion of the IABP Flow Sheet is required and must include documentation of all noted hemodynamic assessments/measurements at a minimum of Q 15 minutes intervals.*

### I. PRIOR TO TRANSPORT:

1. Together with the transferring physician, nurse, or cardiovascular technical staff, evaluate balloon insertion site:
   a. Ensure Intra-aortic balloon catheter is properly secured
   b. Note balloon size on the PCR.
   c. Check intra-aortic balloon insertion site for bleeding or drainage.
   d. Record pre-transport intra-aortic balloon pump settings

2. Establish baseline condition. Evaluate clinical condition and hemodynamics. Measure and record temperature, blood pressure, respiratory rate and quality, heart rate and rhythm, arterial blood pressure, augmented systolic, mean, and diastolic blood pressure, (as applicable) CVP, PAP and PCWP. Evaluate pulses and capillary filling times in all extremities. *IT MAY BE NECESSARY TO USE A DOPPLER STETHOSCOPE TO CONFIRM PULSATILE FLOW IF CARDIOGENIC SHOCK IS SEVERE.*

3. Arterial line shall be maintained for transport (as applicable). Assure transducer is connected and in working order. Zero and check blood pressure measurements. Compare with manual blood pressure measurements. Maintain adequate arterial tracing throughout transport.

4. *Continue written orders for intra-aortic balloon pump settings from sending facility.*

5. Ensure that the intra-aortic balloon pump being used for transport is properly functioning:
   a. Ensure IABP battery is charged and helium tank level is sufficient for transport
   b. An acceptable ECG trigger is present
   c. Settings are as ordered
II. TRANSPORT CONSIDERATIONS:

1. Continuously monitor hemodynamics including augmented systolic, mean, and diastolic blood pressure and left and right radial pulse presence and quality in addition to standard vital signs. (See # 2)

2. In the event of suspected balloon rupture such as blood in helium line, the pump should be discontinued immediately and the helium line should be clamped. Manual pumping is CONTRAINDICATED in suspected balloon rupture.

2. In the event of mechanical failure, and the patient remains stable, attempt to identify and correct the problem. If the problem cannot be identified and corrected within twenty (20) minutes, detach intra-aortic balloon catheter from pump. Using a 60 ml syringe and three-way stopcock, pull negative pressure, if blood is drawn or seen do not inflate the balloon, and disconnect the pump. If there is no blood drawn or seen, inflate and deflate the balloon once. Repeat these steps every three to five minutes starting with identifying that there is no blood drawn. Volume used for inflation should be 10cc LESS THAN the listed balloon volume.

3. In the event of mechanical failure and the patient becomes unstable, attempt to identify and correct the problem. If the problem cannot be immediately identified and corrected, detach intra-aortic balloon catheter from pump. Using a 60 ml syringe and three-way stopcock, pull negative pressure, if blood is drawn or seen do not inflate the balloon, and disconnect the pump. If there is no blood drawn or seen, inflate and deflate the balloon once. Repeat these steps every three to five minutes starting with identifying that there is no blood drawn. Volume used for inflation should be 10cc LESS THAN the listed balloon volume.

4. In the event of a clinical emergency, proceed with cardiopulmonary resuscitation as indicated and contact medical control as soon as possible (without compromising patient safety).

6. Consider diversion to an appropriate facility in the event of pump failure

NOTE: CARDIOPULMONARY RESUSCITATION AND DEFIBRILLATION MAY BE PERFORMED WHILE THE INTRA-AORTIC BALLOON PUMP IS FUNCTIONING.

IV. POST TRANSPORT:

1. Together with the receiving physician, nurse, or cardiovascular technical staff (as appropriate), ensure that hospital pump is properly functioning, that an acceptable ECG trigger is present, that its settings are correct, and that it is placed on standby, ready to be attached to the intra-aortic balloon catheter.

2. Place transport pump on standby, detach intra-aortic balloon catheter from transport pump, and assist with attachment to hospital pump, fill chamber, remove hospital pump from standby, and begin pumping.

3. Record type and model of intra-aortic balloon pump used, settings employed in-transport, and augmented systolic, mean and diastolic blood pressures obtained post-transport, extremity pulse presence and quality, as well as any changes in patient condition, modifications in intra-aortic balloon pump settings, and unusual incidents occurring enroute, in the Golden Hour Clinical Record, IABP Tab.
NOTE: IF YOU ARE NOT FAMILIAR WITH THE TYPE OF INTRA-AORTIC BALLOON PUMP BEING USED, OR DO NOT FEEL COMFORTABLE WITH THE INTRA-AORTIC BALLOON PUMP SETTINGS PRESCRIBED BY THE SENDING PHYSICIAN, DO NOT ATTEMPT TRANSPORT. CONTACT MEDICAL CONTROL FOR FURTHER INSTRUCTIONS.

Personnel participating in interfacility transport of patients with Intra-aortic Balloon pump must have completed vendor sponsored initial and recurrent annual training as directed by the Patient Care Services division of Air Evac EMS Inc.

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11/2016
Hypothermia (Adult and Pediatric) ................................................................. ENV-001
Frostbite Injury (Adult and Pediatric) ........................................................... ENV-002
Heat Emergencies (Adult and Pediatric) ....................................................... ENV-003
Near Drowning (Adult and Pediatric) ............................................................ ENV-004
Envenomation (Stings/Bites) ........................................................................ ENV-005
Protocol: ENV 001
Title: Hypothermia (Adult and Pediatric)
Effective Date: 8-05
Revision Date: 5-06, 1-07, 6-14, 2-16
Revision Number: 4
Reviewed: 2-16

Purpose:

Identifying and recognizing signs of hypothermia to provide adequate therapy as per patient presentation.

Considerations:

Be cautious of afterdrop phenomenon (the continued cooling of body temperature after removal of the cold stress) occurring.

Always check a core temperature.

Treatment Algorithm on Page 2

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**Procedure:**

- **If the core temp is < 90 F (30 C) 90 F**
  - Is the patient breathing?
    - **YES**
      - Gentle evacuation is needed. Remove wet clothing, insulate with dry, warm blankets, and immobilize to avoid exertion by the patient.
    - **NO**
      - Pulse Present?
        - **Yes, Standards of care, then…**
        - **NO**
          - Check for a central pulse for up to a full minute using Doppler.
            - **Yes, Standards of care, then…**
            - **NO**
              - Begin CPR.
                - If rhythm is ventricular fibrillation or ventricular tachycardia, defibrillate once with 2J/kg (peds) or a max of 150 joules.
                  - Initiate warming measures to the extent possible.
                    - If core temperature is less than 30 C (86 F) continue CPR, but withhold IV/IO medications and additional defibrillation.
                    - If core temperature is greater than 30 C (86 F) continue CPR, give IV medications as indicated, but space at longer than standard intervals and repeat defibrillation for VF/VT as core temperature rises.
    - If hypotensive administer 30 mL/kg warm crystalloid bolus IV/IO
      - Perform blood glucose analysis and treat appropriately.
        - If patient is normoglycemic or hypoglycemia is treated appropriately and pt is still unresponsive, refer to Altered Level of Consciousness protocol.
- With return of organized rhythm or ROSC, revert to Standards of Care and continue active warming.

If temp is above 30 C (86 F) and no ROSC or organized rhythm is obtained after standard ACLS guidelines, contact medical control.
Purpose:
To manage, treat and prevent further injury to the affected areas.

Procedure:
1. Expose the affected area.
2. Apply non-adherent gauze as a first dressing layer, with caution to not break blisters.
3. Wrap with gauze for padding.
4. Insert gauze padding between digits to prevent tissue maceration.
5. Treat frozen part as an open wound.
6. Avoid pressure and friction to frozen part, only splint if absolutely necessary.
7. Wrap frozen part for mechanical protection and elevate.

Considerations:
1. Avoid active re-warming if transport time is less than 2 hours to definitive care and/or there is a chance of re-freezing occurring.
2. Assess for and treat coexisting hypothermia. Refer to Hypothermia protocol.
# Protocol: ENV 003

## Title:
Heat Emergencies (Adult and Pediatric)

### Effective Date:
12-05

### Revision Date:
1-07, 4-14, 2-16  Revision Number: 3

### Reviewed:
2-16

## Purpose:
To identify and treat patients with heat emergencies.

## Procedure:
1. Remove from hot environment.
2. Monitor core temperature.
3. Initiate rapid cooling measures.
   a. Evaporative cooling measures
      i. Spraying tepid water on the patient
      ii. Fanning (achieve via opening windows)
   b. Environmental temperature control (excessive air conditioning can cause vasoconstriction and shivering)
   c. Place cold packs to groin, axilla and neck
4. Initiate fluids.
   a. Exertional induced hyperthermia with signs of hypovolemia, 30 mL/kg non-warmed crystalloid IV/IO.
   b. Non-exertional hyperthermia without signs of hypovolemia give non-warmed crystalloid IV/IO as needed.
5. Stop cooling measures when temperature of 38.3C-38.9C (101F-102F) is achieved. If not able to obtain core temperature stop cooling when patient starts shivering.
6. Excessive shivering generates heat and can cause peripheral vasoconstriction ultimately slowing the cooling process and should be treated with Midazolam 0.02 mg/kg to 0.05 mg/kg IV/IO every 5 minutes PRN. Titrate to cessation of shivering and an alert and calm state (RASS 0), maintain SBP appropriate for age. (Single max dose of 5 mg).

## Considerations:
1. Cooling measures are the priority in these patients.
2. Monitor EtCO2 in any patient receiving Midazolam.

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11/2016
Protocol: ENV 004  
Title: Near Drowning (Adult and Pediatric)  
Effective Date: 8-10  
Revision Date: 4-14, 8-15, 2-16  
Revision Number: 3  
Reviewed: 2-16

**Purpose:**

To identify and manage near drowning patients.

**Procedure:**

1. Immobilize patient if unconscious and mechanism of injury is unknown.
2. Provide airway control as needed. You may use CPAP or BIPAP with respiratory distress that does not require intubation.
3. Administer 20 ml/kg IV/IO of NS for hypotension to maintain systolic blood pressure above 90mmHg [if < 1 year old, >70 mmHg; if 1-10 years old, 70 + (age x 2)].
4. Remove wet clothing and start warming measures. Do not warm to temperature >37 degrees C.
5. Follow routine ACLS algorithms for cardiac arrest.
6. If the patient is hypothermic, refer to the Hypothermia protocol.
7. Insert OG/NG tube.

**Considerations:**

1. Abdominal thrusts are contraindicated unless the patient has a foreign body airway obstruction.
2. Higher level of PEEP may be required for this patient population.
3. Consider resuscitation for submersion less than 2 hours in water less than 70F.
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: ENV
005

Title: Envenomation (Stings/ Bites)

Effective Date: 2-16

Revision Date: N/A

Reviewed: 1-16

Purpose:
Define treatment of various poisonous Snake, Spider & Insect Bites.

Procedure:

1. Keep patient calm. Treat anxiety and agitation as needed.

2. Use scraping method to remove stinger/fang only if visible.

3. Note envenomation site, marking swelling with a line and assessment time.
   Reassess every 15 minutes, noting any progression with new mark and time.

4. Immobilize any affected extremity and attempt to maintain at level of patient’s heart.

5. Treat pain as needed.

6. Treat muscle spasms with Midazolam 0.05-0.1mg/kg not to exceed 5mg single dose.
   May repeat as needed every 5 minutes.

Note:
Never transport or handle any snake, spider or insect.

If possible obtain a photo for identification at receiving facility.

Contact Medical Control prior to applying or removing any pressure wrap.

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11/2016
Stroke (Prehospital-Unknown hemorrhagic or Ischemic)..............................MED 001A
Stroke (Ischemic Stroke)..............................................................................MED 001B
Stroke (Hemorrhagic – Interfacility).............................................................MED 001 C
Airway obstruction – Pediatric and Adult..................................................MED 002
Anaphylaxis/Allergic Reaction – Pediatric and Adult ....................................MED 003
Thoracic Aneurysm ......................................................................................MED 004
Ruptured Abdominal Aneurysm .................................................................MED 005
Diabetic Ketoacidosis – Adult and Pediatric (Interfacility Only) ...............MED 006
Symptomatic Hypertension/Hypertensive Emergency ...............................MED 007
Respiratory Distress – Adult (Asthma/COPD) .............................................MED 008
Seizures – Adult, Pediatric .........................................................................MED 009
Toxicologic Emergencies – Ingestion/Exposure/Overdose .........................MED 010
Adult Sepsis ...............................................................................................MED 011
Hyperkalemia .............................................................................................MED 012
Purpose: To define the assessment, management and treatment considerations of patients with symptoms of stroke that require critical care transport.

Procedure:

1. Perform and document a nationally recognized stroke scale.
2. Attempt to determine onset of symptoms/last known time seen normal. Obtain contact information from witnesses/family.
3. Obtain blood glucose. If blood glucose < 60mg/dL, administer dextrose 50% 12.5-25 grams IV/IO. Recheck blood glucose after dextrose administration. Avoid hyperglycemia.
4. If patient is hypotensive (BP significantly lower than normal for patient or systolic <120mmHg), place HOB flat and administer normal saline to improve cerebral perfusion.
5. If hypertensive and BP >220/120 (target B/P is 185/110):
   a. Treat pain, anxiety and/or nausea first.
   b. May consider ONE of the following:
      i. Labetalol 10mg slow IVP over 2 minutes. May repeat every 10 minutes. (max cumulative dose 40mg).
      OR
      ii. Nicardipine infusion 5mg/hr, titrate by 2.5 mg/hr every 5-15 minutes to a maximum of 15mg/hr

   If ineffective contact Medical Control for orders.
6. If patient is febrile (temp >100.5 F), administer 650mg acetaminophen (Tylenol) PR (preferred) or PO.
7. Obtain 12 lead EKG.
8. Administer supplemental O2 to maintain saturations between 94%-99%
9. Treat seizures per protocol.
10. Transport with HOB at 15-30 degrees.

11. Do not delay transport. Destination is based on time of onset, transport time, treatment options, regional stroke guidelines, and/or patient preference. **When times are comparable, patient should be transported to the facility with the greatest capability for treating acute stroke.**

**Notes:**

**Contraindications for labetalol:** Bradycardia, 2\(^{nd}\) or 3\(^{rd}\) degree heart block, history of bronchospastic airway disease.

Do not use IV fluids that contain glucose. Normal saline is the fluid of choice in stroke management.

If possible, obtain information on tPA Administration Screening Form.

**The benefit of routine prehospital blood pressure intervention is not proven; contact with medical control may assist in making treatment decisions.**
**Purpose:** To define assessment, management and treatment considerations for patient with ischemic stroke requiring interfacility critical care transport.

**Procedure:**

1. Obtain orders for blood pressure parameters and management from sending or receiving physician.

2. If blood pressure management orders are not available, treat based on the following guidelines:

   a. **For patient that is eligible for and has not received treatment with intravenous rtPA (Alteplase) or other reperfusion intervention and BP is systolic >185 mmHg or diastolic >110 mmHg, treat to a target BP of just below or at 185/110.**
      i. Treat pain, anxiety and/or nausea first.
      ii. Labetalol 10 to 20mg slow IVP, may repeat X1 (max dose 40mg)
         OR
         Nicardipine infusion, 5mg/hr, titrate up by 2.5mg/hr at 5 to 15 minute intervals, maximum dose 15mg/hr; when target BP attained, reduce to 3mg/hr (max dose 15 mg/hr)

   b. **For patient that has been or is currently being treated with rtPA (Alteplase) or other reperfusion intervention, treat and maintain a target BP of below 180/105:**
      i. Treat pain, anxiety and/or nausea first.
      ii. If Systolic 180 to 230 mmHg or diastolic 105 to 120 mmHg administer:
          Labetalol 10mg slow IVP, may repeat every 10 to 20 minutes, (max dose of 300mg)
iii. If systolic >230 mmHg or diastolic 121 to 140 mmHg administer:
    Labetalol 10mg slow IVP, may repeat every 10 to 20 minutes. (max
dose of 300mg)
    
    OR
    Nicardipine infusion, 5 mg/hr, titrate by 2.5 mg/hr every 5 minutes.
    (max of 15 mg/hr)

c. For patient that is not eligible for or is not going to receive fibrinolysis, treat
    only if SBP is >220 mmHg or DBP is >120 mmHg. Do not reduce BP by more
    than 15%:
    i. Treat pain, anxiety and/or nausea first
    ii. Labetalol 10 to 20mg slow IVP, may repeat X1 (max
dose 40mg)
      OR
      Nicardipine infusion, 5 mg/hr, titrate up by 2.5mg/hr at 5 to 15
      minute intervals, when target BP attained, reduce to 3mg/hr. (max
dose 15mg/hr)
    
    *Blood pressure must be checked every 15 minutes at a minimum*.

3. Monitor blood glucose levels. Avoid hyper or hypoglycemia.
4. If patient is febrile (temp >100.5 F), administer 650mg acetaminophen (Tylenol) PO
or PR.
5. Administer supplemental O2 if needed to maintain saturations between 94%-99%
6. Treat seizures per protocol.
7. Transport with HOB at 15-30°
8. Avoid unnecessary stimulation and keep patient calm.

Notes:

Contraindications for labetalol: Bradycardia, 2nd or 3rd degree heart block, history of
bronchospastic airway disease.
Do not use IV fluids that contain glucose. Normal saline is the fluid of choice in stroke
management.
Purpose: To define assessment, management and treatment considerations for patient with hemorrhagic stroke requiring interfacility critical care transport.

Procedure:

1. Obtain orders for blood pressure parameters and blood pressure management during transport from sending or receiving physician.

2. If orders are unavailable and treatment has not been initiated by sending facility, treatment to lower blood pressure should begin during transport. Treat based on the following guidelines to a target SBP of just below 140 mmHg.
   
   If SBP is > 150 mmHg:
   
   i. Treat pain, anxiety and/or nausea first.
   
   ii. If SBP remains >150 mmHg:
       
       Administer Labetalol 10mg slow IVP over 2 minutes. Repeat every 10 minutes to target goal of just below 140 SBP. (max cumulative dose of 300 mgs).
       
       OR
       
       Nicardipine infusion, 5mg/hr, titrate up by 2.5mg/hr at 5 to 15 minute intervals, maximum dose 15mg/hr.
       
       *If SBP is >220 mmHg contact receiving facility/Medical Control for further orders*

3. Monitor patient temperature. If patient is febrile (temp >100.5 F), administer 650mg acetaminophen (Tylenol) PO or PR.

4. Monitor glucose. Avoid hyper or hypoglycemia.

5. Administer supplemental O2 if needed to maintain saturations between 94%-99%

6. If seizure occurs, treat per protocol.


8. Keep patient calm and avoid unnecessary stimulation.
Notes:

Contraindications for labetalol: bradycardia, 2nd or 3rd degree heart block, history of bronchospastic airway disease.

Do not use IV fluids that contain glucose. Normal Saline is the fluid of choice in stroke management.

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11/2016
MED 002
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PROTOCOLS & STANDING ORDERS

Protocol: MED 002
Title: Airway Obstruction- Pediatric and Adult
Effective Date: 8-05
Revision Date: 12-09, 8-15, 4-16
Reviewed: 4-16
Revision Number: 3

Purpose:
To define the assessment, management and treatment considerations for patient with suspected or known airway obstructions that requiring critical care transport.

Airway Obstruction:
1. If patient can move air and cough, do not interfere with attempts to clear airway.
2. Allow patient to maintain a position of comfort.

Foreign Body:
1. Follow current AHA Guidelines for obstructed airway.

Soft Tissue (Croup/Tracheitis)
1. Administer nebulized epinephrine (1:1000) 0.5 mL/kg of 1 mg/mL solution (maximum dose: 5 mL) diluted in NS, may repeat dose every 20 minutes.
2. Intubation, if needed, should be performed by most experienced provider using ½ to 1 size smaller endotracheal tube.

Consideration:
Nebulized epinephrine should be used with caution if heart rate >150 in Adult or >180 in Pediatric

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11/2016
**Purpose:** To define assessment, treatment and management for patient having allergic or anaphylactic reaction.

**Procedure:**

1. Remove allergen (e.g., stop infusion of a suspect medication or blood products).
2. Consider early intubation in the patient with signs and symptoms of respiratory distress and marked stridor.
3. If hypotension or severe respiratory distress is present, administer epinephrine 1:1000 solution IM in mid-outer aspect of the thigh or deltoid.
   a. Adult - 0.3mg-0.5mg
   b. Pediatric - 0.01mg/kg (max 0.3mg)
4. Administer 30ml/kg crystalloid IV/IO if patient is hypotensive after administration of IM epinephrine.
5. If bronchospasm or wheezing is present, administer albuterol via nebulizer, repeat every 15 minutes as needed.
   a. Adult/Pediatric - 2.5mg via nebulizer
6. Administer diphenhydramine.
   a. Adult – 50mg IV/IO/IM
   b. Pediatric – 1mg/kg IV/IO/IM (max single dose 50mg)
7. If patient is unconscious, administer epinephrine IV/IO push.
   a. Adult - 0.1mg to 0.5 mg (1ml – 5mls of 1:10,000 solution) IV/IO push
   b. Pediatric – 0.01mg/kg IV/IO push (single max dose of 0.5mg of 1:10,000 solution)
8. May consider, methylprednisolone 1mg/kg IV/IM.
9. If hypotension still persists, initiate an epinephrine infusion.
   a. Adult - initiate at 5-10mcg/min IV/IO and titrate to effect. Target SBP of ≥ 90 or MAP of ≥ 65. (max 1 mcg/kg/min)
   b. Pediatric – initiate at 0.1mcg/kg/min IV/IO and titrate to effect. (max 1mcg/kg/min).
10. If hypotension still persists, initiate a norepinephrine infusion:
    a. Adult - initiate 5-10mcg/min and titrate to a target SBP of ≥ 90 or MAP of ≥ 65.
    b. Pediatric – initiate 0.05 to 0.1 mcg/kg/min IV/IO and titrate to effect.
**Considerations:**

1. For the patient with severe anaphylaxis requiring advanced airway management, consider early cricothyrotomy.
2. Patients taking beta-blockers may not exhibit the usual tachycardia or sympathetic adrenergic response to allergic stimuli.

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11/2016
Protocol: MED 004  
Title: Thoracic Aneurysm  
Effective Date: 5-06  
Revision Date: 6-10, 6-14, 4-16  
Revision Number: 3  
Reviewed: 4-16  

Purpose: To define the assessment, management and treatment considerations for patients with suspected or known thoracic aneurysms requiring critical care transport.

Procedure:

1. Secure vascular access with a minimum of two large bore IV’s. Ensure adequate fluid resuscitation.

2. Administer medications based on patient presentation:

If Hypertensive:

- Goal of treatment is to maintain SBP < 100 mmHg and heart rate 60 bpm.
- If leaking or dissecting aneurysms, goal is SBP 80-100 mmHg and heart rate 50-60 bpm.

  a. Administer labetalol 20 mg slow IVP over 2 minutes. Repeat every 10 minutes by doubling dose until cumulative maximum dose of 300 mg is administered or target HR and/or SBP obtained.

  b. If labetalol ineffective or contraindicated, contact Medical Control for orders.

If Hypotensive:

  a. Administer IV NS or LR and deliver 30ml/kg initial bolus. Continue to titrate fluid administration to vital signs to maintain systolic blood pressure = 80-100 mmHg.

  b. If available, transfuse blood per MD order.

  c. Vasopressor agents should be reserved as a last resort if resuscitation cannot be achieved with fluids and/or blood products.

Considerations:

- Treatment of pain should be considered.

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11/2016
Purpose: To define assessment, management and treatment considerations for patients with suspected or known ruptured abdominal aneurysm that require critical care transport.

Procedure:

1. If interfacility, obtain orders from sending/receiving facility. If orders not available or this is a prehospital patient, treat according to below guidelines.

2. Administer medications to reach a target heart rate of 60 bpm and SBP 80-100 mmHg.
   a. Treat pain as needed. Morphine is preferred medication in this patient population.
   b. For SBP >100 give labetalol 20mg slow IV/IO over 2 minutes. Repeat every 10 minutes by doubling dose until cumulative maximum dose of 300 mg is administered or target HR and/or SBP obtained.
   c. If labetalol ineffective or contraindicated, contact Medical Control for orders.

3. If hypotensive:
   A. Initiate limited resuscitation only if SBP is less than 80 mmHg or patient is obtunded or severely confused.
   B. Transfuse blood, if available, per MD order.
   C. If SBP is below 80 mmHg, administer blood and/or FFP to a target SBP of 80 mmHg.
   D. If blood products are not available, proceed with careful limited resuscitation of 500ml bolus of normal saline. May repeat to SBP of 80 mmHg. Do not over resuscitate.

Considerations:
Remember these patients all have significant atherosclerosis and you must be attentive to possible decreased cardiac perfusion with hypotension.
Labetalol is contraindicated in CHF and in patients with HR less than 60, or second or third degree heart block.

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11/2016
Purpose:

To define assessment, management and treatment of the adult or pediatric diabetic ketoacidosis (DKA) patient requiring interfacility critical care transport.

Procedure:

1. Consult with sending and/or receiving physicians prior to leaving facility. Contact Medical Control in event of questions or concerns.
2. Blood glucose checks every 30 minutes. With a minimum of beginning, middle and end of transport.
   a. **GLUCOSE SHOULD NOT EXCEED 100 mg/dL drop per hour**
3. Monitor for signs of cerebral edema
   a. Headache (new onset or intensifying)
   b. Altered level of consciousness
   c. Recurrent vomiting
   d. Increased BP, Bradycardia
   e. Posturing
   **IF SYMPTOMS OF CEREBRAL EDEMA OCCUR, STOP INFUSIONS AND CONTACT MEDICAL CONTROL**
4. If patient is on ventilator, settings must match patient respiratory rate PRIOR to intubation.

*DO NOT ADMINISTER SODIUM BICARBONATE WITHOUT MEDICAL ORDER*

Metabolic acidosis is common in these patients. Sodium bicarbonate has been shown to potentiate cerebral edema. Patients in DKA typically have a high pre-intubation respiratory rate. Ventilated respiratory rate must match the patient’s pre-intubation rate. If the patient is placed at a lower respiratory rate, the metabolic acidosis will increase.

Standard Hospital Treatment

1. Fluid repletion
   a. 10ml/kg crystalloid bolus over an hour.
      i. 20ml/kg bolus for hemodynamic instability
         Pediatrics: Do not exceed 1 L/hr.
Adult: Do not exceed 50ml/kg in first 4 hours.

b. After initial bolus, fluids should run at 1 ½ times normal maintenance rate for the next 24-72 hours depending on degree of dehydration
   i. Amount of fluid given in first hour has to be added to total fluid rehydration of patient

c. May be placed on 0.45 normal saline depending on sodium level

d. Potassium may be added dependent upon K+ level

2. Insulin Administration
   a. 0.1 U/kg/hr infusion
   b. Usually accompanied with D5 ½ or D10 ½ normal saline pending glucose level.
   c. 0.05 U/kg/hr infusion for younger children maybe used along with decreasing to this rate if glucose levels are dropping too quick.

Notes:
*Diagnostic criteria for pediatric DKA includes:
Hyperglycemia (>200 mg/dL) AND
Metabolic Acidosis (pH <7.3 or plasma bicarbonate < 15 mEq/L) AND
Ketosis

*Diagnostic criteria for adult DKA includes:
Hyperglycemia (>250 mg/dL) AND
Metabolic Acidosis (pH <7.3 or plasma bicarbonate < 18 mEq/L) AND
Ketosis
Purpose:
Define treatment of symptomatic hypertension not related to trauma, stroke or pregnancy.

Protocol:
1. Treat pain and/or anxiety if present.
2. Place patient at rest and reassure with head slightly elevated.
3. If evidence of heart failure exists, refer to CHF protocol.
4. If systolic blood pressure >180 and/or Diastolic blood pressure >120, administer labetalol 20 mg IVP slowly over 2 minutes, with doubling of the previous dose every 10 minutes if needed. (Cumulative max dose of 300 mg).
   Target blood pressure should not exceed a 20% reduction of initial MAP within the first hour.
   MAP = (DBPx2) + SBP/3
5. If target blood pressure is not attained after maximum dose of labetalol, nitroglycerin drip may be considered with medical control consultation.

Notes:
1. Document MAP with each set of vital signs and after each intervention aimed at decreasing blood pressure.
2. Hypertension associated with severe head trauma may be a protective response and field treatment should be aimed at the head injury not BP control.
3. In those who have been using cocaine and have hypertension requiring treatment, contact medical control for treatment recommendations. Beta blockers should be AVOIDED.
4. For blood pressure control in patients experiencing transient ischemic attacks (TIA) or cerebral vascular accidents (CVA), refer to stroke protocols.
5. For blood pressure control in obstetrical patients, refer to OB protocols.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

11/2016
Protocol: MED 008
Title: Respiratory Distress Adult (Asthma/COPD)
Effective Date: 8-05
Revision Date: 9-11, 6-14
Reviewed: 6-16
Revision Number: 2

Purpose:
To properly manage and care for the patient with respiratory distress related to obstructive airway disease.

Procedure:
1. Allow patient to sit-up in position of comfort.
2. Obtain 12 lead ECG.
3. If patient is in impending respiratory failure or having decreased level of consciousness, consider intubation and follow appropriate ventilator management protocol.
4. Consider use of non-invasive positive pressure ventilation (CPAP/CPAP+PS). If indicated, follow appropriate protocol.
5. Administer albuterol 2.5 mg in 3 mL normal saline via nebulizer. Consider repetitive bronchodilator treatments if needed.
6. Epinephrine 1:1000 solution 0.3ml (0.3mg) IM in patients < 40 years of age and no known coronary artery disease.
7. For severe asthma, administer magnesium sulfate 2 gm IVPB over 20 minutes.
8. Consider methylprednisolone (Solu-Medrol) 125mg IV/IO for severe cases or extended transport times.
9. If treatments are ineffective, call Medical Control for orders.

Considerations:
- Although anxiety is common in patients with respiratory distress, benzodiazepines should be used with extreme caution due to the respiratory depression side effects. HYPOXIA IS USUALLY THE CAUSE OF ANXIETY IN THESE PATIENTS.
- Do not withhold high concentrations of oxygen from COPD patients if oxygen is needed.
- THE RESTLESS, AGITATED, CONFUSED, AND/OR COMBATIVE PATIENT IS HYPOXIC, UNTIL PROVEN OTHERWISE.
Patient experiencing respiratory distress

**Mild**
Slight wheezing and/or shortness of breath

- Albuterol 2.5 mg nebulized. Repeat as needed for continued distress.
- Provide oxygen as needed

- Obtain 12 Lead EKG

- Monitor for worsening of condition and treat accordingly

**Moderate**
Tachypnea, wheezing

- Albuterol 2.5 mg nebulized. Repeat as needed for continued distress.
- Provide high flow oxygen.

- Methylprednisolone 125 mg IV/IO

- Obtain 12 Lead EKG

**Severe**
Tachypnea, wheezing, accessory muscle use, difficulty speaking

- Albuterol 2.5 mg nebulized. Consider continuous treatment. Provide high flow oxygen.

- Consider CPAP/BiPAP for continued hypoxia not responding to treatment.

- Obtain 12 Lead EKG

- Severe Asthma
Epinephrine 1:1000 0.3mg IM in patients <40 years of age and no known coronary artery disease.

- Severe Asthma
Magnesium sulfate 2 gm IVPB over 20 minutes.

- Methylprednisolone 125 mg IV/IO
Purpose:

To identify and treat patients with seizures.

Procedure:

1. If patient is actively seizing on arrival, protect airway and place in recovery position (maintain spinal precautions if associated with trauma).
2. DO NOT ATTEMPT TO FORCE ANY OBJECT INTO THE MOUTH.
3. Administer oxygen to maintain oxygen saturation between 94-99%.
4. Check blood glucose level. If glucose level less than 60 mg/dL, give 25 gm D50 IV (For children ≤ 10 years of age 0.5 grams/kg D25). Recheck blood sugar after dextrose administration, then Q 30 minutes. Repeat doses of dextrose as needed.
5. For actively seizing patient administer midazolam 0.1 mg/kg IV/IO/IM (with a maximum dose of 10 mg). Give midazolam IM if no IV/IO in place.
6. Attempt IV access. If IV access is not successful, obtain IO access.
7. If seizures persist after 5 minutes from time of IM midazolam administration, repeat midazolam 0.1 mg/kg IV/IO every 2 minutes with a maximum single dose of 10 mg until seizure activity has resolved. (Maintain systolic BP above minimum per age).
8. For recurrent or continuous seizures contact Medical Control for orders.
9. For pediatric patients, check body temperature. If febrile, (> 100 degrees F / ≥ 38 degrees C) administer a single dose of acetaminophen (Tylenol):
   a. Suppository: PR 15-20 mg/kg
      i. Insert multiple 120 mg suppositories to achieve 15-20 mg/kg
   b. Elixir: PO 15-20 mg/kg (only if alert)

Considerations:

1. The maximum volume of an IM injection should be 2 mL in adults, 1 mL in small children and large infants, and 0.5 mL in small infants.
Purpose:

Define treatment of various toxicologic emergencies.

Procedure:

1. Ensure patient is decontaminated or decontaminate patient before initiation of transport.

2. If toxin remains on patient, wash or brush off as appropriate. If in doubt, contact Medical Control for clarification. If eye exposure, flush eyes.

3. Obtain blood glucose analysis.

4. As soon as time permits, obtain 12 lead ECG.

5. If patient has ingested medication, obtain labeled container(s) and bring with patient.

6. Contact with poison control may be considered by the flight crew, or through Medical Control. Do not delay transport to contact poison control.

7. If there is concern for carbon monoxide toxicity:
   a. Ensure the patient is removed from the source of contamination.
   b. Administer high flow oxygen regardless of pulse oximeter reading.
   c. Consider transport to a facility with hyperbaric capabilities.

Considerations:

Crew safety is paramount. Refer to Emergency Response Guide as applicable.
Cause

**Beta Blocker or Calcium Channel Blocker Overdose**
- Immediate Transcutaneous Pacing for absolute bradycardia; may be associated with hypotension and/or altered mental status
- Glucagon 50 mcg/kg IV/IO push, may repeat in 3-5 minutes
- For Mild/Moderate Beta-Blocker Induced Bradycardia Only
  - IV fluid (crystalloid) 250 ml bolus as needed to maintain SBP ≥ 90
  - Norepinephrine 5-10 mcg/min for patients not responding to fluid boluses, may titrate 2.5 mcg every 5 minutes as needed to keep SBP ≥ 90

**Tricyclic Ingestion**
- Patient noted to be on any Tricyclic listed below with a QRS complex wider than 0.12 msec and symptomatic
  - Brand | Generic
  - Adapin | doxepin
  - Anafranil | clomipramine
  - Elavil | amitriptyline
  - Endep | amitriptyline
  - Ludomil | maprotiline
  - Norpramin | desipramine
  - Pamolor | nortyptiline
  - Pertofane | desipramine
  - Sinequan | doxepin
  - Surmontil | trimipramine
  - Tofranil | imipramine
  - Vivactil | protriptyline
- Sodium bicarbonate 50 mEq IV/IO, may repeat after 5 minutes (until the QRS complex narrows to less than 0.12 msec and the patient condition improves)

**Organophosphate or Carbamate**
- Atropine 1 mg IV/IO every 3-5 minutes
- Atropine is given to:
  - Dry Secretions
  - Improve Respirations
- NO MAX DOSE – Give as needed to maintain airway and breathing
- Transport and Contact Medical Control if needed

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Purpose:
To define the treatment and resuscitation goals for adult patients with sepsis.

Procedure:
1. Assess for presence of infection
   a. Patients with one or more of the following:
      i. Recent hospital admission/surgical procedure
      ii. History of Diabetes Mellitus
      iii. History of conditions compromising the immune system
      iv. Skin wounds
      v. Invasive/Implanted devices
      vi. Infiltrate on chest x-ray
      vii. Cough with sputum production
2. Assess for signs of organ dysfunction
   a. Decreased perfusion (capillary refill <3 seconds, skin mottling, cold extremities)
   b. Lactate >2 mmol/L
   c. Circulatory signs
      i. SBP < 90mmHg or decrease in SBP > 40mmHg from baseline
      ii. MAP < 65mmHg
      iii. Absent bowel sounds may be an indication of impaired splanchnic circulation
   d. Respiratory signs
      i. PaO2/FiO2 ratio > 300
      ii. PaO2 < 70mmHg
      iii. SaO2 < 90% with 100% oxygen administration
   e. Hepatic signs
      i. Jaundice
      ii. Total bilirubin > 4mg/dL
      iii. Increased liver function test results
      iv. Prolonged Prothrombin time (PT)
   f. Renal signs
      i. Creatinine > 2mg/dL
      ii. Urine output <0.5 ml/kg/hour for at least two hours
   g. Central nervous system signs
      i. Altered level of consciousness/Confusion/Psychosis
   h. Coagulopathy
      i. INR > 1.5 or aPTT > 60 seconds
      ii. Thrombocytopenia (Platelet count < 100,000/mm3)
3. Initiate treatment per algorithm to achieve resuscitation goals

Resuscitation Goals
1. MAP > 65 mmHg
2. CVP > 8 mmHg (or >12 mmHg if intubated)—if available
3. Urine Output greater than or equal to 0.5 mL/kg/hour
4. SPO2 > 92%
5. Goal tidal volume for mechanically ventilated patients with ALI/ARDS is 6 mL/kg of ideal body weight and keep plateau pressures below 30 cm H2O
1. Verify adequate IV access
   (Ideally 2 large bore peripheral IV's or Central Line)
   Do not delay transport to secure second IV line

2. Is MAP < 65 mmHg or lactate > or equal to 4 mmol/L?

   YES
   Septic Shock
   1. Monitor and maintain respiratory/ hemodynamic status
   2. Fluid bolus 30 mL/kg 0.9% Sodium chloride over 30 minutes, consider additional fluids if MAP < 65 after 3 liters 0.9% NS.
   3. Consider norepinephrine 5mcg/min, titrate by 2.5mcg/min every 5 minutes for persistent hypotension unresponsive to fluid resuscitation
   4. Transfer to facility with ICU capabilities

   NO

   Severe Sepsis (evidence of end organ dysfunction) or Sepsis (no evidence of end organ dysfunction)
   1. Monitor and maintain respiratory/ hemodynamic status
   2. IV Fluids as needed to maintain MAP > 65 up to 30 mL/kg
   3. Rapid transfer to facility with ICU capabilities
   4. Interfacility Transfers
   5. Review available lab data (see above)
   6. Confirm Broad Spectrum Antibiotics administered

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director
Purpose:
To identify and provide treatment of patient with acute hyperkalemia for interfacility transfers

Procedure:
1. Treatment should begin when serum potassium is >6.0 mEq/L or if symptomatic.
2. Obtain 12 Lead EKG.
3. Administer 20 ml/kg bolus of normal saline IV/IO. May repeat fluid bolus (Contraindicated if patient is fluid overloaded or in renal failure)
4. Administer either Calcium Gluconate or Calcium Chloride 1 Gram IV (10cc of 10% solution) over 2 minutes. Do not give if patient is taking Digitalis. Call medical control for orders.
5. Administer Sodium Bicarbonate 50 mEq IV/IO.
6. Administer D50W 25 gm IV/IO unless blood glucose >250mg/dL, followed immediately by Regular Insulin 10 units IV/IO.
7. Perform blood glucose analysis every 30 minutes.
8. If blood glucose analysis <60 mg/dL initiate IV/IO infusion of D10 @ 50-75mL/hr.
9. Consider administering Albuterol in severe hyperkalemia with ECG changes. Administer 10-20 mg diluted in 4mL NS via nebulizer over 10 min.

Special Considerations
1. Calcium administration should be avoided in patients on cardiac glycosides such as Digitalis.
2. Do not mix Calcium and Bicarbonate in the same line or precipitation will result.
3. Obtain any needed medications not available on aircraft from the transferring facility.
4. Children without EKG changes should be treated with Insulin (0.1 unit/kg) and Dextrose (0.5 g/kg), and sodium bicarbonate (1 mEq/kg)
5. Calcium Gluconate (50 mg/kg) should be reserved for children with ECG changes to avoid potential extravasation injury. Children with central venous access can receive Calcium Chloride (10-20 mg/kg) as treatment for Hyperkalemia with or without ECG changes.)
QUINCY AREA EMS SYSTEM
SEMSV OBSTETRICAL PROTOCOLS INDEX

Transport of the Obstetrical Patient ................................................................. OB 001
Complications of Pregnancy: Preterm Labor ................................................. OB 002
Complications of Pregnancy: Hypertensive Disorders
(Preeclampsia/Eclampsia/Pregnancy Induced Hypertension)......................... OB 003
Complications of Pregnancy: Placental Disorders ........................................ OB 004
Protocol:  OB 001
Title:  Transport of the Obstetrical Patient
Effective Date:  8-05
Revision Date:  4-07, 12-08, 2-11,  2-16
Revision Number:  4
Reviewed:  1-16

Purpose:
1. To define assessment and treatment considerations for obstetrical patients requiring critical care transport.

Definitions:
1. Pre-Term Labor – Regular and rhythmic contractions that produce cervical changes after 20 weeks gestation and before 37 weeks gestation.
2. No Labor - ≤ 6 contractions per hour
3. Active Labor > 6 contractions per hour

Procedures:
1. Administer supplemental oxygen.
2. Transport in lateral position, preferably left, or with a left pelvic tilt.
3. Infuse crystalloid at 125m/hour.
4. Monitor fetal heart rate with a Doppler OR fetal movement if fetal heart rate is unobtainable via Doppler.
5. Nothing by mouth.
6. Assess and document vital signs, fetal heart rate, fetal activity, blood loss, intake and output, and relevant changes in assessment every 15 minutes at a minimum.

Required documentation on ALL OB Patient Transports:
1. LMP AND EDC
2. Number of pregnancies
3. Gravida/Parity
4. Vaginal drainage
5. Problems with this or previous pregnancies
6. Pre-natal care
7. Blood type and Rh factor
8. Contractions – onset, frequency, duration, quality
9. Medical history, including medications
10. Transport position in left lateral or left pelvic tilt position.
Company medical crew members may request a vaginal exam from the referring facility at their discretion. It is recognized that a vaginal exam is not recommended in certain situations. If the referring facility will not do a vaginal exam, the flight crew MUST contact medical control for guidance.

The following findings from the vaginal exam will necessitate a conference with the referring and receiving physicians regarding the possibility of safe transport of mother and baby taking into consideration the length of transport and the availability of resources at the referring facility.

1. Cervical dilation of 6 cm or greater and no labor OR
2. Any presenting part observed OR
3. Prolapsed cord observed OR
4. Change in dilation >2 cm within 1 hour.

**Note:**
**Transport Planning:**
The need for inter-facility transport by air should be discussed with the receiving OB physician or with the Air Evac EMS, Inc. Medical Director prior to initiation of transport procedures IF there are questions of patient stability for transport and/or documented signs of fetal distress:
1. The sending and receiving physicians should be in direct contact with each other to make arrangements for transport when the mother is stable in order for highly specialized and complicated transport procedures to be used only when appropriate.
2. Direct communication between the referring and receiving physicians will determine the need for:
   a. Patient needs with regard to stabilization
   b. Continued consultation

Antony Wollaston, MD             Christopher R Solaro, MD, PHD
EMS Medical Director                 Associate Medical Director
12/16
Protocol: OB 002
Title: Complications of Pregnancy: Preterm Labor
Effective Date: 8-05
Revision Date: 5-07, 12-08, 3-09, 4-11, 9-11, 2-16
Revision Number: 6
Reviewed: 1-16

Purpose:
To define assessment and treatment of pre-term labor requiring critical care transport.

Definition:
Regular and rhythmic contractions that produce cervical changes after 20 weeks gestation and before 37 weeks gestation.

Procedures:
1. Administer supplemental oxygen.
2. Transport in lateral position, preferably left, or with a left pelvic tilt.
3. Infuse crystalloid at 125m/hour.
4. Monitor fetal heart rate with a Doppler OR fetal movement if fetal heart rate is unobtainable via Doppler.
5. Nothing by mouth.
6. Assess and document vital signs, fetal heart rate, fetal activity, blood loss, intake and output, and relevant changes in assessment every 15 minutes at a minimum.
7. Via infusion pump initiate Magnesium Sulfate (4 Grams over 20 minutes), followed by a maintenance drip of Magnesium Sulfate at 2 Grams/hour.
8. Assessment of patellar or biceps deep-tendon reflexes every 15 minutes.

Note: In the event of imminent delivery, divert to the closest facility. If time is critical, discuss landing the aircraft with the pilot and contact Central Communications for EMS ground transport.

Antony Wollaston, MD  
EMS Medical Director

Christopher R Solaro, MD, PHD  
Associate Medical Director

12/2016
Protocol: OB 003
Title: Complications of Pregnancy: Hypertensive Disorders
(Preeclampsia/ Eclampsia/Pregnancy Induced Hypertension)
Effective Date: 8-05
Revision Date: 7-07, 9-11, 2-16, 4-16
Revision Number: 4
Reviewed: 4-16

Purpose:
To define assessment, management and treatment of obstetrical hypertensive emergencies in patients requiring critical care transport.

Definition:
A condition of pregnancy characterized by hypertension, edema, and multi-system organ disease, which occurs after 20 weeks gestation.

Mild Preeclampsia: BP > 140/90 mmHg
Proteinuria

Severe Preeclampsia: BP ≥ 160/110 plus one of the following:
- Platelet count < 100,000/mcL
- AST or ALT > 70 units/L
- Serum creatinine > 1.1mg/dL
- Neurological Symptoms: headache, visual changes (flashing, blurring, blindness)

Proteinuria not required for diagnosis

Procedure:

1. Administer supplemental oxygen.
2. Transport in lateral position, preferably left, or with a left pelvic tilt.
3. Infuse crystalloid at 125mL/hr.
4. Monitor fetal heart rate with a Doppler OR assess for fetal movement if fetal heart rate is unobtainable via Doppler.
5. Nothing by mouth.
6. Assess and document vital signs, fetal heart rate, fetal activity, blood loss, strict intake and output, and relevant changes in assessment every 15 minutes at a minimum.

Treat SBP > 160 and/or DBP > 110 to target SBP < 140 and DBP < 90:

1. If administering labetalol for blood pressure management, administer magnesium sulfate for seizure prophylaxis.
   1. **Loading dose**: Mix 4 grams magnesium sulfate in 100mL NS. Infuse over 20 minutes via infusion pump. After loading dose, begin maintenance dose.
   2. **Maintenance dose**: 4 grams magnesium sulfate in 100mL NS and infuse at 2gm/hr via infusion pump.
2. Assess for the development of or increasing severity of frontal headache, blurred vision, spots before the eyes, nausea, vomiting, and/or epigastric pain. These indicate central nervous system involvement and a worsening condition.

3. Should seizure activity occur, **administer additional magnesium sulfate 2-4 grams slow IVP (1gm/min)**. If seizure activity is not controlled with additional magnesium sulfate, administer midazolam 0.1mg/kg IV every 2 minutes (max single dose 10mg) until seizure activity resolves. Maintain systolic blood pressure >100mmHg.

**Note:** If seizures occur, observe for sudden onset of labor or evidence of placental abruption.
Purpose:
Define assessment and treatment considerations for patients with placental disorders in the critical care transport environment

Procedure:

1. Administer supplemental oxygen.
2. Transport in lateral position, preferably left, or with a left pelvic tilt.
3. Infuse Normal Saline at 125m/hour.
4. Monitor fetal heart rate with a Doppler OR fetal movement if fetal heart rate is unobtainable via Doppler.
5. Nothing by mouth.
6. Assess and document vital signs, fetal heart rate, fetal activity, blood loss, intake and output, and relevant changes in assessment every 15 minutes at a minimum.

Considerations:

Placenta Previa:

1. Vaginal exams are contraindicated.

Placental abruption:

1. Administer intravenous fluid boluses for shock as needed. Do NOT give vasopressors without Medical Director approval.

2. Assess for signs consistent with Disseminated Intravascular Coagulation (DIC) such as bruising or petechiae, oozing from venipuncture sites, hematuria, epistaxis, hemoptysis and bleeding gums.

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12/2016
<table>
<thead>
<tr>
<th>Protocol</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pediatric Cardiac Arrest</td>
<td>PED 001</td>
</tr>
<tr>
<td>Pediatric Bradycardia</td>
<td>PED 002</td>
</tr>
<tr>
<td>Pediatric Tachycardia</td>
<td>PED 003</td>
</tr>
<tr>
<td>Newborn Resuscitation</td>
<td>PED 004</td>
</tr>
<tr>
<td>Pediatric Penetrating Trauma</td>
<td>PED 005</td>
</tr>
<tr>
<td>Respiratory Distress/Asthma - Pediatric</td>
<td>PED 006</td>
</tr>
</tbody>
</table>
Protocol: PED 001
Title: Pediatric Cardiac Arrest
Effective Date: 2-12
Revision Date: 6-16

Pediatric Cardiac Arrest

**Shout for Help/Activate Emergency Response**

1. **Start CPR**
   - Give oxygen
   - Attach monitor/defibrillator

2. **Rhythm shockable?**
   - Yes: **Shock**
   - No: **Continue CPR**

3. **CPR 2 min**
   - IV/Intravenous access
   - Epinephrine every 3-5 min.
   - Consider advanced airway

4. **Rhythm shockable?**
   - Yes: **Shock**
   - No: **Continue CPR**

5. **CPR 2 min**
   - IV/Intravenous access
   - Epinephrine every 3-5 min.
   - Consider advanced airway

6. **Rhythm shockable?**
   - Yes: **Shock**
   - No: **Continue CPR**

7. **CPR 2 min**
   - Amiodarone
   - Treat reversible causes

8. **Rhythm shockable?**
   - Yes: **Shock**
   - No: **Continue CPR**

9. **CPR 2 min**
   - IV/Intravenous access
   - Epinephrine every 3-5 min.
   - Consider advanced airway

10. **Rhythm shockable?**
    - Yes: **Shock**
    - No: **Continue CPR**

11. **CPR 2 min**
    - Treat reversible causes
    - No: **Continue CPR**

12. **Rhythm shockable?**
    - Yes: **Shock**
    - No: **Go to 5 or 7**

**Doses/Details**

- **CPR Quality**
  - Push hard (60% of anterior-posterior diameter of chest) and fast (at least 100/min) and allow complete chest recoil.
  - Minimize interruptions in compressions.
  - Avoid excessive ventilation.
  - Rotate compressor every 2 minutes.
  - If no advanced airway, 15:2 compression-ventilation ratio. If advanced airway, 6-10 breaths per minute with continuous chest compressions.

- **Shock Energy**
  - For Defibrillation:
    - First shock 2 J/kg, second shock 4 J/kg, subsequent shocks 4 J/kg, maximum 10 J/kg or adult dose.
  - **Drug Therapy**
    - Epinephrine/IV/IV Dose: 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration). Repeat every 3-5 minutes. If no IV access, may give endotracheal dose: 0.1 mg/kg (0.1 mL/kg of 1:1000 concentration).
    - Amiodarone/IV/IV Dose: 5 mg/kg bolus during cardiac arrest. May repeat up to 2 times for refractory VF/pulseless VT.

- **Advanced Airway**
  - Endotracheal intubation or supraglottic advanced airway.
  - Waveform capnography or capnometry to confirm and monitor ET tube placement.
  - Once advanced airway in place give 1 breath every 6-8 seconds (6-10 breaths per minute).

- **Return of Spontaneous Circulation (ROSC)**
  - Pulse and blood pressure
  - Systolic arterial pressure within 110 mm Hg

- **Reversible Causes**
  - Hypovolemia
  - Hypoxia
  - Hypoventilation
  - Hypo/hypernatremia
  - Hypothermia
  - Tension pneumothorax
  - Tamponade, cardiac
  - Toxaemia
  - Thrombosis, pulmonary
  - Thrombosis, coronary

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Associate Medical Director
**Protocol:** PED 002  
**Title:** Pediatric Bradycardia  
**Effective Date:** 2-12  
**Revision Date:**  
**Reviewed:** 6-16

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**Pediatric Bradycardia**  
**With a Pulse and Poor Perfusion**

1. **Identify and treat underlying cause**  
   - Maintain patent airway; assist breathing as necessary  
   - Oxygen  
   - Cardiac monitor to identify rhythm; monitor blood pressure and oximetry  
   - IO/IV access  
   - 12-Lead ECG if available; don’t delay therapy

2. **Cardiopulmonary compromise continues?**  
   - **No**
   - **Yes**

3. **CPR if HR <60/min with poor perfusion despite oxygenation and ventilation**
   - **No**
   - **Yes**

4. **Bradydcardia persists?**
   - **No**
   - **Yes**

5. **Epinephrine**  
   - Atropine for increased vagal tone or primary AV block  
   - Consider transthoracic pacing/transvenous pacing  
   - Treat underlying causes

6. **If pulseless arrest develops, go to Cardiac Arrest Algorithm**

---

**Cardiopulmonary Compromise**  
- Hypotension  
- Acutely altered mental status  
- Signs of shock

**Doses/Details**

- **Epinephrine IO/IV Dose:** 0.01 mg/kg (0.1 mL/kg of 1:10,000 concentration). Repeat every 3-5 minutes. If IO/IV access not available but endotracheal (ET) tube in place, may give ET dose: 0.1 mg/kg (0.1 mL/kg of 1:1000).

- **Atropine IO/IV Dose:** 0.02 mg/kg. May repeat once. Minimum dose 0.1 mg and maximum single dose 0.5 mg.

---

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EMS Medical Director

Christopher R Solaro, MD, PHD  
Associate Medical Director
Protocol: PED 003
Title: Pediatric Tachycardia
Effective Date: 2-12
Revision Date: 6-16
Reviewed: 6-16
PED 004

QUINCY AREA SEMSV
Protocols & Standing Orders

Protocol: PED 004
Title: Newborn Resuscitation
Effective Date: 2-12
Revision Date: 8-16  Revision Number: 1
Reviewed: 8-16

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EMS Medical Director                 Associate Medical Director

12/2016
Routine Care of Newborn Patients:

1. **Thermoregulation** - all newborns require thermoregulation measures. Thermoregulation can be achieved most times by skin-to-skin contact with the mother after thoroughly drying the infant and covering with dry linens.
2. Clearing the airway- clearing of the airway can be provided as necessary by wiping the infant’s nose and mouth. It is recommended that suctioning following birth (including bulb syringe) should be reserved for babies that have obvious obstruction to spontaneous breathing or who require Positive Pressure Ventilation (PPV).

3. Drying- Drying of the infant should be performed with clean dry linen

4. Ongoing Evaluation- ongoing observation of breathing, activity, and color must be carried out to determine any need for additional intervention

Post-Resuscitation Care:

Newborn infants who have depressed breathing or activity and/or require supplemental oxygen to achieve target SPO2 levels will need closer assessment. These infants may still be at risk for developing problems associated with perinatal compromise and should be evaluated frequently during the immediate neonatal period for these potential complications.

<table>
<thead>
<tr>
<th>Organ System</th>
<th>Potential Complication</th>
<th>Post-resuscitation Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain</td>
<td>Apnea, Seizures, Change in neurologic examination</td>
<td>Monitor for apnea, Support ventilation as needed, Monitor glucose and electrolytes, Avoid hyperthermia, Consider anticonvulsant therapy, Consider therapeutic hypothermia.</td>
</tr>
<tr>
<td>Lungs</td>
<td>Pulmonary hypertension, Pneumonia, Pneumothorax, Transient tachypnea, Meconium aspiration syndrome, Surfactant deficiency</td>
<td>Maintain adequate oxygenation and ventilation, Consider antibiotics, Obtain x-ray and blood gas, Consider surfactant therapy, Delay feedings if respiratory distress present.</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Hypotension</td>
<td>Monitor blood pressure and heart rate, Consider volume replacement followed by inotrope administration if hypotensive.</td>
</tr>
<tr>
<td>Kidneys</td>
<td>Acute tubular necrosis</td>
<td>Monitor urine output, Monitor serum electrolytes, Restrict fluids if baby is oliguric and vascular volume is adequate.</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Ileus, Necrotizing enterocolitis</td>
<td>Delay initiation of feedings, Give intravenous fluids, Consider parenteral nutrition.</td>
</tr>
<tr>
<td>Metabolic/Hematologic</td>
<td>Hypoglycemia, Hypocalcemia; hyponatremia, Anemia if history of acute blood loss, Thrombocytopenia</td>
<td>Monitor blood glucose, Monitor electrolytes, Monitor hematocrit, Monitor platelets.</td>
</tr>
</tbody>
</table>
May occur in a variety of circumstances – GSW, stabbing, missiles from explosions, objects thrown from lawnmowers, etc. DO NOT remove embedded objects or foreign bodies.

1. **Abdomen:**
   a. Check ABC’s / CPR as indicated.
   b. Obtain vital signs.
   c. Start IV LR or NS
   d. If hypotensive, follow shock protocol.
   e. Apply sterile dressing to wound.
   f. Transport to hospital

2. **Chest:**
   a. Check ABC’s / CPR as indicated, with C-Spine precautions.
   b. Obtain vital signs.
   c. Start IV LR or NS
   d. If hypotensive, follow shock protocol.
   e. Apply nonocclusive sterile dressing or three sided occlusive dressing to wound (occlusive dressing may precipitate a tension pneumothorax).
   f. Observe for signs of tension pneumothorax and treat per adult protocol using 14 gauge catheter.
   g. Begin transport to hospital as soon as possible

3. **Head and Neck:**
   a. Check ABC’s / CPR as indicated, with C-Spine precautions.
   b. Obtain vital signs
   c. External pressure to external bleeding.
   d. Start IV LR or NS
   e. If hypotensive, follow shock protocol.

4. **Extremity:**
   a. Obtain vital signs and distal neurovascular status.
   b. Apply external pressure to external bleeding, if unsuccessful, use pressure points and elevation
   c. Apply sterile dressing.
   d. Splint and elevate extremity
   e. Start IV LR or NS in uninjured extremity.
5. **Abdominal Evisceration:**
   a. Place patient supine.
   b. Obtain vital signs.
   c. Cover abdominal viscera with moist sterile dressing; do not attempt to replace viscera.
   d. Start IV LR or NS
   e. If evidence of shock, initiate shock protocol.
   f. Keep patient warm.

Antony Wollaston, MD  
EMS Medical Director

Christopher R Solaro, MD, PHD  
Associate Medical Director

12/2016
Purpose:
To define treatment, management and transport considerations of the pediatric asthma patient requiring critical care transport.

Procedure:
1. Allow patient to sit-up in position of comfort.
2. Consider use of non-invasive positive pressure ventilation (CPAP/CPAP+PS).
3. Consider intubation only if patient is in impending respiratory failure or has decreased level of consciousness.
4. Administer albuterol 2.5mg in 3mL normal saline via nebulizer. If no improvement and Ipratropium Bromide available, add to albuterol dose: 250mcg/dose if <20 kg; 500mcg/dose if > 20kg.
5. Consider epinephrine 1:1000 solution 0.01ml/kg (max 0.3mg) IM.
6. Consider magnesium sulfate 75mg/kg over 20 minutes (max dose 2gm).
7. Consider methylprednisolone 1 to 2mg/kg IV/IO (max dose 125mg) for severe cases or extended transport times.
8. If treatments are ineffective, call Medical Control for orders.

Considerations:
- Although anxiety is common in patients with respiratory distress, use benzodiazepines with extreme caution due to the respiratory depression side effects. HYPOXIA IS USUALLY THE CAUSE OF ANXIETY IN THESE PATIENTS.

- THE RESTLESS, AGITATED, CONFUSED, AND/OR COMBATIVE PATIENT IS HYPOXIC, UNTIL PROVEN OTHERWISE.
QUINCY AREA EMS SYSTEM
SEMSV PHYSICIAN POSITION STATEMENTS INDEX

Blood Draws Requested by Law Enforcement ................................................... PPS 001
Paralytics ........................................................................................................... PPS 002
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: PPS 001
Title: Blood Draws Requested by Law Enforcement Personnel
Effective Date: 3-11
Revision Date:
Reviewed: 6-16
Revision Number:

Air Evac Physician Medical Director Position Statement:

Due to the emergent condition of all patients transported by Air Evac EMS Inc. it is recommended that blood draws requested by law enforcement personnel ONLY be performed when completion of the procedure in no way delays medical assessment, treatment, or transport.

Air Evac EMS Inc. will make every reasonable attempt to inform investigating law enforcement officials of the destination facility so there is no delay in law enforcement investigation.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Air Evac Physician Medical Director Position Statement:

Recently there has been much discussion relating to the use of paralytics in our post intubation patient management. As Senior Medical Director, I wish to speak on the behalf of the medical directors relating to this matter.

Just because the protocol states you can give paralytics to the intubated patient, doesn't mean you have to or should. In fact, the consensus of the medical directors is that every effort should be made to NOT use paralytics in the post intubation period. I will admit, there was a time I preached to keep the patient down with paralytics. However, since that time, our equipment and my knowledge-base has improved.

What we as medical directors are asking you to do is to critically think and make the determination if your patient needs or doesn't need a paralytic in the post intubated period and then document your reasoning. We would like to see a decrease in the use of paralytics in post intubation management. We will be evaluating the documented justification in all cases where paralytics are given post intubation.

Remember, do what you believe is best for your patient and be sure to accurately document your thought process.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PhD
Associate Medical Director

12/2016
<table>
<thead>
<tr>
<th>Protocol Title</th>
<th>Protocol Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Airway Management Algorithm</td>
<td>PRO 001</td>
</tr>
<tr>
<td>The Crash Airway Algorithm</td>
<td>PRO 002</td>
</tr>
<tr>
<td>The Difficult Airway</td>
<td>PRO 003</td>
</tr>
<tr>
<td>The Failed Airway Algorithm</td>
<td>PRO 004</td>
</tr>
<tr>
<td>Rapid Sequence Intubation (RSI)</td>
<td>PRO 005</td>
</tr>
<tr>
<td>Orotracheal Intubation – Adult and Pediatric</td>
<td>PRO 006</td>
</tr>
<tr>
<td>King airway Device (Adult or Pediatric)</td>
<td>PRO 007</td>
</tr>
<tr>
<td>Laryngeal Mask Airway (LMA)</td>
<td>PRO 008</td>
</tr>
<tr>
<td>Surgical Cricothyrotomy</td>
<td>PRO 009</td>
</tr>
<tr>
<td>Needle Cricothyrotomy</td>
<td>PRO 010</td>
</tr>
<tr>
<td>Post Intubation Management (PIM)</td>
<td>PRO 011</td>
</tr>
<tr>
<td>Mechanical Ventilation</td>
<td>PRO 012</td>
</tr>
<tr>
<td>Lung Protective Strategy for Ventilated Adults</td>
<td>PRO 013A</td>
</tr>
<tr>
<td>Lung Protective Strategy for Ventilated Infant/Child</td>
<td>PRO 013B</td>
</tr>
<tr>
<td>Non-Invasive Positive Pressure Ventilation (Patients &gt; 12 years)</td>
<td>PRO 013C</td>
</tr>
<tr>
<td>Transportation of Patients with Chest Tubes</td>
<td>PRO 014</td>
</tr>
<tr>
<td>Needle Thoracostomy</td>
<td>PRO 016</td>
</tr>
<tr>
<td>Adult and Pediatric Intraosseus (IO) Infusion</td>
<td>PRO 017</td>
</tr>
<tr>
<td>Umbilical Vein Catheterization</td>
<td>PRO 018</td>
</tr>
<tr>
<td>Non-Invasive ETCO2 Monitoring</td>
<td>PRO 019</td>
</tr>
<tr>
<td>Ventricular Assist Device (VAD)</td>
<td>PRO 020</td>
</tr>
<tr>
<td>My LVAD EMS Field Guide</td>
<td>PRO 020A</td>
</tr>
</tbody>
</table>
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: PRO 001
Title: Emergency Airway Management Algorithm
Effective Date: 8-05
Revision Date: N/A Revision Number: N/A
Reviewed: 6-16

MAIN EMERGENCY AIRWAY MANAGEMENT ALGORITHM

Needs Intubation

Unresponsive? Near Death?
Yes Crash Airway

Predict Difficult Airway?
Yes Difficult Airway
No

From Difficult Airway

RSI

Attempt Oral Intubation

Successful?
Yes Post Intubation Management
No

BMV Maintains \text{SpO}_2 \geq 90%?
Yes

\geq 3 Attempts by Crew
No

Christopher R Solaro, MD, PHD
Associate Medical Director

Antony Wollaston, MD
EMS Medical Director

12/2016
Protocol: PRO 002
Title: Crash Airway Algorithm
Effective Date: 8-05
Revision Date: 6-07, 4-14
Revision Number: 2
Reviewed: 6-16

Crash Airway

Attempt Oral Intubation

Successful?

YES

Post Intubation Management

NO

BVM Ventilations maintains

YES

Failed Airway

NO

Succinylcholine 2.0 mg/kg IVP

YES

≥3 Attempts by Crew

YES

Post Intubation Management

NO

Repeat attempt at oral intubation

Successful?

YES

NO

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Difficult Airway Predicted → Call for Assistance

SP02 ≥ 90%

NO → BVM Ventilations Maintains Sp02 ≥ 90%

YES → Failed Airway

BVM ventilations predicted

NO → Intubation predicted to be successful?

YES → DAI

NO → Awake Laryngoscopy

SUCCESSFUL → PIM

UNSUCCESSFUL → Sp02 ≥ 90%

NO → Failed Airway

YES → Consider:

Continue BVM Ventilations
King Airway
LMA

NO → BVM Ventilations Maintains Sp02 ≥ 90%

YES → Go to Main Algorithm
PRO 004

QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: PRO 004
Title: The Failed Airway Algorithm
Effective Date: 8-05
Revision Date: 9-07
Reviewed: 6-16
Revision Number: 1

THE FAILED AIRWAY

Failed Airway Criteria → Call for Assistance

BVM Maintains Sp02 > 90%?

No → Cricothyrotomy

Yes → If Contraindicated

Consider King Airway/LMA

Time Allows and Successful?

No →

Yes → Cuffed ETT Placed → Post Intubation Management

Airway Maintains Sp02 > 90%?

No → Cricothyrotomy

Yes → Arrange for Definitive Airway Management

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Indications:

1. A need to gain definitive control of patient’s airway prior to or during transport.
2. Considerations for RSI may include:
   a) Any patient in whom airway closure during transport is a realistic possibility. Examples: Inhalation injuries, refractory anaphylaxis, laryngeal trauma.
   b) Anticipated clinical course of patient requiring a definitive airway.
   c) Failure to oxygenate (while breathing independently with supportive respiratory interventions).
   d) Patients with head injuries with Glasgow Coma Scale (GCS) of 8 or less.
   e) Failure to ventilate.
   f) Decreased mental status with inability to protect airway.
3. Contraindications for RSI may include:
   a) The airway assessment indicates a high likelihood of failure.

Preparation:

1. Assure patient is in need of RSI and the airway assessment (LEMON) has been completed.
2. Establish IV/IO access and assure patency.
3. Place patient on cardiac monitor, pulse oximeter, and NBP.
4. Assure all necessary equipment is functioning properly and readily available.
5. Calculate medication dosages and prepare all appropriate medications for administration.
6. If patient is spontaneously breathing, pre-oxygenate the patient with 100% oxygen per non rebreather and nasal cannula if available. Assist breathing with BVM and 100% oxygen if insufficient oxygenation exists.
7. Be prepared to perform an alternative airway procedure if intubation is unsuccessful.

Premedication:

1. Administer atropine 0.02mg/kg IV prophylactically to prevent bradycardia in all pediatric patients less than 4 years of age. Atropine minimum dose is 0.1 mg to avoid rebound effect.
**Induction:**

Use **ONE** of the following medications: with preference in the order listed.

1. Etomidate 0.3mg/kg IV
2. Ketamine 1mg/kg IV
3. Midazolam 0.1mg/kg IV *(only to be used if Etomidate and Ketamine are unavailable or contraindicated)*

**Neuromuscular Blockade:**

Doses are applicable for both adult and pediatric patients. Use **ONE** of the following medications with preference in the order listed.

1. Succinylcholine 2mg/kg IV *(Max single dose 200mg)*
2. Rocuronium 1mg/kg IV *(Max single dose 2mg/kg of ideal body weight)*
3. Vecuronium 0.1mg/kg IV

**NOTES:**

- Once airway is secured, refer to the Post Intubation Management Protocol.

- If transferring facility has initiated post intubation sedation, Air Evac flight crew members may continue that treatment if orders are obtained from transferring facility. If flight crew members want to use the AEL post intubation management protocol, they must get orders from the sending physician to do so.

- If no post intubation sedation has been initiated by the transferring facility, follow Air Evac Post Intubation Management protocol.

- Air Evac flight crew members must follow local state/regional guidelines regarding administration of sedation medications.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PhD
Associate Medical Director

12/2016
Protocol: PRO 006
Title: Orotracheal Intubation – Adult and Pediatric
Effective Date: 8-05
Revision Date: 3-06, 1-07, 4-07, 2-11, 6-14, 4-16
Revision Number: 6
Reviewed: 4-16

Purpose:
To define assessment, treatment and management of patients who require definitive airway control with orotracheal intubation and require critical care transport.

Procedure:

1. Pre-oxygenate the patient with 100% oxygen per non-rebreather and/or nasal cannula. Assist patient’s breathing with BVM if needed.
2. Administer sedatives / paralytics per RSI protocol if indicated.
3. Manually immobilize the head if needed.
4. Visually identify the epiglottis and the vocal cords. Use BURP maneuver if needed.
5. Place proper size endotracheal tube. If cuffed tube is used, inflate to provide adequate seal.
6. Confirm tube placement with waveform capnography and quantitative end-tidal CO₂ in addition to chest x-ray or direct visualization or symmetric breath sounds.
7. Secure tube with commercial endotracheal tube securing device.
8. Assess and monitor endotracheal tube cuff pressure with cufflator.
9. Insert oral gastric (OG) or nasal gastric (NG) tube.

Notes:
Avoid hyperflexion of neck.
Pediatric patients may require padding under shoulders.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director
Purpose:

The KING LT-D is a device intended for a supraglottic airway for airway management.

Indications for usage:

When endotracheal intubation is unsuccessful, predicted to be difficult, or impractical.

Contraindications:

1. Intact gag reflex.
2. Patients under 35 inches tall
3. Ingestion of caustic substances
4. Known history of esophageal disease

Procedure:

1. Choose the correct KING Airway based on patient height.
2. Test cuff and inflation system for leaks by injecting the maximum recommended volume of air into the cuffs. Apply lubricant to the beveled distal tip and posterior aspect of the tube, taking care to avoid introduction of lubricant in or near the ventilatory openings.
3. Have a spare KING Airway available and prepared for immediate use.
4. Position the head in the “sniffing” or neutral position.
5. Hold the airway at the connector with the dominant hand. With non-dominant hand, hold mouth and apply chin lift.
6. With the KING Airway rotated laterally 45-90 such that the blue orientation line is touching the corner of the mouth, introduce tip into mouth and advance behind base of tongue.
7. As tube passes behind the tongue, rotate tube back to midline (blue orientation line faces chin).
8. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
9. Inflate the cuffs of the KING Airway with the minimum appropriate volume to assure seal, not to exceed King Airway maximum recommendation.
10. Attach bag valve device to the 15mm connector. While gently bagging the patient to assess ventilation, simultaneously withdraw the KING Airway until ventilation is easy and free flowing.
11. Depth markings are provided at the proximal end of the KING Airway that refer to the distance from the distal ventilatory opening. When properly placed, the depth markings give an indication of the distance in centimeters, from the vocal cords to the teeth.
12. Confirm King placement. Confirmation of tube placement must consist of waveform capnography with quantitative end-tidal CO₂ in addition to three (3) clinical (if able to auscultate) and one (1) other mechanical method, which must all be documented for initial confirmation and with all subsequent moves of the patient:
   a. Clinical
      i. Auscultation of bilateral breath sounds
      ii. Absence of epigastric sounds with ventilations
      iii. Adequate chest excursion with ventilations
   b. Mechanical
      i. Colorimetric end tidal CO₂ detection device (Stat Cap)
      ii. Pulse oximetry
14. Secure tube with commercially available King securing device. Tape or other securing mechanism is acceptable if a commercial device is not available.
15. For sizes 3,4, and 5 insert gastric tube 18 french or smaller per manufacturer. Size 2 does not have a port for a gastric tube.

**Considerations:**
1. A King Airway that is adequately functioning can remain in place throughout transport.
2. Removal procedure: Once in position, the KING Airway device is well tolerated until the return of protective reflexes. Removal should always be carried out in an area where suction equipment and the ability for rapid intubation are present.

<table>
<thead>
<tr>
<th>Size</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connector Color</td>
<td>Green</td>
<td>Orange</td>
<td>Yellow</td>
<td>Red</td>
<td>Purple</td>
</tr>
<tr>
<td>Patient Criteria</td>
<td>35-45 inches (90-115 cm) or 12-25 kg</td>
<td>41-51 inches (105-130 cm) or 25-35 kg</td>
<td>4-5 feet (122-155 cm)</td>
<td>5-6 feet (155-180 cm)</td>
<td>greater than 6 feet (&gt;180 cm)</td>
</tr>
<tr>
<td>Cuff Pressure</td>
<td>60 cm H₂O</td>
<td>60 cm H₂O</td>
<td>60 cm H₂O</td>
<td>60 cm H₂O</td>
<td>60 cm H₂O</td>
</tr>
<tr>
<td>KLTD O.D./I.D.</td>
<td>11 mm/7.5 mm</td>
<td>11 mm/7.5 mm</td>
<td>14 mm/10 mm</td>
<td>14 mm/10 mm</td>
<td>14 mm/10 mm</td>
</tr>
<tr>
<td>KLTD O.D./I.D.*</td>
<td>n/a</td>
<td>n/a</td>
<td>18 mm/10 mm</td>
<td>18 mm/10 mm</td>
<td>18 mm/10 mm</td>
</tr>
<tr>
<td>KLTD Cuff Volume</td>
<td>25-35 ml</td>
<td>30-40 ml</td>
<td>45-60 ml</td>
<td>60-80 ml</td>
<td>70-90 ml</td>
</tr>
<tr>
<td>KLTSD Cuff Volume</td>
<td>n/a</td>
<td>n/a</td>
<td>40-55 ml</td>
<td>50-70 ml</td>
<td>60-80 ml</td>
</tr>
</tbody>
</table>

Antony Wollaston, MD  
EMS Medical Director

Christopher R Solaro, MD, PHD  
Associate Medical Director

12/2016
Indications:
1. Inability to secure a patent airway with an endotracheal tube and/or a King Airway in a pediatric and/or adult patient
   a. Greater than five minutes taken for the procedure
   b. Two unsuccessful attempts by each crewmember
   c. Patients with traumatic injury to the face where intubation is not practical
   d. Patients with known or suspected C-spine fractures where possible manipulation may result in a detrimental outcome.
   e. Patients trapped or positioned in such a way as to inhibit traditional intubation.

Contraindications (relative):
1. Gross obesity
2. Inability to open mouth >1.5 cm
3. Pregnancy
4. History of recent opiate ingestion
5. Ability to control airway through intubation or with King Airway device

Procedure:
1. Choose appropriate LMA size
2. Note appropriate inflation volume based on device size
3. Lubrication
4. Appropriate size syringe
5. Ambu bag with face mask
6. Bite block
7. Sedation and paralytics administered for intubation should be used to reduce possibility of aspiration. See appropriate protocol, if necessary.
8. Check LMA cuff and pilot bulb for correct inflation.
9. Deflate by placing in a flat surface and applying downward pressure while removing air from cuff.
10. Generously lubricate the top and point of the LMA.
11. Hold the LMA like a pen, with the index finger placed at the junction of the cuff and the tube. The mask aperture must face forward and the black line on the airway tube should be oriented anteriorly toward the upper lip.
12. Under direct visualization, press the tip of the cuff upwards against the hard palate and flatten the cuff against it.
13. Using the index finger, keep pressing upwards as you advance the mask into the pharynx to ensure the tip remains flattened and avoids the tongue.
14. Keeping the neck flexed and the head extended (not applicable in the immobilized patient), press the mask into the posterior pharyngeal wall using the index finger.
15. Continue pushing with the ball of the index finger guiding the mask downward into position. By withdrawing the other fingers and slight pronation of the forearm, it is usually possible to push the mask fully into position in one fluid movement. NEVER USE FORCE! If resistance is felt with the mask tip just behind the tongue, either the tip has folded over on itself, or has impacted an irregularity or swelling in the posterior pharynx.

16. Grasp the tube firmly with the other hand and withdraw the index finger from the pharynx. Press down gently to ensure that the mask is in the correct position.

17. Inflate the mask with the recommended volume of air. DO NOT OVER INFLATE. Do not hold or touch the LMA while inflating unless the position is grossly unstable. Normally the mask should be allowed to rise up slightly out of the hypopharynx as it is inflated, to find its correct position, slight outward movement of the tube on inflation. Presence of smooth oval swelling in the neck in the thyroid and cricoid area. No cuff visible in the oral cavity.

18. Confirm LMA placement. Confirmation of tube placement must consist of waveform capnography with quantitative end-tidal CO2 in addition to three (3) clinical (if able to auscultate) and one (1) other mechanical method, which must all be documented for initial confirmation and with all subsequent moves of the patient:
   a. Clinical
      i. Auscultation of bilateral breath sounds
      ii. Absence of epigastric sounds with ventilations
      iii. Adequate chest excursion with ventilations
   b. Mechanical
      i. Colorimetric end tidal CO2 detection device (Stat Cap)
      ii. Pulse oximetry

19. Secure tube with commercially available LMA securing device. Tape or other securing mechanism is acceptable if a commercial device is not available.

20. Insert Oral Gastric (OG) or Nasal Gastric (NG) tube.

<table>
<thead>
<tr>
<th>LMA Size</th>
<th>Patient</th>
<th>Maximum Weight</th>
<th>Cuff Inflation Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Neonates/Infants</td>
<td>Up to 5kg</td>
<td>4cc</td>
</tr>
<tr>
<td>1 ½</td>
<td>Infants</td>
<td>5-10kg</td>
<td>7cc</td>
</tr>
<tr>
<td>2</td>
<td>Infants/Children</td>
<td>11-20kg</td>
<td>10cc</td>
</tr>
<tr>
<td>2 ½</td>
<td>Children</td>
<td>21-30kg</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>Children</td>
<td>31 – 50kg</td>
<td>20</td>
</tr>
</tbody>
</table>
QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

<table>
<thead>
<tr>
<th>Protocol:</th>
<th>PRO 009</th>
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<tbody>
<tr>
<td>Title:</td>
<td>Surgical Cricothyrotomy</td>
</tr>
<tr>
<td>Effective Date:</td>
<td>1-07</td>
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<td>Revision Date:</td>
<td>6-07, 12-07, 12-08, 12-10, 12-11, 6-14, 5-16</td>
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<tr>
<td>Reviewed:</td>
<td>5-16</td>
</tr>
<tr>
<td>Revision Number:</td>
<td>7</td>
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</tbody>
</table>

**Purpose:**
Provide surgical treatment to gain immediate need for airway

**Indications:**
Failure to oxygenate and/or ventilate when conditions exist that preclude other airway management techniques and/or all other techniques have failed

**Contraindications:**
Child less than 12 years of age

**Procedure:**

1) Position the patient in the neutral recumbent position. Maintain C-spine precautions if suspected cervical injury.
2) Following exposure of the neck, palpate and identify the trachea, cricoid cartilage and cricothyroid membrane.
3) Cleanse the identified site.
4) Carefully palpate the cricothyroid membrane and stabilize the cartilage with your non-dominant hand.
5) Make an approximately 2cm incision over the larynx, then re-identify the cricothyroid membrane.
6) Horizontal incise the cricothyroid membrane with a scalpel until the widest part of the blade is inserted beneath the skin.
7) Maintain patency of the opening until an airway device can be inserted. Consider the use of a bougie when using an ETT of 5.5 or higher.
8) Insert an appropriately sized, cuffed endotracheal tube over the bougie or tracheostomy tube rotating the tip from the initial perpendicular to the caudal position. Insert until the cuff is in the trachea.
9) Inflate the cuff until no air leak occurs and ventilate the patient.
10) Confirm cricothyrotomy tube placement. Confirmation of tube placement must consist of waveform capnography with quantitative end-tidal CO₂ in addition to three (3) clinical (if able to auscultate) and one (1) other mechanical method, which must all be documented for initial confirmation and with all subsequent moves of the patient:
   a. Clinical
      i. Auscultation of bilateral breath sounds
      ii. Absence of epigastric sounds with ventilations
      iii. Adequate chest excursion with ventilations
   b. Mechanical
      i. Colorimetric end tidal CO₂ detection device (Stat Cap)
      ii. Pulse oximetry

11) Control bleeding with dressings and direct pressure.

**Considerations:**
1. If unable to confirm placement of the tube, consider the likelihood of the tube being inserted into a false passage. The tube should be removed and reinserted into the trachea.
Purpose
To define assessment, management and treatment of pediatric patients (< 12 years of age) that require needle cricothyroidotomy and critical care transport.

Precautions
Caution should be used in patients with:
- Laryngeal injury
- Tracheal rupture
- Anterior neck swelling that obscures anatomical landmarks
- Anatomic anomalies or distortion of the larynx and trachea
- Bleeding disorder.

Procedure
1. Have suction supplies available and ready.
2. Locate the cricothyroid membrane utilizing anatomical landmarks.
3. Use non-dominant hand to secure the membrane.
4. Cleanse the area with antiseptic swab.
5. Draw 2.5cc of normal saline into a 5cc syringe and attach the needle supplied in the needle cricothyroidotomy kit (usually a 5-cc syringe attached to a 14 gauge catheter-over-needle device).
6. Insert the needle through the cricothyroid membrane at a 45 to 60 degree angle toward the feet. Aspirating for air with the syringe throughout the procedure.
7. Once air bubbles return easily, stop advancing the device.
8. Remove the needle and secure the catheter in place.
9. Provide ventilation with:
   a. Attach 3.0 ET tube adapter to catheter.
   b. Apply meconium aspirator to adapter
   c. Connect adaptor to oxygen using suction tubing.
   d. Cover hole on meconium device with finger to provide breaths just enough to allow chest to rise.

   OR

   Ventilate with BVM

10. Assure ample time is provided for inspiration and also for expiration.
11. If unable to obtain an adequate airway, resume basic airway management and transport the patient as soon as possible.

12. Effective use of needle cricothyroidotomy is approximately 30-40 minutes on children. Do not delay transport and consider closest location that can provide definitive airway.

Notes:

Needle catheter cricothyroidotomy provides oxygenation but not adequate ventilation. Over time the patient’s paCO2 will rise.

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EMS Medical Director

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Associate Medical Director

12/2016
Protocol: PRO 011
Title: Post Intubation Management (PIM)
Effective Date: 1-14
Revision Date: 4-14, 4-16
Reviewed: 4-16

Revision Number: 2

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EMS Medical Director

Christopher R Solaro, MD, PHD
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12/2016
POST INTUBATION MANAGEMENT

The goal of post intubation management is to safely provide and monitor adequate sedation of the intubated patient by treating pain and anxiety. Before treating for pain or sedation:

1. Confirm successful placement of an advanced airway.
2. Initiate and continue to monitor ETCO2, SpO2, Cufflator, NIBP values (arterial lines if available.)
3. Establish and maintain patent intravenous/intraosseous access.
5. Assess and document RASS before and after each medication is given, with any change in patient condition and/or every 15 minutes.

**Need for sedation?**

**YES**

**NO**
Reassess RASS every 15 minutes or as needed.

---

**Post Intubation Management Medication List**

**Ketamine:**
- **Adult**- 0.5mg/kg to 1mg/kg IV. May repeat with half of initial dose every 5 -15 minutes.
- **Pediatric**- 1.5mg/kg to 2.0mg/kg IV. May repeat with half of initial dose every 5 -15 minutes.

**THEN** (if needed)

**Fentanyl:**
- **Adult/Pediatric**-0.5mcg/kg to 1.5mcg/kg IV. May repeat every 2 minutes. *(Single max dose of 200mcg)*

**OR**

If patient is hemodynamically stable, may use:

**Fentanyl:**
- **Adult/Pediatric**-0.5mcg/kg to 1.5mcg/kg IV. May repeat every 2 minutes. *(Single max dose of 200mcg)*

**OR**

**Morphine:**
- **Adult/Pediatric**-0.05mg/kg to 0.1mg/kg IV. May repeat every 10 minutes. *(Single max dose of 10mg)*

**THEN** (if needed)

**Midazolam:**
- **Adult/Pediatric**-0.02mg/kg to 0.05mg/kg IVP. May repeat every 2 minutes. *(Single max dose of 5mg)*
Paralytics:
If a paralytic is needed, use ONE of the following medications with preference in the order listed.

1. Rocuronium 1mg/kg IV.
2. Vecuronium 0.1mg/kg IV.

Richmond Agitation Sedation Scale (RASS)

<table>
<thead>
<tr>
<th>Score</th>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>+4</td>
<td>Combative</td>
<td>Overly combative, violent, immediate danger to staff</td>
</tr>
<tr>
<td>+3</td>
<td>Very Agitated</td>
<td>Pulls or removes tubes, catheters; aggressive</td>
</tr>
<tr>
<td>+2</td>
<td>Agitated</td>
<td>Frequent non-purposeful movement, fights ventilator</td>
</tr>
<tr>
<td>+1</td>
<td>Restless</td>
<td>Anxious, movements not aggressive</td>
</tr>
<tr>
<td>0</td>
<td>Alert &amp; Calm</td>
<td>Not fully alert, has sustained awakening (eye-opening/contact) to voice &gt;10 secs</td>
</tr>
<tr>
<td>-1</td>
<td>Drowsy</td>
<td>Briefly awakens w/eye contact to voice &lt;10sec</td>
</tr>
<tr>
<td>-2</td>
<td>Light Sedation</td>
<td>Movement or eye opening to voice (no eye contact)</td>
</tr>
<tr>
<td>-3</td>
<td>Moderate Sedation</td>
<td>No response to voice, movement or eye opening to physical stimulation</td>
</tr>
<tr>
<td>-4</td>
<td>Deep Sedation</td>
<td>No response to voice or physical stimulation</td>
</tr>
<tr>
<td>-5</td>
<td>Unarousable</td>
<td>No response to voice or physical stimulation</td>
</tr>
</tbody>
</table>

Observe Pt.
1. Alert, restless, agitated (0 - +4)
2. Not alert, state pt’s name, ask to “open eyes & look at me”
   a. Pt. awakens w/eyes open & contact (−1)
   b. Pt. awakens w/eyes open & contact unsustained (−2)
   c. Pt. has movement in response to voice but not eye contact (−3)
3. No response to verbal, physically stimulate pt:
   a. Pt. has movement (−4)
   b. Pt. has no response (−5)
PRO 012

QUINCY AREA SEMSV
PROTOCOLS & STANDING ORDERS

Protocol: PRO 012
Title: Mechanical Ventilation
Effective Date: 8-05
Revision Date: 5-06, 9-07, 11-13  Revision Number: 3
Reviewed: 6-16

This page is intentionally left blank. Please refer to the following Algorithms:

PRO 013A  Lung Protective Strategy for Ventilated Adults
PRO 013B  Lung Protective Strategy for Ventilated Infant/Child
PRO 013C  Non-Invasive Positive Pressure Ventilation (Patients >12 years)

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Associate Medical Director

12/2016
LUNG PROTECTIVE STRATEGY FOR VENTILATED ADULTS

MODE: SIMV or A/C
PPlat: Keep <30 cm H2O

CONTROL: Volume or Pressure
FIO2: 100%*
PPIP: Attempt to keep <40 cm H2O**
Avoid Auto PEEP

Evaluate current ABG’s/draw STAT ABG’s if time allows

NO LUNG PATHOLOGY
Vt: 6-10 ml/kg IBW Rate: 8-20 BPM
MV: 5-10 L/min PS: 15 cm H2O***
PEEP: 5-15 cm H2O I:E: Start at 1:2
Contact Medical Control for PEEP >15 cm H2O

OBSTRUCTIVE LUNG PATHOLOGY
Vt: 4-10 ml/kg IBW Rate: 8-16 BPM I:E ≥ 1:3
MV: 5-7 L/min Permissive hypercapnia
PS: 15 cm H2O***
PEEP: 4-10 cm H2O PRN to SpO2, Auto PEEP
Contact Medical Control for PEEP >10 cm H2O

Metabolic
Acid/Base issue?
Rate: Consistent with pts original rate
Permissive hypoxemia, monitor pH if possible

Pneumothorax?
Vt: adjusted to PIP and PPlat

COPD?
Rate: 8-16 BPM I:E ≥ 1:3
Permissive hypercapnia

CHF?
Consider NPPV
PEEP cautiously

Asthma?
Rate: 6-12 BPM I:E ≥ 1:3

Acute Lung Injury or ARDS (Phase Dependent)
Rate 12-20 BPM I:E Lengthen Ti to SpO2
Permissive hypercapnia to maintain PPlat ≤30 cm H2O

Monitor Oxygenation (SpO2/PaO2), Ventilation (ETCO2/PaCO2) and tube placement

Is patient adequately sedated?

No
Consider sedation, analgesia
Avoid paralytics, if possible

Yes
Is air trapping/Auto PEEP present on waveform?

Yes
Decrease RR
Increase E Time
Decrease I Time
Decrease Vt
Measure Auto-PEEP
PPlat <30 cm H2O
Monitor SpO2/ETCO2

No

Is PPlat <30 cm H2O?

Yes

If SpO2 <97%,
Maintain SpO2/FIO2 ratio to 315-500

No

Oxygenation:
- Consider Increasing PEEP
- Consider Increasing FiO2
- Assess for air trapping/Auto PEEP
- Consider lung pathology

Ventilation:
- First consider adjusting RR
- Increase with caution if AUTO PEEP present
- Adjust Vt (aim for lowest Vt consistent with adequate ventilation not to exceed 10 ml/kg IBW)
- Consider methods of decreasing CO2 production, such as fever control
- Consider lung pathology

Factors that cause an increase in
PIP/PPlat in Volume Control:
- Decreased compliance
- Increased resistance
- Increased flow
- Increased volume

Consider lung pathology or metabolic state when making vent changes.

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Associate Medical Director 12/2016
### QUINCY AREA SEMSV
#### PROTOCOLS & STANDING ORDERS

**LUNG PROTECTIVE STRATEGY FOR VENTILATED INFANT/CHILD**

<table>
<thead>
<tr>
<th>MODE: SIMV or A/C</th>
<th>CONTROL: Volume or Pressure</th>
<th>FIO2: 100%*</th>
<th>Avoid Auto PEEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPlat: Keep &lt;30 cm H2O</td>
<td>PIP: Attempt to keep &lt;40 cm H2O**</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pressure Controlled ventilation is the standard of care for the pediatric population

### NO LUNG PATHOLOGY

- **Vt:** 6-10 ml/kg 1BW
- **PS:** 15 cm H2O***
- **Rate:** Age appropriate
- **PEEP:** 5-15 cm H2O
- Contact Medical Control for PEEP >15 cm H2O

<table>
<thead>
<tr>
<th>Metabolic</th>
<th>Acid/Base issue?</th>
<th>Rate: Consistent with pts original rate</th>
<th>Permissive hypocapnia, monitor pH if possible</th>
<th>Patients ≤50 mlVt for IBW, use Pressure Control</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### OBSTRUCTIVE LUNG PATHOLOGY

- **Vt:** 4-10 ml/kg 1BW
- **MV:** 5-7 L/min
- **PS:** 15 cm H2O***
- **PEEP:** 4-10 cm H2O
- PRN to SpO2, Auto PEEP
- Contact Medical Control for PEEP >10 cm H2O

### Asthma?

- Rate: 6-12 BPM
- I:E ≥ 1:3
- Permissive hypercapnia to maintain PPlat

### Pneumothorax?

- Vt: adjusted to PIP and PPlat

### Acute Lung Injury or ARDS (Phase Dependent)

- Rate 12-20 BPM
- I:E Lengthen Ti to ↑SpO2
- Permissive hypercapnia to maintain PPlat ≤30 cm H2O

Continued on Page 2
Monitor Oxygenation (SpO2/PaO2), Ventilation (ETCO2/PaCO2) and tube placement

Is patient adequately sedated?

Yes

Is air trapping/Auto PEEP present on waveform?

Yes

Decrease RR
Increase E Time
Decrease I Time
Decrease Vt
Measure Auto-PEEP
PPlat <30cm H2O
Monitor SpO2/ETCO2

Wean FiO2 to maintain
SpO2 ≥94%
Continue Medical Therapy
Monitor therapy goal

No

Is PPlat <30cm H2)

No

Monitor SpO2 and ETCO2

Yes

Is ETCO2 ≥25 and ≤55?

Is SpO2 ≥94?

No

Notes:
- Normal ETCO2 350-45
- Desired SpO2 ≥94%
- Be prepared for VQ mismatch
- *FiO2 should be adjusted to target of 40% while keeping SpO2 ≥94%
- **Sustained peak inspiratory airway pressures >40cmH2O must be investigated & addressed
- ***PS setting is over baseline of PEEP. Value provided is total PS.
- For rates ≥30 adjust Ti to 0.4-0.5 while monitoring for sufficient Te.

Factors that cause an increase in PIP/Plat in Volume Control:
- Decreased compliance
- Increased resistance
- Increased flow
- Increased volume

Consider lung pathology or metabolic state when making vent changes

Oxygenation:
- Consider increasing PEEP
- Consider increasing FiO2
- Assess for air trapping/auto PEEP
- Consider lung pathology

Ventilation:
- First consider adjusting RR
  Increase with caution if AUTO PEEP present
- Adjust Vt (aim for lowest Vt consistent with adequate ventilation not to exceed 10 ml/kg IBW)
- Consider methods of decreasing CO2 production, especially in TBI or signs of herniation
- Consider lung pathology

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**NON-INVASIVE POSITIVE PRESSURE VENTILATION FOR >12 YEARS OF AGE**

**INDICATIONS:** Any patient who is in respiratory distress with signs and symptoms consistent with: Asthma, COPD, pulmonary edema, CHF, or pneumonia and who is awake and able to follow commands, >12 years old, able to fit the CPAP mask, ability to maintain an open airway AND exhibits two or more of the following: A respiratory rate > 25 BPM, SpO2 of <94% at any time or use of accessory muscles during respirations.

**CONTRAINDICATIONS:** Patients who are apneic, in respiratory arrest, have suspected pneumothorax, open chest trauma, tracheostomy, vomiting, upper GI bleeding, decreased cardiac output, obtunded, questionable ability to protect airway, ARDS, penetrating chest trauma, gastric distention or severe facial injury.

**PRECAUTIONS:** Use care if patient has impaired mental status, had failed at past attempts at noninvasive ventilation, has history of recent gastric surgery, has excessive secretions, has a facial deformity that would alter an adequate mask seal.

<table>
<thead>
<tr>
<th>CPAP</th>
<th>CPCP + PS (Bi-level/BiPAP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FiO2: 100%*  PEEP: 5-15cm H2O</td>
<td></td>
</tr>
<tr>
<td>Contact Medical Control for PEEP &gt; 15cm H2O</td>
<td></td>
</tr>
<tr>
<td>FiO2: 100%*  PEEP: 5-15cm H2O</td>
<td></td>
</tr>
<tr>
<td>PS: 5-15cm H2O***</td>
<td></td>
</tr>
<tr>
<td>Contact Medical Control for PEEP &gt; 15cm H2O</td>
<td></td>
</tr>
</tbody>
</table>

Continued on Page 2
Monitor Oxygenation (SpO2/PaO2), Ventilation (ETCO2/PaCO2) and mask seal

Is patient hypoxic?

No → Acute exacerbation of CHF, COPD or asthma?

No → Complaining or becoming more anxious

No → Becoming obtunded or unable to protect airway?

No → Tolerating NIV and improving clinically?

Yes → Increase FiO2
      Increase PEEP

If no improvement, consider Bi-level NIV

CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask, experiences respiratory arrest or begins to vomit. Do not remove NIPPV until hospital therapy is ready to be placed on patient.

Intermittent positive pressure ventilation with a Bag-Valve-Mask or placement of a secure airway should be considered if the patient is removed from CPAP therapy. Watch patient for gastric distention that can result in vomiting.

Due to changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs must be obtained every 5 minutes.

Notes:
- Normal ETCO2 35-45
- Desired SpO2 ≥94%
- Be prepared for VQ mismatch
- *FiO2 should be adjusted to target of 40% while keeping SpO2 ≥94%
- ***PS setting is over baseline of PEEP. Value provided is total PS.

Consider lung pathology or metabolic state when making vent changes.

Ventilation:
- Increase PS to assist with WOB
- Consider methods of $\text{CO}_2$ production, such as fever control
- Consider lung pathology

Oxygenation:
- Consider increasing PEEP
- Consider increasing FiO2
- Consider lung pathology

#1 Patient Safety

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Associate Medical Director 12/2016
Protocol: PRO 014
Title: Transportation of Patients with Chest Tubes
Effective Date: 8-05
Revision Date: 8-10, 3-16  Revision Number: 2
Reviewed: 3-16

Purpose:
Define the assessment and transport procedures for the patient with a chest tube requiring critical care transport.

Procedure:

1. Assure all holes of the chest tube are within the pleural cavity and chest tube is securely anchored with all connections secured. Assure dressings are dry.
2. Assess bilateral breath sounds.
3. If time permits evaluate the post procedure X-Ray.
4. All tubing and connections will be reassessed with all patient movements to maintain patency of the system and to assure there are no kinks or loops in the tubing.
5. Closed drainage system must remain upright and below the level of the chest at all times.

6. Do NOT (Milk / Strip) or clamp the chest tube.
7. If the chest tube becomes inadvertently dislodged:
   a. Cover the site with sterile occlusive dressing.
   b. If a tension pneumothorax develops burp one corner to relieve pressure. If unsuccessful consider needle decompression.
8. If the closed drainage unit becomes damaged during flight attach Pneumostat or Heimlich valve and notify receiving facility.

Notes:

1. Gentle rise and fall of the water level corresponding to the patient’s respirations indicate that the unit is functioning properly.
2. Continuous bubbling in the closed drainage unit indicates that there is a leak in the system, check all tubing and connectors.
3. Intermittent bubbling in the closed drainage unit indicates an intermittent leak from the patient’s chest.
4. Watch for re-expansion pulmonary edema with rapid fluid removal.
Protocol: PRO 016
Title: Needle Thoracostomy
Effective Date: 8-05
Revision Date: 1-06, 2-07, 6-07, 6-14, 4-16
Revision Number: 5
Reviewed: 4-16

Purpose: To define assessment, management and treatment of patients with known or suspected tension pneumothorax who require critical care transportation.

Procedure:

1. Expose the entire chest and cleanse the affected side.
2. Identify the 2nd or 3rd intercostal space in the anterior chest, midclavicular line OR lateral chest at the mid-axillary 4th or 5th intercostal space. Do not go below the 5th intercostal space.
3. If needed, use a scalpel to make a small puncture where needle will be inserted.
4. Insert the commercial needle/catheter assembly until there has been a rush of air, the catheter is hubbed, or resistance is met.
5. Remove the needle and secure catheter to the chest.
6. Attach the commercial one way valve (if not part of device already) and secure to chest.
7. Reassess breath sounds, chest wall excursion and hemodynamic status.
8. May repeat as necessary.

Considerations:

Use caution with positive pressure ventilation as it may lead to rapid progression of a simple pneumothorax to a tension pneumothorax.

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12/2016
**Purpose:**
Identify and describe placement of intraosseous (IO) vascular access for patients requiring immediate vascular access.

**Procedure:**

1. Determine insertion site.
2. Cleanse the site.
3. Choose appropriate recommended size IO needle:
   a. 15mm needle set for patients 3-39kg.
   b. 25mm needle set for patients ≥3kg.
   c. 45mm needle set for patients >40kg or excessive tissue over other insertion sites.
4. Stabilize the extremity and insert IO.
5. Confirm placement and secure needle set.
6. Administer lidocaine 2% for patients that are responsive to pain:
   a. Initial dosing for **Adults:**
      i. Administer 40mg IO over 2 minutes. Wait 60 seconds, flush with 10ml NS.
      ii. Administer 20mg IO over one minute
   b. Initial dosing for **Pediatrics:** 0.5mg/kg (Single max dose of 40 mg)
7. May repeat Lidocaine as needed:
   a. Adults – 20mg IO q 20 minutes
   b. Pediatrics – half the initial dose q 20 minutes
8. Pressure bag or IV pump must be utilized for fluids being administered through IO needle set.
9. Label IO access site with date and time of placement.

**Consideration:**
Acceptable IO sites all patients include the proximal or distal tibia and proximal humerus.
For pediatrics and infants the distal femur may also be considered.

**Contraindications:**
Weight <3kg
Fracture in targeted bone
Absence of adequate landmarks
Infection at area of insertion site
Previous significant orthopedic procedure at site
Previous access to targeted bone within the past 48hrs
Protocol: PRO 018
Title: Umbilical Vein Catheterization
Effective Date: 1-07
Revision Date: 6-14, 3-16, 4-16
Revision Number: 3
Reviewed: 4-16

Purpose:
Provide intravascular access for neonates <2 weeks of age that require critical care transport.

Procedure:

1. Flush a 5 french catheter with normal saline and attach a closed stop cock.
2. Sterilize umbilical stump and surrounding area.
3. Tie umbilical tape loosely around the base of the stump to provide hemostasis.
4. Use a scalpel and cut the stump horizontally, approximately 1.5-2cm from the abdominal wall.
5. Grasp the catheter 1cm from the distal tip with the iris forceps and gently insert the catheter into the vein, aiming the tip toward the right shoulder. Advance the catheter only 1-2cm beyond the point at which good blood return is obtained. If resistance is initially met, loosen the umbilical tape or suture to manipulate the angle of approach.
6. Secure catheter by tightening the umbilical tape and completing the knot. Tape catheter and extension to umbilicus.
Purpose:
Non-invasive EtCO2 monitoring should be considered in the following patient population who require critical care transport.

1. Altered mental status
2. Cervical spine injury
3. Respiratory distress/failure
4. Chest Wall Injury
5. CNS Depression
6. CVA/TIA
7. Smoke or Chemical Inhalation Injury
8. Seizure
9. Diabetic Ketoacidosis
10. Any patient in which standard vital signs are unable to be obtained. (i.e.: No palpable pulse, LVAD Patient, BP unable to be obtained without use of Doppler).

Notes:
When using the nasal filter line, if one or both nostrils are partially or completely blocked, or the patient is breathing through the mouth, the displayed ETCO2 values may be significantly low.
Purpose:

For the management of patients who have an implanted Ventricular Assist Device (VAD). These may be Right (RVAD), Left (LVAD) or Both (BiVAD). If the patient complaint is related to the VAD, continue with this protocol.

Indications:

There are three general categories of VAD patients:

1. Individuals who require temporary circulatory support who are expected to recover after a cardiac insult and will not need cardiac transplantation (bridge to recovery);

2. Patients awaiting a cardiac transplantation but who would not survive until an organ is available owing to low cardiac output and/or non-cardiac comorbidities (bridge to transplantation);

3. Individuals who need long-term support but who have a relative or absolute contraindication to cardiac transplantation (destination therapy).

SEE PAGE 2
This guide is produce by MCSO – The Mechanical Circulatory Support Organization. It is produced by VAD Coordinators from some of the largest and most successful VAD implantation hospitals in the US. It has been vetted by experts on VADS in Air Medical Transport and EMS. It should not replace the operator manual as the primary source of information.

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Questions and Answers
Ventricular Assist Device

What is a Ventricular Assist Device (VAD)?
A ventricular assist device (VAD) is a mechanical pump that’s used to support heart function and blood flow in people who have weakened hearts.

How does a VAD work?
The device takes blood from a lower chamber of the heart and helps pump it to the body and vital organs, just as a healthy heart would.

What are the parts of a VAD?
The basic parts of a VAD include: a small tube that carries blood out of your heart into a pump; another tube that carries blood from the pump to your blood vessels, which deliver the blood to your body; and a power source.

What is the power source?
The power source is either batteries or AC power. The power source is connected to a control unit that monitors the VAD’s functions. The batteries are carried in a case usually located in a holster in a vest wrapped around the patients shoulders.

What does the control unit or controller do?
The control unit gives warnings, or alarms, if the power is low or if it senses that the device isn’t working right. It is a computer.

The portability of the HeartMate II enables patients to resume many of their normal daily activities.
**MOST** patients have a tag located on the controller around their waist that says what type of device it is, what institution put it in and a number to call. Most importantly is the color of the tag – it matches this EMS Field Guide and allows you to quickly locate the device you are caring for.
Patient Management For VADs

1. Assess the patient’s airway and intervene per your usual protocol.

2. Auscultate Heart Sounds to determine if the device is functioning and what type of device it is. If it is a continuous flow device, you should hear a “whirling sound”.

3. Assess the device for any alarms.

4. Look on controller found around the waist of the patient or in the VAD PAK and see what color tag and device it is.

5. Match the color on the device tag to the EMS Guide.

6. Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.

7. Start Large Bore IV.

8. Assess vital signs – Use Mean BP with Doppler – with the first sound you hear is the Mean Arterial Pressure (MAP).

9. If no Doppler, use the Mean on the non invasive blood pressure machine.

10. Transport to closest VAD center. Call the number on the device to get advice.

11. Bring all of the patient’s equipment.

12. Allow the trained caregiver to ride in the transport vehicle if possible to act as an expert on the device in the absence of consciousness in the patient.
HeartMate II®

1. Can I do external CPR?
   Only if absolutely necessary

2. If not, is there a “hand pump” or external device to use?
   No.

3. If the device slows down (low flow state), what alarms will go off?
   A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 lmp. Can give a bolus of normal saline and transport to an LVAD center.

4. How can I speed up the rate of the device?
   No, it is a fixed speed.

5. Do I need to heparinize the patient if it slows down?
   Usually no, but you will need to check with implanting center.

6. Can the patient be defibrillated while connected to the device?
   Yes.

7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   No.

8. Does the patient have a pulse with this device?
   May have weak pulse or lack of palpable pulse.

9. What are acceptable vital sign parameters?
   MAP 70 - 90 mm Hg with a narrow pulse pressure

10. Can this patient be externally paced?
    Yes.

FAQs

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, grey batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring ALL of the patient’s equipment with them.

Trouble Shooting HeartMate II®

When the Pump Has Stopped

- Be sure to bring ALL of the patient’s equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see changing batteries section on next page)
- If pump does not restart, change controllers. (see changing controllers section on next page)

Alarms: Emergency Procedures

Yellow or Red Battery Alarm: Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient—the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure—treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.

**Trouble Shooting HeartMate II®**

**Changing Batteries**

**WARNING:** At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient’s accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 3 and 4)
- Remove only ONE battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 1)
- Controller will start beeping and flashing green signals.
- Replace with new battery by lining up RED arrows on battery and clip. (Figure 2)
- Slide a new, fully-charged battery (Figure 4) into the empty battery clip by aligning the RED arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and green flashing will stop.
- Repeat previous steps with the second battery and battery clip.

**Changing Controllers**

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient’s travel case.
- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.
- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the RED arrows. ALARMS WILL SOUND-THIS IS OK.
- Depress the silence alarm button (upside-down bell with circle) until the alarm is silenced on the new, replacement Controller.
- Rotate the perc lock on the replacement controller in the direction of the “unlocked” icon until the perc lock clicks into the fully-unlocked position. Repeat this same step for the original Controller until the perc lock clicks into the unlocked position.
- Disconnect the perc lead/driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound.

**Note:** The alarm will continue until power is removed from the original Controller. **Getting the replacement Controller connected and the pump restarted is the first priority.**

- Connect the replacement Controller by aligning the BLACK LINES on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

**Step 1.** Firmly press the Silence Alarm or Test Select Button to restart the pump.

**Step 2.** Check the powersource to assure that power is going to the controller.

**Step 3.** Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT pull the lead.**

- After the pump restarts, rotate the perc lock on the new controller in the direction of the “locked” icon until the perc lock clicks into the fully-locked position. If unable to engage perc lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage perc lock.
- Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

**JANUARY 2014**
HeartMate II® Controller Comparison Guide

POCKET CONTROLLER™

- Cable Disconnect Symbols
- Battery Button
- Pump Running Symbol
- Display Button
- Status Symbols
- Silence Alarm Button

3 Modes: Run, Charge, Sleep
- Run: Driveline + Power source connected.
- Charge: Only power source connected.
- Sleep: No driveline or power source connected, ready to use.

Backup Battery
An emergency backup battery is built into Pocket Controller, powering the pump for 15 minutes in the absence of an external power source. The backup battery is supplied MINISTRIPE.

Event Logger
Pocket Controller includes date/time records in event history. Pocket Controller can store 240 events.

Green Pump Running Symbol
Green “pump running” symbol signifies that the pump is on and running.

Controller Buttons
- Display Button: Enables viewing of pump parameters and backup battery charge states.
- Silence Alarm Button: Silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
- Display Button + Silence Alarm Button: Together displays previous six alarms.
- Battery Button: Displays the battery power gauge when pressed. Activates a self test when held for 5 seconds then released. Enters sleep mode when driveline and external power are disconnected and button is held for 5 seconds then released.

Self Test
Press and hold the Battery Button for 5 seconds.

Low Power
- Yellow Diamond Symbol: Displayed when only 15 minutes of external power is remaining.
- Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

Backup Battery Modes
- Entered after external power is depleted. Provides 15 minutes of internal emergency backup battery power.
- Power Saver Mode: Entered when pump has run on backup battery for 15 minutes. Pump Speed is reduced to the set Low Speed Limit.

Starting the Pump
- > 8000 RPM: Pump starts automatically.
- < 8000 RPM with Backup Battery: Start pump by pressing any button on Pocket Controller.
- < 8000 RPM with no Backup Battery: Pump can only be started via System Monitor.

System Monitor Event History Screen
- PI Event:
- System Information:

Compatibility
System Monitors I and II, Power Module, Pump Module Patient Cable (14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips.

Alarms
For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, Item 107526. Pocket Controller includes a yellow wrench icon to denote advisory alarms. Note that Pocket Controller includes driveline fault detection.

EXTERNAL PERIPHERAL CONTROLLER (EPC)

- Red Heart Alarm
- Cell Module Alarm
- Power Source
- Test Select Button
- Alarm Silence Button
- Battery Alarm
- Battery Gauge

2 Modes: On, Off
- On: Driveline + Power source connected.
- Off: No driveline or power source connected.

Cell Module Battery
No backup battery. The cell module battery powers on audible tone if EPC is removed from power while the driveline is connected. The cell module battery is supplied STERILE.

Event Logger
EPC does not include date/time records in event history. EPC can store 120 events.

Green Power Symbol
Green light only means that the controller is receiving power. Listen over the pump package for confirmation that the pump is running.

Controller Buttons
- Alarm Silence Button: Displays the battery fuel gauge. Also silences hazard alarms for 2 minutes and advisory alarms for 4 hours.
- Test Select Button: Activates a self test when held for 3 seconds.

Self Test
Press and hold the Test Select Button for 3 seconds.

Low Power
- Yellow Battery Symbol: Displayed when only 15 minutes of external power is remaining.
- Red Battery Symbol: Displayed when only 5 minutes of external power is remaining.

Power Saver Mode: Entered when the battery voltage falls to a critically low level. Pump Speed is reduced to 8000 RPM.

Starting the Pump
- > 8000 RPM: Pump starts automatically.
- < 8000 RPM: Start pump by pressing Alarm Silence Button or Test Select Button on EPC.

System Monitor Event History Screen
- PI Event:
- System Information:

Compatibility
System Monitors I and II, Power Module, Power Base Unit (PB) Unit, Power Module Patient Cable (12 Volt and 14 Volt), 14 Volt Lithium-Ion Batteries and Battery Clips, 12 Volt SLA and NiMH Batteries and Clips.

Alarms
For a review of alarms and their meanings, reference HeartMate II Alarms for Clinicians, Item 1035851. Note that EPC does not include driveline fault detection.

JANUARY 2014
HeartMate II Controller Comparison Guide

**DRIVELINE CONNECTION**

**Pocket Controller:**
A safety tab is located on the back of the controller.

**External Peripheral Controller (EPC):**
A percutaneous lock is located on the side of the controller.

The Pocket Controller driveline connection and locking mechanism are different from the EPC. To insert and lock the driveline into Pocket Controller:

1. Slide the safety tab back to expose the red button.
2. Align the arrow on the driveline to the arrow on the Pocket Controller. Firmly insert the driveline until it snaps into place.
3. Tug gently on the metal portion of the driveline to ensure that it is fully engaged.
4. Slide the safety tab over the red button. Ensure the safety tab completely covers the red button.
HeartMate II® with Pocket Controllers

1. Can I do external CPR?
   Only if absolutely necessary

2. If not, is there a “hand pump” or external device to use?
   No.

3. If the device slows down (low flow state), what alarms will go off?
   A red heart alarm light indicator and steady audio alarm will sound if less than 2.5 Lpm. Can give a bolus of normal saline and transport to an LVAD center.

4. How can I speed up the rate of the device?
   No, it is a fixed speed.

5. Do I need to heparinize the patient if it slows down?
   Usually no, but you will need to check with implanting center.

6. Can the patient be defibrillated while connected to the device?
   Yes.

7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   No.

8. Does the patient have a pulse with this device?
   May have weak pulse or lack of palpable pulse.

9. What are acceptable vital sign parameters?
   MAP 70 - 90 mm Hg with a narrow pulse pressure

10. Can this patient be externally paced?
    Yes.

FAQs

- May not be able to obtain cuff pressure (continuous flow pump).
- Pump connected to electric line exiting patient's abdominal area and is attached to computer which runs the pump.
- Pump does not affect EKG
- All ACLS drugs may be given.
- No hand pump is available.
- A set of black batteries last approximately 3 hours, gray batteries last 8-10 hours.
- Any emergency mode of transportation is ok. These patients are permitted to fly.
- Be sure to bring ALL of the patient's equipment with them.

Trouble Shooting HeartMate II® with Pocket Controllers

When the Pump Has Stopped

- Be sure to bring ALL of the patient's equipment with them.
- Fix any loose connection(s) to restart the pump.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair. (see changing batteries section on next page)
- If pump does not restart, change controllers. (see changing controllers section on next page)

Alarms: Emergency Procedures

Yellow or Red Battery Alarm:
Need to Change Batteries. See changing batteries section on next page.

Red Heart Flashing Alarm: This may indicate a Low Flow Hazard. Check patient--the flow may be too low. If patient is hypovolemic, give volume. If patient is in right heart failure-- treat per protocol. If the pump has stopped check connections, batteries and controllers as instructed in the section above.
Trouble Shooting HeartMate II® with Pocket Controllers

**Changing Batteries**

- **WARNING:** At least one power lead must be connected to a power source AT ALL TIMES. Do not remove both batteries at the same time or the pump will stop.

- Obtain two charged batteries from patient’s accessory bag or battery charger. The charge level of each gray battery can be assessed by pressing the battery button on the battery. (Figures 1 and 2)

- Remove only ONE battery from the clip by pressing the button on the grey clip to unlock the battery. (Figure 3)

- Controller will start beeping, flash yellow signals and will read power disconnect on the front screen.

- Replace with new battery by lining up RED arrows on battery and clip. (Figure 4)

- Slide a new, fully-charged battery (Figure 2) into the empty battery clip by aligning the RED arrows. The battery will click into the clip. Gently tug at battery to ensure connection. If battery is properly secured, the beeping and yellow flashing will stop.

- Repeat previous steps with the second battery and battery clip.

**Changing Controllers**

- Place the replacement Controller within easy reach, along with the batteries/battery clips. The spare Controller is usually found in the patient’s travel case.

- Make sure patient is sitting or lying down since the pump will momentarily stop during this procedure.

- Attach the battery clips to the spare controller by lining up the half moons and gently pushing together and attach the batteries to the spare controller by aligning the RED arrows.

- On the back of the replacement controller, rotate down the perc lock so the red tab is fully visible. Repeat this step on the original controller until the red tab is fully visible.

- Disconnect the drive line from the original controller by pressing down on the red tab and gently pulling on the metal end. The pump will stop and an alarm will sound. **Note:** The alarm will continue until the original controller is put to sleep. You can silence the alarm by holding down the silence button. **Getting the replacement controller connected and pump restarted is the first priority.**

- Connect the replacement Controller by aligning the BLACK ARROWS on the driveline and replacement Controller and gently pushing the driveline into the replacement Controller. The pump should restart, if not complete the following steps:

  **Step 1.** Firmly press the Silence Alarm or Test Select Button to restart the pump.

  **Step 2.** Check the powersource to assure that power is going to the controller.

  **Step 3.** Assure the perc lead is fully inserted into the socket by gently tugging on the metal end. **DO NOT** pull the lead.

  - After the pump restarts, rotate up the perc lock on the new controller so the red tab is fully covered. If unable to engage perc lock to a fully locked position, gently push the driveline into the controller to assure proper connection. Retry to engage perc lock.

  - Disconnect power from the original Controller. The original Controller will stop alarming once power is removed.

  - Hold down battery symbol for 5 full seconds for complete shutdown of old controller.
HeartWare® Ventricular Assist System

1. Can I do external CPR?
   Chest compressions may pose a risk of dislodgment – use clinical judgment. If chest compressions are administered, confirm function and positioning of the pump.

2. If not, is there a “hand pump” or external device to use?
   No.

3. If the device slows down (low flow state), what alarms will go off?
   The device runs at a fixed speed. If a low flow state occurs, an alarm will be heard, and the controller display will show a yellow triangle and “Low Flow – Call” message.

4. How can I speed up the rate of the device?
   It is not possible to adjust the pump speed in the prehospital setting. Okay to give IV fluids.

5. Do I need to heparinize the patient if it slows down?
   Call the accepting VAD facility for guidance.

6. Can the patient be defibrillated while connected to the device?
   Yes.

7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   No, defibrillate per protocol.

8. Does the patient have a pulse with this device?
   The patient may not have a palpable pulse. Depending on the patient’s own heart function, you may be able to feel a thready pulse.

9. What are acceptable vital sign parameters?
   Goal Mean Arterial Pressure (MAP) is <85 mmHg. Use a Doppler as the first option to assess blood pressure. If you are using a Doppler, place the blood pressure cuff on the patient arm. As you release the pressure in the blood pressure cuff, the first sound you hear with the Doppler is the MAP. If that is not available, use a non-invasive BP (NIBP).

10. Can this patient be externally paced?
    Yes

FAQs

- May not be able to obtain cuff pressure (continuous flow pump)
- Pump connected to electric line (driveline) exiting patient’s abdominal area and is attached to computer (controller) which runs the pump.
- Pump does not affect EKG, but patient may or may not be symptomatic even with ventricular arrhythmias.
- All ACLS drugs may be given.
- No hand pump is available. This is a rotary (continuous flow) pump with typical speed ranges of 2400 – 3200 RPMs. The patient should have back-up equipment.
- The controller draws power from one battery at a time. A fully charged battery will provide 4-6 hours of power. Both the battery and controller have status lights to indicate the amount of power remaining.
- Transport by ground to implanting facility if possible.
- Be sure to bring ALL of the patient’s equipment with them.


January 2014
HeartWare® Ventricular Assist System
Emergency Operation

ALARM ADAPTER
- Used to silence the internal NO POWER ALARM.
- Should only be used on a controller that is NOT connected to a patient’s pump.
- Must be inserted into the blue connector of the original controller after a controller exchange BUT before the power sources are disconnected or the NO Power alarm will sound for up to two hours.

DRIVELINE CONNECTION
To Connect to Controller:
- Align the two red marks and push together. An audible click will be heard confirming proper connection. (Figure A)
- The Driveline Cover must completely cover the Controller’s silver driveline connector to protect against static discharge. (Figure B)
- NOTE: an audible click should be heard when connecting the Driveline or Driveline extension to the controller. Failure to use the Driveline Cover may cause an Electrical Fault Alarm.

CONNECTING POWER TO CONTROLLER
To Connect a Charged Battery:
- Grasp the cable of the charged battery at the back end of the connector (leaving front end of connector free to rotate)
- Line up the solid white arrow on the connector with the white dot on the Controller.
- Gently push (but DO NOT twist) the battery cable into the Controller until it naturally locks into place; you should hear an audible click.
- Confirm that the battery cable is properly locked on the controller by gently pulling the cable near the controller power connector.
- DO NOT force the battery cable into the controller connector without correct alignment as it may result in damaged connectors.

TO DISCONNECT A DEPLETED BATTERY
- Make sure there is a fully charged battery available to replace the depleted one.
- Disconnect the depleted battery by turning the connector sleeve counterclockwise until it stops.
- Pull the connector straight out from the controller.
HeartWare® Ventricular Assist System
Emergency Operation

STEPS TO EXCHANGE THE CONTROLLER

Step 1: Have the patient sit or lie down.

Step 2: Place the new controller within easy reach.

Step 3: Connect back-up power sources (batteries or AC Power) to the new controller.

- Confirm that the power cables are properly locked on the controller by gently pulling on the cable near the connector.

- A "Power Disconnect" alarm will activate if a second power source is not connected to the new controller within 20 seconds of controller power up.

- A "VAD Stopped" alarm will activate if the pump driveline is not connected to the new controller within 10 seconds - this alarm will resolve once the pump driveline is connected.

Step 4: Pull back the white driveline cover from the original controller’s silver connector.

Step 5: Disconnect the driveline from the original controller by pulling the silver connector away from the controller. Do not disconnect by pulling on the driveline cable. A "VAD Stopped" alarm may activate. Don’t panic. You can silence the alarm after restarting the pump, which is the priority.

Step 6: Connect the driveline to the new controller (align the two red marks and push together). If the "VAD Stopped" alarm was active on the new controller, it will now resolve.

Step 7: The pump should restart. Verify the pump is working (RPM, L/min, Watts).

Step 8: IF THE PUMP DOES NOT RESTART, CALL FOR MEDICAL ASSISTANCE IMMEDIATELY.

Step 9: Insert the Alarm Adapter into the blue connector on the original controller.

- Disconnect both power sources from the original controller.

- The controller will be turned off and all alarms silenced.

Step 10: Slide the white driveline cover up to cover new controller’s silver connector.

Step 11: Contact the VAD Center or Implanting hospital for a new backup controller.
### HeartWare® Ventricular Assist System Troubleshooting

<table>
<thead>
<tr>
<th>ALARM TYPE</th>
<th>ALARM DISPLAY (Line 1)</th>
<th>ACTION (Line 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High - Critical</strong></td>
<td>VAD STOPPED</td>
<td>CONNECT DRIVELINE</td>
</tr>
<tr>
<td>(FLASHING RED)</td>
<td>VAD STOPPED</td>
<td>CHANGE CONTROLLER</td>
</tr>
<tr>
<td></td>
<td>CRITICAL BATTERY 1</td>
<td>REPLACE BATTERY 1</td>
</tr>
<tr>
<td></td>
<td>CRITICAL BATTERY 2</td>
<td>REPLACE BATTERY 2</td>
</tr>
<tr>
<td></td>
<td>CONTROLLER FAILED</td>
<td>CHANGE CONTROLLER</td>
</tr>
<tr>
<td><strong>MEDIUM</strong></td>
<td>CONTROLLER FAULT</td>
<td>CALL ACCEPTING VAD HOSPITAL</td>
</tr>
<tr>
<td>(FLASHING YELLOW)</td>
<td>CONTROLLER FAULT</td>
<td>CALL: ALARMS OFF</td>
</tr>
<tr>
<td></td>
<td>HIGH WATTS</td>
<td>CALL ACCEPTING VAD HOSPITAL</td>
</tr>
<tr>
<td></td>
<td>ELECTRICAL FAULT</td>
<td>CALL ACCEPTING VAD HOSPITAL</td>
</tr>
<tr>
<td></td>
<td>LOW FLOW</td>
<td>CALL ACCEPTING VAD HOSPITAL</td>
</tr>
<tr>
<td></td>
<td>SUCTION</td>
<td>CALL ACCEPTING VAD HOSPITAL</td>
</tr>
<tr>
<td><strong>LOW</strong></td>
<td>LOW BATTERY 1</td>
<td>REPLACE BATTERY 1</td>
</tr>
<tr>
<td>(SOLID YELLOW)</td>
<td>LOW BATTERY 2</td>
<td>REPLACE BATTERY 2</td>
</tr>
<tr>
<td></td>
<td>POWER DISCONNECT</td>
<td>RECONNECT POWER 1</td>
</tr>
<tr>
<td></td>
<td>POWER DISCONNECT</td>
<td>RECONNECT POWER 2</td>
</tr>
</tbody>
</table>

JANUARY 2014
HeartMate® XVE

1. Can I do external CPR?
   No.

2. If not, is there a “hand pump” or external device to use?
   Yes. Pump at a rate of 60 -90 beats per minute.

3. If the device slows down (low flow state), what alarms will go off?
   A red heart alarm light indicator and steady audio alarm will sound if less than 1.5 lpm. Check for hypovolemia or right heart failure and treat if red heart alarm persist after treatment consider performing a controller exchange.

4. How can I speed up the rate of the device?
   Give volume of IV fluids.

5. Do I need to heparinize the patient if it slows down?
   Please check with the accepting hospital.

6. Can the patient be defibrillated while connected to the device?
   No.

7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   Yes, disconnect from power/batteries first, initiate hand pumping, disconnect controller from driveline, defibrillate the patient, remove hand pump, reattach driveline to controller, and then reattach the power source.

8. Does the patient have a pulse with this device?
   Yes, the device produces a Pulsatile flow. Heart rate is independent of pump rate.

9. What are acceptable vital sign parameters?
   The BP will vary. 110/80 -140/80. If greater, call the accepting hospital.

10. Can this patient be externally paced?
    Yes, keep MA less than 40.


Hand pump & white purge valve

Heartmate XVE Controller showing Yellow Wrench & Red Heart indicator lights

HAND PUMPING PROCEDURE

Press the black ball while holding down the white purge valve.

Count to 10, push white purge valve & black bulb should re-inflate.

Push in white purge valve

Release purge valve.

JANUARY 2014
HeartMate® XVE

Steps To Exchange Controller

Step 1: Place new System Controller within easy reach. Have Hand Pump nearby.

Step 2: Disconnect Power source (Batteries, PBU, or EPP) from System Controller. The System Controller will alarm and the pump will stop. (Figure 2A and Figure 2B)

Step 3: Disconnect the Driveline (coming from the patient) from the System Controller by pushing down on the black release button and gently pulling the Driveline connector out of the XVE System Controller socket. (Figure 3)

Step 4: Connect the Driveline to the new, replacement XVE System Controller by lining up the small black arrows on the Driveline connector and System Controller socket FIGURE 4A. Gently push the connector into the socket until it snaps into place FIGURE 4B. The new System Controller will alarm if the System Controller Battery Module is NOT in place. This is normal and should stop after the System Controller Battery Module is inserted. (Figure 4A, Figure 4B and Figure 4C)

Step 5: Connect the new System Controller to power source (Batteries, PBU, or EPP). Your pump will restart and alarm will stop.

Step 6: If the pump does not restart, disconnect System Controller from power source and call for medical assistance; then immediately begin hand pumping.

Air Transport Consideration: In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet-when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.
**Trouble Shooting HeartMate® XVE**

**Half Yellow Wrench**
- Once per second beep

**Yellow Wrench**
- Once per second beep

**Flashing Yellow Battery**
- No audio tone

**Yellow Battery**
- No audio tone

**Red Heart**
- Continuous Audio Tone

**Red Battery**
- Continuous Audio Tone

**Flashing Yellow Battery, Red Heart, & Yellow Wrench**
- Continuous Audio Tone

**NOTE:** If the XVE system controller is connected to the percutaneous tube and all power is removed, the XVE system controller will elicit a continuous audio tone signalling the loss of power. This condition is not accompanied by a visual alarm.

**Half Yellow Wrench**
- Once per second beep

- Controller inoperable
- Controller malfunction
- Rate control fault
- Current limit advisory
- Power cable or battery is disconnected
- XVE system controller battery module voltage low

1. Check all XVE system controller connections.
2. Change vent filter, and check vent part for foreign matter.
3. Replace XVE system controller.
4. Replace the power base unit (PBU) cable.
5. Replace the PBU.
6. If the Yellow Wrench persists and the XVE LVAD remains operational, seek additional help.

**Red Heart**
- Continuous Audio Tone

**Red Battery**
- Continuous Audio Tone

**LOW VOLTAGE**
- (less than 15 minutes of battery power remain)

1. XVE LVAD will automatically to Power Saver mode (50BPM)
2. Immediately replace batteries or connect to power base unit (PBU) cable.
3. If AC or battery power is unavailable, use emergency power pack (EPP).
4. If AC power battery power and EPP are unavailable, disconnect power and initiate emergency hand pumping.

**NO OP or LOW BEAT RATE**
- (less than 35 BPM)

1. Check all XVE system controller connections.
2. Change vent filter, and check vent part for foreign matter.
3. Replace XVE system controller.
4. Replace the power base unit (PBU) cable.
5. Replace the PBU.
6. If the Yellow Wrench persists and the XVE LVAD remains operational, seek additional help.

**LOW STROKE VOLUME**
- (less than 25ML)

1. XVE system controller disconnected from patient.

**LOW FLOW**
- (less than 1.5 LPM)

- Reconnect cable/battery or reinsert battery into battery clips
- 1. Replace XVE system controller battery module.
2. Perform XVE system controller self-test to clear alarm.
3. Change to alternate power source.

**Flashing Yellow Battery**
- No audio tone

- Low voltage advisory
- (less than 15 minutes of battery power remain)

- XVE system controller disconnected from patient.

**Yellow Battery**
- No audio tone

**NOTE:** DO NOT HAND PUMP if there is blood in the vent port. Conditions that affect pump filling, such as hypertension, hypovolemia, or mechanical defects, may limit the restoration of normal pump flows until the conditions are resolved. Hand pumping may be ineffective under these conditions.
Thoratec PVAD™ w/TLC II Driver

1. Can I do external CPR?
   No.
2. If not, is there a “hand pump” or external device to use?
   Yes, find the blue or red hand bulbs.
3. If the device slows down (low flow state), what alarms will go off?
   Low flow alarms: Loss of fill alarm will occur
4. How can I speed up the rate of the device?
   Give volume of IV fluids.
5. Do I need to heparinize the patient if it slows down?
   Only if it stops. Patient will be anti coagulated on Coumadin.
   Only heparinize if the pump stops.
6. Can the patient be defibrillated while connected to the device?
   Yes. Nothing needs to be disconnected. Patient should be placed on battery power BEFORE defibrillation.
7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   No. If the defibrillation is unsuccessful, disconnect pump and continue to defibrillate.
8. Does the patient have a pulse with this device?
   Yes.
9. What are acceptable vital sign parameters?
   Normal blood pressure parameters.
10. Can this patient be externally paced?
    Usually in BiVAD configuration, if yes the ECG not important to treat. Because both sides of the heart are supported, there is little need to pace regardless of the rhythm seen on ECG.

- These patients have biventricular support through 2 pumps: right and left.
- EKG will NOT correlate with the patient’s pulse.
- Patient may be in any arrhythmia, but because they have biventricular support — DO NOT TREAT arrhythmias. Only RVAD or LVAD patients should be treated for arrhythmias.
- Bring all extra batteries & electrical adaptor along during transport. This system is electrically driven.
- The pumps are driven by a compressor called the TLC II driver. The pneumatic hoses and cables plug into the top of the TLC II driver.
- If the Driver loses power, malfunctions, or stops, use the hand pump(s). (hand pump instructions on back of this page)
- Continue hand pumping and then, as soon as possible, replace the TLC II Driver with the backup Driver.
- Backup Driver accompanies the patient at all times. (Driver replacement instructions on back of this page)
- **WARNING:** If the pump has stopped and blood is stagnant in the device for more than a few minutes (depending on the coagulation status of the patient), there is a risk of stroke or thromboembolism. BEFORE the device is restarted or hand pumping is initiated, contact the implanting center for anticoagulation direction.

PVAD/IVAD
Type of Device: pulsatile

What is an LVAD?
Left Ventricular Assist Devices are pumps surgically attached to patients’ hearts to pump blood for the ventricle. There are three basic parts to all VAD systems. The pump, a computer with lamps and alarms, and a power source.

Why do patients get VADs?
Patients who have been treated for heart failure but in spite of optimal care continue to suffer from life limiting heart failure. Patients may be on the heart transplant list but the transplant team is worried the patient may die before a suitable donor is found, bridge to transplant. Pts who are not candidates for transplant but suffer from end stage heart failure may also be implanted as destination therapy.

How do VADs work?
Most vads implanted nationally create continuous flow. Blood comes from patients’ own ventricle into the pump then a turbine like spinning fan pushes the blood out into the aorta then the body. A cable connects the pump inside with the computer/controller and batteries outside the body. The pump needs a constant power supply.

biVAD

Do’s
1. Page the On Call Perfusionist. Call the Tower OR at 3316 to ask for the beeper number.
2. Give whatever medications you want. (no medication contraindication)
3. Defibrillate if indicated
4. Hand pump only if the devise has stopped pumping, left faster than right.

Don’ts
1. NO CHEST COMPRESSIONS.
2. NO MRI.
3. Don’t panic if the ECG is at one rate. The LVAD rate is at another, and the RVAD rate is a third.

Questions:
1. CPR: NO
2. Hand pump: yes called hand bulbs
3. Iow flow alarms: Loss of Fill alarm
4. speed up device: fluids
5. heparin: only if it stops. Patient has to be on Coumadin
6. defib: yes
7. disconnect for defib: no
8. pulse: yes
9. Vital signs: Normal BP parameters
10. externally pace: Usually in Bi VAD configuration if yes the ECG not important to treat

IVAD is implanted inside the abd cavity and is attached to the same TLC II driver on the outside.

JANUARY 2014
Hand Pumping Instructions

**Step 1:** Obtain hand pump(s) from carrying case. Note: One (1) hand pump is needed for each VAD.

**Step 2:** Depress metal clip(s) to disconnect the pneumatic lead(s) from the TLC II Driver.

**Step 3:** Connect the hand pump(s) to the pneumatic lead(s).

**Step 4:** Squeeze hand pump(s) once per second. Use your foot if necessary.
*Note:* For 2 VADs (BiVADs), squeeze each hand pump at the same rate. Never hand pump the right VAD (RVAD) faster than the left VAD (LVAD), as this may cause pulmonary edema.

Switching to Backup TLC-II Driver

**Step 1:** Insert a fully-charged battery (stored in carrying case) into each battery slot of backup TLC-II driver.

**Step 2:** Turn on key switch

**Step 3:** Depress metal clip(s) to remove white occluder from pneumatic port(s):
- LVAD port is **RED**.
- RVAD port is **BLUE**.
- **Note:** For BiVADS, switch LVAD first. Do NOT remove occluder caps from both ports at the same time (or from unused port during single VAD support), or system will depressurize.

**Step 4:** Disconnect pneumatic lead(s) from primary Driver (or hand pump) and connect to backup Driver.

**Step 5:** Disconnect electric lead(s) from primary Driver and connect to backup Driver.

**Step 6:** Place Driver in AUTO mode, if necessary.
*Note:* Backup Drivers are preprogrammed with a patient’s unique settings.

**Step 7:** Verify full signal(s) is/are ejecting completely.

**Step 8:** Remove key and place in carrying case pocket.

**Step 9:** Connect to external power, if available by using the AC power adapter cord.

All modes of emergency transport are acceptable for VAD patients. Aviation electronics will NOT interfere with VAD operation (and vice versa).

**Air Transport Consideration:** In rotor wing and fixed wing aircraft flying at heights lower than 10,000 feet when using the hand pump for external CPR, you must re-purge the bulb every 2000 feet in ascent and 1000 feet in descent. This will assure you have consistent cardiac output.
What Is A Total Artificial Heart?
A total artificial heart (TAH) is a device that replaces the two lower chambers (ventricles) of the heart. You might benefit from a TAH if both of your ventricles don’t work due to end-stage heart failure.

What are the parts of a TAH?
The SYNCARDIA has tubes that, through holes in the abdomen, run from inside the chest to an outside power source.

What is the power source?
Shortly after the TAD is implanted, the patient is switched to the Freedom driver. This is a mobile “driver” for patients to who are ambulatory. The patient considered discharge from the hospital while awaiting a transplant but ultimately received a heart transplant while still an inpatient. Higher rates of survival to transplant have already been proved with the TAH. Potential benefits for the portable Freedom driver include increased mobility, decreased cost, and improved quality of life.

The portability of the Total Artificial Heart (TAH) enables patients to resume many of their normal daily activities.
Patient Management For TAHs

1. Assess the patients airway and intervene per your protocol.

2. Auscultate heart sounds but you can usually hear them without a stethoscope. Since this is pulsatile you should hear two sounds if properly functioning.

3. Assess the device for any alarms.

4. Look on controller usually found around the waist of the patient and to see what color tag and device it is. The backpack or freedom driver should have a pink tag on it. It will have the type of device this is and contact information to the implantation center.

5. Match the color on the device tag to the EMS Guide. The tag on the backpack or freedom driver’s colored tag should matches the ems guide. This will tell you how to manage any alarms.

6. Intervene appropriately based on the type of alarm, tag (device) and EMS Guide.

7. Start Large Bore IV.

8. Assess Vital Signs. REMEMBER THERE IS NO EKG. THE PATIENT IS ASYSTOLIC.

9. YOU SHOULD BE ABLE TO GET A SYSTOLIC AND DIASTOLIC BLOOD PRESSURE.

10. Transport to the closest center that can care for a TAH. Look on the PINK tag to find out this information.

11. Bring all of the patients equipment.

12. Bring the significant other if possible to act as a expert on the device in the absence of consciousness in the patient.
Total Artificial Heart Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART
(not a left ventricular assist device-LVAD)

1. Can I do external CPR?
   No. Will need to rapidly exchange to the backup driver.

2. Is there a “hand pump” or external backup device to use?
   No.

3. Can I give vasopressive IV drugs like epinephrine, dopamine or dobutimine?
   Never give vasopressive drugs, especially epinephrine. These patients primarily have symptomatic hypertension and rarely have symptoms of hypotension. Most IV vasopressive drugs can be fatal to a TAH (Total Artificial Heart) patient.

4. Can I speed up the rate of the device?
   No. The device has a fixed rate between 120-140-BPM.

5. What is the primary emergency intervention for a TAH (Total Artificial Heart)?
   Nitroglycerin sublingual for symptomatic hypertension.

6. Can the patient be defibrillated or externally paced while connected to the device?
   No. There is no heart.

7. What if the patient is symptomatic and the Freedom Driver is alarming with a continuous alarm and the red light?
   If the pump has failed or a line is disconnected or kinked, the patient may pass out within 30 seconds. Even when alarming, the device should continue to pump. When in doubt, immediately change out the Freedom™ Driver immediately. Then quickly check for loose or kinked connections.

8. Does the patient have a pulse with this device?
   Yes. The device produces Pulsatile flow. The device is pneumatically driven and is normally loud.

9. What are acceptable vital sign parameters?
   The BP will vary. Normal range 100-130 systolic and 60-90 diastolic.

10. What kind of Cardiac rhythm should be displayed?
    Asystole.

Trouble Shooting Freedom™ Driver System

This Patient is on an ARTIFICIAL HEART (not a left ventricular assist device -LVAD)

Freedom™ Driver System

IN THE EVENT OF AN EMERGENCY

Immediately notify VAD coordinator listed on the medical alert bracelet or tag attached to the console - please identify the device as a total artificial heart.

## HOW TO RESPOND TO FREEDOM™ DRIVER ALARMS

There is no way to mute an Alarm.

<table>
<thead>
<tr>
<th>ALARM</th>
<th>HEAR</th>
<th>SEE</th>
<th>MEANING</th>
<th>WHAT YOU SHOULD DO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Alarm</td>
<td>Loud Intermittent Tone</td>
<td>Yellow Battery LED Flashing</td>
<td>One or both of the Onboard Batteries have less than 35% remaining charge (only two green lights display on the Battery Fuel Gauge).</td>
<td>Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power (NOTE: Once the batteries are charged above 35% the Battery Alarm will stop).</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Onboard Battery is incorrectly installed.</td>
<td>Reinsert Onboard Battery until locked in place. If Battery Alarm continues, insert a new Onboard Battery.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>One Onboard Battery missing.</td>
<td>Insert charged Onboard Battery into Freedom™ Driver until locked in place.</td>
</tr>
<tr>
<td>Temperature Alarm</td>
<td>Loud Intermittent Tone</td>
<td>Red Alarm LED Flashing</td>
<td>The temperature of the Driver is too hot or too cold.</td>
<td>Remove any objects that are blocking the Filter Cover and/or Fan and check the filter.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>The internal temperature of the Driver is too hot.</td>
<td>Move the Freedom Driver to a cooler or warmer area.</td>
</tr>
<tr>
<td>Fault Alarm</td>
<td>Loud Continuous Tone</td>
<td>Red Alarm LED Solid</td>
<td>Valsalva Maneuver: Strenuous coughing or laughing, vomiting, straining during a bowel movement, or lifting a heavy weight.</td>
<td>Relax/interrupt Valsalva Maneuver.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Kinked or disconnected drive lines.</td>
<td>Straighten or connect drive lines.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Driver is connected to External Power without at least one correctly inserted Onboard Battery.</td>
<td>Insert a charged Onboard Battery into the Freedom™ Driver until locked into place.</td>
</tr>
<tr>
<td>Temperature Alarm</td>
<td>Loud Intermittent Tone</td>
<td>Red Alarm LED Flashing</td>
<td>One or both of the Onboard Batteries have less than 30% remaining charge.</td>
<td>Replace each low Onboard Battery, one at a time, with a charged Onboard Battery or connect to external power. (NOTE: the Fault Alarm will continue and will change into a Battery Alarm as the Onboard Batteries recharge. Once the Onboard Batteries are charged above 35%, the Battery Alarm will stop.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Malfunction of the Driver</td>
<td>If the steps above do not stop the Fault Alarm, switch to Backup Freedom Driver. Return to implant hospital.</td>
</tr>
</tbody>
</table>

You must immediately address the issue that caused the Alarm.

Switching from Primary to Backup Freedom™ Driver

CAUTION: It is recommended to have TWO people exchange the primary Freedom Driver for the backup Freedom Driver. Make sure all items and accessories are closely available before attempting to exchange Drivers.

Setting up the Backup Freedom™ Driver

1. Remove the drive line caps from the ends of the Drive lines.

2. Insert one charged Onboard Battery. The driver will immediately start pumping. (*Figure 1*)

3. Remove the Orange Dummy Battery. (*Figure 1*)

4. Insert the second charged Onboard Battery. (*Figure 2*)

5. If possible, connect the backup Driver into a wall power outlet.

6. Your Freedom™ Driver is now ready to connect to the patient.

Continued on next page.


JANUARY 2014
Switching from Primary to Backup Freedom™ Driver

Continued on from previous page

1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the RED TAH-t Cannula to the RED Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

2. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the BLUE TAH-t Cannula to the BLUE Freedom Drive line. Gently pull to remove the Wire Tie and discard. DO NOT DISCONNECT THE CANNULA FROM THE DRIVE LINE YET.

3. Disconnect the RED Cannula from the RED Drive line of the primary Freedom Driver:
   • Press and hold down the metal release button. Pull the RED Cannula away from the RED Drive line.
   • Immediately insert the RED Cannula into the new RED Drive line from the backup Freedom Drive Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

4. Simultaneously disconnect the BLUE Cannula from the BLUE Drive line of the primary Freedom Driver:
   • Press and hold down the metal release button. Pull the BLUE Cannula away from the BLUE Drive line.
   • Immediately insert the BLUE Cannula into the new BLUE Drive line from the backup Freedom Driver.
   • Insert until a click is heard and lightly tug on the connection to make sure that it is secure.

5. Slide a Wire Tie under the metal release button of each CPC connector. Create a loose loop in the tie, taking care not to depress and disconnect the connectors. Cut off the excess length of both Wire Ties.

6. Patient must notify Hospital Contact Person of the switch.

7. The Hospital should notify SynCardia Systems that the Driver has been switched and return the faulty Driver.

CAUTION: Before disconnecting the Drive lines of the primary Freedom Driver, you must have the Drive lines of the backup Freedom Driver within reach. The backup Driver must be turned on. Perform steps 3 and 4 simultaneously.
DuraHeart™ System®

1. Can I do external CPR?
   • Only if necessary; treat per physician discretion.
   • Closed chest CPR is contraindicated
   • May be performed as needed at the discretion of the attending physician
   • External chest compressions may cause the dislocation/damage of pump Inflow/Outflow conduits
   • External defibrillation any be performed on a patient with the DuraHeart™ System® without disconnecting any of the system components

2. If not, is there a “hand pump” or external device to use?
   No.

3. If the device slows down (low flow state), what alarms will go off?
   An emergency alarm will sound and the emergency alarm indicator (RED LIGHT) will light up.

4. How can I speed up the rate of the device?
   The rate of the device can only be modified in a hospital setting. For low flow rates, check for hypovolemia or RHF and treat accordingly.

5. Do I need to heparinize the patient if it slows down?
   Call the accepting VAD facility for guidance.

6. Can the patient be defibrillated while connected to the device?
   Yes.

7. If the patient can be defibrillated, is there anything I have to disconnect before defibrillating?
   No, defibrillate per protocol.

8. Does the patient have a pulse with this device?
   If the patient’s own heart has some residual function, you may be able to feel a pulse.

9. What are acceptable vital sign parameters?
   Mean Arterial Pressure (MAP) 80-90 mm Hg.

10. Can this patient be externally paced?
    Yes, as needed.
The DuraHeart™ LVAS is the latest-generation rotary blood pump designed for long-term patient support. The system incorporates a centrifugal flow rotary pump with an active magnetically levitated impeller featuring three position sensors and magnetic coils that optimize blood flow. The impeller’s magnetic levitation is designed to eliminate friction by allowing a wide gap between blood contacting surface areas, enabling blood to flow through the pump unimpeded in a smooth non-turbulent fashion.

The DuraHeart™ System consists of an implantable Pump and several components that support the function of the Pump. The system is made up of seven main components (see photo below) which include:

**External Batteries**

Li-ion batteries provide power to the pump for untethered operation for up to 3-1/2 hours per battery. Each battery can be recharged up to 200 times.

DuraHeart™ System®

**CONTROLLER**

- Communicates with console for system set up, monitoring and troubleshooting
- Controls and monitors pump function, stores system data
- Interfaces with external power sources (Console, Batteries, Charger, Emergency Backup Battery)
- Displays system status – Pump Flow Rate
  - Pump Rate
  - Motor Current
  - System alarms and Alerts
  - Power Supply Status

**Emergency Alarms**
- High Priority.
- Flashing RED light and continuous Emergency Alarm tone.
- Requires immediate care by medical specialist and controller exchange.

**Emergency Alarms**
- **Replace Controller**: The Pump may not be rotating
- **Connect Pump cable/Pump disconnected**: The Pump cable is disconnected
- **Controller Error**: Possible serious problem with the controller
- **Pump Failure**: Pump motor may have serious problem
- **Mag-Failure**: The impeller may not be levitated

**EMERGENCY ALARMS**

<table>
<thead>
<tr>
<th>ALARM MESSAGE</th>
<th>PROBLEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replace Controller</td>
<td>The Pump may not be rotating</td>
</tr>
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<td>Connect Pump cable/Pump disconnected</td>
<td>The Pump cable is disconnected</td>
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<td>Controller Error</td>
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<tr>
<td>Pump Failure</td>
<td>Pump motor may have serious problem</td>
</tr>
<tr>
<td>Mag-Failure</td>
<td>The impeller may not be levitated</td>
</tr>
</tbody>
</table>

**SILENCING ALARMS**

**Emergency Alarms**
- Mute button silences audible alarm for 2 minutes
- Audible alarm returns after 2 minutes

**Caution Alerts**
- Mute button silences audible alarm for 5 minutes

**ANTICOAGULATION**

Patients will be on Coumadin with this device. Target INR range should be between 2.0 to 3.0. Combination antplatelet therapy of ASA 81mg daily and Persantine 25-75 mg TID

EMERGENCY MANAGEMENT OF A PATIENT WITH A VENTRICULAR ASSIST DEVICE (VAD)

Contact the On-Call VAD Coordinator or Medical Control

Are VAD Alarms Activated

NO

YES

Is there adequate perfusion?
Does the Patient have a palpable pulse
Does the Patient have a Blood Pressure
Is the Patient Mentating

YES

IMPORTANT
The patient's travel bag will contain
the emergency contact information,
the emergency instruction booklet
and the spare batteries
Follow instructions given in the
emergency instruction booklet, or
those provided by the patient, a
family member, the on-call
specialist or Medical Control

NO

Are VAD Alarms now De-Activated?

YES

NO

If the VAD has a hand pump, connect as instructed.
If necessary provide a rate of 60-90 bpm

If the unit does not have a hand pump, follow guidance provided
by the VAD Coordinator or Medical Control

IMPORTANT
Do not place multifunction pads over the device which
is located under the patient's skin
Pulse Oximetry readings may
be inaccurate due to weak or
absent peripheral pulses,
A Doppler and Manual Blood
Pressure Cuff are the most
effective way to obtain Blood
Pressure. The first sound heard
is the equivalent of the MAP,
90-90 mmhg is the acceptable
range.
Implement specific therapeutic
interventions as appropriate to
improve VAD performance
Only perform CPR when the
patient's VAD has no hand-pump
and no other options exist.
Avoid kinking or twisting
the driveline when placing the
patient on the stretcher

If the VAD has a hand pump, connect as instructed.
If necessary provide a rate of 60-90 bpm

If the unit does not have a hand pump, follow guidance provided
by the VAD Coordinator or Medical Control
Pediatric Information Sheets ................................................................. REF 001
MRX Daily Check and Battery Maintenance ......................................... REF 002
A. Minimum Blood Pressures

<table>
<thead>
<tr>
<th>AGE</th>
<th>NORMAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonate</td>
<td>Less than 60mm Hg systolic</td>
</tr>
<tr>
<td>1-12 months</td>
<td>Less than 70mm Hg systolic</td>
</tr>
<tr>
<td>1-10 years</td>
<td>70 + (2X age in years) mm Hg systolic</td>
</tr>
<tr>
<td>Over 10 years</td>
<td>90 mm Hg systolic</td>
</tr>
</tbody>
</table>

**NOTE:**
Diastolic pressure should be 2/3 of systolic pressure. If systolic falls to level of diastolic, hypotension is present.

Proper BP Cuff Size: Cuff cover 2/3’s of arm from axilla to the elbow.

Endotracheal Tubes and Defibrillation doses for Pediatric Patients

A general rule is that the approximate tube size will be the width of the nailbed of the little finger

\[ \text{ET tube size} = \frac{\text{patient’s age in years}}{4} + 4 \]

This equation applies to children age 1 to 10 years of age and is for both cuffed and uncuffed ET tube inside diameter in mm.

\[ \text{Tube depth of insertion} = \frac{\text{age in years}}{2} + 12 \]

<table>
<thead>
<tr>
<th>Age</th>
<th>Tube size</th>
<th>Depth of insertion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>3.0mm</td>
<td>10-10.5</td>
</tr>
<tr>
<td>6 months</td>
<td>3.5mm</td>
<td>10-10.5</td>
</tr>
<tr>
<td>18 months</td>
<td>4.0mm</td>
<td>11-12</td>
</tr>
<tr>
<td>3 years</td>
<td>4.5mm</td>
<td>13</td>
</tr>
<tr>
<td>5 years</td>
<td>5.0mm</td>
<td>14</td>
</tr>
<tr>
<td>6 years</td>
<td>5.5mm</td>
<td>15</td>
</tr>
<tr>
<td>8 years</td>
<td>6.0mm</td>
<td>16</td>
</tr>
<tr>
<td>12 years</td>
<td>6.5mm</td>
<td>18</td>
</tr>
<tr>
<td>16 years</td>
<td>7.0mm</td>
<td>20</td>
</tr>
<tr>
<td>Adults (F)</td>
<td>8.0 – 8.5mm</td>
<td>21-22</td>
</tr>
<tr>
<td>Adults (M)</td>
<td>8.5 – 9.0mm</td>
<td>22-23</td>
</tr>
</tbody>
</table>
B. Defibrillation Doses (In watts/second – joules)
Placement instructions for pads/ paddles include both Sternum/Apex or Anterior/Posterior positions.
2 joules/kg first attempt. If unsuccessful on first attempt, the dose can be increased to 4 joules/kg and should never exceed 10 joules/kg or the adult dosage. If unsuccessful, be attentive to oxygenation and acid-base balance, as well as administration of Epinephrine.

50th percentile Weights in Kilograms by Sex and Age

<table>
<thead>
<tr>
<th>AGE</th>
<th>MALE</th>
<th>FEMALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn</td>
<td>3.2 kg</td>
<td>3.2 kg</td>
</tr>
<tr>
<td>3 months</td>
<td>6.0 kg</td>
<td>5.4 kg</td>
</tr>
<tr>
<td>6 months</td>
<td>8.0 kg</td>
<td>7.2 kg</td>
</tr>
<tr>
<td>12 months</td>
<td>10.0 kg</td>
<td>9.8 kg</td>
</tr>
<tr>
<td>2 years</td>
<td>12.6 kg</td>
<td>12.0 kg</td>
</tr>
<tr>
<td>3 years*</td>
<td>15.0 kg</td>
<td>14.0 kg</td>
</tr>
<tr>
<td>4 years</td>
<td>17.0 kg</td>
<td>16.0 kg</td>
</tr>
<tr>
<td>5 years</td>
<td>19.0 kg</td>
<td>18.0 kg</td>
</tr>
<tr>
<td>6 years*</td>
<td>21.0 kg</td>
<td>20.0 kg</td>
</tr>
<tr>
<td>7 years</td>
<td>23.0 kg</td>
<td>22.0 kg</td>
</tr>
<tr>
<td>8 years</td>
<td>25.0 kg</td>
<td>25.0 kg</td>
</tr>
<tr>
<td>9 years</td>
<td>28.0 kg</td>
<td>29.0 kg</td>
</tr>
<tr>
<td>10 years*</td>
<td>32.0 kg</td>
<td>33.0 kg</td>
</tr>
<tr>
<td>11 years</td>
<td>35.0 kg</td>
<td>37.0 kg</td>
</tr>
<tr>
<td>12 years</td>
<td>40.0 kg</td>
<td>42.0 kg</td>
</tr>
<tr>
<td>13 years*</td>
<td>45.0 kg</td>
<td>46.0 kg</td>
</tr>
<tr>
<td>14 years</td>
<td>51.0 kg</td>
<td>50.0 kg</td>
</tr>
<tr>
<td>15 years</td>
<td>57.0 kg</td>
<td>54.0 kg</td>
</tr>
<tr>
<td>16 years</td>
<td>62.0 kg</td>
<td>56.0 kg</td>
</tr>
<tr>
<td>17 years</td>
<td>66.0 kg</td>
<td>57.0 kg</td>
</tr>
<tr>
<td>18 years*</td>
<td>69.0 kg</td>
<td>57.0 kg</td>
</tr>
</tbody>
</table>

WEIGHT:
Weight is a difficult evaluation in the field. Ask parent if they know a recent weight of the child. There are 2.2 pounds in a kilogram. Divide the weight in pounds by 2.2 to give you the weight in Kilograms.

Note:
Concentrate on key ages in relation to average kg weights so you can estimate ages with some normal kg weights. The ages marked “*” would be good indices.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director 12/2016
I. Protocol:
The American Heart Association (AHA) recommends completion of a checklist (shift check) at the beginning of each change in personnel to ensure that defibrillators are ready when needed. Air Evac EMS Inc. supports these recommendations and this policy outlines the responsibilities of the oncoming flight crew.

II. Visual Shift Change Activities:
A. Checklist activities include:
   – Device exterior
   – Cables
   – Connectors
   – Paddles/Pads
   – Monitoring electrodes
   – Batteries – See Battery Maintenance below.
   – AC/DC power
   – Printer paper
   – Data card
   – SpO2 sensor
   – NBP cuffs and tubing
   – CO2 Filter Line
   - Daily Shock Test – See instructions and notes below

III. Daily Shock Test
In addition to the shift check, you must verify the ability to deliver defibrillation therapy by performing the following “Shock Test”

   To perform the Shock test:
1. Attach the test load to the end of the patient Therapy cable.
2. Turn the Therapy knob to 150J.
3. Press the Charge button.
4. press the Print button to capture the data.
5. Press the shock button.
6. Confirm on the printed strip that the energy delivered to the test load is 150J + 23J (127J to 173J).
   *** If not, call Medlink, they will begin troubleshooting process***
7. Push print button to shut off the printer.
8. Remove the test load (Or alarm will sound and indicate asystole when in monitoring mode)

Please complete all daily checks on the Commercial Medical Equipment (CME) website (www.emecustomer.com).
*Please remember: ONLY perform the “Shock test” at the beginning of each shift following the verification of a flashing hour glass in the “Ready for Use” (RFU) indicator in the top right portion of the monitor.

** If a Red X is indicated in the RFU section, ensure a fresh battery is installed and turn the green knob to monitor and allow the monitor to “Boot up.” If the Red X continues, call Medical Control for further direction. If it cycles back to an Hour Glass symbol, move on to the shock test and return to service if it passes appropriately.

IV. Battery Maintenance:

Proper maintenance of the MRX battery:
- ensures the battery’s charge state is accurately reported;
- ensures there is sufficient charge and capacity to operate the MRX;
- ensures battery life is optimized; and
- begins upon receipt of a new battery and continues throughout the battery life.

Below are the battery maintenance activities and when they should be performed:

<table>
<thead>
<tr>
<th>Activity</th>
<th>When to Perform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform a visual inspection</td>
<td>As part of the daily Check.</td>
</tr>
<tr>
<td>Charge the battery</td>
<td>Upon receipt, after use, or if the message “Battery Low” is displayed</td>
</tr>
<tr>
<td>Perform a calibration</td>
<td>When the Operational Check test results state Calibration Recommended, or every 6 months (February and August), whichever comes first. Please log all calibrations on the CME website for tracking purposes. See below for proper calibration procedure.</td>
</tr>
<tr>
<td>Discard the battery</td>
<td>When there are visual signs of damage or calibration reports less than 80% capacity.</td>
</tr>
</tbody>
</table>

Batteries should be stored in a state of charge in the range of 20% - 40% when not in use for an extended period of time.

- Battery life is approximately 2 years when properly cared for and depending on the frequency and duration of use.
- Charging a fully (or nearly fully) discharged battery as soon as possible optimizes performance.
- Charging should be done in the Philips approved Battery Support System at temperatures between 0°C (32°F) and 45°C (113°F).
- Charge status is indicated by the fuel gauge on the battery top (each LED represents approx. 20% charge capacity) and the battery power indicator displayed in the General Status area.

V. Process for Calibration/Conditioning using Cadex Universal Battery Conditioning Charger (to be completed biannually February and August or when required by monitor)

1. Please follow the detailed instruction in the Cadex 7200 user manual.
2. Please remember it will take approximately 12-16 hours to fully calibrate and condition the battery. Therefore only 2 batteries should be conditioned at a time leaving the flight crew 2 batteries for use. If the calibration cycle is interrupted at any point, the calibration cycle must be repeated in its entirety.

3. Once calibration/conditioning has taken place on all batteries at the base, please log in to the CME website (www.cmecustomer.com) and complete the calibration and conditioning documentation.

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EMS Medical Director

Christopher R Solaro, MD, PHD
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12/2016
QUINCY AREA EMS SYSTEM
SEMSV STANDARDS OF CARE INDEX

Standards of Practice ................................................................. STAN-001
Maintenance of IV Medications ...................................................... STAN-002
Pain Management ................................................................. STAN-003
Nausea and Vomiting ............................................................. STAN-004
Altered Level of Consciousness - Adult and Pediatric .................. STAN-005
Anxiety / Agitation .............................................................. STAN-006
Restraints ................................................................. STAN-007
Spinal Immobilization ............................................................. STAN-008
Invasive Pressure Monitoring .................................................. STAN-009
Purpose:

In order to deliver safe and effective care in accordance with the Company’s stated Values and Expected Behaviors, we define our Standards of Practice as the minimum care that must be performed universally on each patient attended to by an Air Evac medical crewmember.

Procedure:

Scene

1. Ensure crew safety at all times.
2. Utilize proper universal precautions.

Assessments

1. Begin patient assessment based on dispatch information, scene size up, and on approach to patient.
2. Complete a primary assessment to identify and treat life threats to airway, breathing, circulation, and disability. Immediate life threats will be addressed prior to moving any further. Primary assessment will be reassessed as needed.
3. Complete a secondary (head to toe) exam as soon as practical to include, but not limited to, an airway assessment utilizing the LEMON law and a pain scale assessment. Secondary assessment will be reassessed as needed.
4. Attempt to obtain a SAMPLE history on every patient.
5. A minimum of 3 GCS and RASS assessments (initial contact, mid-flight and at receiving facility) will be performed on all patients.
6. A collaborative transport plan, to include the pilot, will be identified and implemented to the closest appropriate facility, taking into account patient preference, unless receiving facility has been pre-arranged.
7. All patients shall only be exposed for a complete assessment to include the posterior surface, when practical.
8. All patients will have height in inches, weight in kilograms and ideal body weight documented.
**Airway**

1. Provide airway management with c-spine stabilization as needed.

**Breathing**

1. Oxygen will be applied to maintain SpO₂ 94-99%.
2. Rule out hypoxia.

**Circulation**

1. All patients should be transported with a minimum of one “keep vein open” IV or IO if practical. Consideration may be given to an external jugular access, if practical. Consideration may be given to saline lock IV, if practical.
2. Warmed IV fluids should be used unless contraindicated.
3. All medicated IV infusions will be placed on IV pump for transport.
   a. Rate and dose will be verified by both flight crew.
   b. Physician orders will be required for drugs not covered in protocols or doses out of protocol ranges.

**Neurological**

1. Neurological exams to be completed upon patient contact, initial assessment, reassessments and transfer of care, or more frequently if patient condition changes.
2. C-collar for c-spine stabilization if needed.
3. Obtain a blood glucose analysis on all patients with GCS < 15, focal neurological deficit, or as clinically indicated.

**Equipment**

1. Cardiac monitor and defibrillator will be available for all patients during all phases of transport, including all scene time and ground transport legs.
2. Apply cardiac monitor to each patient to include, but not limited to: ECG, non-invasive blood pressure, SPO₂; EtCO₂ and defibrillator pads as needed.
   a. Cardiac rhythm strips will be obtained at lift-off, mid-flight, and end of flight or more frequently if patient conditions warrants it.
   b. EtCO₂ waveforms will be obtained upon successful placement of an advanced airway and with every move of an intubated patient, including at transfer of care.
3. All patients with an advanced airway in place will be transported with ventilator use as soon as practical and maintained until transfer of care of patient.
4. All patients with an advanced airway in place will have an initial, at altitude, and destination cufflator pressure reading assessed and documented in cmH₂O.

**Vital Signs**

1. Vital signs will be obtained and monitored to include, but not limited to, heart rate, blood pressure, respiratory rate, pulse oximetry, temperature in °F. EtCO₂ will be monitored when appropriate.
   a. Vital signs will be performed as soon as practical. At a minimum three sets will be obtained (initial patient contact, transport time, and transfer of care). Reassess as patient condition warrants.
   b. Vital signs will be performed before and after a medical treatment.
   c. Vital signs will be performed before and after the administration of any medication that could alter the patient’s mentation status.
d. Patient temperatures will be obtained at the beginning, middle, and end of the flight, unless patient condition warrants additional monitoring. Febrile patients should treated with antipyretics as needed.
e. Aircraft cabin temperatures will be obtained every 15 minutes while in flight.

Advanced Airway Confirmation

1. Confirmation of tube placement must consist of waveform capnography with quantitative end-tidal CO\textsubscript{2} in addition to chest x-ray (if available), or direct visualization, or symmetric breath sounds or equal chest rise and fall or pulse oximetry.

Electrocardiogram (ECG)

1. A 12-lead ECG should be obtained in the following circumstances:
   a. Patients who are complaining of chest pain, palpitations, irregular heartbeat, shortness of breath, dizziness, syncope, weakness, upper torso pain, or diaphoresis.
   b. A patient that the flight crew suspects is suffering an acute cardiac event, even in the absence of a complaint of chest pain.
   c. Any patient for whom a physician request a prehospital 12-lead ECG be acquired whether or not a cardiac event.
2. Acquire 12-lead ECG as early as practical once patient contact has been made and primary survey completed.
3. If a STEMI is read, transmit 12-lead ECG to closest most appropriate cardiac resuscitation referral or receiving center.
4. A CODE STEMI should be called with patient report as soon as possible after transport has been initiated.
5. Repeat 12-lead ECG with any patient reported change or ECG change.

Interventions

1. All intubated patients will receive gastric decompression unless contraindicated.
2. All non-intubated patients should be considered for gastric decompression before flight.
3. Assess for fluid overload before fluid administration.

Medications

1. Medication administration will be verified by utilizing the “rights of medication administration,” including right patient, right medication, right dose, right route, right time, right documentation, right reason, right response.

Pediatric

1. The Broselow tape should be utilized for all pediatric patients.

OB

1. OB patients will be transported in the left lateral position, when practical.
2. OB patient assessments and clinical documentation will include, but may not be limited to; expected date of confinement, gravida/para, reported findings of cervical exams.
3. Assess and document vital signs, fetal heart rate, fetal activity, blood loss, intake and output, deep tendon reflexes, and relevant changes in assessment every 15 minutes at a minimum
4. Fetal heart tones will be assessed in flight utilizing a doppler headset system.
Transport Considerations

1. May contact Medical Control when needed via a recorded line.
2. For scene flights, the patient should sign the ambulance billing authorization form when possible, and the requestor should sign the medical necessity form.
3. For inter-facility transfers, attempt to obtain copies of the patient chart to include, but not limited to, history and physical, medication administration records, treatment orders, laboratory results, radiology results, nursing notes, and EMTALA forms. The patient should sign the ambulance billing authorization form if possible, and the requestor should sign the medical necessity form.
4. All patients will be secured to aircraft litter using age-appropriate devices in accordance with FAA standards. All patients on a litter will be secured to aircraft for transport.
5. A flight briefing will be given to all patients, when practical.
6. Ear protection will be provided to all patients for transport, when practical.
7. Temperature control interventions will be instituted and documented for all patients throughout transport.
8. Altitude restrictions in regards to the patient’s status will be identified, documented and communicated to the pilot in command.
9. All patients will receive bedside to bedside care by an Air Evac Medical Crew.

Communications

1. A report must be made to the receiving facility while en-route with the patient. The report should include the patient condition and the estimated time of arrival. Every effort should be made to give the receiving facility at least 15 minutes notice of the incoming patient.
2. A complete reassessment and bedside patient care report will be given to receiving staff at time of transfer of care.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Indications:
1. Maintenance of pre-arrival IV medications initiated by other healthcare personnel

Protocol:
1. Flight crews will be permitted to monitor patients on intravenous medications to include but not limited to analgesics, sedatives, antiarrhythmics, antimicrobials, anxiolytics, cardiac inhibitors and blockers, inotropes, vasodilators, vasopressors, rate control antiarrhythmics, thrombolytics, electrolyte supplements, anti-convulsants, or benzodiazepines.

2. The drug must be administered through an infusion pump.

3. When receiving report from the transferring RN, always verify the physician’s orders for infusion rate and dose, and check pump flow rate.

4. Contact medical control as needed for general medical direction.

Notes:
All potential medications that patients may require cannot be accurately captured in the protocols. As an additional resource, please contact Medical Control for further clarification of the infusion medication that you are maintaining.

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12/2016
Purpose:

Adequately and safely provide analgesia to the critically ill or injured adult or pediatric patient.

Procedure:

1. Objectively assess and document the patient’s pain level using the pain scale comparison chart.
2. Use non-pharmacological treatment alternatives for pain management.
3. Treat the patient with an appropriately selected analgesic medication.
4. After analgesic medication is administered, reassess the patient using the pain scale comparison chart.
5. Administer naloxone (Narcan) for known opioid overdose causing unwanted respiratory depression, sedation, or hypotension.

   **Naloxone** - 0.4 mg IV/IO every 2 to 3 minutes PRN.

Medications:

- **Fentanyl** - 0.5 mcg/kg to 1.5 mcg/kg slow IV/IO every 5 minutes PRN. Titrate to pain relief, maintain SBP>90 mmHg. (Single max dose of 200 mcg)

  OR

- **Morphine** - 0.05 mg/kg to 0.1 mg/kg slow IV/IO every 10 minutes PRN. Titrate to pain relief, maintain SBP>90 mmHg. (Single max dose of 10 mg)

  OR

- **Ketamine** - 0.1 mg/kg to 0.5 mg/kg slow IV/IO every 10 minutes PRN. Titrate to pain relief.

Considerations:

1. Consider using 0 to 10 pain scale for adults, Wong-Baker FACES scale for children, FLACC scale for children less than 3 years.
2. Consider the use of non-invasive EtCO2 monitoring.
Protocol: STAN 004
Title: Nausea and Vomiting
Effective Date: 8-05
Revision Date: 12-08, 11-10, 4-14
Reviewed: 4-16
Revision Number: 3

Purpose:
To control nausea/vomiting and reduce the risk of aspiration.

Procedure:
1. If the patient is nauseated or has been vomiting use one of the following medications; with preference in the order listed.
   a. Adults:
      i. Ondansetron (Zofran) 4 mg IV/IO over 2 minutes. Repeat every 30 minutes for continued nausea/vomiting.
      ii. If ondansetron fails or cannot be given, Metoclopramide (Reglan) 20 mg IV/IO/IM x 1 dose.
   b. Pediatric:
      i. Ondansetron 0.1 mg/kg up to max of 4 mg IV/IO over 2 minutes. Repeat every 30 minutes for continued nausea/vomiting.
      ii. If ondansetron fails or cannot be given, Metoclopramide (Reglan) 0.2 mg/kg IV/IO/IM x 1 dose (Max single dose is 20 mg).
2. Insert NG/OG tube if emesis continues.
3. Place in position of comfort to decrease nausea.
4. For dystonic reactions, administer diphenhydramine (Benadryl) 1-2 mg/kg IV/IO up to a max single dose of 25 mg. Repeat dose 1 time for continued dystonic reaction.

Considerations:
1. Nasogastric or orogastric tubes should be considered in all patients who complain of nausea and/or vomiting. Especially trauma patients who are spinal immobilized.
2. Prophylactic administration of anti-emetics should be strictly avoided.

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12/2016
**Purpose:**
Identify and treat patients with altered level of consciousness that are not treated by another protocol

**Procedure:**
1. If patient presents with altered level of consciousness, identify cause and treat with appropriate protocol. THE RESTLESS, AGITATED, CONFUSED, ALTERED AND/OR COMBATITIVE PATIENT IS HYPOXIC OR IN SHOCK, UNTIL PROVEN OTHERWISE.
2. Perform blood glucose analysis.
   a. If blood glucose analysis result is < 60 mg/dl then administer dextrose.
      i. Adult – D50W 25 grams IV/IO
      ii. Pediatric – ≤ 10 years of age D25W 2 ml/kg = 0.5 grams/kg
   b. Repeat blood glucose analysis 5 minutes after dextrose. If blood glucose remains < 60 mg/dl, repeat dextrose.
   c. If no IV/IO access and patient is hypoglycemic, administer glucagon, which may be repeated every 20 minutes as needed.
      i. Adult – 1 mg IV/IO/IM
      ii. Pediatric
         1. < 20 kg – 0.5 mg IV/IO/IM
         2. ≥ 20 kg – 1 mg IV/IO/IM
3. Obtain 12 lead ECG
4. Perform Stroke Assessment
5. Administer naloxone (Narcan) if no other causes identified. May repeat if no response in 5 minutes.
   a. Adult - 0.4 mg to 2 mg IV/IO
   b. Pediatric - 0.1 mg/kg IV/IO (up to 2 mg)

**Considerations:**
If there is a strong suspicion of opioid over-ingestion, then administer naloxone as soon as possible. If the patient has inadequate spontaneous ventilation, then control the airway with bag-valve-mask ventilation until naloxone has been administered and the patient's response assessed.

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12/2016
Purpose:
Adequately and safely treat anxiety and agitation in the critically ill or injured adult or pediatric patient.

Procedure:
1. THE RESTLESS, AGITATED, CONFUSED, AND/OR COMBATIVE PATIENT IS HYPOXIC OR IN SHOCK, UNTIL PROVEN OTHERWISE.
2. Objectively assess and document the patient’s level of anxiety or agitation using the RASS.
3. Use non-pharmacological treatment alternatives to reduce anxiety/agitation.
4. Treat the patient with selected anxiolytic medication.
5. Reassess the patient using the RASS after administration of anxiolytic medication.

Medications:
- Midazolam - 0.02 mg/kg to 0.05 mg/kg IV/IO every 5 minutes PRN. Titrate to alert and calm state (RASS 0), maintain SBP > 90 mmHg. (Single max dose of 5 mg)

Considerations:
1. Consider using non-invasive EtCO2 monitoring.
2. Consider reduced dosing for patients with renal dysfunction.

* Haloperidol and diphenhydramine may NOT be mixed in the same syringe for IM administration.

Antony Wollaston, MD
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Christopher R Solaro, MD, PHD
Associate Medical Director 12/2016
Protocol: STAN 007  
Title: Patient Restraint  
Effective Date: 8-05  
Revision Date: 5-07, 6-10, 7-10, 4-15, 6-15, 8-16  
Revision Number: 6  
Reviewed: 8-16

Purpose:

To establish guidelines for use of restraints in situations where they may be required to protect the health and/or safety of a patient or those on board the aircraft, while maintaining the dignity and rights of the patient as much as possible.

Procedure:

1. Attempt first to control the patient with verbal counseling. Use non-threatening verbal communication to calm the patient.
2. The least restrictive means of control should be employed.
3. Refer to STAN 006 Anxiety/Agitation and PRO 011 Post-Intubation Management for medication management of the agitated patient.
4. Apply soft extremity restraints if appropriate for the situation to the patient.
5. Only “reasonable force” (use of force equal to or minimally greater than the amount of force being exerted by the resisting patient) may be used.
6. Physical restraints should not be applied to the aircraft frame.
7. Caution should be used to assure that the restraints do not impose risks of restraint-related positional asphyxia or other injuries.
8. Patient should be assessed according to STAN 001 to assure that restraints are not impairing circulation to extremities or oxygenation status.

Considerations

1. Consider using Non-Invasive End-Tidal CO2 if possible.
2. Deaths that occur during transport of a patient being restrained must be reported to the Director of Patient Care Services to determine if governmental reporting is required.
**Documentation Requirements:**
Use of restraints of any type must be documented in the patient’s clinical chart and include the following information:

i. Reason for the use of restraints;

ii. The need for treatment was explained to the patient, and the failure of less restrictive methods of control.

iii. Type of restraints used;

iv. Time use of restraints was implemented, and discontinued if appropriate;

v. Assessment of patient’s airway status and circulation to all extremities including capillary refill, temperature, and color of skin;

vi. If correctional restraints are required by law enforcement officials, it should be documented in the patient’s medical record who gave the order for the restraint; and

vii. Patient response to use of restraints.

viii. All other vital sign documentation as required by STAN 001.

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12/2016
Protocol: STAN 008
Title: Spinal Immobilization/Stabilization
Effective Date: 10-14
Revision Date: N/A Revision Number: N/A
Reviewed: 4-16

Purpose:
Identify and provide patients with spine immobilization/stabilization.

Indications:
Mechanism of injury and one or more of the following:
1. Altered Mental Status
2. Inability to communicate
3. Spinal pain, tenderness and/or deformity
4. Motor and/or sensory deficits
5. Drug or alcohol use
6. Painful distracting injury
7. Signs of neurogenic shock
8. Priapism

Procedure:
1. If rapid extrication is required due to immediate life-threatening danger to patient and/or rescuers, attempt to manually immobilize C-spine before movement of patient.
2. Place correctly fitted cervical collar on patient with suspected spinal injury.
3. If no cervical collar can be made to fit patient, towel or blanket rolls may be used to support neutral head alignment.
4. Move patient to supine position and fully immobilize to LSB. Maintain head in neutral position and ensure airway patency.
5. If cervical spine stabilization is indicated a cervical collar may be used without a LSB. Patient must be secured to stretcher while maintaining in-line stabilization.
6. Assess CMS before and after immobilization and all patient movement.

Considerations:
Patients with penetrating head, neck or torso injury and no evidence of spinal abnormality should not be immobilized on a long spine board.

Mechanism of injury is defined as violent impact forces that are clearly capable of damaging the spinal column. Examples include but are not limited to: high velocity crashes, a fall from standing height, axial load injury.

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12/2016
Protocol: STAN 009
Title: Invasive Pressure Monitoring
Effective Date: 2-16
Revision Date: N/A Revision Number: N/A
Reviewed: 1-16

Purpose:

Flight crews are required to monitor invasive pressure on any patient with central venous or arterial access established by referring facility.

Procedure:

1. If the referring facility transducer unit is not compatible with transport unit cable, replace with compatible transducer setup (using aseptic technique).
2. a. Place the transducer at the phlebostatic axis and secure with tape for transport.
   b. Zero the line to obtain a 0 mmHg reading on the transport monitor.
   c. Evaluate the waveform and numeric values for correlation with recent trends as per patient condition.

Notes:

1. Evaluate the insertion site for bleeding, swelling, hematoma or dislodgement.
2. Tightly secure stopcocks and cover openings with male endcaps.
3. If waveform dampened, reassess position of leg or wrist and check pressure bag inflation.
4. If invasive line is in the femoral artery, keep head of stretcher <30° and leg straight. Reassess distal pulses with any patient movement.
5. If invasive line becomes dislodged, apply direct pressure and contact medical control.

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12/2016
<table>
<thead>
<tr>
<th>Topic</th>
<th>Protocol Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremity Trauma – Adult and Pediatric</td>
<td>TRA-001</td>
</tr>
<tr>
<td>Abdominal/Pelvic Trauma</td>
<td>TRA-002</td>
</tr>
<tr>
<td>Initiation of Tranexamic Acid (TXA) Protocol</td>
<td>TRA-003</td>
</tr>
<tr>
<td>Hemorrhagic Shock</td>
<td>TRA-004</td>
</tr>
<tr>
<td>Head Injury/Traumatic Brain Injury</td>
<td>TRA-005</td>
</tr>
<tr>
<td>Major Burns – Adult and Pediatric</td>
<td>TRA-006</td>
</tr>
<tr>
<td>Acute Eye Injuries – Adult and Pediatric</td>
<td>TRA-007</td>
</tr>
</tbody>
</table>
Purpose:

To define assessment, treatment and management for patients with extremity trauma requiring critical care transport.

Procedure:

1. Control any major bleeding.
2. If bleeding not controlled with direct pressure, consider application of commercial tourniquet.
3. Evaluate for obvious deformity, shortening, rotation, or instability.
5. If distal vascular function is compromised, attempt to gently restore normal anatomic position.
6. Stabilize and splint suspected fractures/dislocations. Limit movement to avoid further damage. Elevate extremity fracture above heart level if possible.
7. If amputation has occurred, attempt to locate amputated part. Wrap part with saline moistened dressing and place in bag. Place bag with amputated part into container filled with cool water/ice.
8. Apply ice/cool packs to limit swelling in suspected fractures or soft tissue injury.
9. Treat for pain as needed.

Notes:

A second tourniquet may be applied proximal to the first if needed. Tourniquet should only be removed by receiving facility. Do not place amputated part directly in ice.

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12/2016
Purpose:
To define treatment for patients with known/ suspected abdominal/ pelvic trauma requiring critical care transport.

Procedure:

1. Control any external bleeding.
2. Stabilize any impaled objects. Do not remove.
3. Cover eviscerated organs with saline soaked gauze and keep moist throughout transport. Do not attempt to replace organs.
4. Assess pelvis for stability by gently compressing only once. Do not rock. If unstable consider stabilizing with sheet or commercial device.
5. Consider NG/ OG tube placement.

Considerations:
Unexplained shock after sustaining traumatic injury to the trunk should be assumed to have an intra-abdominal hemorrhage until proven otherwise.

Patients that are pregnant may mask signs/ symptoms of shock

1. Pre-mature labor may be induced (3rd Trimester)
2. Assess for contractions, vaginal bleeding, fetal movement

The pelvic area is a potential space and may accumulate 1500mL of blood.
The abdomen can hold up to 1500mL of blood before showing obvious signs of distension.
Purpose:
Identify and treat patients whom need help in stabilizing clot formation and decrease bleeding associated with traumatic hemorrhagic shock that require critical care transport.

Protocol:

1. TXA may be indicated in the treatment of patients that meet all of the following criteria:
   a. Known or suspected hemorrhage after blunt or penetrating trauma
   b. Age ≥ 18 years
   c. Sustained hypotension (systolic blood pressure (SBP) < 90 mmHg) and/or sustained tachycardia (>110 beats per minute)
   d. Time of injury is less than 3 hours from initiation of TXA

2. Initiate transport to a definitive trauma center that has the capability to administer/continue TXA.

3. Administer a loading dose of 1 gram TXA diluted in 100ml or 250ml normal saline infused IV over 10 minutes.

4. A maintenance dose of 1 gram TXA diluted in 100ml or 250ml normal saline to be administered over 8 hours should then be initiated.

Considerations:

If TXA has already been initiated, it can be continued in its current concentration.

Specific Exclusion Criteria for the administration of TXA:

1. Age <18.
2. Known pregnancy.
3. Known allergy to TXA.

NOTES:
TXA may only be used in states that have approved it for use. Additional training must be completed before an RN/paramedic may administer TXA.

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Protocol: TRA 004  
Title: Hemorrhagic Shock  
Effective Date: 8-05  
Revision Date: 4-15, 6-15  
Reviewed: 6-16  
Revision Number: 2

**Purpose:**

To recognize and manage patients in hemorrhagic shock.

**Procedure:**

1. Suspect hemorrhagic shock if patients have the following:
   - Suspected or visible bleeding (internal or external) **AND**
   - Signs of poor tissue perfusion such as abnormal mental status, cool clammy skin, delayed capillary refill, weak or absent radial pulse **OR**
   - Systolic blood pressure < 90 mm Hg in an adult **OR**
   - Child age < 5 systolic BP < 75 mm Hg or child age 5-10 systolic BP < 85 mm Hg.

2. Control external bleeding with direct pressure.

3. Begin transport as soon as possible to appropriate facility as directed in Trauma Triage Protocol.

4. Without stopping transport, initiate 2 large bore IV's of either normal saline or lactated ringers. Give 1-2 liter wide open for adults **or** 20 ml/kg for children on pressure bag. In cases of penetrating trauma or a single visible bleeding wound minimize fluids unless bleeding is controlled.

5. Consider additional fluid boluses as indicated by reassessment.

**Notes:**

1. The key to good pre-hospital care of the hemorrhagic shock patient is rapid transport to definitive care. Scene time should be kept to a minimum. The philosophy is to make the most efficient use of time before arrival at an appropriate facility.

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12/2016
Purpose:

Identify and treat patients with head trauma or anticipated traumatic brain injury (TBI).

Procedure:

1. Maintain oxygen saturation above 90%.
2. Intubate if GCS is less than 8 or if patient is unable to protect airway.
3. Monitor EtCO2 and ventilate to maintain ETCO2 at 35-40.
4. Obtain ABG results if available.
5. Maintain SBP $\geq$ 90.
6. Reassess GCS every 5 minutes.
7. Perform blood glucose analysis and administer dextrose if <60mg/dL.
   - **Adult** - D50 25G IV/IO
   - **Pediatric** - D25 0.5 gm/kg IV/IO
8. If possible, transport patient with HOB elevated at 30 degrees to decrease intracranial pressure.

Considerations:

If signs of herniation are present and hyperventilation is ordered by sending physician or medical control, hyperventilate to a target EtCO2 of 30-35 and limit hyperventilation to 3-5 minutes.

Pulse oximetry and blood pressure should be monitored continuously. **The primary goal is to prevent secondary brain injury by preventing hypotension (SBP<90) and hypoxia (SpO2 <90).**
Purpose:
To define assessment, management and treatment of thermal, electrical and chemical burns in patients requiring critical care transport.

Procedure:

1. Remove clothing, jewelry and debris as appropriate.
2. For chemical burns, brush powder residue from patient. Flush affected area with copious amounts of warm water.
3. Provide spinal motion restriction if needed.
4. Cover thermal burns with clean, dry sheets or dressing. Prevent hypothermia with active and passive warming measures.
5. Do not delay intubation if inhalation injury is present or suspected.
6. Calculate total body surface area burned using Rule of 9’s chart. Do not include superficial burns.
7. For patients with more than 20% total body surface area burns, use consensus formula for both adult and pediatric fluid resuscitation.

   \[
   2-4\text{ml lactated ringers X kg X }\%\text{TBSA} = \text{total amount of volume needed.}
   \]

   Administer \(\frac{1}{2}\) of total volume over first 8 hours from time of burn.  
   Administer second \(\frac{1}{2}\) of total volume over next 16 hours.

8. If Foley catheter in place, urine output should be maintained at 1 to 2ml/kg per hour for patients <30kg and 0.5 to 1ml/kg per hour for patients \(\geq\)30kg.
10. If electrical burn, obtain 12 lead.
11. If patient adequately stabilized, transport should be to a burn facility.

Notes:
Half of the initial fluid resuscitation needs to be administered in the first 8 hours from the time that the burn occurred. Adjust rate in case of delay in fluid resuscitation. Do not use ointments, occlusive dressings, plastic wrap or ice.
**Consensus Formula:**

2-4 ml x kg x TBSA (partial and full thickness burns) = amount administered in 24hrs
One half of the calculated estimate is administered in the first 8 hours and the second half over the subsequent 16 hours.

In case of delay in the initiation of fluid resuscitation the amount of fluid calculated to be administered in the first 8 hours should be infused at a rate such that half of the estimated 24 hour fluid requirement will be delivered by 8 hours post burn.
Purpose:
To define assessment, management and treatment of patients experiencing an acute eye injury, with actual or suspected chemical exposure, blunt, penetrating or non-penetrating eye trauma, with or without associated facial trauma, who require critical care transport.

Procedure:

1. Provide reassurance. Avoid any unnecessary eye manipulation.
2. Assess for gross visual acuity.
3. Do not remove impaled object or protruding foreign body, stabilize in place.
4. If open globe injury is suspected, place metal eye shield over both eyes. Do not put pressure on globe. Soft eye pad may be used for unaffected eye to minimize ocular movement.
5. If eye is out of socket, cover with saline soaked gauze or cover entire eye area affected with rigid container.
6. If chemical exposure or non-penetrating foreign body in eye, remove contact lenses, if present, and begin eye irrigation. Irrigate with normal saline until arrival at receiving facility.

Notes:
Minimization in any increase of intraocular pressure is paramount.

Normal visual acuity can be present with severe eye injury.

Administration of Succinylcholine and/or Ketamine is a relative contraindication with penetrating eye/open globe injuries or increased intraocular pressure.

If possible obtain chemical name and provide to receiving facility.

Antony Wollaston, MD
EMS Medical Director

Christopher R Solaro, MD, PHD
Associate Medical Director

12/2016
Abandonment/Utilization of Manpower ................................................................. OP-1
Physician/Nurse at the Scene ............................................................................... OP-2
Transport to Appropriate Hospital ................................................................. OP-3
Patient Disposition ............................................................................................ OP-3a
Resource Hospital Over-rides .......................................................................... OP-4
Refusal of Services ............................................................................................. OP-5
Treatment of Minors ........................................................................................... OP-6
Behavioral Emergencies ..................................................................................... OP-7
Death at the Scene ............................................................................................... OP-8
Resuscitation ...................................................................................................... OP-8a
DNR Policy ........................................................................................................ OP-8b
DNR Form .......................................................................................................... OP-8c
Responsibility at the Scene/Law Enforcement ................................................ OP-9
Confidentiality .................................................................................................... OP-10
Major EMS Incident .......................................................................................... OP-11
Start Triage – Adult .......................................................................................... OP-11b
Durable Power of Attorney for Healthcare ...................................................... OP-12
Infection Control ................................................................................................. OP-13
Physician at the Operational Control Point .................................................... OP-14
Trauma Triage Criteria ...................................................................................... OP-15
Trauma Load and Go ........................................................................................ OP-16
Distribution of the EMS System Manual ........................................................ OP-17
EMS Resource Center ........................................................................................ OP-18
Duty to Perform Services without Discrimination ........................................ OP-19
Air Ambulance Utilization Protocol ................................................................. OP-20
Professional Conduct/Code of Ethics .............................................................. OP-21
EMS Assistance Funds ...................................................................................... OP-22
Preparedness to a System Wide Crisis ............................................................ OP-23
Worksheets for System Wide Crisis ............................................................... OP-23-F
System Bypass ................................................................................................... OP-24
IDPH Bypass Notification Form ....................................................................... OP-24-F
Hazardous Material Incident ........................................................................... OP-25
Nerve Gas Auto-Injector Guidelines ............................................................... OP-26
I. Advanced life support and basic life support ambulances shall respond as dispatched within their geographical area.

II. Once medical care has been given, the prehospital care personnel are committed to the care of the patient until the patient is delivered to appropriate aid with the same degree or a superior degree of training and ability.

III. The ALS team on the scene is responsible under the direct authority of the EMS physician and/or designated authority of the ECRN and will assume responsibility for carrying out appropriate patient care at the site and enroute to the hospital.

IV. Triage is the responsibility of the senior paramedic with radio directions by Medical Control. In the event there are several patients and ALS treatment is begun on a patient who needs transportation, an EMT/paramedic must accompany the patient enroute to the hospital to assume continuity of care.

V. BLS teams on the scene are under the medical direction of the ALS team on the scene. If it is impossible for an ALS team to respond to the call, BLS EMT/B manned team will assume authority at the scene under the direct radio supervision of Medical Control.
QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

PHYSICIAN/NURSE AT THE SCENE

I. **Physician is a Bystander:**
   
   A. Require identification
   
   B. Determine if physician is willing to assume responsibility for patient care and accompany patient to the hospital (transport by ground only due to space limitations in the aircraft).
   
   C. Confirm all orders with Medical Control.

II. **Physician is Patient's Physician:**
   
   A. Confirm identity as patient's physician
   
   B. Determine if physician is willing to assume responsibility for patient care and accompany patient to the hospital.
   
   C. If physician accompanies the patient, confirm and document physician's orders with Medical Control.
   
   D. In the event the physician orders therapy not consistent with the system medical protocol, he shall be requested to accompany the patient to the hospital to continue his therapy and assume responsibility. All therapy shall be confirmed and documented with Medical Control.
   
   E. If physician does not accompany the patient, confirm physician's orders with Medical Control. In the event of conflict or change in condition, follow orders of Medical Control.

III. **Nurse is a Bystander:**
   
   A. The nurse at the scene shall function under the direction of the ALS team. A nurse cannot be directed to deliver ALS care in the prehospital setting unless he or she is an approved Prehospital RN participating in the system.
   
   B. Request identification if it is unknown where the bystander nurse meets the requirement in II. A.
   
   C. Notify the receiving hospital as part of the in bound status report.
I. When known, the patient choice of hospital is to be honored with the following noted exceptions:

A. When the patient is unresponsive, or when the patient condition does not allow him to make an informed decision, and there is also no legal guardian, patient physician, or agent with durable power of attorney for health care present to make his desires known.

B. If a critically ill or injured patient appears to be in need of specialized care available at only a specific hospital.

C. If the patient's choice is not either a trauma center or the closest hospital.

D. If the patient's choice of hospital would require the SEMSV to travel an unreasonable distance from its primary coverage area.

II. Medical Control must be consulted when A, B, C, or D, above exists. The flight crew will contact the medical control hospital and after field assessment is given, the EMS physician at Medical Control will evaluate and decide the disposition of the patient. If the patient declines the advice of the Medical Control physician after risks are explained, then the patient should be transported to the facility of choice. It should be clearly documented on the run form and Medical Control should document this on the radio log. A System Event Report should be initiated.

III. If a receiving facility advises they are on diversion, Medical Control must be contacted.

IV. All Category I and Category II trauma patients should be transported to the nearest trauma center if one is within 25 minutes transport time from the scene.
QUINCY AREA EMS SYSTEM
PATIENT DISPOSITION

I. When Medical Control is contacted by a flight crew requesting direction on where to transport a patient in accordance with policy O-4, the EMS Medical Director or his qualified designee will direct that ambulance to the nearest hospital, or trauma center in the Quincy Area EMS System.

II. The flight crew may be directed by the EMS physician at Medical Control to a more distant hospital or trauma center if he or she has determined and certified that based upon the reasonable risks and benefits to the patient, and based upon the information available at the time, the medical benefits reasonably expected from the provision of appropriate medical treatment at a more distant hospital or trauma center outweigh the increased risks to the patient from transport to the more distant hospital.

III. In order to certify the determination to transport any patient to a more distant hospital or trauma center, the EMS Medical Director or qualified designee must note on the ER radio log that determination and sign the record.

Kelly Cox, M.D., SEMSV Medical Director

10/01; re: 2/02, 3/05
I. Intervention policy shall be initiated when one of the following occurs:

A. No radio response by the receiving hospital after 3 attempts by the prehospital unit.

B. Deviation from Quincy System defined treatment protocols, disposition, or communication protocols.

C. Undue delay in initiation of treatment or delayed transport of critically ill or injured patients (greater than 25 minutes) without reasonable cause.

D. When the Receiving or Alternate Medical Control Hospital requests the intervention.

E. When a flight crew requests the intervention.

II. Intervention should first be initiated as suggestions given to the treating physician via phone by the Resource Hospital physician.

III. If this indirect intervention does not result in closer compliance to the Quincy Area EMS System standards then:

A. The Resource physician will notify the Receiving or Alternate Medical Control Hospital physician via phone that the Resource physician is “overriding” the call.

B. The Resource Hospital Physician will notify the SEMSV that the Resource Hospital is overriding the call.

IV. A summary of the intervention will be written by the Resource Hospital EMS Physician and will include the reasons for the override. Copies of this report will be sent to the Quincy Area EMS System's Medical Director and the involved Receiving Hospital Medical Director.

V. The EMS Medical Director will review the call and summary and will follow up in writing to the appropriate Receiving or Alternate Hospital EMS Medical Director.

Kelly Cox, M.D., SEMSV Medical Director

10/01; re: 2/02, 9/03 reviewed: 3/05
I. Purpose: to clarify the responsibility of the flight crew when a patient refuses treatment and/or transportation.

   A. At no time should any EMS provider suggest or initiate patient refusal. Advise the patient of the nature of proposed care and the potential consequences of not receiving care.

II. Who May Refuse Care: A patient may refuse medical care and/or transportation if he/she does not appear to be a threat to himself or others and meets the following criteria:

   A. A competent, conscious adult over the age of 18

   B. A minor (under age 18) who meets one or more of the following criteria:
      1) Has been granted legal emancipation and provides documentation
      2) Is pregnant
      3) Is a parent

   C. A Durable Power of Attorney for Health Care may request to limit or refuse medical care.

   D. The legal guardian or parent of a minor

III. Refusal Procedure for Persons Meeting Criteria in Section II

   A. Assess the patient and obtain vital signs. If the patient refuses assessment, document this in the narrative.

   B. Explain to the patient or legal guardian the risks associated with their decision to refuse treatment/transport.

   C. Medical Control MUST be contacted via radio or phone to verify the refusal.

   D. After concurrence of Medical Control to accept the refusal, obtain signatures of the patient or legal guardian and the EMS provider obtaining the refusal. It is always preferable to have two witnesses if possible.

   E. If the patient or legal guardian refuses treatment and/or transport after having been informed of the risks involved and also refuses to sign the refusal form, relay this information to Medical Control

IV. Patient with Diminished Mental Capacity

   A. Assess the patient as completely as possible and obtain vital signs. Consent is implied if the patient’s mental status is such that he/she is incapable of making a rational decision.

   B. Advise the patient of the risks associated with his decision to refuse treatment/transport.
C. If family members/friends are present, advise them of the risks associated with the patient’s refusal of treatment/transport. They may be able to reason with the patient.

D. If unsuccessful in reasoning with the patient and/or family, contact Medical Control for further instructions. You may be advised to obtain assistance from law enforcement to use reasonable force/restraints to provide treatment/transport.

V. Refusal by a Minor

A. Assess the patient and obtain vital signs. If the patient refuses assessment, document this in the narrative.

B. Determine patient age and if under age 18, determine emancipation status.

C. If the minor does not meet the criteria listed in Section II.B., contact with a parent or legal guardian must be made.

D. Contact the parent/legal guardian by phone and report circumstances of the incident and patient condition. Advise that the patient is refusing care and ask if they would like the patient to be treated/transported.

E. If the parent/legal guardian refuses treatment/transport, advise them of risks and ask them to repeat the refusal to a witness if possible.

F. Contact Medical Control for verification of the refusal.

G. If contact with the parent/legal guardian is unsuccessful, contact Medical Control for further instructions.

H. If this process would delay the treatment of another seriously ill or injured patient on the scene, refer to Section VI below

VI. Multiple Refusal Incident

A. Initial EMS personnel on the scene should perform an initial triage to determine the number of victims/injuries and whether additional resources are needed. There may be many people involved in the incident, but few injuries requiring ambulance transport. A brief initial contact should be made with all potential patients.

B. If the flight crew determines there are seriously ill or injured patients requiring their immediate attention, additional EMS personnel should be requested to assist with minor injuries and obtaining refusals.
   1. Additional EMS personnel may consist of additional ambulance crews or non-transport crews.
   2. The additional personnel will assess remaining potential patients and follow guidelines in previous sections for obtaining refusals.
   3. If a disaster is declared, refer to Policy SEM O-11

Kelly Cox, M.D., SEMSV Medical Director 10/01; re: 2/02, 9/03, 3/05
TREATMENT OF MINORS

I. Definition of minor: Any person under the age of eighteen.

A. Anyone under the age of eighteen is to be considered a minor unless they meet one or more of the following criteria:
   1. Has been granted legal emancipation and can provide documentation of this
   2. Is pregnant
   3. Is a parent

II. Treatment of a minor

A. Assess the patient

B. Obtain consent from the parent or legal guardian for treatment/transport

C. If a delay to locate the parent or legal guardian could adversely affect the patient, begin lifesaving measures and contact Medical Control for instructions.

III. Refusal of Treatment: See Protocol SEM-OP-5.

IV. Legal guardian: An adult who has been appointed or granted legal custody by the court. This person is legally responsible for the minor.
SEM-OP-7.1

QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

BEHAVIORAL EMERGENCIES

I. Definition: A behavioral emergency is a situation in which a patient’s behavior becomes so unusual, bizarre, threatening or dangerous that it requires intervention.

A. Objective factors demonstrated by the patient that may indicate a behavioral or psychological condition exists when:
   1. Actions interfere with core life functions such as eating, sleeping, hygiene
   2. Actions pose a threat to the life or well-being of the patient or others
   3. Actions significantly deviate from the social norm

II. Consents

A. The patient must be a conscious, competent adult

B. The patient may consent to treatment and transport through quiet cooperation or lack of resistance

C. Whenever possible also obtain consent from a relative of the patient, legal guardian or Power of Attorney for Healthcare

D. Refusal: refer to Policy SEM-OP-5 Refusal of Services

III. Restraint

A. Consider Policy SEM MP-31 for pharmacological restraint.

B. Physical restraint may be necessary when EMS personnel have a reasonable belief that the patient may harm himself or others.
   1. Indications: A disoriented, combative or violent patient who has demonstrated behavior harmful to himself or other persons.

C. The objective of physical restraint is to restrict movement in order to stop dangerous behavior. Safety of EMS personnel should be a priority – do not attempt restraint without adequate assistance
   1. Request law enforcement respond to the scene and advise them of the situation.
   2. Prepare all equipment/stretcher in advance.
   3. Clear bystanders/unnecessary persons from the area.
   4. Utilize law enforcement to physically restrain the patient using the minimum force necessary.
   5. Appropriate restraining devices should be utilized including leather or soft anklets/wristlets, wide roller bandages, restraint jacket. Do not remove restraints until moving the patient in the Emergency Department unless an emergency situation requires it.
D. Monitoring/treating the restrained patient
   1. Position the patient in a manner that gives immediate access to the airway and allows visualization of breathing/chest rise.
   2. Check circulation in all limbs during transport.
   3. Provide emergency care as indicated.
   4. Two attendants should be in attendance with the patient whenever possible. In extreme cases, or cases in which the EMS personnel feel uncomfortable with transporting the patient alone, law enforcement should be asked to accompany the crew.

IV. Documentation should be objective, clear and concise and should include:

A. The initial physical assessment
B. Behaviors noted that led you to believe the patient presented a danger to himself or others
C. Measures taken to obtain consent for treatment/transport.
D. Resources utilized for physical restraint including the type of restraints used.
E. Physical assessment during transport including positioning, circulation, and treatment provided.
DEATH AT THE SCENE

I. If a patient is pulseless and non-breathing and does not meet the criteria for initiation of resuscitative efforts, emergency personnel are to:

A. Advise the medical control physician
   1) Communicate pertinent medical history (use cell phone if possible)
   2) Transmit a sample EKG if requested

B. Notify the coroner on all prehospital deaths (after contact with Medical Control)
   1) Contact dispatch and advise of need for coroner

II. If a crime is suspected:

A. Disturb the body and scene as little as possible

B. Request presence of law enforcement personnel if already not at the scene

III. In all instances, document as much pertinent information as may be obtained from bystanders and/or observed at the scene such as:

A. Time patient collapsed

B. Time patient became pulseless and non breathing

C. When patient last seen

D. Recent medical history if available

E. Environmental observations

F. Pertinent physical findings

__________________________ 10/01
Kelly Cox, M.D., SEMSV Medical Director

reviewed: 3/05
QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

RESUSCITATION

I. All pulseless and non breathing patients are to receive full resuscitative efforts except when any of the following physical findings can be documented:

A. rigor mortis
B. tissue decomposition
C. extreme dependent lividity
D. injuries incompatible with life
   1. decapitation
   2. incineration
   3. etc

OR

II. The duration of complete cessation of cardiovascular function can accurately be determined and documented to be greater than 15 minutes. To make a decision not to initiate CPR in this setting, the responder(s) must be confident that:

A. Bystanders at the scene are able to recognize cardiac arrest.
B. Bystanders at the scene are reliable in documenting the time elapsed.
C. Bystanders are acting in good faith.
D. No independent influences on central nervous system function, such as drugs or hypothermia are operative

OR

III. A valid written DNR is received (see Policy SEM-OP-8B)

IV. It should be considered in all cases that the patient could have collapsed from a cardiac or non cardiac cause, yet continued to have cardiac activity sufficient to sustain the brain until the arrival of emergency personnel. When doubt exists, assume the patient has not sustained irreversible cessation of circulatory and respiratory functions and initiate full resuscitative efforts.
DNR POLICY

I. All field personnel (EMT-B, EMT-I, EMT-P, and prehospital RN) are authorized to recognize a valid “Do Not Resuscitate” (DNR) policy. The role of the on-line medical control physician is to interpret policy and provide guidance and direction to field personnel as needed.

II. Upon receipt of a written DNR order from a long term care facility, hospice, or home care patient, or for any patient being transported by ambulance for any reason, EMS System participants within Region 3 will utilize the following procedure:

A. Beginning July 23, 2005, a valid DNR shall be written on a brightly colored form provided by Illinois Department Public Health which shall contain all the elements listed in B.
   1. Any DNR that has an effective date prior to July 1, 2001, can also be recognized if it contains the data elements listed in B.

B. Field personnel shall confirm the written DNR order contains at least the following information:
   1. name of patient
   2. name and signature of attending physician
   3. effective date
   4. the words written out “Do Not Resuscitate”
   5. evidence of consent either:
      a) signature of patient; or
      b) signature of legal guardian; or
      c) signature of durable power of attorney for health care agent; or
      d) signature of surrogate decision maker

C. Field personnel shall make a reasonable attempt to verify the identity of the patient.

D. Field personnel shall notify the treating hospital of the DNR order and the existence or absence of items B1, 2, 3, 4, and 5.

E. Emergency Communication RN’s (ECRN’s) shall summon the EMS physician to the radio control location and that physician will advise the prehospital personnel to honor the DNR order or reject it based upon all information available at that time.

III. A DNR order shall be revoked in one or more of the following ways:

A. By the patient, or

B. The order is physically destroyed or verbally rescinded by the physician who signed the order, or

C. The order is physically destroyed or verbally rescinded by the person who gave written consent to the order.

IV. The original or copy of the original written DNR order shall accompany the patient and be a permanent part of the EMS medical record. The copy is not required to be brightly colored.
V. General Orders

A. DNR orders can affect the treatment of patients prior to or during a full cardiac arrest. Please review section 2 of the DNR form.

B. System personnel will submit a report regarding any difficulties experienced in complying with this policy. Problems will be evaluated as necessary by the Region 3 Advisory Committee.

C. DNR cases will be reviewed by the EMS Office for policy compliance.

D. An annual report will be submitted to IDPH delineating DNR issues which have been identified and the Systems’ response to those issues.

E. Education of the system personnel regarding this policy will be accomplished in one or more of the following manners:
   1. Agency CME by Training Officer
   2. System Wide Education Program
   3. Distribution of copies of the policy
   4. CME articles specific to DNR and this policy

F. In the absence of a valid DNR order, CPR may only be withheld in accordance with the Systems policies on Death At The Scene and/or Resuscitation

VI. A living will by itself cannot be recognized by prehospital care providers.

VII. You can review “DNR – Guidance for Health Care Providers and Professionals” by logging on to www.idph.state.il.us and click on “Living Wills, DNR, Power of Attorney” icon.
Patient Directive

I, _____________________________, born on ____________, hereby direct the following in the event of:

1. FULL CARDIOPULMONARY ARREST (When both breathing and heartbeat stop):

   ❑ Do Not Attempt Cardiopulmonary Resuscitation (CPR)
   (Measures to promote patient comfort and dignity will be provided.)

2. PRE-ARREST EMERGENCY (When breathing is labored or stopped, and heart is still beating):

   SELECT ONE
   ❑ Do Attempt Cardiopulmonary Resuscitation (CPR) -OR-
   ❑ Do Not Attempt Cardiopulmonary Resuscitation (CPR)
   (Measures to promote patient comfort and dignity will be provided.)

Other Instructions__________________________________________________________________
__________________________________________________________________________________

Patient Directive Authorization and Consent to DNR Order (Required to be a valid DNR Order)

I understand and authorize the above Patient Directive, and consent to a physician DNR Order implementing this Patient Directive.

________________________________________ ________________________________________ ________________
Printed name of individual Signature of individual Date

-OR-

________________________________________ ________________________________________ ________________
Printed name of (circle appropriate title):
legal guardian
OR agent under health care power of attorney
OR healthcare surrogate decision maker
Signature of legal representative Date

Witness to Consent (Required to have two witnesses to be a valid DNR Order)

I am 18 years of age or older and have witnessed the giving of consent by the above person.

________________________________________ ________________________________________ ________________
Printed name of witness Signature of witness Date

________________________________________ ________________________________________ ________________
Printed name of witness Signature of witness Date

Physician Signature (Required to be a valid DNR Order)

I hereby execute this DNR Order on _____________.

______________________________
Signature of attending physician

______________________________
Printed Name of attending physician

______________________________
Physician's telephone number

◆ Send this form or a copy of both sides with the individual upon transfer or discharge. ◆
Illinois Department of Public Health
UNIFORM DO-NOT-RESUSCITATE (DNR) ORDER FORM

Patient’s name ____________________________________________________

Summarize medical condition:

When This Form Should Be Reviewed

This DNR order, in effect until revoked, should be reviewed periodically, particularly if –

• The patient/resident is transferred from one care setting or care level to another, or
• There is a substantial change in patient/resident health status, or
• The patient/resident treatment preferences change.

How to Complete the Form Review

1. Review the other side of this form.
2. Complete the following section.

If this form is to be voided, write “VOID” in large letters on the other side of the form.

After voiding the form, a new form may be completed.

Date Reviewer Location of review Outcome of Review
☐ No change
☐ FORM VOIDED; new form completed
☐ FORM VOIDED; no new form completed

Advance Directives

I also have the following advance directives: Contact person (name and phone number)

☐ Health Care Power of Attorney

☐ Living Will

☐ Mental Health Treatment Preference Declaration

◆ Send this form or a copy of both sides with the individual upon transfer or discharge.◆
I. Law Enforcement personnel will be notified when the following circumstances occur:
   A. Gunshot or knife wounds
   B. Sexual assault
   C. Attempted suicide
   D. Abuse cases:
      1. child
      2. elderly
      3. any battery
   E. Unlawful possession of controlled drugs

II. SEMSV personnel obligations at the scene of a violent crime.
   A. Immediately notify law enforcement.
   B. If the patient is obviously dead, the body and surrounding scene shall remain undisturbed.
   C. Do not touch, move, or relocate any item at the scene unless absolutely necessary to provide treatment to an injured victim. Mark the location of any item that must be moved.
   D. No onlookers or other unauthorized personnel on the premises of the crime scene.
   E. Observe and note anything unusual, especially if the evidence may not be present when law enforcement arrives, i.e., smoke and odors.
   F. Give immediate care to the victim.
   G. Keep detailed records of the incident including observations of the victim at the scene.
   H. Once law enforcement arrives, do not hinder their work. Restrict your movements to those which relate to patient care. Give any information to the police which may be helpful but keep conversation to a professional level. Do not draw conclusions, but make observations.

III. The police have broad legal authority to enforce the law. They also have the equal right to control a situation to the degree that it does not needlessly hinder emergency care. Law enforcement may let EMS personnel perform their work unhampered if they understand the reason and need for treatment, and are sure that the treatment will not delay them from their rights to enforce the law. If a conflict should exist between the EMS personnel and law enforcement the following guidelines shall apply:
   A. Meet with law enforcement in private and try to agree on an approach that will satisfy their needs along with your own.
   B. Explain why the treatment is needed, and how law enforcement work may hinder the treatment.
   C. If they still refuse to let you start treatment, diplomatically advise that the incident will be noted in the run form.
   D. Remember that they also have a duty to perform.
   E. If an agreement can not be reached, you must give in to their demands, continue the treatment allowed and never abandon the patient.
   F. You are not required to perform services or treatment demanded by law enforcement.
   G. You can advise the patient about limits placed on treatment by law enforcement.
   H. Contact Medical Control and advise of the situation.
   I. Document objectively and clearly.

Kelly Cox, M.D., SEMSV Medical Director

10/01; re: 9/03
reviewed: 3/05
CONFIDENTIALITY

I. Prehospital personnel and others functioning within the Quincy Area EMS System will maintain confidentiality regarding patients and patient care.

II. Information accorded to physicians and/or nurses at the receiving or Resource Hospital should be of a medical nature or pertinent to the care of the patient.

III. Information will be provided to law enforcement agencies or other governmental agencies as required by Illinois law.

IV. All records will be maintained in confidential files.

______________________________ 10/01
Kelly Cox, M.D., SEMSV Medical Director
reviewed: 3/05
QUINCY AREA EMS SYSTEM
Major EMS Incident / Multiple Casualty Protocol

I. Purpose: This policy shall serve as a guide to the overall responsibilities of EMS providers at the scene of a major EMS incident or disaster.

II. Definitions:

A. Major EMS Incident: can include both man-made and natural situations or disasters that could include but not be limited to:
1. An incident with multiple patients requiring more than two ambulances for transport.
2. An incident with special hazards such as chemical, biological, radiologic, nuclear or explosive (CBRNE).
3. A situation involving a difficult, prolonged rescue or extrication
4. A situation in which EMS prehospital and/or hospital resources are overloaded

B. Mass casualty incident / disaster: Generally ten or more victims, or an unstable (open) incident that could likely escalate into more casualties. This type of event would be expected to greatly tax local providers.

C. Incident command system (ICS): designed to control field response operations by establishing functional areas under the direction of the Incident Commander.

D. Incident Commander (IC): the person in overall control of the incident site. The person in charge may change, but the overall function does not.

E. Unified command: the incident command system can be utilized across multi-jurisdictional boundaries. Realize that in a disaster situation you may be instructed to report to a person other than your usual supervisor.

III. EMS Responsibilities

A. Incident commander: The senior EMT in the first responding unit can assume the role initially if incident command has not already been assumed by an authority having jurisdiction in the incident.
1. Duties include:
   a. Perform overall scene evaluation.
   b. Identify yourself to dispatch and declare a major EMS incident / disaster
      NOTE: Notify the local hospital(s) via MERCI or phone of the incident.
   c. Determine need for and request additional resources.
   d. Begin scene organization keeping in mind any potential hazards at the site.
      • Set up command post – may utilize the ambulance as a convenient initial command post
      • Designate a treatment area where all victims will be brought after triage while awaiting transport
      • Designate vehicle/crew/equipment staging area in an area that does not hamper entrance and egress from the disaster site.
   e. Determine a plan of action for the event
   f. Assigns EMS personnel to tasks
   g. Due to limited EMS resources, this person should consider transfer of command as soon as is feasible. This could be to an EMS person that is more experienced and/or a person with more advanced trained person or to the authority having jurisdiction from another agency.
B. Triage Officer: The person designated to oversee triage functions. The second senior EMT in the first responding unit will usually assume this role.
   1. Duties include:
      a. Perform primary triage to count the initial number of victims and severity.
      b. Provide numbers and severity information to the Incident Commander
      c. Make recommendations to the Incident Commander concerning additional resources needed
      d. Coordinate secondary triage in the treatment area until all patients are cleared from the scene

C. Medical Branch Officer: In a very large scale operation, this person is responsible for all EMS functions. Designated by the Incident Commander.

D. General responsibilities for other EMS providers responding to a disaster
   1. Response by personal vehicle
      a. Be prepared to show medical provider identification to law enforcement to be allowed on scene.
      b. Park personal vehicles in an area designated that will not hamper entrance and egress from the disaster site.
      c. Report to the command post or to other designated areas for further instructions.
   2. Response by emergency vehicle
      a. Check in and park emergency vehicles in designated staging areas.
      b. You may be instructed to turn off emergency lights if doing so will not cause a hazard to you and the vehicle.
      c. Report to the command post or to other designated areas for further instructions. You may be asked to remain with your vehicle.
   3. Response by aircraft
      a. Will land in designated landing areas.
      b. Staff will remain with the aircraft unless specifically instructed by the Incident Commander or designee.
   4. General duties of EMS providers
      a. Assist with primary and ongoing triage
      b. Assist with medical care on scene in the designated treatment area
      c. Provide emergency care during transport
      d. Provide emergency medical care to other personnel at the disaster site

IV. Declaration of a major EMS incident

A. Enroute declaration: any EMS unit dispatched to a situation with the potential as a major EMS incident can declare a possible major EMS incident or disaster while enroute to the scene. The senior crew member should verify as soon as possible once they have arrived on scene whether a major EMS does or does not exist and relay this information to dispatch.

B. On scene declaration: After arrival on scene the senior crew member determines in the scene size-up that a major EMS incident exists and makes the declaration.

C. Upon declaration:
   1. The senior crew member will notify dispatch and advise them to activate the disaster plan, giving them as many specifics as are available at the time. If possible, this will include:
      a. Disaster situation
      b. Estimated number of victims
      c. Location of the incident
d. Potential for escalation  
e. Requests for additional EMS units and other resources  
f. Specifies hazards noted that could impact responding units  

2. The senior crew member should also notify the local hospital(s) in order for the hospital to be prepared to receive patients.

V. Communications  

A. It should be noted that communications during a disaster is often a weak link due to overloading of radio frequencies.  

B. Communications between EMS providers/agencies should be conducted on MERCI radio frequency 155.340, by cell phone or on another specifically designated frequency.  

C. There should be no unnecessary radio traffic  

D. Patient report to the hospital: during transport communication should be through cell phone or MERCI and should be limited to the number of patients being transported in the vehicle, their severity based on the assigned METTAG color and estimated time of arrival to the Emergency Department. Do not attempt to give a full report as this may lead to overload of the communications system.

VI. Coordinating this policy with your county or local emergency medical disaster plan:  

A. The EMS Medical Director is responsible for medical oversight of EMS System personnel during routine and disaster operations.  

B. The Resource Hospital should be notified in the event of a disaster declaration in order for assistance with the overall EMS response to take place. Contact Blessing Hospital on the dedicated Medical Control phone line 217-224-7743 or on MERCI radio frequency 155.340. Advise of the type and location of the disaster and ask that the EMS System Coordinator be contacted.  

1. The EMS System Coordinator or designee will respond to the disaster site or to the Emergency Operations Center (EOC) if activated, to assist with overall EMS functions.

VII. EMS Disaster Resources  

A. Adams County Ambulance & EMS Mass Casualty Response Unit  

1. Contents: Disaster supplies sufficient for 50-100 patients including backboards. (There are fifty backboards on the trailer – if additional are needed be sure to specifically request.)  

2. Request by calling Quincy/Adams County 9-1-1 or request through your local 9-1-1 dispatch center to relay the request. Be prepared to provide the following information:  

a. Your name, agency and contact number  

b. Name of incident commander and radio frequency to use  

c. Type of disaster  

d. Location of disaster  

e. Time the incident occurred  

f. Route for entry to the staging area or location that the Incident Commander is requesting the trailer be located.  

g. Directions
B. Master list of all approved providers in the Quincy Area EMS System
   1. Can be utilized for request of additional providers to report to the scene
   2. Request by contacting the Resource Hospital at 217-224-7743 and detail type of provider needed. The Resource Hospital will contact the EMS System Coordinator or designee who will access this information.

C. Master list of all non-system ambulance providers (ambulance services that border the Quincy Area EMS System)
   1. Can be utilized for request of additional ambulance and/or providers to report to the scene
   2. Request by contacting the Resource Hospital at 217-224-7743 and detail type of provider needed. The Resource Hospital will contact the EMS System Coordinator or designee who will access this information.

D. Activation of State Emergency Medical Disaster Plan (see policy SEM OP-12a)
   1. Can be utilized for large scale request of additional equipment, supplies, p 2.
   Request by contacting the Resource Hospital at 217-224-7743 and detail type of provider needed. The Resource Hospital will contact the EMS System Coordinator or designee who will access this information.
QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

START TRIAGE - ADULT
Simple Triage and Rapid Treatment

I. Purpose: To clarify a simple, quick and effective way to triage numerous patient in a short period of time.

II. Procedure

A. Start where you stand and walk either clockwise or counterclockwise until the entire area has been triaged.

B. As you approach, identify the uninjured or “walking wounded”
   1. Move them out of danger or use them (until additional help has arrived)
      a) To control bleeding
      b) To maintain an airway

C. Proceed to the victims that cannot move.

   STEP I: Respiration’s (breathing)
   1. None, open airway, still no breathing, tag DECEASED
   2. Respiration’s greater than 30/min or less than 10/min, tag IMMEDIATE
   3. Respiration between 10-30/min, go on to Step 2

   STEP 2: Perfusion check (radial pulse) or use capillary refill test
   1. If color regains in greater than 2 seconds or no radial pulse, tag IMMEDIATE
   2. If color returns in less than 2 seconds or has a radial pulse, tag DELAYED
   3. If severe bleeding, apply a quick bandage “walking wounded” can assist
   4. Raise legs to return blood to heart if time permits

   STEP 3: Mental Status
   1. Altered mental status is in the ability to follow simple commands, tag IMMEDIATE
   2. Able to follow commands, tag DELAYED
   3. If victim is unconscious, tag as IMMEDIATE

NOTE: Some minor changes on pediatric START. See Pediatric Algorithm O11b.3

Kelly Cox, M.D., EMS Medical Director.

12/03, re: 1/04, 3/05
START TRIAGE
Simple Triage and Rapid Treatment

Walk out on own?

YES

GREEN TAG

NO

Breathing?

NO

Open Airway

YES

Breathing?

NO

BLACK TAG

YES

RED TAG

Resp > 30 OR < 10?

YES

RED TAG

NO

Radial Pulse?

NO

RED TAG

YES

Follow Commands?

NO

RED TAG

YES

YELLOW TAG
**PEDIATRIC START TRIAGE**

- **Able to Walk?**
  - **YES:** Minor → Secondary Triage
  - **NO:**
    - **Breathing?**
      - **NO:** Position Upper Airway → Breathing → Immediate
      - **YES:**
        - **APNEC:** PEDI → No Pulse
          - **APNEC:** DECEASED
          - **Breathing:** Immediate
        - **+ Pulse:**
          - **5 Rescue Breaths:** Immediate
    - **Respiratory Rate:** Immediate
      - **<15 OR >45 PEDI**
      - **Perfusion:** Immediate
        - **YES:** No palpable pulse PED
        - **Mental Status:** Immediate
          - **“P” Inappropriate Posturing or “U” (Pediatric)**
            - **“A”, “V” OR “P” (Appropriate) (Pediatric)** → Delayed

3/05
QUINCY AREA EMERGENCY MEDICAL SERVICE SYSTEM
DURABLE POWER OF ATTORNEY FOR HEALTH CARE

I. Patients with prolonged illness may invoke the right to choose a person to make health care decisions for them in the event that their mental functions become impaired.

II. A properly executed Durable Power of Attorney for Health Care is a legal document which formalizes the decision described in I.

III. EMS personnel should honor patient request expressed through a valid Durable Power of Attorney for Health Care. If a question arises regarding this issue, contact Medical Control for further direction.
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM

INFECTION CONTROL

I. HANDWASHING

A. All prehospital care personnel must wash their hands before and after contact with any patient regardless of the use of gloves. Utilize an anti-bacterial hand gel/cleaner between patients if handwashing facilities are unavailable.

B. Each aircraft should carry a 1:10 bleach solution pre-mixed daily or approved commercial cleaner for handwashing whenever there has been direct blood exposure to the skin.

II. NEEDLES AND SYRINGES

A. Needles must be disposed in a rigid puncture resistant container.

B. Needles should not be recapped, bent, or broken.

C. Needle cutting devices should not be used.

III. CLEANSING OF AMBULANCE AND EQUIPMENT

A. The aircraft and any equipment coming into contact with blood, body fluids or a patient with known or suspected infectious disease should be cleaned with a 1:10 bleach solution or an approved commercial cleaner.

B. Gloves should be used when cleaning any contaminated surface.

IV. SOILED CLOTHING

A. Linen soiled with blood or body fluids should be placed and transported in bags that prevent leakage.

V. MASKS

A. Masks should be worn whenever there is direct contact with patients that have transmissible respiratory disease (i.e., tuberculosis).

B. Masks should also be worn whenever there is the risk of blood or body fluids splashing onto mucous membranes.

VI. PROTECTIVE EYE WEAR

Use of glasses or goggles is recommended when there may be splattering of blood or body fluids.
VII. **GLOVES**

A. Gloves should be worn when there will be contact with blood or body fluids.

B. Open cuts or skin dermatitis on prehospital personnel should be covered with a sealed moisture proof covering.

VIII. **CARDIOPULMONARY RESUSCITATION**

A. Resuscitating masks with one-way valves should be carried on all ambulances.

B. No one should perform unprotected mouth to mouth resuscitation.

IX. **SIGNIFICANT EXPOSURE**

A. Each agency will have a policy in place which will provide guidelines for prehospital personnel who have had a significant exposure to infectious materials.

B. List of potentially infectious diseases (most common)
   1. Human Immunodeficiency Diseases
   2. Hepatitis
   3. Tuberculosis
   4. Meningitis
   5. chicken Pox
   6. Measles
   7. Mumps
   8. Rubella
   9. Antibiotic resistant infections (MRSA, VRE)
PHYSICIAN AT THE OPERATIONAL CONTROL POINT

I. An operations control point for a Medical Emergency Communications of Illinois (MERCI) VHF/UHF base station with telemetry receiving and monitoring shall be maintained by the Resource Hospital.

II. The ECRN at the resource hospital will call the EMS Medical Director or a designated physician to the operational control point (radio) whenever:

   A. A decision regarding where a patient is to be transported needs to be made by the resource hospital. (see policy SEM-OP-3)

   B. Intervention by the resource hospital is indicated. (see policy SEM-OP-4)

   C. A major EMS incident is declared.

   D. When a Quincy ALS unit is requesting permission to respond to a second and simultaneous dual response.

   E. When an ALS crew is requesting an infield service level downgrade.

III. The ECRN at the Resource or Associate hospital will call the EMS Medical Director or a designated physician to the operational control point (radio) whenever:

   A. A patient is reported to have no blood pressure, no pulse, and no spontaneous respirations.

   B. Orders are requested by prehospital personnel that are inconsistent with system policy and procedure.

   C. A physician is at the scene requesting medical responsibility for a patient. (see policy SEM-OP-2)

   D. A patient refusing care is incapable of making a rational or informed decision to refuse

   E. A major EMS incident is declared. (see policy SEM-OP-11)

   F. Treatment/refusal by a minor (SEM-OP-5 and SEM-OP-6)
I. SEM-OP-15.1 QUINCY AREA EMS SYSTEM POLICY AND PROCEDURE TRAUMA TRIAGE CRITERIA

* Sustained Hypotension - BP ≤ 90 Systolic (Peds ≤ 80 Systolic) on Two Consecutive Measurements Five Minutes Apart
* Cavity Penetration of Torso or Neck

**CATEGORY I**
Blunt or Penetrating Trauma with Unstable Vital Signs and/or:
- Hemodynamic compromise as evidenced by:
  - BP ≤ 90 systolic
  - (Peds - BP ≤ 80 systolic)
- Respiratory compromise as evidenced by:
  - Respiratory rate < 10 or > 29
- Altered mentation as evidenced by:
  - Glasgow Coma Scale ≤10

Anatomical Injury
- Penetrating injury of head, neck, torso, groin
- Two or more body regions with potential life or limb threat
- Combination trauma with ≥ 20% TBSA burn
- Amputation above wrist or ankle
- Limb paralysis and/or sensory deficit above the wrist and ankle
- Flail chest

**NO**

**CATEGORY II**
Mechanism of Injury
- Ejection from motor vehicle
- Death in same passenger compartment
- Falls > 20 feet (Peds - falls ≥ three time body length of child)
- Pregnancy ≥ 24 weeks

**NO**

Mandatory Notification of the Trauma Surgeon From the Field

**YES**

• Initiate Field Trauma Treatment Protocols
• Rapid Transport to Trauma Center (1)

**NO**

(1) > 25 minutes from Trauma Center, transport to nearest participating trauma hospital.
> 30 minutes from Trauma Center or participating trauma hospital, transport to nearest hospital
> 45 minutes from Trauma Center or participating trauma hospital in a rural area where there is no comprehensive emergency department available, transport to nearest hospital.
Trauma Triage Criteria (continued)

II. Unless delayed by extrication or other mitigating circumstances, the goal is to have a total on-scene time of under 10 minutes. (See Policy SEM OP-16)
QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

TRAUMA LOAD AND GO

I. Certain signs/symptoms require the trauma patient to be immediately loaded onto a spine board, transferred to the SEMSV, and transported rapidly. Non life-saving procedures (such as splinting and bandaging) may be needed but should be done during transport. Life-saving procedures must not delay transport. The following are critical situations that require “load and go”

A. Cardiac/respiratory arrest
B. Obstructed airway
C. Decreased level of consciousness
D. Respiratory difficulty
E. Signs of shock
F. Injuries that will rapidly lead to shock or respiratory difficulty:
   * flail chest
   * open pneumothorax
   * tender abdomen
   * unstable pelvis
   * bilateral femur fractures
   * poorly controlled major bleeding

II. Unless delayed by extrication or other mitigating circumstances, the goal is to have a total on-scene time of 10 minutes or less.

A. The following procedures are appropriate to provide on scene in a load and go situation.
   1. Airway management
   2. Oxygen
   3. Stabilize flail chest
   4. Seal open pneumothorax
   5. Needle chest decompression
   6. Stabilize impaled objects
   7. Spinal immobilization
   8. Control major bleeding

B. All other procedures including IV therapy, splints, bandaging should be performed enroute unless the patient is entrapped and the procedures can be done during extrication.

Kelly Cox, M.D., SEMSV Medical Director

10/01; re: 9/03
reviewed 3/05
DISTRIBUTION OF THE EMS SYSTEM MANUALS

I. PURPOSE:

A copy of the EMS System and/or SEMSV manual will be distributed to each EMS System agency to ensure that they and their employees have an up to date resource for system policies, procedures, and protocols. The manual will include the following sections:

A. Operational Policies
B. Communications
C. Problem Solving
D. Approved Procedures
E. Medications
F. Medical Protocols
G. Continuing Education and Training
H. Personnel
I. Quality Assurance

II. Those EMS System participants not affiliated with a specific system agency will be provided with a copy of the EMS System manual upon their request. There will be a charge of $30 for the manual.

III. EMS System Amendments

A. Upon revision of any portion of the EMS System Plan, participants will be notified by inservice or memorandum.
   1. Inservices regarding policy/protocol changes will be approved by the Resource Hospital and will include all providers in the system.
   2. Minor revisions of the EMS system plan will be distributed to all providers in the form of a memorandum or letter.

KELLY COX, M.D., SEMSV Medical Director

10/01; re: 9/03
reviewed: 3/05
I. EMS Resource Center:

A. Location
1. An audiovisual library containing EMS resources is located in the Blessing Hospital EMS Department.

B. Loan of Materials
1. Students and system participants may utilize materials in the resource center upon availability.
2. Equipment loans will be for no longer than three days or per agreement with the Director of Emergency Medical Services.
3. Videotape, audiotape, periodical or book loans will be for one week or per agreement with the Director of Emergency Medical Services.
4. The borrower is responsible for loaned items and will be billed for the replacement value or repair of any item lost, stolen or damaged while in their possession.
5. Failure to return loaned materials on time may result in refusal of future requests.

II. EMS System Activities/Regional Activities

A. Participants in the EMS System will be notified of activities in the following manner:
1. letter/memorandum
2. announcement at inservices
3. postings on bulletin board in the EMS Department
I. The Quincy Area EMS System providers will perform all services deemed necessary during an emergency ambulance call without regard to color, race, religion, national origin, sex, ancestry, or age. (See SEM-PS-2)

______________________________________

Kelly Cox, M.D., SEMSV Medical Director           reviewed: 3/05
AIR AMBULANCE UTILIZATION PROTOCOL

I. Purpose:
To assure a mechanism for ground ambulance crews and First Responders to request a scene response by a helicopter air ambulance when specific criteria exist.

II. Criteria:
A. Category I trauma or seriously ill patient in remote or off-road locations not easily accessible to ground ambulances, or whose location may cause delay in transport time.
B. MVC or incident with prolonged extrication time anticipated (> 20 minutes).
C. Special environmental conditions such as extreme heat or cold which affect potential patient outcome or prohibit ground access to the hospital (road or bridge damage).
D. No available trauma center within 20 minutes by ground transport time.
E. Reduction in transport time to a trauma center compared to ground transport for the seriously injured patient
F. Ground transport resources are exhausted or exceeded (multi-casualty or multiple calls). (See Policy O-11)

III. Procedure:
A. Determination of need.
1. When dispatch information indicates existence of any of the previous criteria, the responder will initiate helicopter response.
2. When preliminary information or mechanism of injury indicates any possibility that helicopter transport may be indicated, the air ambulance should be immediately placed on standby.
3. After arrival at the scene and a full patient assessment by the ambulance crew, air ambulance should be notified whether their response is indicated or if they may be canceled.

IV. Patient Preparation
A. Treat injuries/illnesses per protocol.
B. Utilize full spinal immobilization for trauma patients.
C. Package all patients for transport on a long spine board.
D. Secure all loose objects.
E. Provide a concise report to the helicopter crew.
V. Landing Zone Criteria

A. Landing zone designation and preparation will usually be the responsibility of the responding fire department. If time permits, it is advisable to evaluate the landing zone yourself for safety.

B. General
   1. Solid, fairly flat surface
   2. Free of potentially loose debris
   3. Free of obstacles such as trees, power/telephone/light poles, wires, vehicles, animals or people
   4. Should be located approximately 100 yards from the scene.

C. Dimensions:
   1. Daylight: 80X80 foot area
   2. Night: 100X100 foot area
I. Prehospital personnel are expected to conduct interaction with patients and colleagues in a manner consistent with the EMT Code of Ethics. Failure to do so could result in suspension from the System (See SEM-PS-2)
I. The EMS System Coordinator or designee will distribute information regarding available grants to all agencies participating in the system after being made aware that these funds are available.

II. Any agency receiving grant funds will be responsible for reporting to Illinois Department Public Health every 6 months regarding fund status (if requested). Such agencies will also submit a final report consisting of a financial report and brief narrative describing the completed project (if requested).

Kelly Cox, M.D., SEMSV Medical Director
I. **Purpose**: Natural and technological crises may place an intense demand on EMS and emergency department resources. The potential exists for these crises to occur or evolve without adequate warning or notification and to overload the resources of the EMS System. Recognition of an impending or active System-wide crisis will better prepare hospitals and ambulance providers within the System to handle the situation.

   A. Examples of possible System-wide crises:
      1. Heat emergency
      2. Communicable disease
      3. Influenza epidemic
      4. Terrorist act involving a nuclear, biological or chemical agent

II. **Recognition**: Upon recognition of a potential evolving trend or influx of patients with similar signs and symptoms, the Resource Hospital should be notified. Utilize the System-wide crisis worksheet (O 23-F-1).

   A. Dispatch agencies may note an unusual increase in the number of calls in one area with patients complaining of similar signs and symptoms
   B. Ambulance providers may see an unusual increase in calls with patients complaining of similar signs and symptoms
   C. Participating/Associate hospitals may see an unusual increase of patients with similar symptoms

III. **Notification**

   A. The Resource Hospital emergency department shall document any notification received from dispatch agencies, hospitals, or ambulance providers within the System of recognition of a potential evolving trend/potential crisis. Forward all notifications to the EMS System Coordinator, Blessing EMS Department.
      1. If the Resource Hospital receives more than one notification of the same evolving trend/potential crisis, the EMS Medical Director will be notified of the situation.
      2. The EMS System Coordinator or EMS Medical Director will then:
         a) Check with other agencies in the area to determine if they are also seeing an increase in patients with similar symptoms
         b) Contact the Illinois Poison Control Center if feasible to see if they are receiving additional calls for similar type problems
         c) Contact the local health department medical director for further information
      3. If there appears to be a definite trend, either prehospital or hospital, the EMS System Coordinator or EMS Medical Director will page the Emergency Officer for the Illinois Department of Public Health at 1-800-782-7860.
IV. Plan of Action

A. Once notified that there may be a potential for increased utilization of resources, the EMS System Coordinator will contact dispatch agencies, System hospitals and local ambulance providers to inform them of the situation.

B. Dispatch agencies will be notified to closely monitor ambulance response and transport times and report increases to the EMS System Coordinator.

C. The EMS System Coordinator will request that each hospital take steps to avoid ambulance diversion and alert them to the possible need to mobilize additional staff, resources or activate their internal disaster plan. Any diversions must meet the criteria found in System Bypass Policy O-24.

D. If ambulance response and transport times become excessive due to an increase in calls or due to a hospital being on bypass, the Chief of EMS at Illinois Department Public Health will be contacted. The Chief of EMS will assist in contacting emergency department charge nurses and senior administrators of System hospitals to advise them to activate internal disaster plans so that they may rapidly come off bypass. They will be given a specific time frame in which to accomplish this.

E. During an impending or actual System-wide crisis, the local municipality may request mutual aid through pre-existing agreements from the surrounding areas.

F. All information should be documented by the EMS System Coordinator or designee on the “System-Wide Crisis Form” (O 23 F1) developed by the Illinois Department of Public Health.

V. All Clear

A. The Director of Public Health or his designee will contact the Resource Hospital when the response to the crisis appears to be over.

B. The EMS System Coordinator will then contact dispatch agencies, ambulance providers and hospitals within the System to advise same.

10/01, 3/05

Kelly Cox, M.D
SEMSV Medical Director
EMS PROVIDER/ASSOCIATE & PARTICIPATING HOSPITAL
WORK SHEET
SYSTEM-WIDE CRISIS

Name of Hospital/Provider          Date         Time

Name of Person Reporting

HOSPITALS ONLY

Number of Patients with Same/Like Symptoms Seen in Last Six (6) Hours

PROVIDERS ONLY

Number of Patients Transported to Emergency Departments by All ambulances in Our Service with Same/Like Symptoms

Any Increase in Response Time

☐ Yes  ☐ No

HOSPITALS AND PROVIDERS

Common Like Complaints by Patients: 

ANY OTHER PERTINENT INFORMATION: 

EMS PROVIDER/ASSOCIATE & PARTICIPATING HOSPITAL
WORK SHEET
SYSTEM-WIDE CRISIS (CONTINUED)

Resource Hospital Contacted

☐ Yes  ☐ No

Person Contacted at Resource Hospital:

Name  Title

How was Information Reported?

☐ Phone  ☐ Fax

☐ Page  ☐ Dedicated Phone Line

☐ Person to Person  ☐ Other

Names/Organizations and/or Titles of Other Persons Contacted:

____________________________________________________________

____________________________________________________________

____________________________________________________________

____________________________________________________________

____________________________________________________________
QUINCY AREA EMERGENCY MEDICAL SERVICES SYSTEM

SYSTEM BYPASS POLICY

I. General Bypass Rules apply to all Quincy Area EMS System hospitals).

A. The hospital shall notify the Illinois Department of Public Health, Division of Emergency Medical Services, during the next business day following any bypass or resource limitation decision. This notification can be faxed. Utilize Form O 24-F.
   1. Fax to: Illinois Department of Public Health at 217-524-0966
   2. Include the following information:
      a) Name of facility
      b) Date and time of bypass decision
      c) Name of person making the bypass decision
      d) Reason for the bypass decision

B. The receiving hospital may direct bypass when current resources are limited for the following conditions:
   1. There are no critical or monitored beds available in the hospital.
   2. An internal disaster has occurred, including but not limited to a power failure.
   3. Staffing is seriously insufficient after attempts have been made to call in additional staff (in accordance with your facility policy).
   4. For trauma centers, see additional reasons for bypass in Section II.C.

II. Trauma Bypass: Blessing Hospital as a Level II Trauma Center will provide Trauma Services in compliance with the rules and regulations of the Illinois Trauma Center Code. With respect to a Trauma Bypass Policy, the following shall apply:

A. When known, the patient choice of hospital is to be honored with the following exceptions:
   1. When the patient is unresponsive, or when the patient’s condition does not allow him to make an informed decision and there is no family patient physician or agent with durable power of attorney for health care present to make his desires known.
   2. When the medical benefits to the patient reasonably expected from the provision of appropriate medical treatment at a more distant facility outweigh the increased risks to the patient from the transport to the more distance facility or trauma center.
   3. When there is a life-threatening condition, a patient may be transported to the closest facility whether or not that facility is on bypass status.
   4. When the patients choice is neither a trauma center or the closest hospital.
   5. When the patients choice of hospital would require the ambulance to travel an unreasonable distance from its primary coverage area.

B. The trauma hospital/medical control hospital must be consulted when A: 1,2,3,4,5, above exists. The ambulance crew will contact the hospital and after field assessment is given, the Emergency Department physician will evaluate and decide the disposition of the patient.
C. The receiving facility may direct bypass when current resources are limited for the following conditions:
   1. An internal disaster occurs in the hospital.
   2. There are no critical or monitored beds available in the hospital.
   3. All staffed operating suites are in use of fully implemented with on-call teams, and at least one or more of the procedures is an operative case.
   4. The CAT scan is not working.

D. Bypass status may not be honored if three or more hospital in the geographic areas are on bypass status and transport time by ambulance to the nearest facility exceeds fifteen (15) minutes.

E. Bypass may only be initiated if the receiving hospital emergency physician certifies that transport to the farthest hospital would not be detrimental to the patient.

F. Category I trauma patients should be transported to the nearest trauma center if one is within twenty-five (25) minutes transport time from the scene.
State of Illinois
Department of Public Health
Division of Emergency Medical Services
Bypass Notification Form

__________________________
Name of Hospital

__________________________
Resource

__________________________
Associate

__________________________
Participating

__________________________
City

Bypass Decision Authorized by: ____________________________________________

Name and Title

Time of Bypass: ________________ Date of Bypass: ________________

Area Hospital(s) Notified: Yes _____ No _____

Area Fire and/or Private Ambulance Notified: Yes _____ No _____

If Participating or Associate Hospital, has Resource Hospital been notified: Yes _____ No _____

Reason for Bypass:
   a) No critical or monitored beds available in hospital, including ED
      Yes _____ No _____
      If yes, record the total number of institution’s monitor capability,
      including monitored beds and portable monitors ____, and the
      Total number in use ______.
   b) Internal/External Disaster Yes _____ No _____

For Trauma Centers ONLY
   a) No OR available Yes _____ No _____
   b) CT scan down Yes _____ No _____
   c) General bypass criteria (above) Yes _________ No _____

Cancellation: Date ____________ Time _______________

IDPH Notified: Yes _____ No _____ How notified:

___________ Pager ___________ Phone __________ Fax

Fax form to IDPH EMS within 24 hours of start of bypass (217/524-0966)
I. General

A. In general, EMS providers should remain uphill, upwind, upstream and up-grade of a hazardous materials incident. You should follow instructions of the Incident Commander regarding staging and treatment areas.

B. Individuals who respond to and function within the Hot Zone and Warm Zone must be members of specifically trained HazMat teams, trained in the use of self-contained breathing apparatus, selection of appropriate chemical protective suits and how to function in these suits.

C. Other EMS providers should be trained in HazMat Awareness in accordance with Federal OSHA standards identified in OSHA 29 CFR 1910.120.

II. Definitions

A. Hot Zone (also known as the Exclusion Zone): is the area immediately around the spill or contamination.

B. Warm Zone: the area between the Hot Zone and the Cold Zone. This area often includes a holding area for patients awaiting decontamination and the actual decontamination area.

C. Cold Zone (also known as the Support Area): a clean area outside the contaminated areas. This is a safe area for EMS personnel to receive and begin treatment of contaminated patients. Secondary exposure to hazardous materials is not expected in this area and specialized suits are not required.

III. EMS Interface with HazMat teams

A. Unified command: in a hazardous materials incident EMS providers and agencies will operate within the unified command structure under the authority having jurisdiction. Due to limited HazMat training, EMS will not usually maintain overall command of the incident.

B. In the event of multiple casualties, a designated Medical Branch Supervisor may be designated to oversee EMS operations. This should be the senior EMS crew member on site.

C. EMS will operate in the designated Cold Zone to receive patients after decontamination and to provide treatment/transport.

D. EMS will relay information regarding the type of chemical and exposure (ingestion, absorption through skin etc.) to Medical Control as soon as that information has been relayed to them from Incident Command.

E. Medical Control can make recommendations regarding patient treatment based upon the exposure.

F. The Bioterrorism Treatment Guidelines booklet supplied by IDPH may be helpful in the treatment or determination of exposure during an event.

G. The Emergency Response Guidebook may be helpful in the treatment or determination of the chemical and exposure.
IV. Patient management

A. Contact Medical Control early in the incident for treatment regarding specific exposures.

B. If a nerve agent or other WMD agent is suspected, follow policy SEM OP-26 Nerve Gas Auto-Injector Guidelines.

C. Follow the major EMS incident plan, policy O-12 if appropriate.

_________________________
Kelly Cox, M.D.
SEMSV Medical Director
STATE OF ILLINOIS
NERVE GAS AUTO-INJECTOR GUIDELINES

I. Purpose
A. To provide Illinois EMS agencies with guidelines on the appropriate use of Mark I kits.
B. The Mark I kit contains antidotes to be used in instances of exposure to nerve agents such as Sarin, Soman, Tabun, VS or to organophosphate agents such as Lorsban, Cygon, Delnavmalathion, Supracide parathion and carbopenthion.

II. Equipment
A. Each Mark-I kit consists of two auto-injectors:
   1. atropine sulfate 2 mg in 0.7 mL
   2. pralidoxime chloride (2PAM) 600 mg in 2 mL

III. Key provisions
B. Only those licensed EMS providers governed by the State of Illinois EMS Act (210 ILCS 50/) are authorized by an EMS Medical Director to utilize the specialized equipment and medications needed in Weapons of Mass destruction (WMD) incidents including the Mark I auto-injectors.
   1. When appropriate conditions warrant, contact medical control.
   2. Other organized response teams not governed by the EMS Act may use the Mark I auto-injectors on themselves or other team members when acting under the Illinois Emergency Management Agency Act. (20 ILCS 3305)

IV. How to Access/Request Mark I Kits
A. MABAS
   1. Contact local dispatch and request the local fire department contact MABAS for kits available in our region.
B. IDPH
   1. Contact Medical Control by MERCI or phone and request CHEM PACKS
   2. Medical Control will contact EMS System Coordinator and a request through EMA will be initiated.

V. Guidelines
A. The guidelines for the use of Mark I kits were developed by the EMS Committee of the Illinois College of Emergency Physicians (ICEP). They were then adopted by the Illinois Department of Public Health, the Illinois Terrorism Task Force, Illinois Medical Directors and Mutual Aid Box Alarm System (MABAS) to provide guidance to EMS providers.
B. There are ten provisions in the guidelines:
   1. To utilize these kits you must be an EMS agency or EMS provider within an Illinois EMS System and participate within an EMS disaster preparedness plan.
   2. The decision to utilize the Mark I antidote kit is authorized by following this State protocol.
   3. You must be an Illinois First Responder or EMT at any level with additional training in the use of the auto-injector.
4. The kit is not used for prophylaxis. It is an antidote, not a preventive device. The Mark I kit can be self-administered if you are exposed and become symptomatic. After self-administration you should exit immediately to the Safe Zone for further medical attention.
5. Use of the Mark I kit is based on signs and symptoms of the patient. The suspicious or identified presence of a nerve agent is not sufficient reason to administer these medications.
6. Atropine sulfate may be administered IV/IM in situations where Mark I kits are not available.
7. Auto-injectors are NOT to be used on children under 88 pounds (40 kilograms). Pediatric Mark I injectors are currently under review by the FDA.
8. If available, a paramedic or prehospital RN may administer diazepam (Valium) cautiously if seizures are not controlled by the antidote.
9. If the nerve agent was ingested, exposure may continue for some time due to slow absorption from the lower bowel. Fatal relapses have been reported after initial improvement. Continued monitoring and transport is required.
10. If dermal exposure has occurred, decontamination is critical and should be done with standard decontamination procedures. Continued monitoring and transport is required.

VI. Personal protection

A. The first priority when encountering a potential nerve agent victim is self protection.

B. Personal protective equipment (PPE) and decontamination are key elements in the successful management of exposed casualties.

C. All persons entering a HOT Zone or working a decontamination station must wear full protective ensembles including full body and respiratory protection. Persons operating in these zones must be trained in the use of self contained breathing apparatus, selection of appropriate chemical protective suits and how to function in these suits.

D. Do not cross contaminate yourself when handling patients in triage, treatment and staging areas or if you have begun treatment in the Hot Zone.

VII. Pre-hospital management

A. Prehospital management for nerve agent or organophosphate poisoning is a two pronged attack focusing on countering the poison with antidotes and preventing death by supporting respirations and controlling seizures.

1. The primary cause of death from these agents is respiratory failure; therefore aggressive airway control and ventilation are top priorities.
2. With antidotal therapy, spontaneous respirations should resume within a short period of time.

B. Notify receiving hospitals prior to transport so they can prepare the facility for your arrival and also consider activating local mass casualty protocols.
### RECOGNITION OF EXPOSURE

1) Signs and symptoms consistent with exposure to nerve or organophosphate agents = mnemonic SLUDGE BAM:
   - Salivation = excessive production of saliva
   - Lacrimation = excessive tearing of the eyes
   - Urination = uncontrolled urine production
   - Defecation = uncontrolled bowel movements
   - Gastrointestinal distress (cramps)
   - Emesis = excessive vomiting
   - Breathing difficulty / respiratory failure
   - Arrhythmias = irregular heart beat or cardiac abnormalities
   - Myosis = pinpoint pupils
   - Other neuromuscular and CNS effects: twitching, weakness, paralysis, seizures, confusion, slurred speech

2) Determining severity of exposure
   - Severe exposure: unconscious, cyanosis, seizures
   - Moderate exposure: vomiting, drooling, pinpoint pupils
   - Mild exposure: short of breath, wheezing, runny nose

<table>
<thead>
<tr>
<th>EXPOSURE</th>
<th>CLINICAL FINDINGS</th>
<th>TREATMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unknown – possibly not exposed</td>
<td>No clinical signs/symptoms</td>
<td>Removal of patient to the Cold Zone, decontamination, observation &amp; transport</td>
</tr>
<tr>
<td>Mild exposure</td>
<td>Short of breath, wheezing, runny nose</td>
<td>- Administer one Mark I kit or Atropine 2-4 mg IM/IV AND 2 PAM 600-1200 mg IM or 1 gram IV</td>
</tr>
<tr>
<td>Moderate exposure</td>
<td>Vomiting, diarrhea, drooling, pinpoint pupils</td>
<td>- Administer one-two Mark I kits or Atropine 2-4 mg IM/IV AND 2PAM 600-1200 mg IM or 1 gram IV</td>
</tr>
<tr>
<td>Severe exposure</td>
<td>Unconsciousness, paralysis, cyanosis, seizures</td>
<td>- Administer three Mark I kits in rapid succession (stacked) OR Atropine 6 mg IM/IV AND 2 PAM 1800 mg IM or 1 gram IV repeated twice at hourly intervals. Valium per Medical Control for seizures</td>
</tr>
</tbody>
</table>

IF SYMPTOMS RESOLVE, CONTINUE TO MONITOR THE PATIENT AND TRANSPORT.
IX. Procedure

A. Only those persons specifically trained and equipped with the appropriate personal protective equipment should enter the Warm or Hot Zones. (see policy –SEM-OP-25 Hazardous Materials Incidents-EMS Response)

B. Injection site selection: the injection site is normally in the outer thigh muscle. If the individual is very thin, the injection can be administered into the upper outer quadrant of the buttocks. See below.

C. Arming the auto-injector
   1. With your non-dominant hand, hold the auto-injector by the plastic clip so that the larger auto-injector is on top. Position at eye level.
   2. With your dominant hand, grasp the atropine auto-injector (the smaller of the two) with your thumb and first two fingers.
   3. Do NOT cover or hold the needle end with your hand, thumb or fingers – you might accidentally inject yourself.
   4. Pull the auto-injector out of the clip with a smooth motion. It is now armed and ready to administer.

D. Self-administration (You should immediately self-administer the nerve gas antidote if you experience any or all of the nerve agent poisoning symptoms).
   1. Hold the auto-injector with your thumb and two fingers (pencil writing position). Be careful not to inject your self in the hand as this will NOT administer an effective dose.
   2. Position the green (needle) end of the injector against your thigh.
   3. Apply firm even pressure to the injector until it pushes the needle into your thigh.
   4. Hold the injector in place for at least 10 seconds.
   5. Carefully remove the auto-injector from the injection site.
   6. Pull the 2PAM auto injector (the larger of the two) out of the clip
   7. Now inject yourself in the same manner as above holding the black (needle) end against your outer thigh.
   8. Wait 5-10 minutes, during which decontamination procedures should be started.

E. Administration to a patient in the Hot Zone
   1. Squat – do NOT kneel next to the patient. (kneeling can force the chemical agent through your protective clothing).
   2. Apply a mask to the patient
   3. Position the patient on his side
   4. Administer the Mark I kit as above in the self-administration section.
   5. Mark, label or tag the patient in such a way that rescuers in the Warm Zone or triage areas can identify that medication has been administered.
Local System Review Board .......................................................... SEM-PS-1
Local System Review Board Members ............................................. SEM PS-1.3
Suspension ...................................................................................... SEM-PS-2
Problem Solving ............................................................................. SEM-PS-3
Event Form ...................................................................................... SEM-PS-3.F
Suspected Chemical Abuse on Duty .................................................. SEM-PS-4
Appeal of the Local System Review Board Decision .......................... SEM-PS-5
Disciplinary Action Form ................................................................. SEM-PS-6
Notice of Corrective Action/Record of Disciplinary Action ............... SEM-PS-6-F
Filing a Complaint with IDPH Central Complaint Registry .............. SEM-PS-7
I. Purpose: The Resource Hospital shall designate a Local System Review Board for the purpose of reviewing a decision of the SEMSV Medical Director to suspend an individual, individual provider or participant from participation in the Quincy Area EMS System.

II. Local System Review Board Members

A. The Board will consist of three members

B. Board Make-up
   1. One Emergency Department physician with knowledge of EMS
   2. One EMT
   3. One person of the same professional category as the suspended individual, individual provider or participant requesting the hearing.

C. Board Selection
   1. The System Review Board list shall consist of six persons in each provider category, selected at random from system agencies.
   2. The System Review Board list shall be reviewed annually and will be posted in the Resource Hospital Emergency Department.
   3. Upon request for a Local System Review Board Hearing, the SEMSV Medical Director will select the three persons to make up the review board as indicated in II.B. from the System Review Board List.

III. Procedure to Request Hearing

A. Within 15 days of a suspension notice, the suspended participant may request a hearing from the SEMSV Medical Director in writing via certified mail.

B. The SEMSV Medical Director will schedule the Board to meet within 21 days after receipt of the written request.

C. The SEMSV Medical Director shall arrange for a certified shorthand reporter to make a stenographic record of that hearing and thereafter prepare a transcript of the proceedings. The transcript, all documents or materials received as evidence during the hearing, and the Local System Review Board’s written decision shall be retained in the custody of the EMS System.

D. The Board shall review and consider any testimony and documentation related to the issue offered by either party.

E. The Board shall state in writing to the SEMSV Medical Director its decision to affirm, reverse, or modify the suspension. The subject of the hearing shall also be given a copy of the written decision within 5 business days after the conclusion of the hearing.
F. The suspension shall commence when:
  1. The provider has waived the opportunity for a hearing before the Local Review Board. Failure to request a hearing within 15 days shall constitute a waiver to the right to a Local System Review Board Hearing.
     OR
  2. The suspension order has been affirm by or modified by the local board and the provider has waived the opportunity for review by the State Board.
     OR
  3. the suspension order has been affirmed or modified by the State Board.

G. The SEMSV Medical Director shall notify in writing, within five (5) business days after the Board’s decision to either uphold, modify, or reverse the SEMSV Medical Director’s suspension of an individual, individual provider or participant. The notice shall include a statement detailing the duration and grounds for the suspension.

IV. Immediate Suspensions (prior to due process)

  A. An immediate suspension order may be issued when the SEMSV Medical Director finds that the individual, individual provider, or other participants continued practice would cause imminent harm to patients.

  B. The suspended party will be issued immediate verbal notification followed by a written suspension order including duration, terms and basis for suspension.

  C. Within 24 hours following commencement of the suspension, the SEMSV Medical Director will deliver to the Department by messenger or telefax, a copy of the suspension order and written materials related to the suspension.

  D. The SEMSV Medical Director must inform the suspended party that within 24 hours following the suspension they may deliver to the Department by messenger or telefax, a written response to the suspension order and written material related to the response.

  E. The SEMSV Medical Director will be notified by the Department within 24 hours following receipt of the suspension order or the suspended parties written response. The SEMSV Medical Director must inform the provider or EMT immediately upon receipt of this determination.
I. Names and Categories of System Review Board Members. This list will be updated yearly and posted in Blessing Emergency Department

**EMT**
- Aaron Feagain
- Darin Estes
- Mike Gretzinger
- Erica Gulledge
- Les Heffner
- Carlos Hill

**PREHOSPITAL RN**
- Ashley Castro
- Sandy Dyer
- Christopher Foster
- Samantha McCarty
- Alisa Potts
- Lucinda Spencer

**EMERGENCY ROOM PHYSICIAN**
- Dr. James Shumake
- Dr. Edward Goetten
- Dr. Chris Solaro
- Dr. Antony Wollaston
- Dr. Richard Saalborn
- Dr. Mark Schaadt

**FLIGHT RN**
- Lisa Howell
- Eric Bean
- Debra Ertl
- Tracy Karnes
- Kristina Lorenzini
- Aaron Straube
SUSPENSION

I. The SEMSV Medical Director may suspend from participation within the system any individual or individual provider within the system.

II. Any such suspension may be based on one or more of the following:

A. Failure to meet the educational and training requirements of the State or by the EMS Medical Director.

B. Violation of the EMS act or any rule promulgated under it.

C. Failure to maintain proficiency in the provision of basic or advanced life support services.

D. Failure to comply with System Policies and Procedures.

E. Intoxication or personal misuse of any drugs or the use of intoxicating liquors, narcotics, controlled substances, or other drugs or stimulants in such manner as to adversely affect the delivery, performance, or activities in the care of patients.

F. Falsification of any reports or orders, or making misrepresentations involving patient care.

G. Abandoning or neglecting a patient requiring emergency care.

H. Unauthorized use or removal of narcotics, drugs, supplies or equipment from any ambulance, health care facility, institution, or other workplace location.

I. Performing or attempting emergency care, techniques or procedures without proper permission, certification, training, or suspension.

J. Discriminating in rendering care due to race, sex, creed, religion, national origin or ability to pay.

K. Medical misconduct or incompetence.

L. Physical impairment to the extent that emergency care and life support functions for which the provider is certified, cannot be physically performed.

M. Mental impairment to the extent that the appropriate judgment, skill and safety required for performing the emergency care and life support functions for which the provider is certified cannot be exercised.

N. The SEMSV Medical Director believes that the continuation in practice by the provider would constitute an imminent danger to the public.

O. Committing a felony act while on or off duty.
I. Reporting and documentation requirements:

   The use of an event report form is mandatory in the Quincy Area EMS System. This form shall be used to report any unusual occurrence or deviation from accepted standard of care. This form shall serve the following functions:

   A. Improving the management and treatment of patients in the system
   B. Inservice education of personnel
   C. Administrative supervision
   D. Medico-legal coverage

II. The event report form shall be filled out by the individual who observed or who was involved in the event. The form will be filled out as completely as possible using wording carefully chosen to avoid implication of blame and retribution. The facts of the event shall be carefully stated with no conclusions drawn.

III. The event form shall be completed and sent (in a timely manner) to the Quincy Area EMS System Coordinator and to the individual supervisor
QUINCY AREA EMS SYSTEM
SEMSV POLICY AND PROCEDURE

EVENT REPORT

DATE: _______________ REPORTER:__________________________________________

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Event reports should be completed when any of the following occur:

1. deviation from policy and procedure including medical protocol of the Quincy Area EMS System
2. violation of any rule or regulation of the Illinois Department of Public Health or state statute, (i.e., Illinois EMS Act)
3. equipment problems that have or may affect patient care.
4. interagency personnel conflicts
5. instances in which the system did not work (inadequacy of policy and procedure as well as medical protocol)
6. complaints in general

In narrative form, relate the details of the event including the details leading up to the event, i.e., who, what, where, when, why. Be as objective as possible giving only factual information. Do not include personal opinion or conjecture.

Kelly Cox, MD, SEMSV Medical Director

11/01

re: 9/10
I. Reporting suspected intoxication/personal misuse of drugs
   A. When to report
      1. You observed the provider misusing an intoxicating substance
      2. You observe behaviors/signs/symptoms that you believe the provider is under the
         influence of an intoxicating substance.
      3. The provider is scheduled on duty, either paid or volunteer.
   B. How to report
      1. Contact the Resource Hospital ER physician and provide information.
      2. Follow up with an Event Report to the EMS Department within 24 hours.

II. Physical Exam/Labwork.
   A. The Resource Hospital ER physician will request the provider voluntarily submit to a
      physical exam.
      1. If physical findings indicate possible substance abuse, a urinalysis and
         toxicological screen will be performed.
   B. If the Resource Hospital ER physician finds no indication of substance abuse, the
      provider will be returned to duty.
   C. If the exam/lab corroborates substance abuse or the provider refuses the exam, they will
      be placed “off-duty” for the remainder of their shift. A full investigation will be
      conducted by the SEMSV Medical Director.

III. In the event that this policy conflicts with or duplicates a provision of a collective bargaining
     agreement that requires testing for drug use, the provider will contact their representative.
APPEAL OF THE LOCAL SYSTEM REVIEW BOARD DECISION

I. In the event that the Local System Review Board affirms or modifies the suspension order, the individual, individual provider, or other participant will be afforded the opportunity for review of the decision by the State EMS Disciplinary Review Board.

II. In the event that the Local System Review Board reverses or modifies the EMS Medical Director’s suspension order, the SEMSV Medical Director will have the opportunity for review of the decision by the State EMS Disciplinary Review Board.

III. Requests for review must be submitted in writing to the Chief of the Department’s Division of Emergency Medical Services and Highway Safety within ten (10) days after receiving the Local Boards decision or the EMS Medical Director’s suspension order, whichever is applicable. You must include a copy of the decision or suspension order.
DISCIPLINARY ACTION FORM

I. Use: for documentation of disciplinary action taken by the SEMSV Medical Director

A. Verbal Counseling
B. Written warning
C. Suspension
D. Probation

II. Procedure for verbal counseling/written warning:

A. The SEMSV Medical Director or designee will contact the person(s) involved.
B. A meeting time will be agreed upon.
C. The SEMSV Medical Director and/or designee will discuss the concern/problem and the corrective action to be taken.
D. The form will be signed by the provider receiving disciplinary action, the EMS System Coordinator, and the SEMSV Medical Director.
E. The original will be placed into the providers file in the EMS Department with copies going to the involved provider and their agency director.

III. Suspension Procedure

A. The SEMSV Medical Director may suspend from participation within the System any individual, individual provider or other participant considered not to be meeting the requirements of the System Program Plan. (Refer to policy SEM-PS-2)
B. The SEMSV Medical Director shall provide a written explanation of the reason for suspension, the terms, length, and condition of the suspension; and the date the suspension will commence unless a hearing is requested.
C. The procedure for requesting a hearing is outlined in policy SEM-PS-1.
D. Immediate suspension policy outlined in SEM-PS-1, Section IV.
E. The disciplinary action form will be completed as in II. D. and II.E. above.
IV. Probation Procedure

A. The SEMSV Medical Director may elect to place an individual on probationary status if skills or knowledge base is determined to be insufficient to allow independent function.
NOTICE OF CORRECTIVE ACTION
“RECORD OF DISCIPLINARY ACTION”

NAME: ____________________________________________ DATE ______________________

JOB CLASSIFICATION ______________________________________________ AGENCY ________________

You are hereby officially counseled for the following incident(s) which occurred on ________________

Event and Issues

ACTION TAKEN/DATE

- Verbal Counseling  --------------------------/---------------------------
- Written Warning  --------------------------/---------------------------
- Suspension  --------------------------/---------------------------
- Probation  --------------------------/---------------------------

If suspension, was due process offered and explained?  YES NO

Has previous disciplinary action been given for this offense:  YES NO

This notice is being placed in your personnel file and a copy sent to your agency director. You are warned that further incidents of poor conduct or performance may lead to your termination from the Quincy Area EMS System.

Reviewed by: ___________________________________________________________________________________
EMS System Coordinator    Title     Date

Reviewed by: ___________________________________________________________________________________
SEMSV Medical Director    Title     Date

I have reviewed and understand the above:

__________________________________________  Date  
Signature  

10/01: re: 2/02, 9/10
Filing a Complaint with the IDPH Central Complaint Registry

I. Purpose of this policy: to familiarize System participants and provider agencies with the procedure for filing a complaint with the Illinois Department of Public Health Central Complaint Registry.

II. Definition of complaint: a report of an alleged violation of the EMS Act or Administrative Rules pursuant to the Act by any System participants and/or providers covered under the Act. A complaint should be defined as problems related to the care and treatment of a patient.

III. Procedure for Complaint Submission

A. Submit the complaint to:
   1. IDPH Central Complaint Registry** and/or
   2. SEMSV Medical Director***
   3. Trauma Center Medical Director (only if related to a trauma patient)***

**Complaints received by IDPH will be forwarded to the SEMSV Medical Director and/or the Trauma Center Medical Director.

*** The SEMSV Medical Director and/or Trauma Center Medical Director will forward the complaint to the IDPH Central Complaint Registry within five working days of receipt of the complaint.

B. Form of submission
   1. Telephone call
      a. IDPH Central Complaint Registry: 1-800-252-4343
      b. SEMSV Medical Director: 217-223-8400 ext. 6590
      c. Trauma Center Medical Director: 217-223-8400 ext. 6592
   2. Letter
   3. Fax
   4. In Person

C. Information required
   1. Date and time or shift of occurrence
   2. Names of the patient, EMS personnel, family members, and other persons involved.
   3. Relationship of the complainant to the patient or to the provider.
   4. Condition and status of the patient
   5. Details of the situation

IV. Complaint investigation

A. Confidentiality: IDPH and the SEMSV Medical Director and/or the Trauma Center Medical Director shall not disclose the name of the complainant unless the complainant consents in writing to the disclosure.
B. Notification of involved parties
   1. The substance of the complaint shall be provided in writing to the System participant and/or provider agency no earlier than at the commencement of an onsite investigation.

C. Investigation
   1. Conducting the investigation
      a) IDPH will conduct the investigation jointly with the SEMSV Medical Director or the Trauma Center Medical Director if a death or serious injury has occurred or there is imminent risk of death or serious injury, or if the complaint alleges action or conditions that could result in a denial, non-renewal, suspension or revocation of license or designation.
      b) If the complaint alleges a violation by the SEMSV Medical Director, EMS System Coordinator or Trauma Center Medical Director, IDPH will conduct the investigation.
      c) If the complaint alleges a violation that would not result in licensure or designation action, the IDPH will forward the complaint to the SEMSV Medical Director or Trauma Center Medical Director for review and investigation.
      d) The SEMSV Medical Director or Trauma Center Medical Director may request the assistance of IDPH at any time during an investigation.
      e) In a case between EMS Systems, the IDPH will be involved as mediator or lead investigator.
   2. Results of investigation
      a) The SEMSV Medical Director or Trauma Center Medical Director will forward the results of the investigation and any disciplinary action resulting from a complaint to IDPH.
         (1) Documentation of the investigation will be retained at the hospital in accordance with EMS System improvement policies and will be available to IDPH upon request.
         (2) The investigation file will be considered privileged and confidential in accordance with the Medical Studies Act [735 ILCS 5/8-2101].
      b) Based on the information submitted by the complainant and the results of the investigation conducted, IDPH will determine whether the Act or part of the Act is being or has been violated.
      c) IDPH will have final authority in the disposition of a complaint and will classify the complaint as “valid”, “invalid” or “undetermined”.
      d) IDPH will inform the complainant and the System participant or provider of the complaint results within twenty days after its determination.
c) A complainant or EMS System participant or provider who is dissatisfied with the determination or investigation by IDPH may request a hearing pursuant to section 515.160 of the EMS and Trauma Center Code. A request for a hearing shall be submitted to IDPH within thirty days after the determination is mailed.
QUINCY AREA EMS SYSTEM
QUALITY ASSURANCE

Data Collection and Evaluation --------------------------------------------- SEM-QA-1

Quality Assurance Guidelines and Standards -------------------------------- SEM-QA-2

Case Audit Form ---------------------------------------------------------- SEM-QA-2F

Blood Glucometer---------------------------------------------------------- SEM-QA-3

Manual Defibrillator and Battery System Tests ----------------------------- SEM-QA-4
QUINCY AREA EMS SYSTEM
DATA COLLECTION AND EVALUATION

I. An Illinois patient care report bubble sheet and air provider narrative sheet (if used) will be completed by each vehicle service provider for every emergency prehospital or interhospital transport.

II. Disposition of forms copies

A. The copy designated “receiving facility” copy is to be left at the receiving hospital emergency department. This copy is to be included with the patient’s permanent medical record.

B. The copy designated “EMS Resource Hospital” and/or IDPH copy is to be forwarded to Blessing Emergency Medical Services department for purposes of data collection/quality assurance.

C. The copy designated “Service/Provider” is to be maintained by the vehicle service providers agency.

III. The Resource Hospital shall submit a data report to IDPH on March 1, June 1, September 1, and December 1 of each year, covering run report data from the preceding quarter. The data shall be in one of the following formats:

A. The scannable patient care report form

B. A data diskette containing prescribed data elements

____________________________________
Kelly Cox, M.D., EMS Medical Director 7/03
I. Objectives of quality assurance reviews
   A. Review effectiveness of policies and procedures
   B. Detect trends and repeated errors
   C. Identify and acknowledge exceptional performance
   D. Identify and correct substandard performance

II. Analysis screens
   A. Illinois patient care report forms
   B. System event reports
   C. ER radio logs
   D. Patient report tapes
   E. Complaints

III. Corrective Measures
   A. Plan and conduct educational activities
   B. Quarterly trauma/case reviews
   C. Create policy and procedure
   D. Amend policy and procedure
   E. Issue commendations
   F. Take disciplinary actions

IV. Review Indicators: May change as specific System needs are identified
   A. Cardiac/respiratory arrest
      1. Documentation of airway management
      2. Documentation of CPR
      3. ACLS/System protocol followed
      4. Any problems/unusual circumstances
B. DOA
   1. Documentation of known or estimated downtime or last time patient was seen.
   2. Documentation of physical assessment
   3. Documentation of cardiac rhythm
   4. Documentation of notification of Medical Control
   5. Randomly review tape to determine if Medical Control was contacted prior to notification of need for the coroner

C. Trauma (Category I or II)
   1. Documentation of airway management/oxygenation
   2. Scene time
   3. Load and go criteria
   4. Treatment appropriate for condition

D. Pediatric (birth to age 18)
   1. Documentation of assessment
   2. Vital signs
   3. Treatment appropriate for condition

E. Medication administration
   1. Medication appropriate for condition
   2. Correct dosage/route
   3. Assessment before and after administration
   4. If pain medication was severity assessed using 0-10 pain scale before and after administration
   5. Any documented side effects/untoward reactions

F. Refusals
   1. Documentation of assessment or that patient refused assessment
   2. Vital signs
   3. Documentation of contact with Medical Control
   4. Randomly review tape to determine if Medical Control was contacted prior to leaving the scene

G. Cases requested for review

H. Incomplete forms

I. Unusual circumstances

J. Exceptional performance

Kelly Cox, M.D., EMS Medical Director 7/03
QUINCY AREA EMS SYSTEM
CASE AUDIT FORM

DATE: ___________________________  PCR # _________________________

SITUATION/PATIENT COMPLAINT: ______________________________________

REVIEW INDICATOR:

☐ Cardiac Arrest  ☐ Refusal
☐ DOA/Treat-Dead at Scene  ☐ Unusual Circumstances
☐ Trauma  ☐ Request for Review
☐ Pediatric  ☐ Incomplete Form
☐ Medication Administration  ☐ Random Audit

Comments: ____________________________________________________________

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Recommended Corrective Measures: _______________________________________

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Auditor Signature: ___________________________ Date: _______________________
DAILY EQUIPMENT CHECKS
BLOOD GLUCOMETER

I. Glucometer tests will be used to identify and resolve significant sources of error.

A. A daily operation test will be performed on each Glucometer at the beginning of each shift using the plastic test strip provided with the instrument. This should include HI and Low reading.

B. A control will be performed weekly on each blood Glucometer according to the manufacturers recommended procedures.

C. If any control test exceeds limits, do not use that instrument for patient testing until the problem is reconciled.

D. A written record will be maintained of each test which documents the instrument tested and the results of the test. This record will be kept on the ambulance with the blood Glucometer until the next test is performed. The previous test record may be transferred to a central location to be kept on file.

E. Each test record must consist of at least the following:
   1. serial number, make and model of the instrument
   2. date of test
   3. results of test
   4. signature of person performing the test
   5. steps taken to resolve any problem with the instrument or controls

F. After each patient use, record the Glucometer reading on the test record and the results of the control test performed.
QUINCY AREA EMS SYSTEM
POLICY AND PROCEDURE

MANUAL DEFIBRILLATOR AND BATTERY SYSTEM TESTS

Tests will be regularly conducted on manual defibrillators and battery systems to identify and resolve conditions that could lead to possible malfunction.

1. A daily operational test of all manual defibrillators in service will be conducted and documented utilizing the manufacturer’s guidelines. Operator's Shift Checklist as recommended by the manufacturer’s guidelines.

2. A quarterly evaluation and recondition will be performed on each battery in service utilizing the manufacturer’s recommended procedure. The Reconditioning Procedure and Shelf Life Tests will be alternated every 90 days.

3. If any discrepancy in either defibrillator/monitor operation or battery condition is found, appropriate corrective action must be taken immediately.

4. Records of all tests and documentation or corrective actions taken must be kept on file a minimum or 2 years.

5. Assure all other batteries used on additional equipment are maintained per manufactured recommendation.

________________________________________       7/03
Kelly Cox, M.D., EMS Medical Director