Medical Control Board

Treatment Protocols

for

EMS System for Metropolitan Oklahoma City & Tulsa

Preface

Patients for whom EMS is summoned, EMS professionals providing life-sustaining and life-saving care, EMS professionals supporting field care through dispatch, education, quality improvement, and administrative leadership, and EMS physicians supporting all aspects of EMS through clinical leadership all deserve the finest clinical treatment protocols available. This protocol set was developed in that exact spirit to achieve that exact mission.

While no single set of EMS protocols can prove exhaustive, this particular compilation of protocols reflects essential care for the wide spectrum of patient ages, conditions, and acuities encountered by EMS professionals in metropolitan Oklahoma City and Tulsa. For 2019, we've made multiple updates. Notable examples include promoting earlier utilization of the Flex-Guide during endotracheal intubation attempts in adults, promoting continuous cardiopulmonary monitoring throughout endotracheal intubation, addition of a suspected croup protocol in pediatrics, standing orders for pediatric pain management in orthopedic injuries and burn injuries, and further clarifying patient prioritization by injury types. The work of the Airway Management Task Force in our EMS system will become even more apparent in further protocol updates anticipated to become effective over the course of 2019. This 2019 set continues to include every protocol identified as essential by the National Association of State EMS Officials.

Protocols are sectioned in easy to anticipate groupings (e.g. airway, cardiac arrest, trauma) and are formatted for brevity whenever possible. When appropriate, flowchart algorithms are utilized for easy to read care directives. Extensive use of pictures and diagrams are included in procedural protocols to promote clarity of understanding and accuracy of performance. Scopes of practice by EMS certification/licensure are clearly designated and use of color coding by scope of practice is consistent throughout all protocols.

With the exception of non-traumatic cardiac arrest, wherein patient return of spontaneous circulation is most often dependent upon effective, immediate interventions on scene, transport should be initiated as soon as possible.

EMS professionals should never perform emergency medical care outside of their individual scope of practice established by professional medical training, certification/licensure, and as credentialed by the Medical Control Board/Office of the Medical Director. When encountering patient conditions requiring care unspecified in these protocols, seek appropriate direction from on-line medical control, always delivering care with prudence and reasonable regard for safety of the patient, peers, and the public.

When possible, medication alternatives are indicated in these protocols in light of current and anticipated future medication supply shortages affecting EMS systems throughout the United States.

The Medical Control Board/Office of the Medical Director protocols development team has taken exhaustive efforts in developing and reviewing these protocols for accuracy. Despite every human effort, unintended typographical errors may persist. EMS professionals are directed to always deliver care with the highest regard for patient safety and when questions arise to care directives, care sequences, and/or medication selections and dosages, answers should be sought via on-line medical control during real-time patient care and via the medical directors/OMD personnel during protocol training and review events.

In addition to this "Reference Edition" of these protocols, a "Field Edition" can be found at the Medical Control Board/Office of the Medical Director website (www.okctulomd.com). The Field Edition excludes the extensive medical literature references organized by individual protocol that reflect the evidence-based medicine used in protocol development in an effort to make the field edition more usable as a real-time clinical care resource.

It is the sincere hope that these protocols will guide EMS professionals serving metropolitan OKC and Tulsa in achieving the best clinical outcome possible for each and every patient receiving their dedicated care.

Index of Protocols

SECTION 1 GENERAL ASSESSMENT & GENERAL SUPPORTIVE CARE

1A Medical General Assessment – Adult & Pediatric
1B Trauma General Assessment – Adult & Pediatric
1C General Supportive Care – Adult & Pediatric
1D Trauma and Hypovolemic Shock Supportive Care – Adult & Pediatric
1E Neonatal Resuscitation- Pediatric

SECTION 2 AIRWAY

2A Airway Assessment – Adult & Pediatric
2B Airway Establishment/Obstruction Management – Adult & Pediatric
2C Airway Suctioning – Adult & Pediatric
2D Bag Valve Mask (BVM) Management – Adult & Pediatric
2E Supraglottic Airways– Adult & Pediatric
2F Oral Intubation – Adult
2G Medication Assisted Intubation - Adult
2H Nasal Intubation – Adult
2I Cricothyrotomy – Adult
2J Confirmation of Endotracheal Airway Placement – Adult & Pediatric
2K Stoma/Tracheostomy Management – Adult & Pediatric

SECTION 3 PULMONARY/RESPIRATORY

3A Respiratory Arrest – Adult & Pediatric
3B Dyspnea – Uncertain Etiology – Adult & Pediatric
3C Dyspnea – Asthma – Adult & Pediatric
3D Dyspnea – Chronic Obstructive Pulmonary Disease (COPD) – Adult
3E Dyspnea – Congestive Heart Failure (CHF) – Adult & Pediatric
3F Dyspnea – Brief Resolve Unexplained Event (BRUE) - Pediatric
3G Pulse Oximetry – Adult & Pediatric
3H Waveform Capnography – Adult & Pediatric
3I Oxygen Administration – Adult & Pediatric
3J Nebulization Therapy – Adult & Pediatric
3K Non-Invasive Positive Pressure Ventilation (NIPPV) – Adult
3L Mechanical Ventilation – Adult
3M Acute Dyspnea – Croup - Pediatric

Index of Protocols

SECTION 4 CARDIAC ARREST

4A Resuscitation (CPR) – Adult & Pediatric
4B Resuscitation Team Roles – Adult & Pediatric
4C Automated External Defibrillation (AED) – Adult & Pediatric
4D Manual Defibrillation – Adult & Pediatric
4E Double Sequential External Defibrillation – Adult
4F Asystole– Adult & Pediatric
4G Ventricular Fibrillation/Pulseless Ventricular Tachycardia – Adult & Pediatric
4H Pulseless Electrical Activity (PEA) – Adult & Pediatric
4I Specific Causes of Cardiac Arrest – Adult & Pediatric
4J Post Cardiac Arrest Treatment – Adult & Pediatric
4K "Do Not Resuscitate"/Advanced Directive Orders, Futility of Resuscitation Initiation &Termination of Resuscitation – Adult & Pediatric
4L Intra-Arrest Wakefulness - Adult
4M Active Compression Decompression CPR - Adult

SECTION 5 CARDIAC (NON-ARREST)

5A Chest Pain – Uncertain Etiology – Adult & Pediatric
5B Acquiring & Transmitting 12-Lead ECGs – Adult & Pediatric
5C Acute Coronary Syndrome – Adult
5D Bradycardia – Adult & Pediatric
5E Transcutaneous Pacing – Adult & Pediatric
5F Tachycardia – Stable – Adult & Pediatric
5G Tachycardia – Unstable – Adult & Pediatric
5H Synchronized Cardioversion – Adult & Pediatric
5I Implantable Pacemaker Management – Adult & Pediatric
5J Implantable Cardioverter/Defibrillator (ICD) Management – Adult & Pediatric
5K Premature Ventricular Contractions – Adult & Pediatric
5L Hypertensive Emergency – Adult & Pediatric
5M Ventricular Assist Device (VAD) Management – Adult
5N Intra-Aortic Balloon Pump (IABP) Monitoring – Adult

SECTION 6 NEUROLOGIC/ALTERED MENTAL STATUS

6A Stroke – Adult & Pediatric
6B Altered Mental Status – Adult & Pediatric
6C Glucometry (Blood Glucose Determination)
6D Seizure – Adult & Pediatric

Index of Protocols

SECTION 6 NEUROLOGIC/ALTERED MENTAL STATUS (CONTINUED)

6E Syncope – Adult & Pediatric
6F Dystonic Reactions – Adult & Pediatric

SECTION 7 PSYCHIATRIC/BEHAVIORAL DISORDERS

7A Behavioral Disorder – Adult & Pediatric
7B Physical Restraint – Adult & Pediatric
7C Chemical Restraint – Adult & Pediatric
7D Emergency Mental Hold Issues – Adult & Pediatric

SECTION 8 TOXICOLOGIC/POISONINGS

8A Poisonings – General Management – Adult & Pediatric
8B Toxidromes – Adult & Pediatric
8C Oklahoma Poison Control Center Use
8D Acute Allergic Reactions – Adult & Pediatric
8E Snakebites Pit Vipers (Rattlesnakes, Copperheads, & Mocassins) (Crotalinae Envenomation) – Adult & Pediatric
8F Bee/Wasp Stings & Fire Ant Bites (Hymenoptera Envenomation) – Adult & Pediatric
8G Hazardous Materials Response
8H Hydrofluoric Acid – Adult & Pediatric

SECTION 9 MEDICAL

9A Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult & Pediatric
9B Sepsis – Adult & Pediatric
9C Epistaxis – Adult & Pediatric
9D Pain Management (Acute Onset & Chronic Type) – Adult & Pediatric
9E Dialysis-Related Issues – Adult & Pediatric

Index of Protocols

SECTION 9 MEDICAL (CONTINUED)

9F Infectious Disease Precaution Recommendations – EMS Professionals
9G Post-Exposure Prophylaxis Recommendations – Adult & Pediatric
9H Vascular Access – Intravenous – Adult & Pediatric
9I Vascular Access – Intraosseous – Adult & Pediatric
9J Indwelling Central Vascular Device Management – Adult & Pediatric
9K Medication Administration – Adult & Pediatric
9Ka – Intravenous/Intraosseous – Adult & Pediatric
9Kb – Intramuscular/Subcutaneous– Adult & Pediatric
9Kc – Intranasal – Adult & Pediatric
9Kd – Sublingual/Oral – Adult & Pediatric
9Ke – Intraocular – Adult & Pediatric
9Kf – Intravascular Infusion Management – Adult & Pediatric
9L Nasogastric/Orogastric Tube– Adult
9M Suspected Abuse/Neglect – Adult & Pediatric

SECTION 10 TRAUMA

10A Head/Neck/Spine Injury – Adult & Pediatric
10B Eye Injury – Adult & Pediatric
10C Dental Injury/Pain – Adult & Pediatric
10D Chest/Abdomen/Pelvis Injury – Adult & Pediatric
10E Needle Thoracostomy (Tension Pneumothorax Decompression) – Adult & Pediatric
10F Chest Tube Monitoring – Adult & Pediatric
10G Extremity/Amputation Injury – Adult & Pediatric
10H Tourniquet – Adult & Pediatric
10I Hemostatic Agents – Adult & Pediatric
10J Compartment Syndrome – Adult & Pediatric
10K Crush Injury Syndrome – Adult & Pediatric
10L Burns – Adult & Pediatric
10M Conductive Energy Weapon Related Management – Adult & Pediatric
10N "Less Lethal" Weapon Related Management – Adult & Pediatric
10O Splinting of Injuries – Adult & Pediatric
10Oa – Spinal Motion Restriction – Adult & Pediatric
10Ob – Extremity – Adult & Pediatric
10P Blast Injury – Adult & Pediatric

Index of Protocols

SECTION 11 ENVIRONMENTAL

11A Heat Illness – Adult & Pediatric
11B Cold Illness/Injury – Adult & Pediatric
11C Electrical/Lightning Injury – Adult & Pediatric
11D Water Submersion Events – Adult & Pediatric

SECTION 12 FIREGROUND-RELATED

12A Fireground Rehabilitation Concepts - Adult
12B Smoke Inhalation – Adult & Pediatric
12C Carbon Monoxide – Adult & Pediatric
12D Hyperbaric Oxygen Therapy Considerations – Adult & Pediatric
12E Cyanide – Adult & Pediatric

SECTION 13 OBSTETRIC/GYNECOLOGIC

13A Childbirth – Routine
13B Childbirth – Complicated
13C Vaginal Bleeding/Discharge – Adult & Pediatric
13D Complications of Pregnancy – Adult
13E Pelvic Pain – Adult & Pediatric
13F Alleged Sexual Assault – Adult & Pediatric

SECTION 14 RESPONSE, SCENE ISSUES & PATIENT TRANSPORTATION

14A Staging Considerations
14B Actions to Preserve Crime Scenes
14C Other Health Care Professionals on Scene
14D Informed Patient Consent/Refusal
14E On-Line Medical Control Physicians
14F Helicopter EMS (HEMS) Considerations
14G Patient Prioritization
14H Radio Report Communications
14I Interhospital Transfers
14J Scene Coordination

Index of Protocols

SECTION 15 MASS CASUALTY/DISASTER/TERRORIST EVENTS

15A Multiple Patient Scenes/Mass Casualty Event Concepts
15B Regional EMS System (REMSS) Activation Procedure
15C Chemical Weapons
15D ChemPack Deployment Activation Procedure
15E Nerve Agents
15F Biological Weapons
15Fa Suspicious Powder Response Procedure
15G Radiological Weapons
15H Nuclear Weapons

SECTION 16 FORMULARY

16A Activated Charcoal
16B Adenosine (Adenocard®)
16C Albuterol (Proventil®, Ventolin®)
16D Amiodarone (Cordarone®, Nexterone®)
16E Aspirin
16F Atropine Sulfate
16G Calcium Chloride
16H Dextrose (50% as D50 and 25% as D25)
16I Diazepam (Valium®)
16J Diltiazem (Cardizem®)
16K Diphenhydramine (Benadryl®)
16L Dopamine (Intropin®)
16M DuoDote® Auto-Injector
16N Epinephrine 1:1,000 & 1:10,000
16O Epinephrine Auto-Injector (Epipen®, Auvi-Q®)
16P Etomidate (Amidate®)
16Q Fentanyl (Sublimaze®)
16R Glucagon
16S Glucose (Oral)
16T Haloperidol (Haldol®)

Index of Protocols

SECTION 16 FORMULARY (CONTINUED)

16U Hydralazine (Apresoline®)
16V Hydromorphone (Dilaudid®)
16W Hydroxocobalamin (CyanoKit®)
16X Ipratropium Bromide (Atrovent®)
16Y Labetalol (Normodyne®, Trandate®)
16Z Lidocaine 2% Intravascular (Xylocaine®)
16AA Lidocaine Viscous Gel (Xylocaine®)
16BB Lorazepam (Ativan®)
16CC Magnesium Sulfate
16DD Methylprednisolone (Solu-Medrol®)
16EE Midazolam (Versed®)
16FF Morphine Sulfate
16GG Naloxone (Narcan®)
16HH Nitroglycerin – Nitroglycerin (Nitrolingual®, Nitromist®, Nitrostat®, Nitroquick®, Tridil (IV Infusion), Nitro-Bid® - Dermal)
16II Norepinephrine (Levophed®)
16JJ Ondansetron (Zofran®)
16KK Phenylephrine 2% (NeoSynephrine®)
16LL Pralidoxime Chloride (2-PAM)
16MM Sodium Bicarbonate
16NN Calcium Gluconate

SECTION 17 RESERVED FOR AGENCY SPECIFIC USE

17A MCB: Destination Determination
17B MCB: Table: Categorization of Hospitals
17C MCB: EMS Diversion from Hospitals
17D MCB: “No Fly Zones”
17E MCB: Advanced Airway Management: Pediatric Oral Intubation
17F MCB: Medication-Assisted Intubation – Pediatric
17G MCB: Confirmation of Endotracheal Airway Placement – Pediatric
17H MCB: Helmet Removal
17I MCB: Controlled Substance Handling & Documentation – Field Paramedics
17J MCB: Seasonal Influenza Vaccine Administration
17K MCB: Tranexamic Acid (TXA) Formulary

Index of Protocols

SECTION 18 RESERVED FOR AGENCY SPECIFIC USE – PILOT PROGRAMS/RESEARCH

SECTION 19 APPENDICES

19A – Approved Abbreviations
19B – Oklahoma State Department of Health Communicable Disease Risk Exposure Report, OSDH - 207
19C – Oklahoma Model Trauma Triage Algorithm, Adult & Pediatric
19D – Sample Fireground Rehabilitation Policies - Tulsa Fire Department; Oklahoma City Fire Department

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

1A – MEDICAL GENERAL ASSESSMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Assessment:
   - SCENE SAFETY
   - PROTECTIVE EQUIPMENT
   - Primary Survey
   - Secondary Survey (when appropriate)
2. Primary Survey Care:
   - Initiate cardiopulmonary resuscitation if indicated
   - Open airway
   - Support oxygenation/ventilation
   - Support circulation – Dysrhythmia care? Rate control? Hypotension care?
3. Minimize scene time in critical case unless working cardiac arrest
4. Enroute Care:
   - Reassess all primary care
   - Support oxygenation/ventilation
   - Vascular access
   - Secondary Survey (if able)
   - Keep patient warm/avoid hypothermia
5. Hospital per destination protocol..

In general, approach the assessment of medical (non-trauma) patients, in A-B-C order:

Airway: Evaluate the patency and mechanics of the airway. Is the patient able to oxygenate and ventilate? Rapid intervention may be required during the assessment phase if airway patency and protection is compromised.

Breathing: Expose the chest as required to accurately assess the mechanics of respiration (taking into account patient privacy/modesty if in public location). Note the rate, depth, and pattern of respirations and if any degree of respiratory distress or effort. Auscultate breath sounds bilaterally.

Liberally obtain pulse oximetry readings and in patients with respiratory difficulties, waveform capnography readings (if equipped, **Mandatory use if the patient is intubated).

Circulation: The adequacy of a patient's circulation is best assessed first by evaluating their level of consciousness and mental status. Next assess the location, rate, and character of the pulse. Then check a blood pressure – preferably, manually for at least the first reading. Apply the cardiac monitor (if equipped) liberally.

Cardiac Arrest is an exception to the above order. Aggressively initiate chest compressions and search for shockable rhythms at the appropriate intervals per Section 4 protocols.

Protocol 1A: Medical General Assessment – Adult & Pediatric, cont.

Many treatment decisions regarding airway management involve calculating the adult patient's Glasgow Coma Scale score using the following table:

Eyes Open		Best Motor Response		Best Verbal Response	
Spontaneously	4	Obeys verbal orders	6	Oriented, conversant	5
To command	3	Localizes painful stimuli	5	Disoriented, conversant	4
To pain	2	Withdraws	4	Inappropriate words	3
No response	1	Painful stimulus, flexion	3	Inappropriate sounds	2
		Painful stimulus, extension	2	No response	1
		No response	1		

Maximum 15 points

After addressing the A-B-C order in most medical patients, including evaluating and addressing any life-threatening conditions, minimize scene time and initiate timely transport to an appropriate emergency department in any setting of a time-sensitive medical condition.

Complete a head-to-toe assessment of the patient if the patient is relatively medically stable. Obtain relevant history of past and current medical problems, medications, allergies, and physicians/hospitals used in care plans to help guide further assessment.

Reassess patients frequently, typically at least every 10 minutes, and more often if critical illness is discovered and being treated. In the situations of an unstable patient, vital signs should be assessed every 5 minutes, especially if hemodynamic changes are occurring.

Assess and treat per symptom or illness specific protocols that follow in this protocol set.

Pediatric Assessment Comments:

1. Pediatric respiratory distress may look just like adult respiratory distress, presenting with:

slowing respirations	cyanosis
accessory muscle use	pallor
nasal flaring	lethargy/listlessness
retractions – intercostal or subcostal	irritability
tachypnea	stridor
mottling	grunting

Protocol 1A: Medical General Assessment – Adult & Pediatric, cont.

2. Vital signs vary with age. In general, the younger the patient, the faster the respiratory rate, the faster the heart rate, and the lower the blood pressure:

AGE	HEART RATE (BPM)	RESP. RATE (BPM)	SYSTOLIC BP (mmHg)
Premature	100-190	40-60	
Neonate	90-190	30-60	50-70
6 months	80-180	25-40	60-110
1 year	80-150	20-40	70-110
3-4 years	80-140	20-30	80-115
5-6 years	70-120	20-25	80-115
7-8 years	70-110	20-25	85-120
11-12 years	60-110	15-20	95-135

The average normal systolic BP can also be estimated by: 80 + (2 x age) in years.
Lower limits of normal systolic BP can also be estimated by: 70 + (2 x age) in years.

3. The following table can be used to calculate Glasgow Coma Scale scores in pediatric patients, especially those under 4 years of age. Most pediatric patients above the age of 4 years will be able to be assessed for Glasgow Coma Scale scores using the adult table.

Pediatric Glasgow Coma Scale Scores

Points*	Best eye	Best verbal		Best Motor
6	--	--		obeys
5	--	smiles, oriented to sound, follows objects, interacts		localizes pain
		Crying	**Interaction**	
4	spontaneous	consolable	inappropriate	withdraws to pain
3	to speech	inconsistently consolable	moaning	flexion (decorticate)
2	to pain	inconsolable	restless	extensor (decerebrate)
1	none	none	none	none

* Range of total points:
3 (worst) to 15 (normal)

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1B - TRAUMA GENERAL ASSESSMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Assessment:
   - SCENE SAFETY
   - PROTECTIVE EQUIPMENT
   - Primary Survey
   - "Trauma Alert" to receiving ED if indicated
   - Secondary Survey (when appropriate)
2. Primary Survey Care:
   - Control arterial bleeding
   - Open airway
   - Seal "sucking" chest wound(s)
   - Needle thoracostomy for closed chest tension pneumothorax
3. Minimize scene time in critical case.
4. Enroute Care:
   - Reassess all primary care
   - Support oxygenation/ventilation
   - Vascular access
   - Secondary Survey (if able)
   - Keep patient warm/avoid hypothermia
5. Hospital per destination protocol..

Before entering any trauma scene, ensure your personal safety. Do not attempt patient contact until hazards can be appropriately mitigated. In addition to scene safety, factor mechanisms of injury, number of patients, and special equipment/extrication needs.

All trauma patients should be assessed utilizing primary, secondary, and reassessment surveys.

The **primary survey** is to be conducted on all trauma patients. It is designed to rapidly identify life-threatening or potentially life-threatening injuries. The primary survey should be completed within 2 minutes of patient contact. THE PRIMARY SURVEY IS ONLY INTERRUPTED FOR LIFE-THREATENING ARTERIAL BLEEDING, AIRWAY OBSTRUCTION, OR RESPIRATORY/CARDIAC ARREST. The following are the steps of the **primary survey**:

1) Manually stabilize the cervical spine while assessing the airway and level of consciousness.
2) Evaluate breathing – present? rapid? normal? slow? shallow?
3) Evaluate circulation – carotid and radial pulses? Control external hemorrhage.
4) Exam the head for deformity, contusions, abrasions, penetrations, burns, lacerations, or swelling ("DCAP-BLS").
5) Exam the neck for deformity, contusions, abrasions, penetrations, burns, lacerations, swelling ("DCAP-BLS"), or subcutaneous emphysema.
6) Exam the chest for deformity, contusions, abrasions, penetrations, burns, lacerations, swelling ("DCAP-BLS"), or paradoxical movement.
7) Auscultate the chest for breath sounds in the mid-axilla bilaterally – present? equal?
8) Exam the abdomen and pelvis for deformity, contusions, abrasions, penetrations, burns, lacerations, or swelling ("DCAP-BLS").
9) Exam the extremities for deformity, contusions, abrasions, penetrations, burns, lacerations, or swelling ("DCAP-BLS"), and pulse, movement, sensation.

Protocol 1B: Trauma General Assessment – Adult & Pediatric, cont.

Primary survey interventions include airway management (See Section 2 Protocols – Airway), sealing open chest wounds, needle thoracostomy for suspected tension pneumothorax (See Protocol 10E – Needle Thoracostomy), oxygen administration and controlling any obvious external hemorrhage. Remember to expose the patient as needed to conduct an appropriate exam.

Any trauma patient with altered level of consciousness, abnormal respiration, abnormal circulation, or signs/conditions likely to lead to shock (distended abdomen, pelvic instability, bilateral femur fractures) should be rapidly immobilized and transported after completing the primary survey. These are "LOAD & GO" patients.

The **secondary survey** is always done enroute on critical patients. If no critical conditions are found in the primary survey, the secondary survey may be conducted on the scene and should be completed within 5 minutes after the primary survey is completed. The following are the steps of the **secondary survey**:

1) Obtain vital signs (pulse, respiratory rate, blood pressure, pulse oximetry)
2) Obtain history of traumatic event and pertinent patient medical history (allergies, medications, past illness/injury, last oral intake)
3) Head to toe exam – look for "DCAP-BLS" in every body area. Calculate GCS score
4) Perform indicated bandaging and splinting

The **reassessment survey** is an abbreviated exam after interventions and done at least every five minutes for critical patients (and approximately every ten minutes for non-critical patients). The following are the steps of the **reassessment survey**:

1) Repeat the primary survey
2) Repeat vital signs
3) Repeat GCS score calculation
4) Check every intervention – proper placement of intubation? Proper placement of IV/IO?
5) Check results of every intervention – improved oxygenation/ventilation? Improved blood pressure?

Medical Literature References
1B – Trauma General Assessment – Adult & Pediatric

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1C - GENERAL SUPPORTIVE CARE ADULT & PEDIATRIC

TREATMENT PRIORITIES
1. Assessment:
   - SCENE SAFETY
   - PROTECTIVE EQUIPMENT
   - ABCs unless cardiac arrest
   - CAB if cardiac arrest
   - Early vital signs
   - Get best history possible
2. Evaluate/treat underlying medical cause per protocol(s)
3. Early transport & ED notification for patients with time sensitive conditions (Resp Failure, STEMI, Stroke)

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

IF CHIEF COMPLAINT IS ***MEDICAL*** IN NATURE, CHOOSE THE PROTOCOL THAT BEST FITS THE PATIENT'S FOREMOST SYMPTOMS, WITH PRIORITY SYMPTOMS TAKING PRECEDENCE

QUESTIONS TO ADDRESS SCENE SAFETY ISSUES

EMR | EMT

AIRWAY MANAGEMENT
SUPPORT OXYGENATION/VENTILATION

OBTAIN VITAL SIGNS

APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (when indicated & if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING HOSPITAL
MONITOR END – TIDAL CO_2 & WAVEFORM CAPNOGRAPHY
(when indicated & if equipped, **Mandatory use if pt intubated)

ASSIST PT WITH PT'S OWN MEDICATION IF DIRECTED BY PROTOCOL(S)

DETERMINE BLOOD GLUCOSE/TREAT HYPOGLYCEMIA PER PROTOCOL

EMT-I85 | AEMT

INTUBATE IF INDICATED

IV/IO ACCESS IF INDICATED
FLUID BOLUS AS DIRECTED BY SPECIFIC MEDICAL PROTOCOL(S)

MEDICATION ADMINISTRATION PER SPECIFIC MEDICAL PROTOCOL(S)

PARAMEDIC

CONTINUOUS TREATMENT AND ASSESSMENT PER SPECIFIC MEDICAL PROTOCOL(S)
INTERPRETATION OF 12-LEAD ECGS (when indicated & if equipped)

Clinical Operational Notes (All Field Provider Levels):

1. The practice of EMS medicine is built upon the foundation of "taking medical care to the patient". To achieve this objective, appropriate equipment (airway equipment kit, med/trauma equipment kit, suction device, AED/Cardiac Monitor/Defibrillator, patient packaging equipment) should be brought to the patient's side per Protocol 14J – Scene Coordination to minimize critical treatment delays.

2. Minimize active movement on the patient's part in settings of suspected myocardial ischemia, stroke, and dyspnea. Move and package the patient for transport with safety considerations for all involved.

Medical Literature References
1C – General Supportive Care – Adult & Pediatric

1. Self, W. H., Semler, M. W., Wanderer, J. P., Wang, L., Byrne, D. W., Collins, S. P., … Rice, T. W. (2018). Balanced Crystalloids versus Saline in Noncritically Ill Adults. New England Journal of Medicine. https://doi.org/10.1056/NEJMoa1711586.
2. Semler, M. W., Self, W. H., Wanderer, J. P., Ehrenfeld, J. M., Wang, L., Byrne, D. W., … Rice, T. W. for the S. I. and the P. C. C. R. G. (2018). Balanced Crystalloids versus Saline in Critically Ill Adults. New England Journal of Medicine. https://doi.org/10.1056/NEJMoa1711584.
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4. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
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7. de Caen AR, Maconochie IK, Aickin R, Atkins DL, Biarent D, Guerguerian AM, Kleinman ME, Kloeck DA, Meaney PA, Nadkarni VM, Ng KC, Nuthall G, Reis AG, Shimizu N, Tibballs J, Veliz Pintos R; Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators. Part 6: Pediatric Basic Life Support and Pediatric Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S177-203.
8. Murphy MF, Walls RM. Identification of the Difficult Airway. In Walls RM, Murphy MF, eds. Manual of Emergency Airway Management. Philadelphia, PA: Lippincott Williams & Wilkins, pp. 81-93, 2008.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

1D - TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Assessment:
   - SCENE SAFETY
   - PROTECTIVE EQUIPMENT
   - Primary Survey
   - "Trauma Alert" to receiving ED if indicated
   - Secondary Survey (when appropriate)
2. Primary Survey Care:
   - Control arterial bleeding
   - Open airway
   - Seal "sucking" chest wound(s)
   - Needle thoracostomy for closed chest tension pneumothorax
3. Minimize scene time in critical case.
4. Enroute Care:
   - Reassess all primary care
   - Support oxygenation/ventilation
   - Vascular access
   - Secondary Survey (if able)
   - Keep patient warm/avoid hypothermia
5. Hospital per destination protocol..

EMD

IF CHIEF COMPLAINT IS ***TRAUMATIC*** IN NATURE, CHOOSE THE PROTOCOL THAT BEST FITS THE PATIENT'S FOREMOST SYMPTOMS, WITH PRIORITY SYMPTOMS TAKING PRECEDENCE

QUESTIONS TO ADDRESS SCENE SAFETY ISSUES

EMR | EMT

SERIOUS HEMORRHAGE CONTROL:
TOURNIQUET IF INDICATED
BANDAGE/DRESSING/DIRECT PRESSURE
PRESSURE DRESSING IF INDICATED (if equipped)
TOPICAL HEMOSTATIC AGENT IF INDICATED (if equipped)

AIRWAY MANAGEMENT
SUPPORT OXYGENATION/VENTILATION

OBTAIN VITAL SIGNS/ASSESS FOR AND TREAT SHOCK

PREVENT HYPOTHERMIA

EMT-I85 | AEMT

INTUBATE IF INDICATED

IV/IO ACCESS IF INDICATED
FLUID BOLUS AS DIRECTED BY SPECIFIC TRAUMA PROTOCOL(S)

PARAMEDIC

CRICOTHYROTOMY IF INDICATED

NEEDLE THORACOSTOMY IF TENSION PNEUMOTHORAX SUSPECTED

CONTINUOUS TREATMENT AND ASSESSMENT PER SPECIFIC TRAUMA PROTOCOL(S)

Clinical Operational Note (All Field Provider Levels): The practice of EMS medicine is built upon the foundation of "taking medical care to the patient". To achieve this objective, appropriate equipment (airway equipment kit, med/trauma equipment kit, suction device, patient packaging equipment) should be brought to the patient's side per Protocol 14J – Scene Coordination to minimize critical treatment delays

Medical Literature References
1D– Trauma and Hypovolemic Shock Supportive Care – Adult & Pediatric

1. Self, W. H., Semler, M. W., Wanderer, J. P., Wang, L., Byrne, D. W., Collins, S. P., … Rice, T. W. (2018). Balanced Crystalloids versus Saline in Noncritically Ill Adults. New England Journal of Medicine. https://doi.org/10.1056/NEJMoa1711586.
2. Semler, M. W., Self, W. H., Wanderer, J. P., Ehrenfeld, J. M., Wang, L., Byrne, D. W., … Rice, T. W. for the S. I. and the P. C. C. R. G. (2018). Balanced Crystalloids versus Saline in Critically Ill Adults. New England Journal of Medicine. https://doi.org/10.1056/NEJMoa1711584.
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1E – NEONATAL RESUSCITATION PEDIATRIC

TREATMENT PRIORITIES

1. Preserve patient warmth/avoid hypothermia
2. Assessment:
   - Primary Survey
   - Secondary Survey (when appropriate)
3. Primary Survey Care:
   - Initiate cardiopulmonary resuscitation if indicated
   - Open airway
   - Support oxygenation/ventilation
   - Support circulation
4. Minimize scene time in critical case unless working cardiac arrest
5. Enroute Care:
   - Reassess all primary care
   - Support oxygenation/ventilation
   - Secondary Survey (if able)
6. Hospital per destination protocol..

In general, approach the resuscitation of the newborn or infant within the first 30 days of life focusing on basic life support interventions. Invasive, advanced procedures are rarely warranted and are rarely more effective than simple, yet important basic interventions.

Warmth (Body Temperature Conservation): Due to high surface to body weight ratios, the neonate rapidly loses body heat which can lead to respiratory and circulatory distress. Keep the neonate warm and minimize skin exposures unless absolutely warranted during care events.

Airway: Evaluate the patency and mechanics of the airway. Is the patient able to oxygenate and ventilate? Simple positioning intervention may be required during the assessment phase if airway patency and protection is compromised.

Breathing: Briefly expose the chest as required to accurately assess the mechanics of respiration. Note the rate, depth, and pattern of respirations and if any degree of respiratory distress or effort. Auscultate breath sounds bilaterally in the axilla to avoid confusing breath sounds from the other side of the chest. Gentle tactile stimulation (e.g. rubbing of the back, flicking the soles of the feet) may be required early in the assessment and often proves very effective in improving breathing activity.

Liberally obtain pulse oximetry readings and in patients with respiratory difficulties, waveform capnography readings (if equipped with neonatal sized equipment, **Mandatory use if the patient is intubated).

Protocol 1E: Neonatal Resuscitation – Pediatric, cont.

Circulation: The adequacy of a neonate's circulation is best assessed first by evaluating their level of activity and general body warmth. Next assess the rate and character of the brachial pulse. Pulse rates less than 100/minute are abnormal and a cause for concern of impending cardiovascular collapse. Pulse rates less than 60/minute indicate cardiovascular collapse and chest compressions should be initiated.

Cardiac Arrest is an exception to the above order. Aggressively initiate chest compressions, while still conserving warmth and initiating supplemental oxygenation and ventilation.

After addressing the Warmth-A-B-C order in most neonates, including evaluating and addressing any life-threatening conditions, minimize scene time and initiate timely transport to an appropriate emergency department.

Reassess patients frequently, typically at least every 5 minutes, and more often if critical illness is discovered and being treated. Assess and treat per symptom or illness specific protocols.

Neonatal Assessment Comments:

1. Respiratory distress may or may not look just like adult respiratory distress, presenting with:

slowing or increasing respirations	cyanosis
accessory muscle use	pallor
nasal flaring	lethargy/listlessness
retractions – intercostal or subcostal	grunting
tachypnea	mottling

2. Vital signs vary with age. In general, the younger the patient, the faster the respiratory rate, the faster the heart rate, and the lower the blood pressure. In most neonates, blood pressure is difficult to measure and often unreliable in attempts to do so in the field. Rather than focus extended time on blood pressure measurements, evaluate perfusion by overall activity level, skin temperature/color, capillary refill (normally < 3 seconds), and muscular tone.

3. Use APGAR scoring at 1 and 5 minutes post-birth, continue every 5 mins if APGAR < 7:

APGAR SCORING (SIGN)	0	1	2
APPEARANCE	BLUE OR PALE	BODY PINK, EXTREMITIES BLUE	COMPLETELY PINK
HEART RATE (BPM)	ABSENT	≤100	>100
GRIMACE (REACTION TO CATHETER IN NARES)	NO RESPONSE	GRIMACE	COUGH OR SNEEZE
MUSCLE TONE	LIMP	SOME FLEXION	ACTIVE MOTION
RESPIRATORY RATE	ABSENT	SLOW/IRREGULAR	GOOD, CRYING

Medical Literature References
1E – Neonatal Resuscitation – Pediatric

1. de Caen AR, Maconochie IK, Aickin R, Atkins DL, Biarent D, Guerguerian AM, Kleinman ME, Kloeck DA, Meaney PA, Nadkarni VM, Ng KC, Nuthall G, Reis AG, Shimizu N, Tibballs J, Veliz Pintos R; Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators. Part 6: Pediatric Basic Life Support and Pediatric Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S177-203.
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2A – AIRWAY ASSESSMENT ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

The following principles should be followed to allow optimum assessment and care of the airway without unnecessary intervention.

1. Use the least invasive method of airway management appropriate to the patient.
2. Use a method of airway management with which you are procedurally comfortable.
3. Use meticulous suctioning to keep the airway clear of debris.
4. Monitor continuously to be sure that oxygenation/ventilation is as effective as intended and as needed.
5. Understand the difference between these various aspects of airway management:

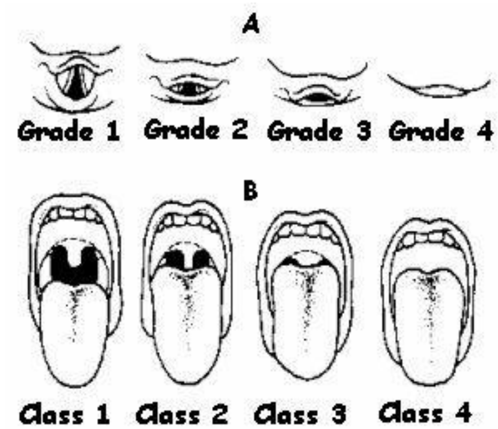
    A. Patency: how open and clear is the airway, free of foreign substances, blood, vomitus, and tongue obstruction?
    B. Ventilation: the amount of air the patient is able to inhale and exhale in a given time, promoting exhalation of carbon dioxide. Use waveform capnography if equipped.
    C. Oxygenation: the amount of oxygen the patient is able to convey to the circulation for tissue/organ perfusion. Use pulse oximetry when available.

Although the dynamics of EMS care often dictate rapid decisions in critical skill performance, assessment for difficult airway characteristics should precede intubation attempt(s). Several methods of evaluating airway-related anatomy exist. One commonly used mnemonic in emergency airway care is “LEMON”, which stands for:

Look externally (Heavy perioral facial hair? Mis-shaped or missing dentition?)
Evaluate 3-3-2 (Can at least three fingers be placed in the vertical axis of the mouth? Can at least three fingers be placed in the space between the chin apex and the top of the neck? Can at least 2 fingers fit between the top of thyroid cartilage and the top of the neck? Three “yes” answers predicts lesser anatomical difficulty in establishing intubation.)
Mallampati scoring – see Images A and B (View of posterior pharyngeal structures correlated to anticipated laryngeal view.)
Obstructions (Oral or upper neck masses? Large tongue?)
Neck mobility (Unable to assess if concerns of cervical spine injury.)

Protocol 2A - Airway Assessment - Adult & Pediatric, cont.

Mallampati Scoring:



The LEMON criteria, including Mallampati scoring, is easiest to apply to compliant patients without acute respiratory distress and without need for emergent intubation. By nature, these are NOT the patients that EMS professionals are tasked with managing. However, the concepts expressed in these criteria can help in predicting more difficult invasive airway management. EMS professionals should always work in developing "Plan B" approaches in airway management to anticipate and be capable of effective care when facing obstacles to usually successful airway management methods.

The following directives guide the approach to typical medical and trauma-related airway problems. They assume the treating EMS professional is skilled in the various procedures appropriate for their scope of practice. Advanced procedures should only be attempted if clinically indicated after less invasive measures fail or are futile to attempt. Individual cases may require modification of these protocols. Airway management decisions and actions should always be thoroughly documented in the patient care report.

Medical Respiratory Arrest:

1. Open airway using head tilt-chin lift.
2. Oxygenate/ventilate with Bag-Valve-Mask (BVM) with supplemental O_2 near 100% FiO_2.
3. Insert nasopharyngeal airway(s) and/or oropharyngeal airway as needed for patency.
4. Suction as needed.
5. Intubate per applicable protocols. If unable to successfully intubate or intubation is not within the scope of practice of available EMS professionals, place supraglottic airway per Protocol 2E – Supraglottic Airways.

Protocol 2A - Airway Assessment - Adult & Pediatric, cont.

Trauma Respiratory Arrest:

1. Open airway using jaw thrust maneuver with another EMS professional applying in-line stabilization of cervical spine.
2. Oxygenate/ventilate with Bag-Valve-Mask (BVM) with supplemental O_2 near 100% FiO_2.
3. Insert nasopharyngeal airway(s) only if no head/facial trauma and/or oropharyngeal airway as needed for patency.
4. Suction as needed.
5. Intubate per applicable protocols. If unable to successfully intubate or intubation is not within the scope of practice of available EMS professionals, place supraglottic airway per Protocol 2E – Supraglottic Airways.

Medical Respiratory Insufficiency (Oxygenation, Ventilation, or Both):

1. Establish patency – either spontaneously by patient, patient positioning, or with nasopharyngeal airway(s).
2. Suction as needed.
3. Apply supplemental O_2 by nasal cannula, non-rebreather mask, BVM, or if EMT license or higher, NIPPV if patient condition indicates need for oxygenation assist.
4. Assist ventilations by BVM, or if EMT license or higher, NIPPV if patient condition indicates need for ventilation assist.
5. If actions in steps 1-4 do not achieve needed oxygenation/ventilation AND if licensed as EMT-I85 or higher, intubate.

Trauma Respiratory Insufficiency (Oxygenation, Ventilation, or Both):

1. Establish patency – either spontaneously by patient, patient positioning, or if no head/facial trauma with nasopharyngeal airway(s).
2. Suction as needed.
3. Apply supplemental O_2 by nasal cannula, non-rebreather mask, BVM as patient condition indicates need for oxygenation assist.
4. Assist ventilations by BVM as patient condition indicates need for ventilation assist.
5. If actions in steps 1-4 do not achieve needed oxygenation/ventilation AND if licensed as EMT-I85 or higher, intubate.

Medical Literature References
2A – Airway Assessment – Adult & Pediatric

1. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
2. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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2B - AIRWAY ESTABLISHMENT / OBSTRUCTION MANAGEMENT
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1, Remove obstruction
2. Oxygenation/Ventilation support

EMD

VERIFY IF PATIENT IS CHOKING
AVOID BACK SLAPS
ENCOURAGE COUGHING AND BREATHING EFFORTS
INSTRUCT CALLER IN HEIMLICH MANEUVER IF INDICATED

EMR | EMT

GENERAL SUPPORTIVE CARE

ADULTS: HEIMLICH MANEUVER OR ABDOMINAL THRUSTS IF SUPINE
(CHEST COMPRESSIONS IF PREGNANT OR MORBID OBESITY)
PEDIATRIC: HEIMLICH MANEUVER OR ABDOMINAL THRUSTS IF SUPINE
(CHEST COMPRESSIONS IF < 1 YR OLD)

OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT- I85 | AEMT

DIRECT LARYNGOSCOPY & REMOVAL OF FOREIGN BODY

ADULT: INTUBATE IF INDICATED

IV ACCESS (IF NEEDED)

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
ADULT: CRICOTHYROTOMY FOR COMPLETE, INTRACTABLE OBSTRUCTION
PEDIATRIC: PT > 6 YRS OLD, CRICOTHYROTOMY FOR COMPLETE, INTRACTABLE OBSTRUCTION

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

CONSULT OLMC IF AIRWAY OBSTRUCTION PERSISTS DESPITE ABOVE MEASURES

Medical Literature References
2B Airway Establishment/Obstruction Management – Adult & Pediatric

1. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
2. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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2C - AIRWAY SUCTIONING ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Trauma to the face and/or upper airway, with potential or actual airway obstruction.
2. Vomitus, food boluses or other liquid foreign material in airway.
3. Excess secretions or pulmonary edema fluid in upper airway (or lungs with endotracheal tube in place).
4. Amniotic fluid in naso/oropharynx of newborn with obvious obstruction to spontaneous breathing or who require positive-pressure ventilation.
5. Meconium in naso/oropharynx of non vigorous newborn.

Contraindications:

1. Airway patency effective without additional suctioning assistance.
2. Amniotic fluid or meconium in naso/oropharynx of vigorous, non-dyspneic newborn.

Technique:

A. Open airway and inspect for visible foreign material.
B. Turn patient on side if possible to facilitate clearance of liquid foreign material.
C. Remove large or obvious foreign particulates with gloved hands. Sweep finger ACROSS posterior pharynx and clear material out of mouth in adults or if visible material in pediatrics.
D. Power on suction machine.
E. Suction of oropharynx:
   1. Attach suction catheter (or use open end of suction tubing for large amounts of debris).
   2. Oxygenate and ventilate the patient prior to the procedure as needed.
   3. Insert tip into oropharynx under direct vision, with sweeping motion.
   4. Continue intermittent suction interspersed with active oxygenation by mask. Use positive pressure ventilation if needed.
   5. If suction becomes clogged, dilute by suctioning water or normal saline to clean tubing. If suction clogs repeatedly, use connecting tubing alone, or manually remove large debris.

PROTOCOL 2C: Airway Suctioning – Adult & Pediatric, cont.

Technique, cont.:

F. Catheter suction of endotracheal tube:

1. Attach suction catheter to tubing of suction device (leaving suction end in sterile container).
2. Ventilate patient 4 - 5 times for pre-suction oxygenation.
3. Detach bag from endotracheal tube and insert sterile tip of suction catheter without suction.
4. When catheter tip has been gently advanced to estimated carina depth, apply suction and withdraw catheter slowly.
5. Rinse catheter tip in sterile water or normal saline.
6. Ventilate patient before each suction attempt.

Precautions:

1. Suctioning, particularly through endotracheal tubes, always risks suctioning the available oxygen as well as the fluid from the airway. In most situations, limit the suction time to a few seconds while the catheter is being withdrawn. This precaution should NOT be followed when vomitus or other material continues to well up and completely obstruct airway. Then suctioning must be continued until an airway is reestablished, with intermittent oxygenation and ventilation performed to avoid prolonged lack of oxygen.

2. Use equipment large enough for the job at hand. Large, solid matter will not be cleared out with suction catheters. Large amounts of particulate matter require open-ended suction using connecting tubing and physical removal with a gloved hand (using bite precautions) or use of Magill forceps.

3. The catheter and tubing will require frequent rinsing with water or normal saline to permit continued suctioning. Have a container of water or normal saline at hand before you begin. Use gauze to remove large material from the end of the catheter.

4. Do not insert a suction catheter with the suction functioning. Suction only on withdrawal of the catheter.

Complications:

1. Hypoxia due to excessive suctioning time without adequate ventilation between attempts.
2. Persistent obstruction due to inadequate tubing size for removal of debris.
3. Lung injury from aspiration of stomach contents due to inadequate suctioning.
4. Asphyxia due to recurrent obstruction if airway is not monitored after initial suctioning.
5. Trauma to the posterior pharynx from forced use of equipment.
6. Vomiting and aspiration from stimulation of gag reflex.
7. Induction of cardio-respiratory arrest from vagal stimulation.

Medical Literature References
2C Airway Suctioning– Adult & Pediatric

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2D - BAG VALVE MASK (BVM) MANAGEMENT ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Respiratory arrest.
2. Inadequate oxygenation/ventilation not improved by non-positive pressure methods or immediately obvious that will not improve by non-positive pressure methods.

Contraindications:

1. Acute dyspnea of lesser severity able to be managed without BVM management
2. Active or suspected impending emesis

Technique:

Utilize the following mnemonic to guide correct BVM management:

C Hold mask by **c-clamp** (now referred to as e-clamp) formed by one, preferably both hands
O Use an **oropharyngeal and/or nasopharyngeal airway(s)**
P **Place in a sniffing position** to open the airway (***unless spinal injury suspected)
E **Elevate the jaw** to additionally open the airway
S **Seal the mask** over the mouth and nose without excessive downward force

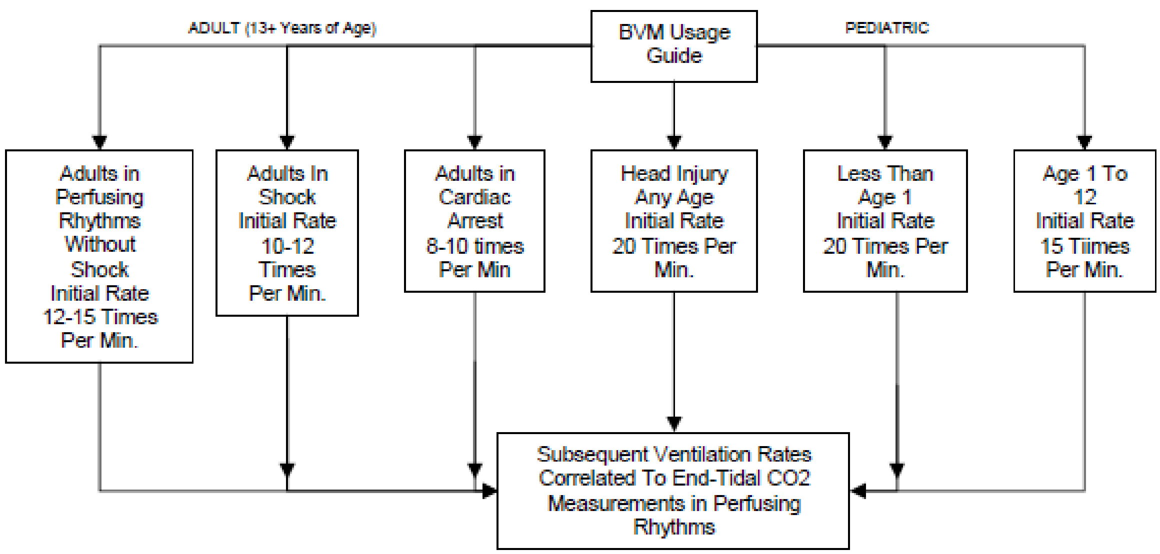
S Use **Sellick maneuver** if indicated (**BURP** = backward, upward, rightward pressure) on the cricoid cartilage to partially occlude the esophagus in the unconscious patient. Do not utilize if ventilations are effective and without onset of gastric distention. Be ready for emesis when releasing Sellick maneuver.
O Use 100% **oxygen** concentration (FiO_2 = 1.0) to start and titrate down as indicated
S **Squeeze the bag slowly and smoothly** (over 1 second ventilation periods) delivering adequate ventilation volume (approx. 6-8 mL of air/kg if respiratory/cardiac arrest or shock; 8-10 mL of air/kg up to 1000 mL if non-shock hemodynamics) and provide adequate exhalation time.

PROTOCOL 2D: Bag Valve Mask (BVM) Management – Adult & Pediatric, cont.

BVM technique that promotes optimal oxygenation/ventilation takes two, sometimes three EMS professionals to achieve.

Utilization of the above technique will promote improved oxygenation/ventilation, while reducing potential for gastric insufflation, vomiting, and aspiration. For gastric insufflation in adults compromising BVM ventilations, utilize a nasogastric/orogastric tube per Protocol 9L – Nasogastric/Orogastric Tube.

Utilize the flowchart below to guide BVM management ventilation rates. Use of an adjustable rate metronome can promote delivery at the indicated rate(s).



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2D – Bag Valve Mask (BVM) Management – Adult & Pediatric

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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

2E – SUPRAGLOTTIC AIRWAYS ADULT & PEDIATRIC

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Hypoxia and/or hypoventilation refractory to non-invasive airway/respiratory management.
2. Airway protection to reduce aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score < 8.
3. Three unsuccessful oral and/or nasal intubation attempts in the above settings. An intubation attempt has occurred when the tip of the endotracheal tube is advanced beyond the gum line or into a nare. Attempts are counted per patient not per intubator. It is not necessary to first attempt intubation if a difficult airway is anticipated or visualized. A supraglottic airway may be used as the first–line airway in these cases.

Contraindications:

1. Ability to maintain oxygenation and ventilation by less invasive methods, such as Bag-Valve-Mask ventilation.
2. Intact gag reflex
3. Known esophageal disease
4. Ingestion of caustic substance (e.g. lye, acids) or extensive airway burns
5. Tracheotomy or laryngectomy
6. Suspected Foreign Body Airway Obstruction
7. (Relative Contraindication): Patient size outside of manufacturer recommended range for airway size used. The supraglottic airway may be utilized in such patients if the fit of the airway allows for appropriate oxygenation and ventilation of the patient.

Precaution:

Medical literature indicates concerns regarding reduction in cerebral arterial flow and impedance of cerebral venous return due to pressure effects of supraglottic airways. Supraglottic airways should not be utilized when other methods of airway management are capable of achieving needed oxygenation/ventilation.

PROTOCOL 2E: Supraglottic Airways – Adult & Pediatric, cont.

Technique (King LT-D™/LTS-D™):

Patient Size	King Airway Size	15 mm Connector Color	Typical Cuff Inflation
35 - 45 inches height or 12-25 kg	2	Green	25 – 35 mL
41 - 51 inches height or 25-35 kg	2.5	Orange	30-40 mL
4 ft – 5 ft height	3	Yellow	45 – 60 mL
5 ft – 6 ft height	4	Red	60 – 80 mL
6 ft + height	5	Purple	70 – 90 mL

The King LT-D™/LTS-D™ Airway has two cuffs that inflate from one port. The smaller, distal cuff inflates in the esophagus and serves to isolate the laryngopharynx from the esophagus. The larger, proximal cuff inflates at the base of the tongue and serves to isolate the laryngopharynx from the oropharynx and nasopharynx.

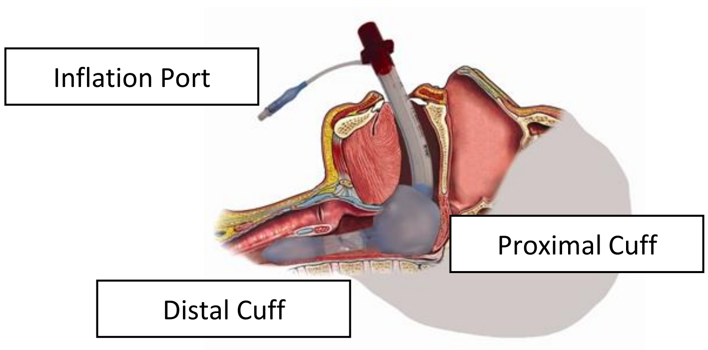


Illustration of Correct Placement King LT-D™ Airway (Size 4 Shown)

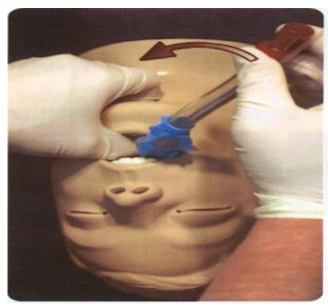
To prepare the King LT-D™/LTS-D™ Airway:

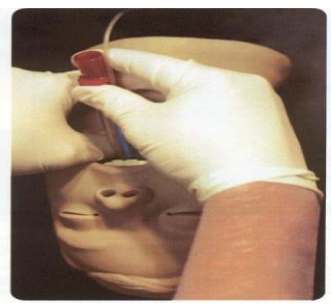
- Test cuffs inflation by injecting air into the cuffs through the inflation port.
- Remove all air from cuffs prior to insertion.
- If lubricant is applied to the posterior aspect of the tube, take care to avoid the introduction of lubricant in or near the ventilation portals in the airway.

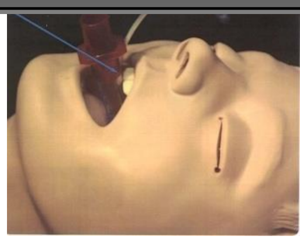
PROTOCOL 2E: Supraglottic Airways – Adult & Pediatric, cont.

- Hold the King LT-D™/LTS-D™ Airway at the connector with dominant hand (right hand dominant depicted)
- With non – dominant hand, hold mouth open and apply chin lift, **unless contraindicated by C – spine precautions or patient position**
- With a lateral approach from the right, introduce tip into mouth
- Laryngoscope(by EMT- I85 or higher license) may allow easier oropharynx passage

- Advance the tip behind the base of the tongue while rotating tube back to midline, so that the blue orientation line faces the chin of the patient







- Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums
- Inflate cuffs with supplied syringe – use minimum mL necessary to achieve seal for appropriate oxygenation/ventilation. **Excessive cuff inflation may compromise cerebral blood flow!**

- Attach bag-valve to King LT-D™/LTS-D™ Airway
- Gently ventilate the patient while withdrawing the tube until ventilation is easy (without significant resistance)
- Confirm proper position by auscultation of epigastrum and chest and observing physiologic changes. Waveform capnography is not required though strongly recommended for ongoing ventilation and perfusion assessment.

PROTOCOL 2E: Supraglottic Airways – Adult & Pediatric, cont.

Removal of the KING LT-D™/LTS-D™ Airway:

1. Once in correct position, the KING LT-D™/LTS-D™ Airway should be well tolerated until return of airway reflexes.
2. Suction MUST always be available when a King LT-D™/LTS-D™ Airway is removed. Anticipate vomiting with removal, positioning patient in lateral recumbent position unless contraindicated. A suction catheter up to an 18 French size can be inserted through the gastric access lumen of the King LTS-D™.
3. Completely deflate cuffs prior to removal.

Additional Information:

1. If unable to place a King LT-D™/LTS-D™ Airway in three attempts, utilize BVM ventilation.
2. Ventilation portals of the King LT-D™/LTS-D™ Airway must align with the laryngeal inlet for adequate oxygenation and ventilation. Insertion depth should be adjusted to optimize ventilation.
3. Ensure cuffs are not over inflated. Inflate the cuffs with the minimum volume necessary to seal the airway. If the patient becomes more alert, it may be helpful in retaining the tube to remove a slight amount of air from the cuffs.
4. Most unsuccessful insertion attempts relate to the failure to keep the tube in a midline position during insertion.
5. Do not force the tube during insertion; this may result in trauma to the airway or esophagus.
6. Document any complications as well as all methods used to ensure appropriate placement of the King LT-D™/LTS-D™ Airway including auscultation of absence of epigastric sounds and presence of lung sounds, physiologic changes (chest rise and fall, improved oxygenation, condensation in King LT-D™/LTS-D™ Airway with exhalations), and waveform capnography readings (if applied).
7. Assess and document placement verification of the King LT-D™/LTS-D™ Airway after patient moves and periodically throughout care and transportation.

Medical Literature References
2E – Supraglottic Airways – Adult & Pediatric

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2E.1 – SUPRAGLOTTIC AIRWAYS ADULT & PEDIATRIC

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Hypoxia and/or hypoventilation refractory to non-invasive airway/respiratory management.
2. Airway protection to reduce aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score < 8.
3. Three unsuccessful oral and/or nasal intubation attempts in the above settings. An intubation attempt has occurred when the tip of the endotracheal tube is advanced beyond the gum line or into a nare. Attempts are counted per patient not per intubator. It is not necessary to first attempt intubation if a difficult airway is anticipated or visualized. A supraglottic airway may be used as the first–line airway in these cases.

Contraindications:

1. Ability to maintain oxygenation and ventilation by less invasive methods, such as Bag-Valve-Mask ventilation.
2. Intact gag reflex
3. Known esophageal disease
4. Ingestion of caustic substance (e.g. lye, acids) or extensive airway burns
5. Tracheotomy or laryngectomy
6. Suspected Foreign Body Airway Obstruction
7. (Relative Contraindication): Patient size outside of manufacturer recommended range for airway size used. The supraglottic airway may be utilized in such patients if the fit of the airway allows for appropriate oxygenation and ventilation of the patient.

Precaution:

Medical literature indicates concerns regarding reduction in cerebral arterial flow and impedance of cerebral venous return due to pressure effects of supraglottic airways. Supraglottic airways should not be utilized when other methods of airway management are capable of achieving needed oxygenation/ventilation.

PROTOCOL 2E.1: Supraglottic Airways – Adult & Pediatric, cont.

Technique (I-gel™):

Patient Size	I-gel™ Size	Color	Nasogastric Tube Size
Neonate 2-5 kg	1	Pink	N/A
Infant 5-12 kg	1.5	Light Blue	10
Small Pediatric 10-25 kg	2	Grey	12
Large Pediatric 25-35 kg	2.5	White	12
Small Adult 30-60 kg	3	Yellow	12
Medium Adult 50-90 kg	4	Green	12
Large Adult 90+ kg	5	Orange	14

Illustration of Correct Placement I-gel™ Airway (Size 4 Shown)

To prepare the I-gel™ Airway:

- Open the package and take out the protective cradle containing the device.
- Remove the accessory pack containing the lubricant and airway support strap from the protective cradle and place the support strap aside.
- Open the lubricant and place in cradle.
- Grasp the I-gel™ along the integrated bite block and lubricate the back, sides and front of the cuff with a thin layer of lubricant.
- When lubricant is applied take care to avoid the introduction of lubricant in or near the ventilation portal in the airway.

Approved 11/7/2018, Effective 2/1/19, replaces all prior versions

PROTOCOL 2E.1: Supraglottic Airways – Adult & Pediatric, cont.

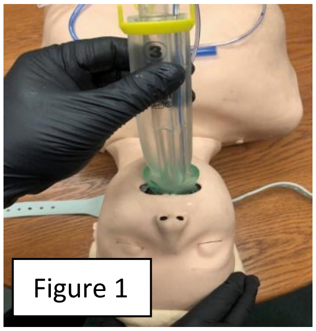


Figure 1

- Grasp the lubricated I-gel™ firmly along the integrated bite block (tube portion of the device). Position the device so that the I-gel™ cuff outlet is facing toward the chin of the patient. (Figure 1)
- The patient should be in the “sniffing” position, with head extended and neck slightly flexed forward. If cervical injury is suspected, use modified “jaw thrust” instead of any flexion at the neck. The chin should be gently pressed down/inferior before proceeding to insert the I-gel™.

- Introduce the leading soft tip into the mouth of the patient in a direction toward the hard palate.

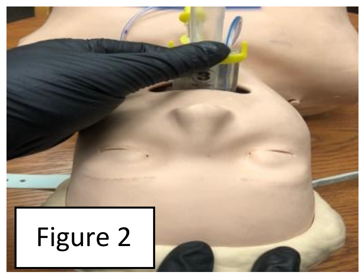


Figure 2

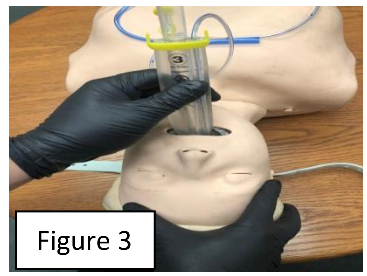


Figure 3

- Glide the device downwards and backwards along the hard palate with a continuous, but gentile push until a definitive resistance is felt. (Figure 2)
- WARNING: Do not apply excessive force on the device during insertion. It is not necessary to insert your fingers or thumbs into the oral cavity of the patient during insertion of the device. If there is resistance during insertion, a ‘jaw thrust’ and slight rotation of the device is recommended.

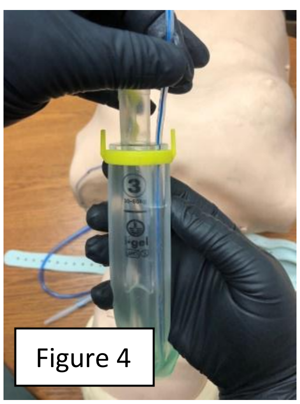


Figure 4

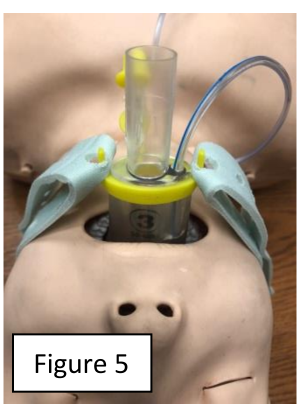


Figure 5

- At this point, the tip of the device should be located into the upper esophageal opening and the cuff should be located against the laryngeal framework. The incisors should be resting on the integrated bite block. (Figure 3)
- Confirm proper position by auscultation of epigastrium and chest and observing physiologic changes. Waveform capnography is not required though strongly recommended for ongoing ventilation and perfusion assessment.
- Preload NG tube in the side port after I-gel is in place, advance to appropriate position, apply suction to decompress the stomach. (Figure 4)
- Secure the tube with strap provided. (Figure 5)

PROTOCOL 2E.1: Supraglottic Airways – Adult & Pediatric, cont.

Removal of the I-gel™ Airway:

1. Ensure suctioning equipment is ready, roll patient onto left side
2. Carefully remove I-gel™ airway with gentle, but firm traction. Suction as needed.
3. Insert an oropharyngeal or nasopharyngeal adjunct, as needed
   Protocol Title: I-gel™ Airway Placement Procedure
4. Continue ventilations with a BVM at 10-15 LPM flow, as needed or place on non-rebreather mask at 10-15 LPM
5. Document time of removal and ongoing vitals

Additional Information:

1. If unable to place an I-gel™ Airway in three attempts, utilize BVM ventilation.
2. Ventilation portal of the I-gel™ Airway must align with the laryngeal inlet for adequate oxygenation and ventilation. Insertion depth should be adjusted to optimize ventilation.
3. Preload the correct size NG tube prior to insertion. (NG will need to be lubricated prior to loading into I-gel™).
3. Most unsuccessful insertion attempts relate to the failure to keep the tube in a midline position during insertion.
4. Do not force the tube during insertion; this may result in trauma to the airway or esophagus.
5. Document any complications as well as all methods used to ensure appropriate placement of the I-gel™ Airway including auscultation of absence of epigastric sounds and presence of lung sounds, physiologic changes (chest rise and fall, improved oxygenation, condensation in I-gel™ Airway with exhalations), and waveform capnography readings (if applied).
6. Assess and document placement verification of the I-gel™ Airway after patient movement and periodically throughout care and transportation.
7. If strap is unavailable use tape as pictured below. (Figure 6)

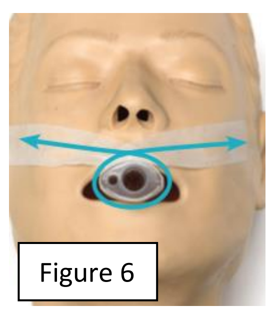


Figure 6

2F – ORAL INTUBATION ADULT

EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Hypoxia and/or hypoventilation refractory to non-invasive airway/respiratory management.
2. Airway protection to minimize aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score <8.
3. Impending airway edema in the setting of respiratory tract burns or anaphylaxis.

Contraindications:

1. A total of three unsuccessful oral and/or nasal intubation attempts in the above settings. An intubation attempt has occurred when the tip of the endotracheal tube is advanced beyond the gum line or into a nostril. Attempts are counted per patient not per intubator.
2. Waveform capnography not immediately available.

Technique:

1. Throughout the period pre-, during, post-intubation the patient must be continually monitored for hypoxia, bradycardia, or hypotension. Corrective measures, including BVM oxygenation should take priority over continuing the current intubation attempts.

2. In pulsatile (non-cardiac arrest) patients, provide supplemental oxygenation throughout the intubation process with nasal cannula oxygen delivery at 15 lpm flow. While this flow rate is much higher than typical nasal cannula oxygen flow rates, the additional force of 15 lpm will help to reduce intra-intubation oxygen desaturation/hypoxia.

3. Walk the laryngoscope down the tongue to avoid placing the laryngoscope in the esophagus.

4. If unable to lift the mandible with the laryngoscope, place your left forearm on the pt's head for leverage.

5. If the vocal cords are poorly visualized in any patient, manipulate the thyroid cartilage with your right hand until appropriate visualization is achieved. Have a colleague hold the thyroid cartilage in this place while you finish intubating. This technique is referred to as "bimanual laryngoscopy" and works much more reliably than cricoid pressure.

6. If the vocal cords are still poorly visualized in obese patients without suspected spinal injury, elevate their head/neck/shoulders. Place blankets or pillows under the head/neck/shoulders until the patient's chin or nose is level with the chest.

PROTOCOL 2F: Oral Intubation – Adult, cont.

7. If ambient light inhibits visualization of the larynx, block this light by any means possible, including a blanket stretched over your head and the patient's head and neck.

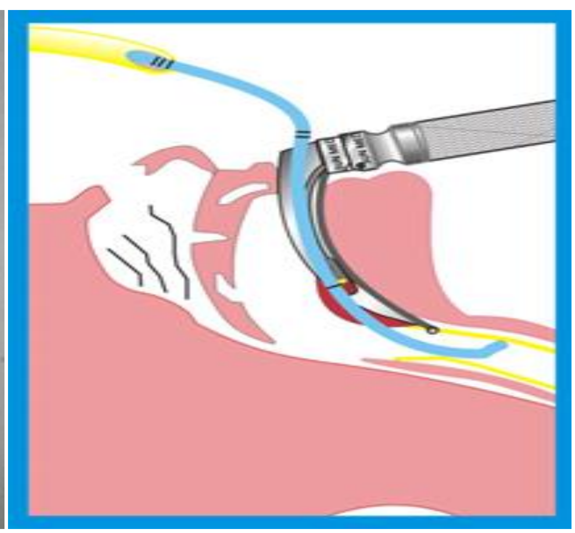
8. In adult patients of appropriate size, strong preference is given for using the 8.0 mm endotracheal tube for orotracheal intubation. Use of this sized tube enables inpatient pulmonary care unable to be performed with smaller sized tubes.

9. It is strongly recommended the Flex-Guide™ introducer be used during any second intubation attempt.

10. It is required the Flex-Guide™ introducer be used during the third intubation attempt.

<u>The Flex-Guide™ Introducer (also known as the Gum Elastic Bougie)</u>:

The Flex-Guide™ Introducer is a single patient use, semi-rigid plastic rod with an angled tip, promoting glottic passage when the vocal cords are incompletely visible during laryngoscopy. A 1 cm wide black band is located along the Flex-Guide™ to help determine correct placement depth. The Flex-Guide™shape and elasticity allow the intubator to feel a "washboard" sensation as the anteriorly-angled tip is advanced down the tracheal rings. Failure to feel a "washboard" sensation indicates inadvertent esophageal placement and the Flex-Guide™ must be fully withdrawn before reattempting placement. The Flex-Guide™ length allows it to be advanced to the carina where resistance is met, also a means of confirming tracheal rather than esophageal placement. Avoid storing the Flex-Guide™ coiled, as it works best in these regards when it is straight. The Flex-Guide™ is contraindicated in patients ≤ 16 years of age.



<u>Flex-Guide™ Introducer Technique</u>:

1. Advance the angled tip facing anteriorly, with continual visualization by laryngoscopy. Anytime resistance is met, stop advancing and reassess placement - forceful passage can result in perforation of soft tissues.

2. Stabilize the Flex-Guide™ when in place, while maintaining laryngoscopy

PROTOCOL 2F: Oral Intubation – Adult, cont.

3. Direct a colleague to slide the endotracheal tube over the Flex-Guide™. He or she stabilizes the proximal end of the Flex-Guide™ as it emerges from the sliding endotracheal tube.

4. Take control of the endotracheal tube, sliding it down the Flex-Guide™ length, while being careful to avoid Flex-Guide™ migration. Once the endotracheal tube has passed to an appropriate estimated endotracheal depth, stabilize it while your colleague withdraws the Flex-Guide™ prior to laryngoscope removal

Confirmation of Oral Endotracheal Placement:
The following sequence is to be used (and its use documented) to verify and maintain correct oral endotracheal placement without fail:

1. **Visualization of endotracheal tube passage between the vocal cords.**

2. **Detection of End-tidal carbon dioxide.** End-tidal carbon dioxide ($EtC0_2$) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of $EtC0_2$ measurement, and a rapid downstroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn. **To be perfectly clear, the use of an endotracheal tube for ongoing oxygenation and ventilation is dependent upon continuously measurable capnography waveforms**. See Protocol 3H-Capnography for discussion of $EtCO_2$ values.

3. **Auscultation. Auscultate the epigastrum.** If epigastric sounds are heard, intubation is to be reattempted. The endotracheal tube placed in the esophagus may be left in place, at the intubator's discretion, until another endotracheal tube is correctly placed and verified. If no epigastric sounds are heard, proceed to **auscultation of the thorax bilaterally.** Breath sounds are best auscultated in the anterior to mid axillary lines. If breath sounds are present on the right and absent on the left, this suggests a right main stem intubation. Withdraw the endotracheal tube 1cm and repeat auscultation. If necessary, the tube may be withdrawn an additional 1-2cm.

4. **Assessment of physiologic changes.** These include equal rise and fall of the chest, condensation in the endotracheal tube on exhalation, improvement in the patient's color, and improvement in the patient's respiratory distress or failure.

PROTOCOL 2F: Oral Intubation – Adult, cont.

5. **Secure the endotracheal tube with a tube holder and place a cervical collar.**
   When intubated patients are moved during EMS care, waveform capnography must be rechecked for any change. If the waveform continues to show a normal pattern of rapid upstroke with exhalation, exhalation plateau, and rapid downstroke with inhalation, no further repeat confirmation is required. If at any time, the capnography waveform is abnormal, steps 2-5 must be rechecked and documented. If at any time during patient care there is doubt as to correct endotracheal placement of intubation, you must either re-verify by this sequence or reattempt correct endotracheal placement. While the intubator may delegate confirmation steps to his/her colleagues, he or she is ultimately responsible to ensure that a complete confirmation sequence is performed. If the intubator accompanies the patient to the hospital, he or she remains ultimately responsible for ongoing endotracheal tube placement confirmation. If the intubator does not accompany the patient to the hospital by ambulance or helicopter ambulance transport, the primary transporting/treating paramedic or RN assumes ultimate responsibility for ongoing endotracheal tube placement confirmation.

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2G - MEDICATION ASSISTED INTUBATION ADULT

TREATMENT PRIORITIES

1, Oxygenation/Ventilation support

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

PARAMEDIC

MEDICATION-ASSISTED INTUBATION IF INDICATED
FOLLOW PROTOCOL 2F – ORAL INTUBATION FOR TECHNIQUE & CONFIRMATION OF INTUBATION

FOR FACILITATING ORAL INTUBATION:
ADULT: ETOMIDATE 0.3 mg/kg IVP/IOP SINGLE DOSE
OR
ADULT: MIDAZOLAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP
MAY REPEAT ONCE IF ADULT SYS BP ≥ 100 mmHg

FOR POST-ORAL INTUBATION SEDATION TO PREVENT EXTUBATION (IF INDICATED):
ADULT: MIDAZOLAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP
MAY REPEAT ONCE IF ADULT SYS BP ≥ 100 mmHg
OR
ADULT: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP
MAY REPEAT ONCE IF ADULT SYS BP ≥ 100 mmHg
OR
ADULT: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IOP
MAY REPEAT ONCE IF ADULT SYS BP ≥ 100 mmHg

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

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2H – NASAL INTUBATION ADULT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Indications:

1. Hypoxia and/or hypoventilation refractory to non-invasive airway/respiratory management, including refractory to NIPPV.
2. Airway protection to minimize aspiration in the setting of sustained altered mental status with a Glasgow Coma Scale Score <8.
3. Impending airway edema in the setting of respiratory tract burns or anaphylaxis.
4. Patients more compliant with intubation attempts in a sitting position.
5. Oral anatomy, injury, or jaw clenching preventing indicated orotracheal intubation.

Contraindications:

1. Apnea.
2. Pediatric patients (age ≤12 years).
3. Suspected basilar skull fracture.
4. Mid-facial injuries with bony instability.
5. Combativeness preventing patient compliance.
6. Anticoagulant use (Warfarin/Coumadin, Plavix, or Aspirin) - Relative contraindication - orotracheal intubation preferred to minimize bleeding complications
7. Three unsuccessful oral and/or nasal intubation attempts in the above settings. An intubation attempt has occurred when the tip of the endotracheal tube is advanced beyond the gum line or into a nostril. Attempts are counted per patient not per intubator.
8. Waveform capnography not immediately available.

Technique:

1. Apply two sprays of phenylephrine 2% in each nostril to induce local vasoconstriction. This will enlarge the nostril and decrease epistaxis complications.

2. Apply lidocaine 2% gel to the endotracheal tube cuff.

3. Insert the well-lubricated tube along the floor of the most patent nostril, bevel side facing inward toward the septum. This positioning will prevent a turbinate from being trapped in the tube and subsequently being sheared off as the tube is advanced. Pass the tube straight back (not angulated upward) with constant, gentle pressure. Do not use an endotracheal stylet in nasotracheal intubations.

4. As the tube is advanced, there is a loss of resistance as the tube passes from the nasopharynx into the oropharynx. Continue advancing the tube.

PROTOCOL 2H: Nasal Intubation – Adult, cont.

5. As the tube nears the glottis, guide the tube by listening at the adaptor. The awake patient should be instructed to deeply inspire to help guide the tube through the vocal cords and into the trachea. Correct endotracheal placement may also be assisted by rotating the tube 90 degrees so that the bevel is up and facing the glottis.

6. Once the tube has been placed, the patient should not be capable of phonation. The ability to speak after "nasotracheal intubation" actually denotes "nasoesophageal intubation." In such cases, the tube is to be slightly withdrawn and correct placement reattempted. The Flex-Guide™ may NOT be used for difficult nasotracheal intubations.

Confirmation of Nasal Endotracheal Placement:
The following sequence is to be used (and its use documented) to verify and maintain correct nasal endotracheal placement without fail:

1. **Detection of End-tidal carbon dioxide.** End-tidal carbon dioxide ($EtC0_2$) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of $EtC0_2$ measurement, and a rapid down stroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn. **To be perfectly clear, the use of an endotracheal tube for ongoing oxygenation and ventilation is dependent upon continuously measurable capnography waveforms**. See Protocol 3H -Capnography for discussion of $EtCO_2$ values.

2. **Auscultation. Auscultate the epigastrum.** If epigastric sounds are heard, intubation is to be reattempted. If no epigastric sounds are heard, proceed to **auscultation of the thorax bilaterally.** Breath sounds are best auscultated in the anterior to mid axillary lines. If breath sounds are present on the right and absent on the left, this suggests a right main stem intubation. Withdraw the endotracheal tube 1 cm and repeat breath sound auscultation. If necessary, the tube may be withdrawn an additional 1-2 cm.

3. **Assessment of physiologic changes.** These include equal rise and fall of the chest, condensation in the endotracheal tube on exhalation, improvement in the patient's color, and improvement in the patient's respiratory distress or failure.

4. **Secure the endotracheal tube with tape and place a cervical collar.**
When intubated patients are moved during EMS care, waveform capnography must be rechecked for any change. If the waveform continues to show a normal pattern of rapid upstroke with exhalation, exhalation plateau, and rapid down stroke with inhalation, no further repeat confirmation is required. If at any time, the capnography waveform is abnormal, steps 1-4 must be rechecked and documented. If at any time during patient care there is doubt as to correct endotracheal placement of intubation, you must either re-verify by this sequence or reattempt correct endotracheal placement

PROTOCOL 2H: Nasotracheal Intubation – Adult, cont.

Confirmation of Nasal Endotracheal Placement (cont.):

While the intubator may delegate confirmation steps to his/her colleagues, he or she is ultimately responsible to ensure that a complete confirmation sequence is performed. If the intubator accompanies the patient to the hospital, he or she remains ultimately responsible for ongoing endotracheal tube placement confirmation. If the intubator does not accompany the patient to the hospital by ambulance or helicopter ambulance transport, the primary transporting/treating paramedic or RN assumes ultimate responsibility for ongoing endotracheal tube placement confirmation.

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2H – Nasal Intubation – Adult

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Approved 1/16/2019, Effective 4/1/2019, replaces all prior versions
PerTrach® Kit authorized until 8/1/19; Control-Cric™ mandatory by 8/1/19

2I – CRICOTHYROTOMY ADULT

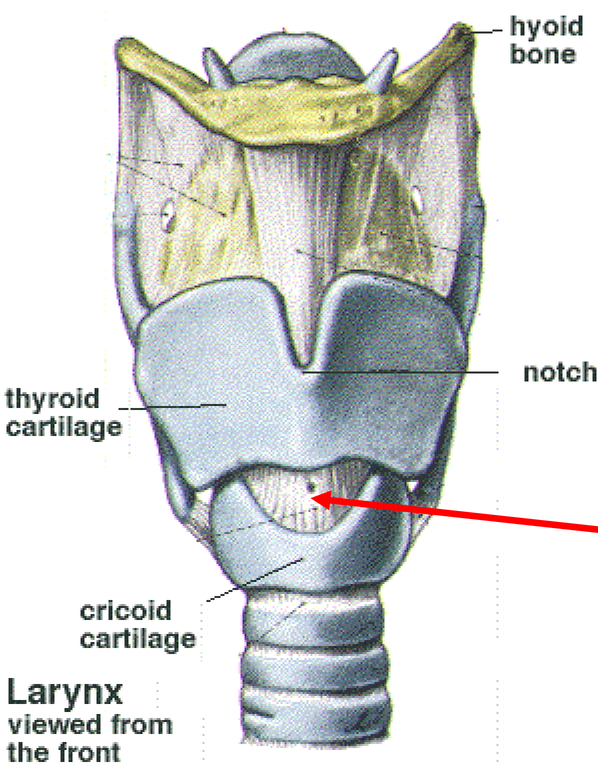
PARAMEDIC

Indications:

1. Upper airway obstruction (eg. facial or neck trauma occluding airway patency, foreign body unable to be removed, angioedema) and inability to adequately oxygenate and ventilate using less invasive methods.

Contraindications:

1. Ability to oxygenate and ventilate using less invasive methods.
2. Infant and younger pediatrics – airway anatomical size not conducive to successful cricothyrotomy in EMS care. Contact OLMC for direction in these ages.
3. Older pediatrics – airway anatomical size MAY not be conducive to successful cricothyrotomy in EMS care. Contact OLMC for direction in these ages.
4. Suspected fractured larynx and/or cricoid cartilage.
5. Suspected tracheal transection with retraction of the trachea into the chest.
6. Inability to find anatomical landmarks



Do not confuse the hyoid bone for the thyroid cartilage.

Attempted placement of a cricothyrotomy airway superior to the thyroid cartilage will cause anatomical disruption and will NOT establish a secure airway capable of needed oxygenation and ventilation. The hyoid bone does NOT have the distinct notch of the thyroid cartilage.

Cricothyroid membrane

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

<u>Non-Surgical Technique (Control-Cric™):</u>

A. Position patent supine and identify the cricothyroid membrane.

B. Stabilize the thyroid cartilage with the non-dominant hand (illustration shows the right hand as non-dominant). The dominant hand rests on the sternum, holding the device, with the scalpel oriented horizontal, across the neck at the cricothyroid membrane (illustration shows the left hand as dominant). (Figure 1)


Figure 1

C. Inserting the scalpel to its depth safety hub, make a horizontal incision through both the skin and the underlying cricothyroid membrane. (Figure 2)

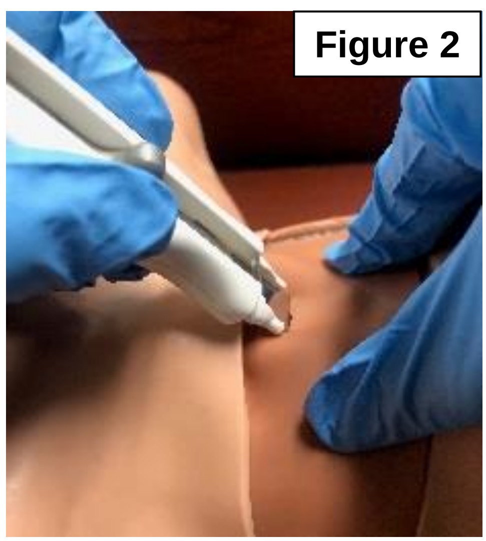


Figure 2

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Non-Surgical Technique (Control-Cric™), cont:

D. Slide the included tracheal hook down the handle with the thumb placed at the knob, advancing the tip of the hook into the incision made in Step C/Figure 2. (Figure 3)

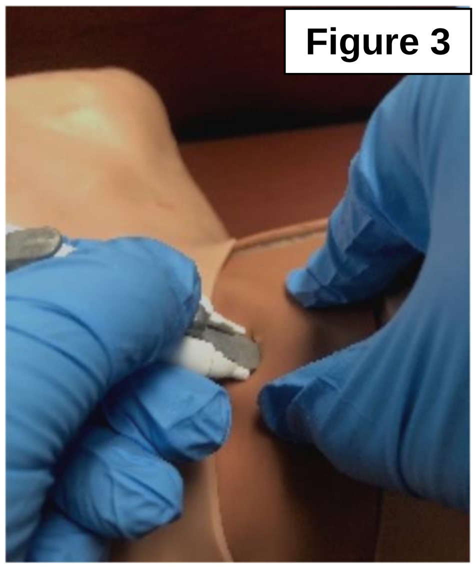


Figure 3

E. Free the tracheal hook from the handle by sliding it fully down the handle and transfer control of the hook to the non-dominant hand. The tracheal hook should now be able to stabilize movement of the trachea as it is pulled in a controlled force and manner, with the hook under the inferior edge of the thyroid cartilage. (Figure 4)

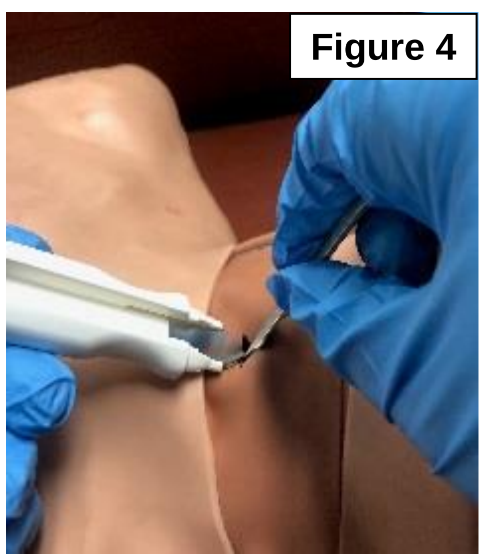


Figure 4

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Non-Surgical Technique (Control-Cric™), cont:

F. Insert the Cric-Key™ through the cricothyroid membrane incision. Confirm placement by moving the Cric-Key™ introducer along the anterior wall of the trachea to feel for the tracheal rings as partial confirmation of correct placement. (Figure 5)


Figure 5

G. Remove the Cric-Key™ introducer. (Figure 6) Inflate the cuff until resistance is met. Confirm placement with continuous waveform capnography. See also Protocol 3H: Waveform Capnography – Adult & Pediatric.

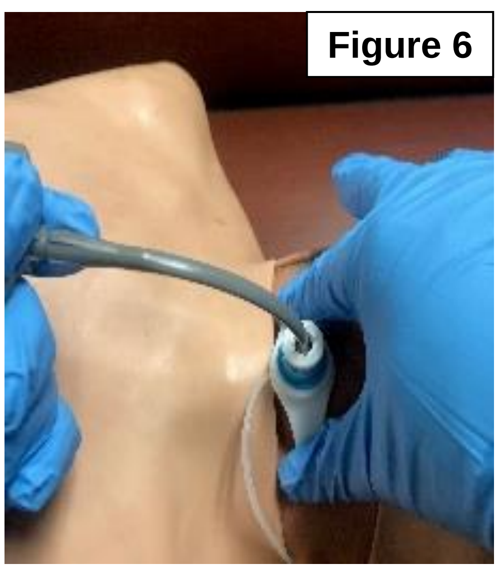


Figure 6

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Non-Surgical Technique (Control-Cric™), cont:

G. Secure the cricothyrotomy airway with the included stabilizing strap. (Figure 7)


Figure 7

Surgical Technique (6.0 endotracheal tube and tracheal hook):

A. Establish adequate space and lighting. Do not attempt cricothyrotomy in poorly visualized conditions.

B. If rapidly available, clean anterior neck with ChloraPrep®, Betadine®, or alcohol wipe.

C. Definitively locate the following landmarks: thyroid cartilage ("Adam's apple") and cricoid cartilage. The cricothyroid membrane lies between these cartilages.

D. Using the non-dominant hand, spread the overlying skin taut with the thumb and fingers, and slightly depress the skin over the cricothyroid membrane with the index finger to mark the site of cricothyrotomy. Do not release the non-dominant hand from the neck until the procedure is complete! Once the anatomy is found and defined, avoid movement of the anatomy to promote proper cricothyrotomy airway placement.

E. Stabilization of the anatomy requires assistance from a second EMS professional, preferably licensed as a paramedic as well.

F. Ask second EMS professional to aspirate all air from the endotracheal tube cuff.

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Surgical Technique, cont.:

G. Using a sterile scalpel, make a vertical incision in the mid-line of the neck extending from just above the lower edge of the thyroid cartilage to the middle of the cricoid cartilage. Make the depth of this incision sufficient to extend through the skin and fatty tissue underneath.

H. Using sterile hemostats, spread the incision open horizontally to expose the cricothyroid membrane. Instruct the second EMS professional to hold the hemostats in this position.

I. Using the same scalpel as in Step G, now make a short horizontal incision in the middle of the cricothyroid membrane. There is a small artery running vertically on each side of the cricothyroid membrane. Keeping the horizontal incision less than ½ inch (approx. 1 cm) will decrease bleeding that may occur.

J. Pass the 6.0 mm endotracheal tube through the horizontal incision in the cricothyroid membrane, angling the tube inferior and posterior along the tracheal anatomy. A "washboard" sensation may be felt as the tube slides along the tracheal wall. Avoid excessive pressure in placing the endotracheal tube, but a moderate degree may be required to first pass the endotracheal tube through the cricothyroid membrane. If significant resistance is encountered (without suspicion of lower respiratory tract foreign body), the hemostats used in Step H may be used to spread the cricothyroid membrane incision vertically while the endotracheal tube is passed through it and/or use of the tracheal hook may better stabilize the anatomy to overcome resistance to airway passage.

K. Inflate the endotracheal cuff and verify airway placement per Protocol 2J – Confirmation of Artificial Airway Placement.

L. Secure the airway using a cloth tie or commercial endotracheal tube restraint while continuing oxygenation and ventilation. Artificial ventilation will generally be easier if the endotracheal tube is cut to a shorter length. Be careful to cut the upper aspect of the endotracheal tube above the insertion site of the cuff inflation portal to avoid irreversible cuff deflation.

Non-Surgical Technique (PerTrach® Kit and tracheal hook):

A. Establish adequate space and lighting. Do not attempt cricothyrotomy in poorly visualized conditions.

B. If rapidly available, clean anterior neck with ChloraPrep®, Betadine®, or alcohol wipe.

C. Definitively locate the following landmarks: thyroid cartilage ("Adam's apple") and cricoid cartilage. The cricothyroid membrane lies between these cartilages in the neck midline.

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Non-Surgical Technique (PerTrach® Kit and tracheal hook), cont.

D. Using the non-dominant hand, spread the overlying skin taut with the thumb and fingers, and slightly depress the skin over the cricothyroid membrane with the index finger to mark the site of cricothyrotomy. Do not release the non-dominant hand from the neck until the procedure is complete! Once the anatomy is found and defined, avoid movement of the anatomy to promote proper cricothyrotomy airway placement.

E. Stabilization of the anatomy requires assistance from a second EMS professional, preferably licensed as a paramedic as well.

F. Ask second EMS professional to aspirate all air from the tracheostomy tube cuff.

G. Using the dominant hand on the break-away needle and syringe, puncture in the lower half of the cricothyroid membrane, mid-line, at a 45 degree angle towards the chest (following the path of the airway from superior to inferior). Once air is aspirated in the syringe, advance another few millimeters in depth and remove the syringe.

H. Using the included small scalpel, make a single vertical “stab” incision immediately to one side of the needle.

I. Place a tracheal hook in the incision and position the hook to pull anterior and superior on the inferior border of the thyroid cartilage. Exercise caution when manipulating the tracheal hook into the incision – the tip of most tracheal hooks is particularly sharp-edged.

J. The second EMS professional should now control the tracheal hook.

K. Palming the airway and dilator stylet, advance through the needle until resistance is met. The second EMS professional should split the needle by compressing and widening the “butterfly” tips on the needle and then remove each side of the needle. Constant inward/downward pressure on the airway and stylet must be maintained to avoid inadvertent displacement of the airway and ensure the tip of the airway will remain in the trachea.

L. Continue to advance the airway/stylet until the airway is fully in the trachea (airway passed to hub contact with overlying skin) and remove the tracheal hook.

M. Inflate the airway cuff and verify airway placement per Protocol 2J – Confirmation of Artificial Airway Placement.

N. Secure the airway using the cloth tie while continuing oxygenation and ventilation.

PROTOCOL 2I: Emergency Cricothyrotomy – Adult, cont.

Modified Non-Surgical Technique (Control-Cric™ or PerTrach® Kit):

In patients with neck edema, subcutaneous air, or fat/obesity preventing necessary tactile identification of anatomical landmarks to perform standard non-surgical cricothyrotomy, utilize the following modification:

A. Using the included scalpel, make a single, vertical, mid-line incision in the skin overlying the area that is estimated to contain the thyroid cartilage, cricothyroid membrane, and cricoid cartilage. When making the incision, make an incision approximately 2 inches (5 cm) in length and deep enough that the subcutaneous fat can be visualized. Using a gloved index finger palpate the structures through the incision and when identified, proceed as per standard non-surgical cricothyrotomy.

Medical Literature References
2I - Cricothyrotomy – Adult

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2J – CONFIRMATION OF ENDOTRACHEAL AIRWAY PLACEMENT ADULT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

The following sequence is to be used (and its use documented) to verify and maintain correct endotracheal artificial airway placement without fail:

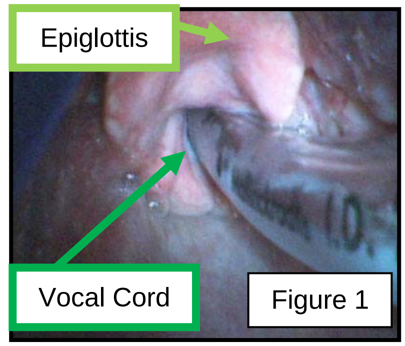

Figure 1

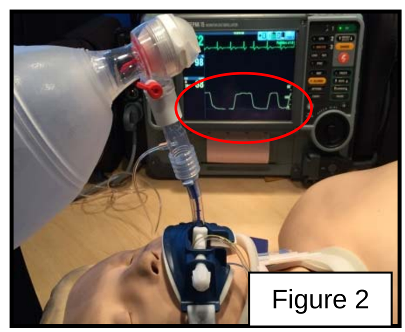
Figure 2

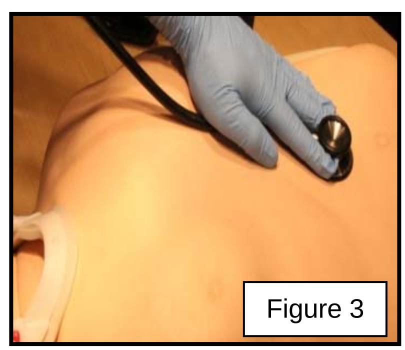
Figure 3

1. **Visualization of endotracheal tube passage between vocal cords – oral intubation only.** (Figure 1)

2. **Detection of End-tidal carbon dioxide.** End-tidal carbon dioxide ($EtCO_2$) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of $EtCO_2$ measurement, and a rapid downstroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn. **To be perfectly clear, the use of an endotracheal tube for ongoing oxygenation and ventilation is dependent upon continuously measurable capnography waveforms.** See Protocol 3H -Capnography for discussion of $EtCO_2$ values and waveforms. (Figure 2)

3. **Auscultation. Auscultate the epigastrium.** (Figure 3) If epigastric sounds are heard, intubation is to be reattempted. The endotracheal tube placed in the esophagus may be left in place, at the intubator's discretion, until another endotracheal tube is correctly placed and verified. If no epigastric sounds are heard, proceed to **auscultation of the thorax bilaterally**. Breath sounds are best auscultated in the anterior to mid-axillary lines. If breath sounds are present on the right and absent on the left, this suggests a right mainstem intubation. Withdraw the endotracheal tube 1 cm and repeat breath sound auscultation. If necessary, the tube may be withdrawn an additional 1-2 cm.

PROTOCOL 2J: Confirmation of Endotracheal Artificial Airway Placement – Adult

4. **Assessment of physiologic changes.** These include equal rise and fall of the chest, condensation in the endotracheal tube on exhalation, improvement in the patient's color, and improvement in the patient's respiratory distress/failure.

5. **Secure the endotracheal tube with a tube holder and place a cervical collar.** (Figure 4)

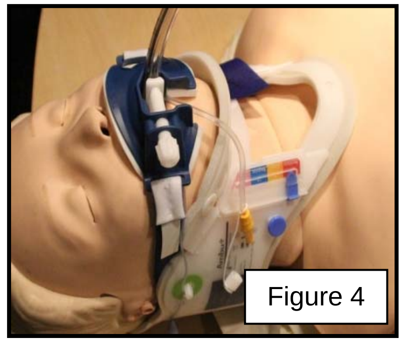
Figure 4

When intubated patients are moved during EMS care, waveform capnography must be rechecked for any change. If the waveform continues to show a normal pattern of rapid upstroke with exhalation, exhalation plateau, and rapid downstroke with inhalation, no further repeat confirmation is required. If at any time, the capnography waveform is abnormal, steps 2-5 must be rechecked and documented. If at any time during patient care there is doubt as to correct endotracheal placement of intubation, either re-verify by this sequence or reattempt correct endotracheal placement. While the intubator may delegate confirmation steps to his/her colleagues, he or she is ultimately responsible to ensure that a complete confirmation sequences performed. If the intubator accompanies the patient to the hospital, he or she remains ultimately responsible for ongoing endotracheal tube placement confirmation. If the intubator does not accompany the patient to the hospital by ambulance or helicopter ambulance transport, the primary transporting/treating paramedic or RN assumes ultimate responsibility for ongoing endotracheal tube placement confirmation.

Upon delivery of the patient at treatment destination or at subsequent transport (eg. helicopter transport), a waveform capnograph will be obtained and documented after the patient has been physically transferred onto the destination's/subsequent transport's stretcher/bed/operating table to show confirmed, continued correct endotracheal tube placement at EMS transfer of patient care.

Medical Literature References
2J – Confirmation of Endotracheal Artificial Airway Placement – Adult& Pediatric

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2K – STOMA/TRACHEOSTOMY MANAGEMENT ADULT & PEDIATRIC

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Emergency Management:

- The majority of adults and children with tracheostomies are dependent on the tube as their primary airway. Cardio-respiratory arrest most commonly results from tracheostomy obstructions. Obstruction may be due to thick secretions/mucous plug, blood clot, foreign body, or kinking or dislodgement of the tube. Work expeditiously and deliberately to re-establish airway patency and support oxygenation/ventilation.
- Early warning signs of obstruction include tachypnea, tachycardia, and desaturation. Cyanosis, bradycardia and apnea are late signs - do not wait for these to develop before intervening.

Complications:

- Airway obstruction
- Aspiration
- Blocked tube
- Bleeding
- Tracheal trauma
- Pneumothorax
- Subcutaneous and mediastinal emphysema
- Respiratory and cardiovascular collapse
- Dislodged tube
- Tracheo-esophageal fistula
- Infection

Endotracheal Suctioning:

Endotracheal suctioning is necessary to remove mucus, maintain a patent airway, and avoid tracheostomy tube blockages. Indications for suctioning include:

- Audible or visual signs of secretions in the tube
- Signs of respiratory distress
- Suspicion of blocked or partially blocked tube
- Inability to clear the tube by coughing out the secretions
- Increases in required ventilation pressures (in ventilated patients)
- Request by patient for suction

PROTOCOL 2K: Stoma/Tracheostomy Management– Adult & Pediatric, cont.

Endotracheal Suctioning, cont.:

- Tracheal suctioning should be carried out regularly for patients with a tracheostomy. The frequency varies between patients and is based on individual assessment.
- Tracheal damage may be caused by suctioning. This can be minimized by using the appropriate sized suction catheter and only suctioning within the tracheostomy tube.

Table 1: recommended suction catheter sizes

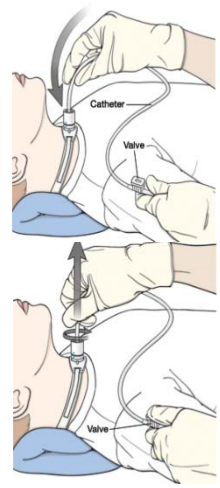
Tracheostomy tube size (in mm)	3.0 mm	3.5 mm	4.0 mm	4.5 mm	5.0 mm	6.0mm	7.0mm	7.5mm	8.0mm	9.0mm – 10mm
Recommended suction catheter size (Fr)	7	8	8	10	10	10-12	14	14-16	14-16	16

- The suction depth is determined by the estimated length of the tracheostomy tube.
- The depth of insertion of the suction catheter needs to be determined prior to suctioning to avoid trauma.
- Using the patient's spare tracheostomy tube of the same size (if available) to estimate needed depth of suctioning.
- The pressure setting for tracheal suctioning (suction machine pressure for small children 50-100 mmHg, for older children/adults 100-120 mmHg) to avoid tracheal damage.
- In most circumstances, it is best to limit the duration of suctioning (including passing the catheter and suctioning the tracheostomy tube) to 5-10 seconds.
- Routine use of normal saline is not necessary although there is anecdotal evidence it may thin secretions. In situations where this may be of benefit, only 1-2 mL is usually needed.

PROTOCOL 2K: Stoma/Tracheostomy Management– Adult & Pediatric, cont.

Tracheal Suctioning Procedure:

1. Inform pt of intended action.
2. Maintain appropriate PPE throughout procedure.
3. Assemble needed suction equipment and power on suction device.
4. Instill small volume of sterile normal saline into the tracheostomy tube if needed for thick or dry secretions. Excessive use of saline is not recommended. Use saline only if the mucus is very thick, hard to cough up or difficult to suction. Recommended amount per instillation is approximately 1-2 mL.
5. Gently insert catheter into the tracheal tube without applying suction, passing to the previously estimated needed depth.
6. Put thumb over opening in catheter to create suction and use a circular motion (twirl catheter between thumb and index finger) while withdrawing the catheter so that the mucus is removed well from all areas. Avoid suctioning longer than 10 seconds because of oxygen loss. Suction normal saline from a container if needed to clear catheter.
7. For tracheostomy tubes with cuffs, it may be necessary to deflate the cuff periodically for suctioning to prevent pooling of secretions above tracheal cuff.
8. Let patient rest and breathe, then repeat suction if needed until clear (trying to allow about 30 seconds between suctioning).
9. Oxygenate/ventilate as needed.



Tracheostomy tube tie changes:

- There is a potential risk for tracheostomy tube dislodgment when attending to tie changes, therefore two personnel who are competent in tracheostomy care should undertake tracheostomy tie changes.
- During the tracheostomy tie change one person is to maintain the airway by securing the tracheostomy tube in place and not removing the hand until the new tracheostomy ties are applied. The other person is to change the ties and attend to stoma care.
- If the tie becomes loose, make it is a priority to re-secure the tracheostomy tube before it can become dislodged.

Medical Literature References
2K - Stoma/Tracheostomy Management– Adult & Pediatric

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3A – RESPIRATORY ARREST ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Airway patency
2. Oxygenation/Ventilation
3. Vital signs
4. Dextrose for hypoglycemia
5. Naloxone for narcotic/opiate overdose

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

CPR BY EMD INSTRUCTION

EMR | **EMT**

ESTABLISH AIRWAY PATENCY (POSITIONING, OPA, NPA)
O_2 VIA BVM AS APPROPRIATE
GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
DETERMINE BLOOD GLUCOSE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC
ADULT: NALOXONE 2 mg IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

EMT OR HIGHER LICENSE:
MEASURE END–TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | **AEMT**

ADULT: INTUBATE IF INDICATED PER APPLICABLE PROTOCOLS
DO NOT INTUBATE PATIENTS WITH RAPIDLY REVERSIBLE RESP ARREST ETIOLOGY (e.g. NARCOTIC/OPIATE OVERDOSE)

IV/IO ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 250 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 125 mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED
ADULT & PEDIATRIC: REPEAT DETERMINATION OF BLOOD GLUCOSE POST-DEXTROSE TREATMENT

ADVANCED EMT OR HIGHER LICENSE:
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC
ADULT: NALOXONE 2 mg IVP/IOP/IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G

CONTINUOUS ASSESSMENT & TREATMENT OF SUSPECTED RESP ARREST ETIOLOGY PER APPLICABLE PROTOCOL(S)

Medical Literature References
3A – Respiratory Arrest – Adult & Pediatric

1. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
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10. Wang HE, Davis DP, O'Connor RE, Domeier RM. Drug-assisted intubation in the prehospital setting (resource document to NAEMSP position statement). *Prehosp Emerg Care*. 2006 Apr-Jun;10(2):261-71.
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3B – DYSPNEA – UNCERTAIN ETIOLOGY
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
   (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
3. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
4. Nebulization therapy
   - Albuterol

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
IF PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ADULT: OBTAIN 12-LEAD ECG & TRANSMIT TO RECEIVING EMERGENCY DEPARTMENT (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

ADULT & PEDIATRIC WEIGHT ≥15 kg: NEBULIZED ALBUTEROL 5 mg
PEDIATRIC WEIGHT <15 kg: NEBULIZED ALBUTEROL 2.5 mg
MAY REPEAT ALBUTEROL ENROUTE X 1 AS NEEDED

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED PER APPLICABLE PROTOCOLS

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
3B – Dyspnea – Uncertain Etiology - Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
2. Welsford M, Nikolaou NI, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, O'Connor RE, Pichel DR, Scott T, Walters DL, Woolfrey KG; Acute Coronary Syndrome Chapter Collaborators. Part 5: Acute Coronary Syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation.* 2015 Oct 20;132(16 Suppl 1):S146-76.
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EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

3C – DYSPNEA – ASTHMA ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
3. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
4. Nebulization therapy
   - Albuterol, Ipratropium bromide

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
AS PREVIOUSLY PRESCRIBED FOR ASTHMA SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped,**Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

ADULT & PEDIATRIC WEIGHT ≥15kg: NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg
PEDIATRIC WEIGHT <15kg: NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg
MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED
FOR SEVERE ASTHMA REFRACTORY TO NEBULIZATION:
ADULT: EPINEPHRINE 1mg/mL (1:1000) 0.3 mg (0.3 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH
PEDIATRIC: EPINEPHRINE 1mg/mL (1:1000) 0.15 mg (0.15 mL) AUTOINJECTOR INTRAMUSCULAR INJECTION IN THIGH
OLMC ORDER ONLY FOR EPHINEPHRINE IF PT ≥50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE >140/90 mmHg

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED PER APPLICABLE PROTOCOLS

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

AEMT OR HIGHER LICENSE:
FOR SEVERE ASTHMA REFRACTORY TO NEBULIZATION:
ADULT: EPINEPHRINE 1mg/mL (1:1000) at 0.3 mg (0.3 mL) IM
PEDIATRIC: EPINEPHRINE 1mg/mL (1:1000) at 0.01 mg/kg (0.01 mL/kg) NOT TO EXCEED 0.3 mg (0.3 mL) IM
OLMC CONSULT FOR EPHINEPHRINE IF PT ≥50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE >140/90 mmHg

PARAMEDIC

ADULT: METHYLPREDNISOLONE 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.
PEDIATRIC: METHYLPREDNISOLONE 2 mg/kg NOT TO EXCEED 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.
ADULT: MAGNESIUM SULFATE 1 gram VERY SLOW IVP OVER 10 MINS
AVOID/STOP IF HYPOTENSION OR KNOWN RENAL FAILURE
ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
3C– Dyspnea – Asthma - Adult & Pediatric

1. Goodacre S, Cohen J, Bradburn M, Stevens J, Gray A, Benger J, Coats T; 3Mg Research Team. The 3Mg trial: a randomised controlled trial of intravenous or nebulised magnesium sulphate versus placebo in adults with acute severe asthma. *Health Technol Assess*. 2014 Apr;18(22):1-168.
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3D – DYSPNEA – CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) ADULT

TREATMENT PRIORITIES

1. Vital signs
   (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
3. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
4. Nebulization therapy
   - Albuterol, Ipratropium bromide

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
AS PREVIOUSLY PRESCRIBED FOR COPD SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
APPLY Bi/CPAP IF INDICATED (if equipped)
NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg
MAY REPEAT ENROUTE X 2 AS NEEDED
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

INTUBATE IF INDICATED PER APPLICABLE PROTOCOLS

IV ACCESS
IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

METHYLPREDNISOLONE 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.

MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
3D– Dyspnea – Chronic Obstructive Pulmonary Disease (COPD) - Adult

1. Williams TA, Finn J, Perkins GD, Jacobs IG. Prehospital continuous positive airway pressure for acute respiratory failure: a systematic review and meta-analysis. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):261-73.
2. Wijesinghe M, Perrin K, Healy B, Hart K, Clay J, Weatherall M, Beasley R. Pre-hospital oxygen therapy in acute exacerbations of chronic obstructive pulmonary disease. *Intern Med J*. 2011 Aug;41(8): 618-22.
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8. Richmond NJ, Silverman R, Kusick M, Matallana L, Winokur J. Out-of-hospital administration of albuterol for asthma by basic life support providers. *Acad Emerg Med*. 2005 May;12(5):396-403.
9. Thompson M, Wise S, and Rodenberg H. A preliminary comparison of levalbuterol and albuterol in prehospital care. *J Emerg Med*. 2004; 26(3):271-277.
10. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.

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3E – DYSPNEA – CONGESTIVE HEART FAILURE (CHF) ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
   (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
3. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
4. Cardiac pre-load & after-load reduction
   - Adult: Nitroglycerin
   - Pediatric: OLMC CONSULT

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. NITROGLYCERIN SPRAY/TABS)
AS PREVIOUSLY PRESCRIBED FOR CHF SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)
ADULT: ASSIST PT WITH PT OWN NITROGLYCERIN AS PREVIOUSLY PRESCRIBED FOR CHF SYMPTOMS IF SYS BP ≥ 100 mmHg
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED PER APPLICABLE PROTOCOLS

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G

ADULT: PHARMACOLOGIC TREATMENT IF SYS BP ≥ 100 mmHg:
NITROGLYCERIN 0.4 mg SUBLINGUAL EVERY 5 MINS **OR**
IF PATIENT ON NIPPV, USE NITROGLYCERIN 2% OINTMENT 1½ INCHES APPLIED TO CHEST WALL
ADULT: PHARMACOLOGIC TREATMENT IF SYS BP < 100 mmHg:
NOREPINEPHRINE 2-4 mcg/min TITRATE to SYS ≥ 100 mmHg **OR**
DOPAMINE 5-20 mcg/kg/min TITRATE TO SYS BP ≥ 100 mmHg
PEDIATRIC: OLMC CONSULT FOR PHARMACOLOGIC TREATMENT

TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME AND/OR DYSRHYTHMIA PROTOCOL(S) AS INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)
TRANSPORT ASAP PER DESTINATION PROTOCOL

Medical Literature References
3E– Dyspnea – Congestive Heart Failure (CHF) - Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
2. Welsford M, Nikolaou NI, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, O'Connor RE, Pichel DR, Scott T, Walters DL, Woolfrey KG; Acute Coronary Syndrome Chapter Collaborators. Part 5: Acute Coronary Syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation.* 2015 Oct 20;132(16 Suppl 1):S146-76.
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12. McKinney J, Brywczynski J, Slovis CM. Med under scrutiny: the declining roles of furosemide, morphine & beta blockers in prehospital care. *JEMS*. 2009 Jan;34(1):10-2.
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14. Hubble MW, Richards ME, Jarvis R, Millikan T, Young D. Effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):430-9.
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3F – DYSPNEA – BRIEF RESOLVE UNEXPLAINED EVENT (BRUE) PEDIATRIC LESS THAN 1 YEAR OF AGE

TREATMENT PRIORITIES

1. Vital signs
   (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM if indicated
3. Ventilation support
   - BVM if indicated
4. Transport for further evaluation

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

KEEP PATIENT FREE FROM INJURY HAZARDS
AVOID PLACING ANYTHING IN MOUTH
PLACE IN POSITION OF RESPIRATORY COMFORT

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
HISTORY TO DEFINE IF BRUE – CYANOSIS? CHANGE IN BREATHING? MOTOR TONE LOSS OR STIFFNESS? ALTERED MENTAL STATUS? NO OTHER EXPLANATION FOR SYMPTOMS?
DOES BRUE = LOW RISK? - SINGLE EVENT TODAY? EVENT LESS THAN 1 MINUTE? NO PRIOR EVENT? GESTATIONAL AGE AT BIRTH >32 WEEKS? AGE NOW > 2 MOS? NO CPR GIVEN? NORMAL EXAM?
DOES BRUE = HIGH RISK? – "NO" TO A LOW RISK ITEM ABOVE? FAM HX OF SUDDEN CARDIAC DEATH? SOCIAL ENVIRONMENT CONCERNING FOR POSSIBLE CHILD ABUSE?
***OLMCP CONSULT REQUIRED IF PARENT/GUARDIAN REFUSAL OF TRANSPORT IF BRUE = HIGH RISK
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)

EMT-I85 | AEMT

IV ACCESS IF INDICATED
IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 2G
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
3F – Dyspnea – Apparent Life Threatening Event – Pediatric

1. Tieder JS, Altman RL, Bonkowsky JL, Brand DA, Claudius I, Cunningham DJ, Dewolfe C, Percelay JM, Pitetti RD, Smith MB. Management of Apparent Life-Threatening Events in Infants: A Systematic Review. *J Pediatr*. 2013 Feb 14.
2. Kaji AH, Claudius I, Santillanes G, Mittal MK, Hayes K, Lee J, Gausche-Hill M. Apparent life-threatening event: multicenter prospective cohort study to develop a clinical decision rule for admission to the hospital. *Ann Emerg Med*. 2013 Apr;61(4):379-387.e4.
3. Kaji AH, Santillanes G, Claudius I, Mittal MK, Hayes K, Lee J, Gausche-Hill M. Do infants less than 12 months of age with an apparent life-threatening event need transport to a pediatric critical care center? *Prehosp Emerg Care*. 2013 Jul-Sep;17(3):304-11.
4. Romaneli MT, Fraga AM, Morcillo AM, Tresoldi AT, Baracat EC. Factors associated with infant death after apparent life-threatening event (ALTE). *J Pediatr* (Rio J). 2010 Nov-Dec;86(6):515-9.
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11. Davies F, Gupta R. Apparent life threatening events in infants presenting to an emergency department. *Emerg Med J*. 2002 Jan;19(1):11-6.

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3G – PULSE OXIMETRY ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Medical General Assessment/General Supportive Care
2. Trauma General Assessment/Trauma & Hypovolemic Shock Supportive Care
3. Acute Dyspnea (Uncertain Etiology, Asthma, COPD, CHF, BRUE).
4. Cardiovascular Disorders (Chest Pain, Acute Coronary Syndrome, Dysrhythmias).
5. Neurologic Disorders/Altered Mental Status (Stroke, Seizure, Syncope).
6. Toxicologic/Poisonings (Altered Mental Status, Dyspnea)
7. Trauma (Head, Face, Neck, Chest Injuries)

Contraindications: None

Technique:

A. Power on the pulse oximeter (may be included with monitor/defibrillator).
B. Select an appropriate site for measurement.
   1. Best skin color on hand (or foot/ear if pediatric).
   2. Not distal to acute suspected orthopedic injuries.
C. Place the infrared sensor on the patient.
D. Read the pulse rate and oximetry reading (SpO_2).

Precautions:

A. Pulse oximetry values may be inaccurate in hemodynamically compromised patients (shock), patients with peripheral vascular constriction, carbon monoxide poisonings/smoke inhalations, and any conditions that may cause methemoglobinemia or sulfhemoglobinemia. Always correlate the patient's clinical condition with SpO_2 readings.
B. Trends prove more informative than a single measurement. At least two measurements should be performed and documented when using pulse oximetry. In the setting of artificial airway placement, pulse oximetry should be utilized continuously.

Medical Literature References
3G– Pulse Oximetry - Adult

1. Aguilar SA, Davis DP. Latency of pulse oximetry signal with use of digital probes associated with inappropriate extubation during prehospital rapid sequence intubation in head injury patients: case examples. *J Emerg Med*. 2012 Apr;42(4):424-8.
2. Wijesinghe M, Perrin K, Healy B, Hart K, Clay J, Weatherall M, Beasley R. Pre-hospital oxygen therapy in acute exacerbations of chronic obstructive pulmonary disease. *Intern Med J*. 2011 Aug;41(8): 618-22.
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4. Davis DP, Aguilar S, Sonnleitner C, Cohen M, Jennings M. Latency and loss of pulse oximetry signal with the use of digital probes during prehospital rapid-sequence intubation. *Prehosp Emerg Care*. 2011 Jan-Mar;15(1):18-22.
5. Austin MA, Wills KE, Blizzard L, Walters EH, Wood-Baker R. Effect of high flow oxygen on mortality in chronic obstructive pulmonary disease patients in prehospital setting: randomised controlled trial. *BMJ* 2010 Oct 18;341:c5462.
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10. Van Dyk NT, Cloyd DJ, Rea TD, Eisenberg MS. The effect of pulse oximetry on emergency medical technician decision making. *Prehosp Emerg Care* 2004 8(4):417-419.

3H – WAVEFORM CAPNOGRAPHY ADULT & PEDIATRIC

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Medical General Assessment/General Supportive Care.
2. Trauma General Assessment/Trauma & Hypovolemic Shock Supportive Care.
3. Acute Dyspnea (Uncertain Etiology, Asthma, COPD, CHF, BRUE).
4. Confirmation of Endotracheal Airway Placement – EARLY USE INDICATED; SEE PROTOCOL 2J.
5. Mechanical Ventilation
6. Termination of Resuscitation; SEE PROTOCOL 4K
7. Neurologic Disorders/Altered Mental Status (Stroke, Seizure, Syncope).
8. Toxicologic/Poisonings (Altered Mental Status, Dyspnea).
9. Trauma (Head, Face, Neck, Chest Injuries).

Contraindications: None

Technique:
(Physio-Control LifePak® 12/15):

1. Connect the CO_2 FilterLine® tubing by turning clockwise until securely fitted, evidenced by the wings in a horizontal position and the message "CO2 Initializing" appearing.

Critical Comment:

When CO_2 is **NOT** detected, four factors must be quickly assessed:

1. Loss of airway - apnea? esophageal endotracheal tube placement/migration? obstruction?
2. Circulatory collapse - cardiac arrest? massive pulmonary embolism? exsanguination?
3. Equipment failure - disconnected or malfunctioning bag-valve or ventilator?
4. Adjust EtCO2 scale to 0-20 and print 6 second strip to verify waveform capnography.

PROTOCOL 3H: Waveform capnography – Adult & Pediatric, cont.

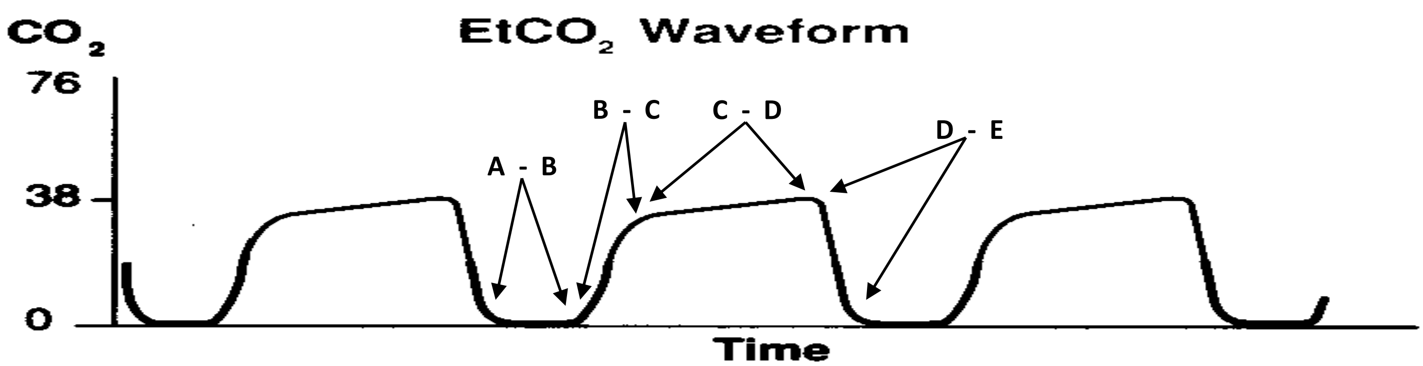
Interpreting Capnography:

The figure below shows a normal capnography waveform display. There are 4 phases of the waveform that require analysis. The flat **A – B** baseline segment (Respiratory Baseline) represents the beginning of exhalation of CO_2 – free gas that is contained in dead space from the conduction airways (trachea, bronchi). This value normally is zero. The **B – C** segment (Expiratory Upstroke), a sharp rise, represents exhalation of a mixture of dead space gases and alveolar gases. The **C – D** segment represents the alveolar plateau, characterized by exhalation of mostly alveolar gas. Point **D** is the end-tidal ($EtCO_2$) value that is recorded and displayed by the monitor, (peak concentration of CO_2 occurring at the end of expiration). The **D – E** segment (Inspiratory Downstroke), a sharp fall, reflects the inhalation of gases that are CO_2 – free (room air or supplemental oxygen). Alterations of the normal capnograph or $EtCO_2$ values are the result of changes in metabolism, circulation, ventilation, or equipment function.

A normal range for $EtCO_2$ is **35 – 45 mmHg**, similar to the range of CO_2 in arterial blood.

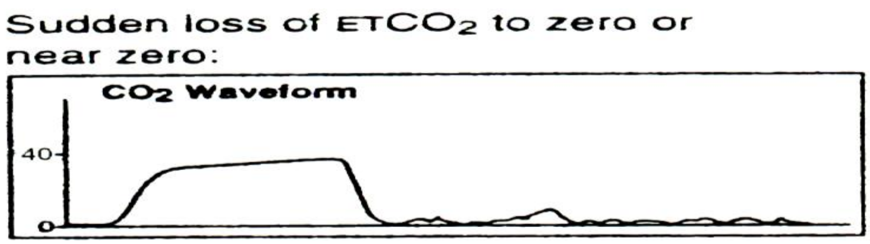
Normal Waveform:

Normal Capnography Waveform



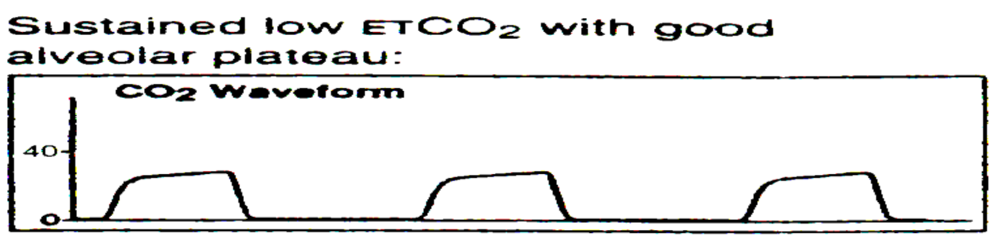
PROTOCOL 3H: Waveform capnography – Adult & Pediatric, cont.

<u>Abnormal Waveforms</u>:

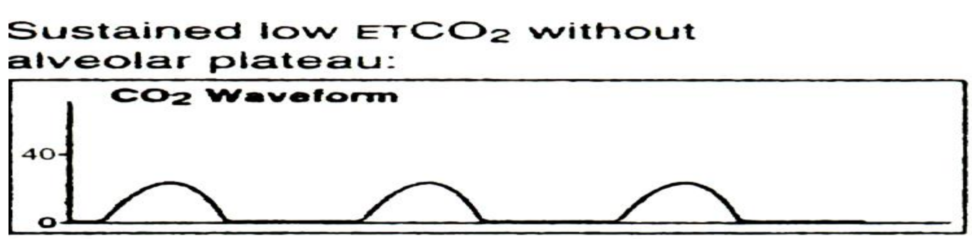


Possible Causes:

1.Endotracheal tube in esophagus.
2.Apnea.
3.Endotracheal tube or supraglottic not connected to capnography detector.
4.Total obstruction/mucus plugging.
5.Capnography malfunction - if abnormal waveform persists with change in capnography adaptor, the endotracheal tube or supraglottic MUST be withdrawn and intubation or supraglottic placement reattempted.



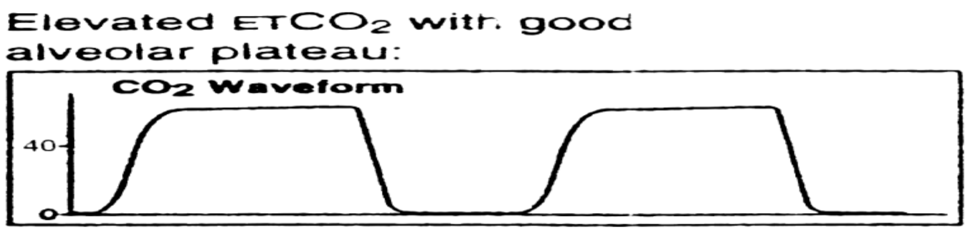
Possible Causes:
1. Hyperventilation (due to underlying illness/injury or excessive assisted ventilations).
2. Hypothermia (Decrease in Metabolism).



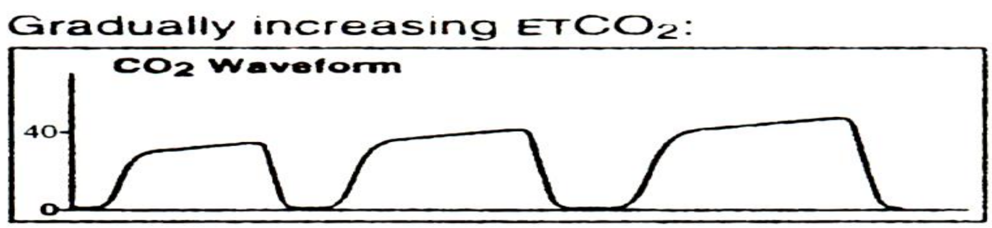
Possible causes:
1. Bronchospasm of asthma or COPD exacerbation.
2. Incomplete obstruction/mucus plugging.

PROTOCOL 3H: Waveform capnography – Adult & Pediatric, cont.

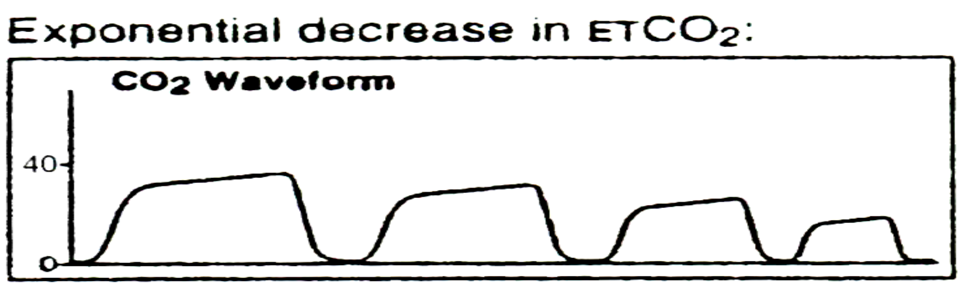
<u>Abnormal Waveforms</u>:



Possible causes:
1. Hypoventilation (due to underlying illness/injury or inadequate assisted ventilations).
2. Hyperthermia, pain, shivering (Increase in Metabolism).



Possible causes:
1. Hypoventilation (due to underlying illness/injury or inadequate assisted ventilations).
2. Rising body temperature, increasing pain (Increasing Metabolism).



Possible causes:
1. Cardiopulmonary arrest.
2. Pulmonary embolism.
3. Sudden hypotension, massive blood loss, cardiopulmonary bypass.

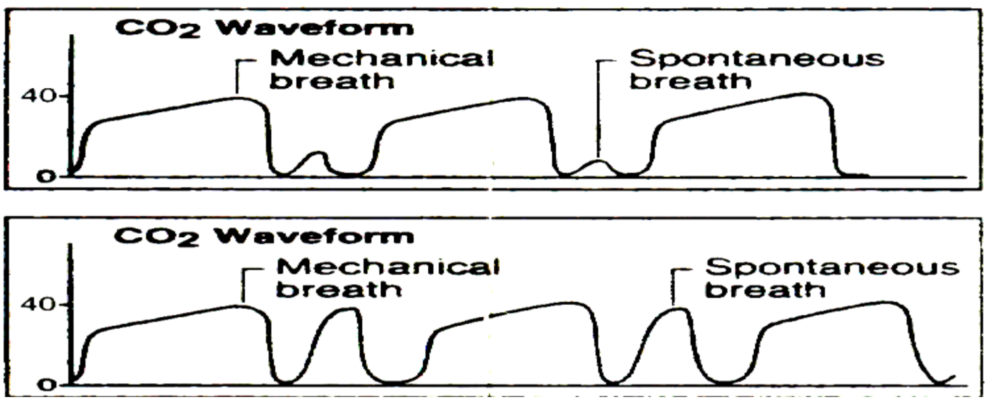
PROTOCOL 3H: Waveform capnography – Adult & Pediatric, cont.

Abnormal Waveforms:

Cardiogenic oscillations:

Cardiogenic oscillations are caused by changes in thoracic volume secondary to expansion and contraction of the myocardium with each heartbeat. They are usually seen in patients with small tidal volumes and slow respiratory rates, and are of little physiologic consequence.

Spontaneous breathing during mechanical ventilation:



Spontaneous breathing efforts may be evident on the CO2 waveform display. The patient on the top demonstrates poorer quality spontaneous breathing effort than the patient on the bottom.

PROTOCOL 3H: Waveform capnography – Adult & Pediatric, cont.

Troubleshooting Tips for EtCO2 monitoring:

Observation/Message	Possible Cause	Corrective Action
ALARM APNEA	No breath has been detected for 30 seconds since last valid breath	Check the patient, then ventilation equipment for leaks/disconnected tubing
CO2 FILTERLINE OFF	FilterLine®, or any other CO2 accessories disconnected or not securely connected to the LifePak® EtCO2 connector	Connect FilterLine®, or any other CO2 accessories, to input connector or tighten connection
CO2 FILTERLINE BLOCKAGE	FilterLine® is twisted or clogged. The message appears after 30 seconds of unsuccessful purging Airway Adapter clogged	Check the FilterLine® and if necessary replace it Check the Airway Adapter and necessary, replace it
CO2 FILTERLINE PURGING	FilterLine® tube twisted or clogged with water	Check the FilterLine® and if necessary, untwist or reconnect it
EtCO2 values erratic	A leak in the tubing Assisted ventilated patient breaths spontaneously	Check for connection leaks and line leaks to patient and correct if necessary
EtCO2 values are consistently higher or lower than expected	Physiological cause Ventilator/Assisted ventilation error	Check patient (pulse?) Check ventilator &/or assisted ventilation rate Adjust EtCO2 scale to 0-20mmHg to reflect lower than anticipated value Print 6 second strip for verification of waveform
XXX appears in place of EtCO2 value	CO2 module not calibrated successfully CO2 module failed	Notify appropriate supervisor/materials agent of critical equipment failure

Medical Literature References
3H - Capnography - Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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9. Delerme S, Freund Y, Renault R, Devilliers C, Castro S, Chopin S, Juillien G, Riou B, Ray P. Concordance between capnography and capnia in adults admitted for acute dyspnea in an ED. *Am J Emerg Med*. 2010 Jul;28(6):711-4.
10. Jabre P, Jacob L, Auger H, Jaulin C, Monribot M, Aurore A, Margenet A, Marty J, Combes X.Capnography monitoring in nonintubated patients with respiratory distress. *Am J Emerg Med*. 2009 Nov;27(9):1056-9.
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13. Silvestri S, Ralls GA, Krauss B, Thundiyil J, Rothrock SG, Senn A, Carter E, Falk J. The effectiveness of out-of-hospital use of continuous end-tidal carbon dioxide monitoring on the rate of unrecognized misplaced intubation within a regional emergency medical services system. *Ann Emerg Med*. 2005 May;45(5):497-503.
14. Katz SH, Falk JL. Misplaced endotracheal tubes by paramedics in an urban emergency medical services system. *Ann Emerg Med*. 2001 Jan;37(1):32-7.

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3I – OXYGEN ADMINISTRATION ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

Use in chronic conditions to include:

COPD – chronic bronchitis or emphysema
Chronic lung disease – lung cancer, sarcoidosis, pulmonary fibrosis, pulmonary hypertension.

EMS administration of O_2 may be at usual concentrations (e.g. nasal cannula flow at 2-3 liters per minute) or at higher concentrations than usual during acute dyspnea episodes (e.g. non-rebreather mask flow at 12 liters per minute) if the chronic pulmonary disease patient exhibits more than typical dyspnea or more than typical hypoxemia.

Use in acute conditions to include:

Respiratory arrest
Dyspnea – uncertain etiology, asthma, COPD, CHF, BRUE, acute allergic reaction
Cardiac arrest
Acute coronary syndrome (if associated with dyspnea or pulse oximetry< 94%)
Stroke (if associated with dyspnea or pulse oximetry< 94%)
Multi-systems trauma

EMS administration of O_2 should be goal-directed to achieve oxygen saturation levels, based on pulse oximetry, with a target level of 94–98% in most patients, or 88–92% in COPD patients.

Precautions:

Excessive oxygen levels can impair the respiratory drive in chronic pulmonary disease patients and paradoxically contribute to as much tissue disease as hypoxemia. Multiple studies show that **hyper**oxemia in certain ischemic tissue disease events (e.g. cardiac arrest, stroke) can lead to worse outcomes than normal oxygen levels. Treat hypoxemia, but avoid excessive oxygen levels that are unneeded in addressing patient symptoms of dyspnea or signs of respiratory failure (e.g. low pulse oximetry readings).

PROTOCOL 3I: Oxygen Administration – Adult & Pediatric, cont.

<u>Supplemental oxygen concentration capabilities of different devices</u>:

Via nasal cannula (NC) at 1 – 6 liters per minute (lpm), yields 24-44% concentration of inhaled oxygen (FiO_2 of 0.24 – 0.40). Typically, each additional liter flow will increase the concentration of inhaled oxygen by 4%. With higher lpm flows (5-6 lpm) via NC, nasal irritation and drying of mucosa can occur without use of humidified O_2.

There are a number of face mask options, such as the simple face mask, often used between 6 and 12 lpm, resulting in a concentration of oxygen to the patient between 40% and 50%. This is closely related to the more controlled air-entrainment masks, also known as Venturi masks, which can accurately deliver a predetermined oxygen concentration in a range of 24 - 50%.

In some instances, a partial rebreathing mask can be used, which is based on a non-rebreather mask, but with the valves over the exhalation ports removed. The partial rebreathing mask can provide oxygen concentrationin the 40 – 70% using up to 15 lpm flow.

Non-rebreather masks draw oxygen from an attached reservoir bags, with one-way valves that direct exhaled air out of the mask. When properly fitted and used at flow rates of 10-15 LPM or higher, they deliver 60 - 80% oxygen concentrations and occasionally higher, depending upon mask/face interface and valve function. Minimum lpm flow through a non-rebreather (even when using for presumed psychogenic hyperventilation) should be 10 lpm.

Medical Literature References
3I – Oxygen Administration – Adult & Pediatric

1. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
2. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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5. Martin DS, Grocott MP. Oxygen therapy in critical illness: precise control of arterial oxygenation and permissive hypoxemia. *Crit Care Med*. 2013 Feb;41(2):423-32.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

3J – NEBULIZATION THERAPY ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMR may only assist with patient's own nebulizer

Indications:

1. Dyspnea – Uncertain Etiology
2. Dyspnea – Asthma
3. Dyspnea – Chronic Obstructive Pulmonary Disease (COPD)
4. Acute Allergic Reactions
5. Bronchospasm from toxic inhalations

Contraindications:

1. Non-bronchospastic respiratory distress (eg. clear presentation of CHF)

Technique:

A. Assemble nebulization device.
B. Fill nebulization chamber with medication to be nebulized.
C. Initiate 6-10 lpm O_2 flow if using hand-held nebulization device or via face mask.
D. Place nebulization chamber "in-line" with respiratory circuit if using nebulization via NIPPV, supraglottic airway or endotracheal tube. Use continuing pre-nebulization lpm flow of O_2 to deliver nebulized medication through the respiratory circuit.

Repeat steps B – D as patient condition indicates per applicable protocol(s).

Medical Literature References
3J – Nebulization Therapy - Adult & Pediatric

1. Myers JB, Slovis CM, Eckstein M, Goodloe JM, Isaacs SM, Loflin JR, Mechem CC, Richmond NJ, Pepe PE; U.S. Metropolitan Municipalities' EMS Medical Directors. Evidence-based performance measures for emergency medical services systems: a model for expanded EMS benchmarking. *Prehosp Emerg Care*. 2008 Apr-Jun;12(2):141-51.
2. Bryson D, Camargo CA Domeier RM, Gaeta TJ, Hendeles L, Hise S, Nowak RM, Russotti R, Sapien R, Wallace D, Wright JL, Boss L, Greiling A, Redd S, Workgroup on EMS Management of Asthma Exacerbations. A model protocol for emergency medical services management of asthma exacerbations. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):418-429.
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5. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.
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Approved 9/12/18, Effective 1/1/19, replaces all prior versions

3K – NON-INVASIVE POSITIVE PRESSURE VENTILATION (NIPPV) ADULT

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

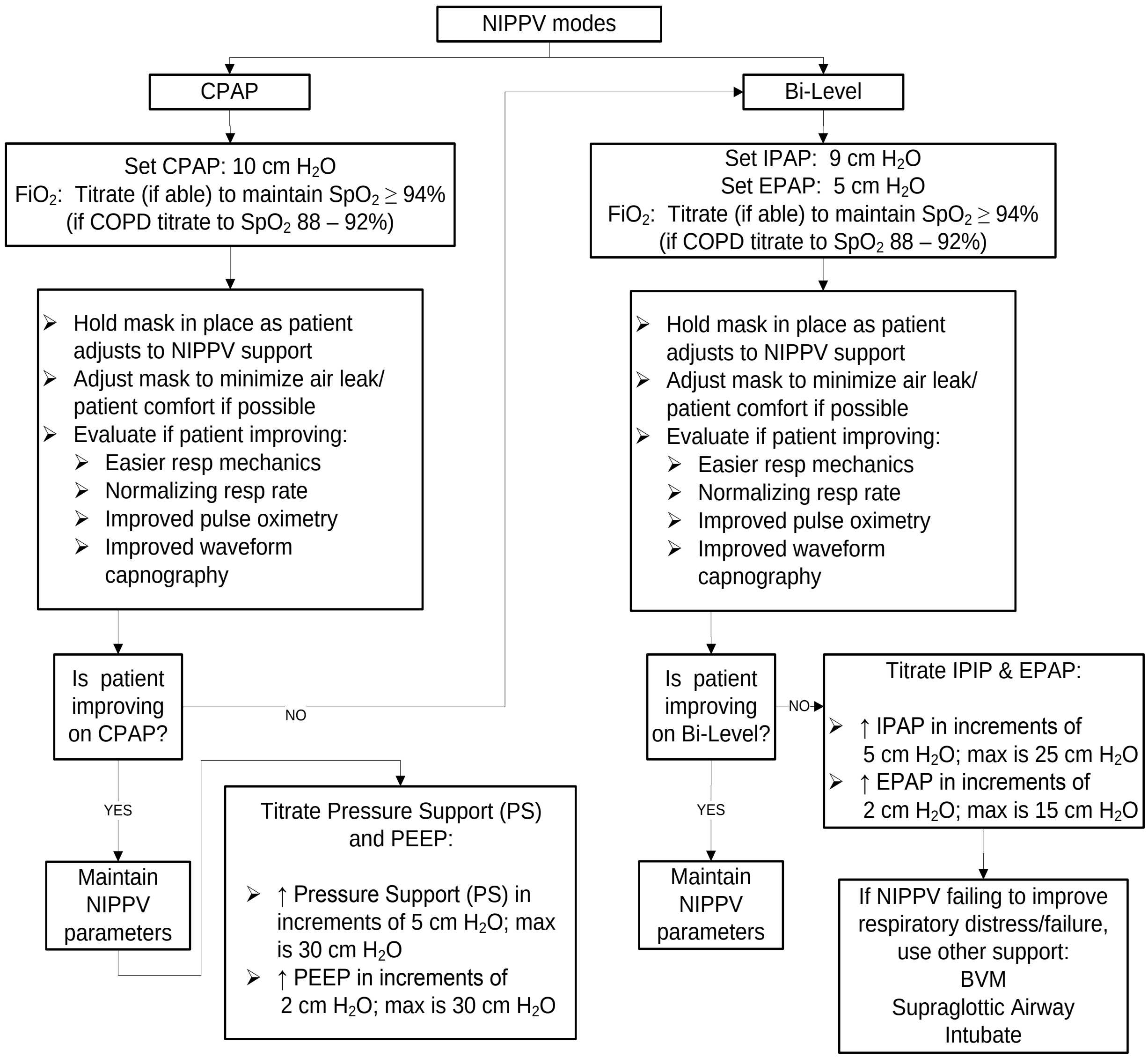
Indications:
1. Dyspnea – Uncertain Etiology – Adult.
2. Dyspnea – Asthma – Adult.
3. Dyspnea – Chronic Obstructive Pulmonary Disease (COPD) – Adult.
4. Dyspnea – Congestive Heart Failure (CHF) – Adult.
5. Acute Allergic Reactions – Adult (Dyspnea).
6. Water Submersion Event – Adult (Dyspnea).

Contraindications:
1. Apnea.
2. Pediatric dyspnea.
3. Adult dyspnea of lesser severity able to be managed without NIPPV.
4. Adult dyspnea of greater severity requiring invasive airway management.
5. Altered mental status preventing patient cooperation with NIPPV.
6. Active or suspected impending emesis.
7. High risk of aspiration/Impaired gag reflex.
8. Facial trauma/features impairing a tight NIPPV mask-face seal.

Approved 9/12/18, Effective 1/1/19, replaces all prior versions

PROTOCOL 3K: Non – Invasive Positive Pressure Ventilation (NIPPV) - Adult, cont.

Bi-Level/CPAP Ventilation Algorithm



Special Considerations/Complications

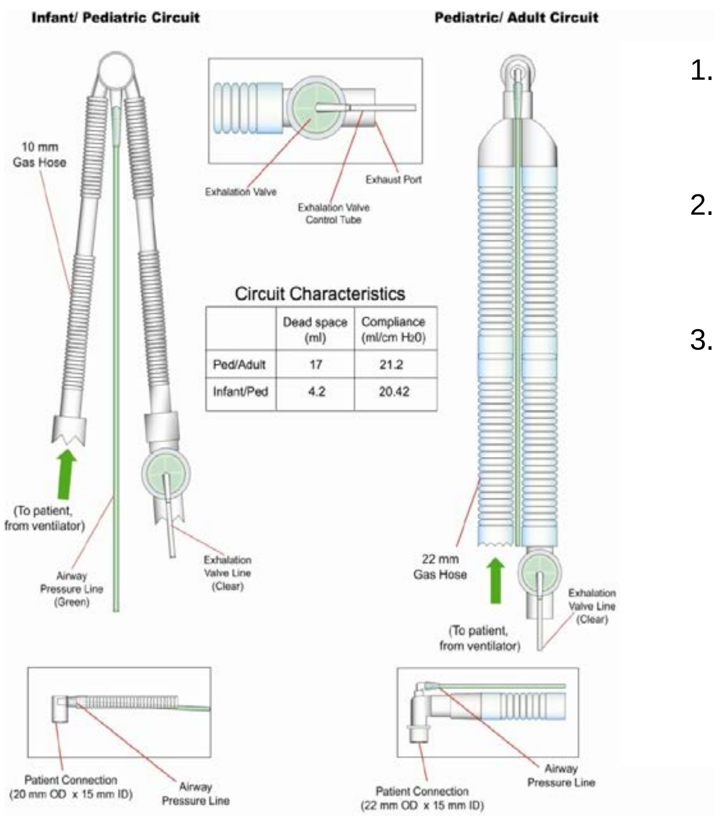
- Patients requiring bronchodilator therapy?
  - ✓ Bronchodilators via nebulizer t-piece in line with NIPPV
- It is very important to achieve a tight seal between face and NIPPV mask to deliver anticipated levels of NIPPV
- Monitor closely for nausea/impending emesis – be prepared to quickly remove facemask to avoid aspiration of emesis

Approved 9/12/18, Effective 1/1/19, replaces all prior versions

PROTOCOL 3K: Non – Invasive Positive Pressure Ventilation (NIPPV) - Adult, cont.

Technique (ZoLL Model 731):

Circuits:



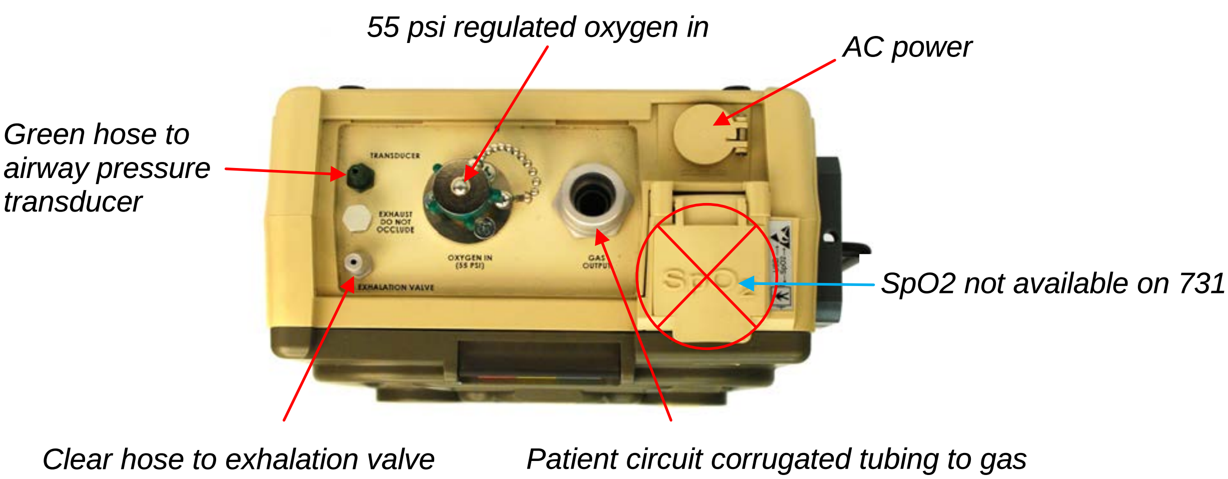
1. 731 ventilator circuits feature a low dead space design that minimizes CO2 re-breathing.

2. Note: dead space (circuit and HME) should never be greater than **25%** of the patient's tidal volume (set or spontaneous.

3. The 2 standard ventilator circuits cover the range of patient from infant through adult.
   - Pediatric/adult – patients 20 kg through adult, minimum tidal volume 200mL;
   - Infant/pediatric – 5 through 30 kg, maximum tidal volume 300 mL.***DO NOT USE FOR NIPPV

Connections - check the ventilator for proper operation before connecting to patient:

Step 1: Connect ventilator circuit (use test lung whenever possible) oxygen hose to 55 psi regulated output.



PROTOCOL 3K: Non – Invasive Positive Pressure Ventilation (NIPPV) - Adult, cont.

Step 2: Power

Turn power switch to "ON"

- Unit performs a Self-Check and AUTO-CAL of the internal transducers.
- 731 then begins operation using the default settings.
- AUTO-CAL is performed every 5 minutes thereafter or when an altitude or temperature change is detected.
- Start-up settings may be changed during operation at any time.

Factory Defaults:

• *FiO2:*	*21%*
• *High PIP Limit:*	*35 cm H2O*
• *PEEP:*	*5 cm H2O*
• *Vt:*	*450 ml*
• *BPM:*	*12*
• *I:E*	*1:3*
• *Mode:*	*AC (V)*

Step 3: Changing a Primary Parameter:

3. Confirm by Press select "√" to accept new value

1. Current value is highlighted.
2. Turn rotary encoder to desired value.
   - Adult
   - Pediatric
   - NIPPV
   - Custom (Cardiac Arrest)
   - Last setting

Remember: "Touch,Turn,Confirm"™

Medical Literature References
3K – Non-Invasive Positive Pressure Ventilation (NIPPV) – Adult

1. Goodacre S, Stevens JW, Pandor A, Poku E, Ren S, Cantrell A, Bounes V, Mas A, Payen D, Petrie D, Roessler MS, Weitz G, Ducros L, Plaisance P. Prehospital noninvasive ventilation for acute respiratory failure: systematic review, network meta-analysis, and individual patient data meta-analysis. *Acad Emerg Med*. 2014 Sep; 21(9):960-70.
2. Williams TA, Finn J, Perkins GD, Jacobs IG. Prehospital continuous positive airway pressure for acute respiratory failure: a systematic review and meta-analysis. *Prehosp Emerg Care*. 2013 Apr-Jun;17(2):261-73.
3. Williams B, Boyle M, Robertson N, Giddings C. When pressure is positive: a literature review of the prehospital use of continuous positive airway pressure. *Prehosp Disaster Med*. 2013 Feb;28(1):52-60.
4. Cheskes S, Thomson S, Turner L. Feasibility of Continuous Positive Airway Pressure by Primary Care Paramedics. *Prehosp Emerg Care*. 2012 Oct-Dec;16(4):535-40.
5. Bledsoe BE, Anderson E, Hodnick R, Johnson L, Johnson S, Dievendorf E. Low-fractional oxygen concentration continuous positive airway pressure is effective in the prehospital setting. *Prehosp Emerg Care*. 2012 Apr-Jun;16(2):217-21.
6. Dib JE, Matin SA, Luckert A. Prehospital use of continuous positive airway pressure for acute severe congestive heart failure. *J Emerg Med*. 2012 May;42(5):553-8.
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8. Daily JC, Wang HE. Noninvasive positive pressure ventilation: resource document for the National Association of EMS Physicians position statement. *Prehosp Emerg Care*. 2011 Jul-Sep;15(3):432-8.
9. Warner GS. Evaluation of the effect of prehospital application of continuous positive airway pressure therapy in acute respiratory distress. *Prehosp Disaster Med*. 2010 Jan-Feb;25(1):87-91.
10. Hubble MW, Richards ME, Wilfong DA. Estimates of cost-effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):277-85.
11. Hubble MW, Richards ME, Jarvis R, Millikan T, Young D. Effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):430-9.

3L – MECHANICAL VENTILATION ADULT

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:
1. Respiratory/Cardiac Arrest.
2. Any Medical Etiology of Dyspnea or Airway Management Intubation.
3. Any Trauma Etiology of Dyspnea or Airway Management Intubation (except suspected pneumothorax).

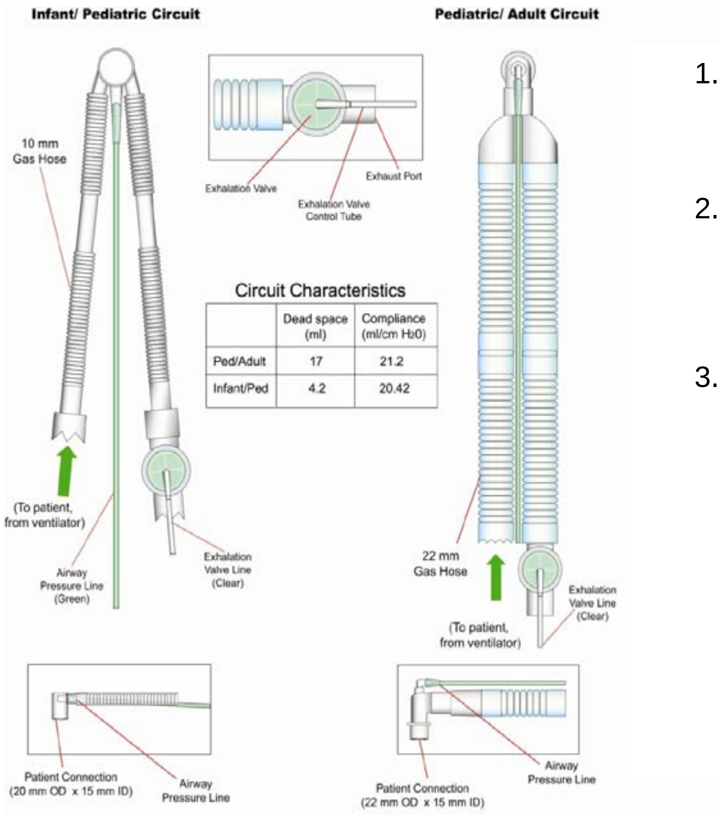
Contraindications:
1. Pediatric dyspnea.
2. Adult dyspnea of lesser severity able to be managed without mechanical ventilation.
3. Active or suspected impending emesis.
4. Suspected or impending pneumothorax/tension pneumothorax.

Technique (Zoll Model 731 Series):

Controls:

PROTOCOL 3L: Mechanical Ventilation - Adult, cont.

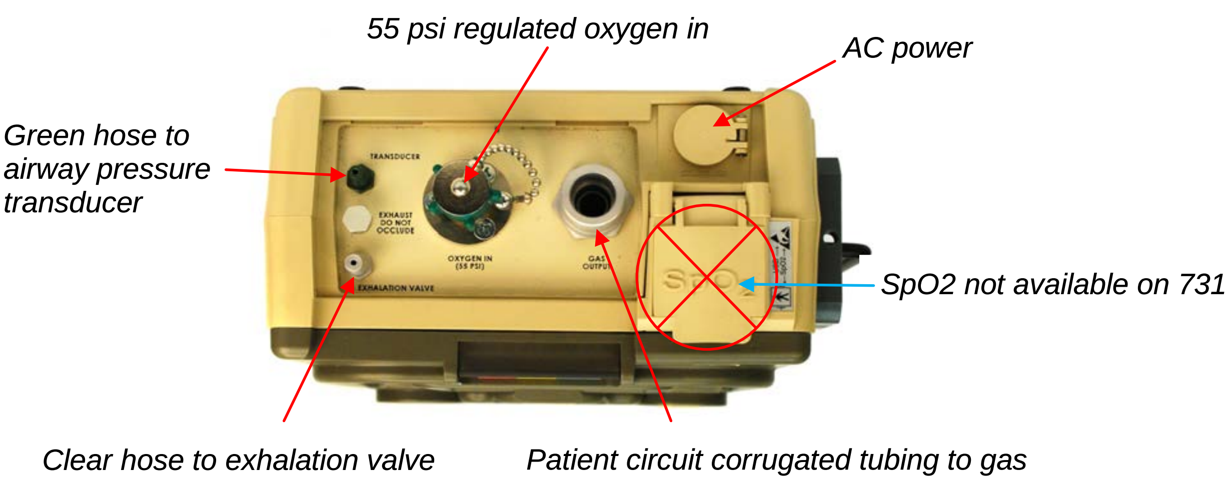
Circuits:



1. 731 ventilator circuits feature a low dead space design that minimizes CO2 re-breathing.
2. Note: dead space (circuit and HME) should never be greater than **25%** of the patient's tidal volume (set or spontaneous.
3. The 2 standard ventilator circuits cover the range of patient from infant through adult.
   - Pediatric/adult – patients 20 kg through adult, minimum tidal volume 200 mL;
   - Infant/pediatric – 5 through 30 kg, maximum tidal volume 300 mL.***DO NOT USE FOR MECH VENT

Connections- check the ventilator for proper operation before connecting to patient:

Step 1: Connect ventilator circuit (use test lung whenever possible) oxygen hose to 55 psi regulated output.



PROTOCOL 3L: Mechanical Ventilation - Adult, cont.

<u>Step 2: Power</u>:

Turn power switch to "ON"

- Unit performs a Self-Check and AUTO-CAL of the internal transducers.
- 731 then begins operation using the default settings.
- AUTO-CAL is performed every 5 minutes thereafter or when an altitude or temperature change is detected.
- Start-up settings may be changed during operation at any time.

<u>Factory Defaults</u>:

- *FiO2:* *21%*
- *High PIP Limit:* *35 cm H2O*
- *PEEP:* *5 cm H2O*
- *Vt:* *450 ml*
- *BPM:* *12*
- *I:E* *1:3*
- *Mode:* *AC (V)*

<u>Step 3: Changing a Primary Parameter</u>:

<u>Custom Setting (Cardiac Arrest)</u>:

- *FiO2:* *100%*
- *High PIP Limit:* *25 cm H2O*
- *PEEP:* *0 cm H2O*
- *Vt:* *400-500 ml (keep within since it will be an end result not a setting.)*
- *BPM:* *10*
- *I:E* *1:2.5*
- *Mode:* *AC (P)*

3. Press select "√" to accept new value

1. Current value is highlighted.
2. Turn rotary encoder to desired value.
   - Adult
   - Pediatric
   - NIPPV
   - Custom (Cardiac Arrest)
   - Last setting

Remember: "Touch,Turn,Confirm"™

PROTOCOL 3L: Mechanical Ventilation - Adult, cont.

Safety notes:

A. Initial airway management and ventilation must not be compromised while preparing mechanical ventilation equipment.
B. If problems arise during 731 use or if there is uncertainty about the adequacy of oxygenation and ventilations with the 731, then STOP and ensure oxygenation and ventilation with the usual methods.
C. Using the 731 mechanical ventilation device will give the ability to determine early changes in pulmonary compliance, such as may be detected using a bag-ventilation technique.
D. The incidence of a pneumothorax is increased in the presence of chest trauma with any form of positive pressure ventilation.
E. Gastric distention can cause resistance to mechanical ventilation. Gastric distention should be suspected in patients with an acutely distended abdomen after non-intubate positive pressure ventilation. Relieve gastric distention impairing respiratory mechanics with either a nasogastric or orogastric tube with low suction until distention is relieved.
F. Continuous waveform capnography is indicated for mechanical ventilation utilizing the 731. If transporting a patient with a home ventilator that remains on baseline settings the use of continuous waveform capnography is optional.

Medical Literature References
3L – Mechanical Ventilation – Adult

1. Cheskes S, Thomson S, Turner L. Feasibility of Continuous Positive Airway Pressure by Primary Care Paramedics. *Prehosp Emerg Care*. 2012 Oct-Dec;16(4):535-40.
2. Bledsoe BE, Anderson E, Hodnick R, Johnson L, Johnson S, Dievendorf E. Low-fractional oxygen concentration continuous positive airway pressure is effective in the prehospital setting. *Prehosp Emerg Care*. 2012 Apr-Jun;16(2):217-21.
3. Dib JE, Matin SA, Luckert A. Prehospital use of continuous positive airway pressure for acute severe congestive heart failure. *J Emerg Med*. 2012 May;42(5):553-8.
4. Frontin P, Bounes V, Houzé-Cerfon CH, Charpentier S, Houzé-Cerfon V, Ducassé JL. Continuous positive airway pressure for cardiogenic pulmonary edema: a randomized study. *Am J Emerg Med*. 2011 Sep;29(7):775-81.
5. Daily JC, Wang HE. Noninvasive positive pressure ventilation: resource document for the National Association of EMS Physicians position statement. *Prehosp Emerg Care*. 2011 Jul-Sep;15(3):432-8.
6. Warner GS. Evaluation of the effect of prehospital application of continuous positive airway pressure therapy in acute respiratory distress. *Prehosp Disaster Med*. 2010 Jan-Feb;25(1):87-91.
7. Hubble MW, Richards ME, Wilfong DA. Estimates of cost-effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):277-85.
8. Hubble MW, Richards ME, Jarvis R, Millikan T, Young D. Effectiveness of prehospital continuous positive airway pressure in the management of acute pulmonary edema. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):430-9.

EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

Approved 9/12/18, Effective 1/15/19

3M – DYSPNEA – CROUP PEDIATRIC

TREATMENT PRIORITIES

1. Vital signs
   (including EtCO2, if equipped)
2. Oxygenation support
   - O_2 by NC, NRB
   - BVM, ETT if indicated
3. Ventilation support
   - BVM, ETT if indicated
4. Nebulization therapy
   - Epinephrine 1mg/mL 1:1,000 at 3mL

   Consider Foreign body as a cause of stridor

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
AS PREVIOUSLY PRESCRIBED FOR DYSPENA SYMPTOMS

EMR | EMT

CROUP MOSTLY OCCURS IN INFANTS AND YOUNG CHILDREN BETWEEN SIX MONTHS AND THREE YEARS OF AGE, AND IS LESS COMMONLY SEEN IN CHILDREN OLDER THAN SIX YEARS

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ATTEMPT TO KEEP CHILD CALM WHILE PROPERLY SECURING THE CHILD FOR TRANSPORT

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped,**Mandatory use if pt intubated)

EMT-I85 | AEMT

PEDIATRIC: INTUBATE IF INDICATED PER PROTOCOL 17E

IV ACCESS
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

PEDIATRIC: METHYLPREDNISOLONE 2 mg/kg NOT TO EXCEED 125 mg IVP. MAY GIVE IM IF NO VASCULAR ACCESS OBTAINED.

FOR SIGNIFICANT INSPIRATORY STRIDOR AT REST, DECREASED RESPONSIVENESS, POOR PERFUSION, APNEA OR CYANOSIS
PEDIATRIC: NEBULIZED EPINEPHRINE 1mg/mL (1:1000) at 3mg/3mL VIA NEBULIZER

PEDIATRIC: MEDICATION-ASSISTED INTUBATION IF INDICATED PER PROTOCOL 17F
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
3M – Dyspnea - Croup - Pediatric

1. Eghbali A, Sabbagh A, Bagheri B, Taherahmadi H, Kahbazi M. Efficacy of nebulized L-epinephrine for treatment of croup: A randomized, double-blind study. Fundam Clin Pharmacol. 2016. doi:10.1111/fcp.12158.
2. Petrocheilou A, Tanou K, Kalampouka E, Malakasioti G, Giannios C, Kaditis AG. Viral croup: Diagnosis and a treatment algorithm. Pediatr Pulmonol. 2014. doi:10.1002/ppul.22993.
3. Bjornson C, Russell KF, Vandermeer B, Durec T, Klassen TP, Johnson DW. Nebulized epinephrine for croup in children. Evidence-Based Child Heal. 2012. doi:10.1002/ebch.1856.
4. Argent AC, Hatherill M, Newth CJL, Klein M. The effect of epinephrine by nebulization on measures of airway obstruction in patients with acute severe croup. Intensive Care Med. 2008. doi:10.1007/s00134-007-0855-0.
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6. Wright RB, Pomerantz WJ, Luria JW. New approaches to respiratory infections in children: Bronchiolitis and croup. Emerg Med Clin North Am. 2002. doi:10.1016/S0733-8627(03)00053-1.
7. Waisman Y, Klein BL, Boenning DA, et al. Prospective randomized double-blind study comparing L-epinephrine and racemic epinephrine aerosols in the treatment of laryngotracheitis (croup). Pediatrics. 1992.

4A - RESUSCITATION (CPR) ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Circulatory support
   - Apply ResQCPR® within 2 minutes
   - Chest compression rate 80/min ResQCPR®
   - Chest compression rate 110/min standard CPR
   - Appropriate compression depth & full recoil
   - Limit pauses in compressions
   - Timely defibrillation (if indicated)
   - Utilize Res-Q-Pod®
2. Oxygenation/Ventilation support
   - Avoid hyperventilation in rate & volume
   - Use waveform capnography (if equipped)
     **Mandatory use if patient intubated

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

CPR BY EMD INSTRUCTION

EMR | EMT

POSITION PATIENT FOR EFFECTIVE RESUSCITATION.
FOR ADULT NONTRAUMATIC CARDIAC ARREST ONLY: CHEST COMPRESSIONS AT 80/MINUTE USING ResQCPR®
CHEST COMPRESSIONS AT 110 COMPRESSIONS/MINUTE USING HANDS ONLY
USE METRONOME THROUGHOUT TO GUIDE COMPRESSION RATE
LIMIT PAUSES IN CHEST COMPRESSIONS – AVOID PAUSES WHENEVER PHYSICALLY POSSIBLE.

APPLY AED (OR MANUAL DEFIBRILLATION PADS IF PARAMEDIC PRESENT) PLACE PADS ANTERIOR-POSTERIOR.

IF CARDIAC ARREST DURATION ESTIMATED > 4 MINS AND WITHOUT GOOD QUALITY BYSTANDER CPR,
PERFORM CPR FOR 2 MINUTES PRIOR TO AED/RHYTHM ANALYSIS FOR DEFIBRILLATION DETERMINATION.

IF CARDIAC ARREST DURATION ESTIMATED ≤ 4 MINS, IMMEDIATE AED/RHYTHM ANALYSIS FOR DEFIBRILLATION DETERMINATION.

ADULT: 110 COMPRESSIONS/MINUTE WITH 8-10 VENTILATIONS/MINUTE WITHOUT PAUSE IN COMPRESSIONS.
ATTACH RES-Q-POD® TO BVM.
PEDIATRIC: 15 COMPRESSION : 2 VENTILATION CYCLES WITH 110 COMPRESSIONS/MINUTE RATE
ATTACH ResQPOD® TO BVM IF PT ≥ 12 YEARS OF AGE AND ESTIMATED WEIGHT ≥ 50 kg.

FOLLOW AED PROMPTS FOR RHYTHM ANALYSIS & DEFIBRILLATION IF INDICATED (USING 2015 AHA STANDARDS).
AFTER AED SHOCK (IF APPLICABLE), IMMEDIATELY RESUME CPR FOR 2 MINUTES.
IF NO AED SHOCK ADVISED, IMMEDIATELY RESUME CPR FOR 2 MINUTES.

EMT OR HIGHER LICENSE ONLY:
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE.
IF RETURN OF SPONTANEOUS CIRCULATION, REFER TO PROTOCOL 4J – POST CARDIAC ARREST TREATMENT

AT 20 MINS OF RESUSCITATIVE MEASURES (IF APPLICABLE):
CONTACT OLMC FOR TERMINATION OF RESUSCITATION CONSULTATION
(IF APPLICABLE PER PROTOCOL 4K - TERMINATION OF RESUSCITATION)

EMT-I85 | AEMT

ADULT: INTUBATE AFTER CPR INITIATED – FIRST ATTEMPT WITHOUT PAUSE IN COMPRESSIONS
LIMIT INTUBATION COMPRESSION PAUSE TO MAXIMUM OF 10 SECONDS

IV / IO ACCESS

PARAMEDIC

ASSESS FOR UNDERLYING ETIOLOGY OF CARDIAC ARREST & TREAT PER APPLICABLE PROTOCOL(S)
RHYTHM ANALYSIS AT NEXT APPROPRIATE RHYTHM CHECK
LIMIT RHYTHM ANALYSIS COMPRESSION PAUSE TO MAXIMUM OF 5 SECONDS
RHYTHM SPECIFIC MANAGEMENT PER APPLICABLE PROTOCOL(S) 4F – 4H

Medical Literature References
4A – Resuscitation (CPR) – Adult & Pediatric

1. Ji, C., Lall, R., Quinn, T., Kaye, C., Haywood, K., Horton, J., … Perkins, G. D. (2017). Post-admission outcomes of participants in the PARAMEDIC trial: A cluster randomised trial of mechanical or manual chest compressions. Resuscitation. https://doi.org/10.1016/j.resuscitation.2017.06.026
2. Scales, D. C., Cheskes, S., Verbeek, P. R., Pinto, R., Austin, D., Brooks, S. C., … Morrison, L. J. (2017). Prehospital cooling to improve successful targeted temperature management after cardiac arrest: A randomized controlled trial. Resuscitation.https://doi.org/10.1016/j.resuscitation.2017.10.002
3. Brooks SC, Anderson ML, Bruder E, Daya MR, Gaffney A, Otto CW, Singer AJ, Thiagarajan RR, Travers AH. Part 6: Alternative Techniques and Ancillary Devices for Cardiopulmonary Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S436-43.
4. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
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4A – Resuscitation (CPR) – Adult & Pediatric (cont)

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4B - RESUSCITATION TEAM ROLES ADULT & PEDIATRIC

Four + Rescuers/ Compression & Ventilation Leader/ Position 4 (P4)
Always outside CPR "triangle"

- Monitors time intervals
  - Calls for compressor change every 60 seconds
  - Calls for rhythm analysis every 2 minutes
- Monitors quality of CPR and use of metronome
  - 80 compressions per minute ResQCPR®
  - 110 compressions per minute if standard CPR
- Assures manual defibrillator in "paddles" mode
- Monitors for use of proper equipment/adjuncts
- Gathers concise history from family/bystanders
- Keeps resuscitation area quiet so team members can hear
- Monitors for DNR issues
- Avoids direct patient care to maintain supervisory duties if greater than four rescuers throughout EMS resuscitation.
- Directs "staging" of personnel beyond six rescuers away from immediate resuscitation area to prevent crowding.

Three + Rescuers/Airway/Position 3 (P3)
Always at patient's head

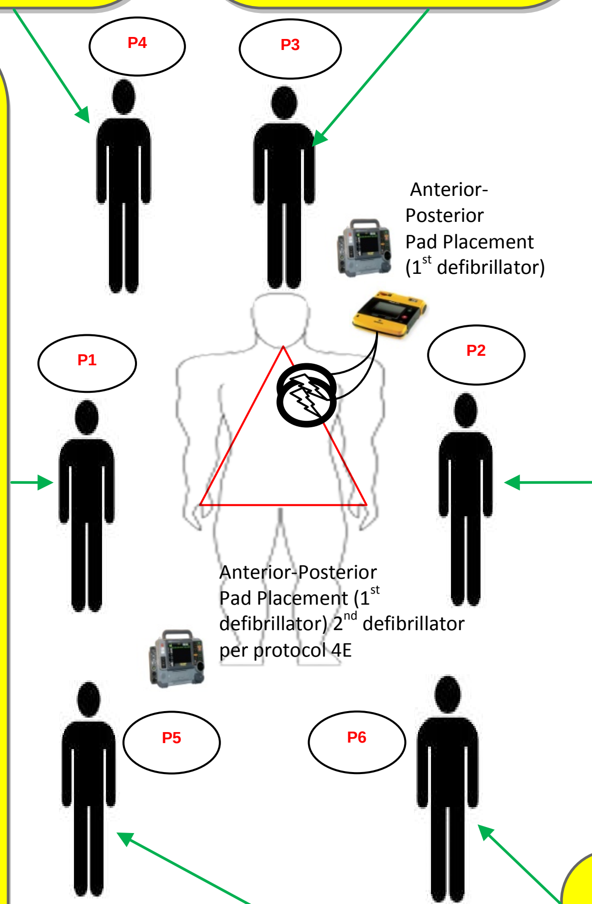
- Airway management per protocol(s)
  - for BVM ventilations, applies mask seal with both hands while P1 and P2 alternate bag squeezing during their respective compression off cycles. Squeezes bag only when P1 AND P2 busy with other tasks.
  - assists EMT-I/AEMT/paramedic during intubation as needed (if not EMT-I/AEMT/ paramedic)
- Avoids compression interruptions for airway procedures.

Two + Rescuers/ Circulation 2/ Position 2(P2)
Always on patient's left

- If more than two rescuers:
  - applies AED/manual defibrillator in first minute while P1 compressing
  - if good bystander CPR for arrest or estimated arrest ≤4 mins, charges manual defib (if applicable) last 15 seconds of P1 compressions & prepares to deliver compressions after rhythm analysis
  - analyzes rhythm (by AED or paramedic)
  - starts chest compressions immediately if no defib indicated or immediately after defib (if indicated)
  - continuous chest compressions 1 min
    Adult non-trauma 80/min ResQCPR® (deploy ResQPUMP within 2 minutes)
    Adult/Pediatric110/min standard CPR
  - if no/poor bystander CPR for arrest or estimated arrest time > 4 mins, alternate compressions with P1
  - starts compression metronome as soon as possible when P1 compressing (priority goes to AED/manual defibrillator attachment)
  - if BVM ventilations by P3 & when able, squeezes bag with ResQPod® light at 10/min rate in off compression cycle (while P1 compressing) as P3 maintains mask seal
- If two rescuers:
  - applies AED/manual defibrillator in first minute while P1 compressing
  - if good bystander CPR for arrest or estimated arrest time ≤4 mins, charges manual defib (if applicable) last 15 seconds of P1 compressions & prepare to deliver compressions after rhythm analysis
  - analyzes rhythm (by AED or paramedic)
  - starts chest compressions immediately if no defib indicated or immediately after defib (if indicated)
  - continuous chest compressions 1 min
    Adult non-trauma 80/min ResQCPR® (deploy ResQPUMP within 2 minutes)
    Adult/Pediatric110/min standard CPR
  - pediatric 2 ventilations per 15 compressions by P1
  - if no/poor bystander CPR for arrest or estimated arrest time > 4 mins, alternate compressions with P1
  - starts compression metronome as soon as possible when P1 compressing (priority goes to AED/manual defibrillator attachment)

Single Rescuer/ Circulation 1/ Position 1 (P1)
Always on patient's right

- If more than two rescuers:
  - continuous chest compressions 1 min
    Adult non-trauma 80/minResQCPR®
    Adult/Pediatric:110/min standard CPR
  - alternates compressions with P2
  - charges manual defib (if applicable)last 15 seconds of P2 compressions
  - analyzes rhythm (by AED or paramedic)
  - if AED is used and defib indicated, resume chest compressions while AED is charging. Clear for defib. Resume compressions immediately after P2 delivers AED defib or paramedic delivers manual defib (if paramedic present &defib indicated)
  - if BVM ventilations by P3 & when able, squeeze bag with ResQPod® light at 10/min rate in off compression cycle (while P2 compressing) as P3 maintains mask seal
- If two rescuers:
  - continuous chest compressions 1 min
    Adult non-trauma 80/min ResQCPR®
    Adult/Pediatric:110/min standard CPR
  - adult passive oxygenation with NRB O2 in second minute when P2 compressing (passive oxygenation limited to first 6 mins of EMS resuscitation)
  - pediatric 2 ventilations per 15 compressions by P2
  - alternates compressions with P2
  - charges manual defib (if applicable) last 15 seconds of P2 compressions
  - if AED is used and defib indicated, resume chest compressions while AED is charging. Clear for defib. Resume compressions immediately after P2 delivers AED defib or paramedic delivers manual defib (if paramedic present &defib indicated)
- If alone and cardiac arrest duration estimated ≤ 4 mins:
  - apply AED/manual defibrillator
  - analyze rhythm (by AED or paramedic)
  - defib if indicated (by AED or paramedic) with compressions during AED or manual defib charging. Clear for defib.
  - call for additional help
  - continuous chest compressions
    Adult non-trauma 80/min ResQCPR®
    Adult/Pediatric:110/min standard CPR
  - maintain compressions and analyze rhythm by AED or paramedic every 2 minutes (with defib if indicated as above) until additional help arrives
- If alone and cardiac arrest duration estimated >4 mins:
  - call for additional help
  - continuous chest compressions 2 mins
    Adult non-trauma 80/min ResQCPR®
    Adult/Pediatric:110/min standard CPR
  - apply AED/manual defibrillator
  - analyze rhythm (by AED or paramedic)
  - defib if indicated (by AED or paramedic) with compressions during AED or manual defib charging. Clear for defib.
  - maintain compressions and analyze rhythm by AED or paramedic every 2 minutes (with defib if indicated as above) until additional help arrives



Five + Rescuers/ Vascular and Medication/ Position 5 (P5)
Paramedic
Always outside CPR "triangle" at lower 1/2 of patient

- Initiates IV/IO access
- Administers medications per protocol(s) in consult with P6

Delivers manual defib (when indicated) if both P1 and P2 non-paramedic - in this situation monitor/manual defib moved from patient upper left to P5 location

Six + Rescuers/ Resuscitation Leader/ Position 6 (P6)
Paramedic
Always outside CPR "triangle" at lower 1/2 of patient

- Maintains overall awareness of resuscitation dynamics
- "Busiest mental activity" position on team dictates little to no physical activity for success
- Interfaces with P1-5 as situation dictates
- Prioritizes communication with P1-3 through P4
- Assesses for etiologies of cardiac arrest
- Determines if termination of resuscitation appropriate
  - consult OLMC when indicated by protocol
  - communicates with family/bystanders if indicated

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4B – Resuscitation Team Roles – Adult & Pediatric

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4C – AUTOMATED EXTERNAL DEFIBRILLATION (AED) ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

Adults and pediatrics that are unresponsive, apneic or agonally breathing, and pulseless.

Contraindications:

None, though futile in obvious death (decapitation, rigor mortis, dependent lividity, and/or decomposition).

Technique (Physio-Control LifePak®1000):

1. Turn ON AED. (Figure 1)

2. Apply AED. Follow illustration for correct defibrillation pad placement. (Figure 2)
   a. Avoid air spaces/incomplete skin contact under pads.
   b. Avoid placing pads over suspected implanted pacemakers and/or implanted defibrillators.
   c. **NOTE (Pediatric):** If victim is less than 8 years old or under 25 kg (55 lbs), connect the Infant/Child Reduced Energy Defibrillation Electrodes to the AED and proceed to STEP 3. If Infant/Child Reduced Energy Defibrillation Electrodes are unavailable, place pads in anterior left chest and posterior left chest position when using a standard AED.
   d. **NOTE (Infant <1 year of age):** Manual defibrillation preferred. Follow STEP 2c if manual defibrillation/paramedic unavailable.


Figure 1

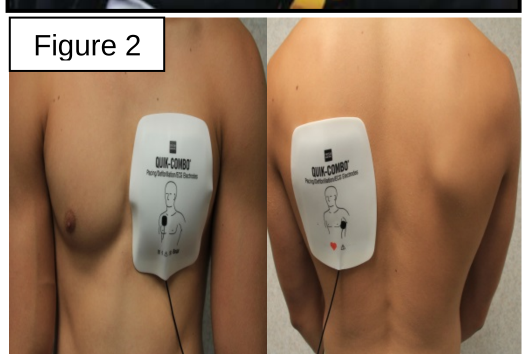
Figure 2

Protocol 4C: Automated External Defibrillation (AED) – Adult& Pediatric, cont.

3. Follow AED visual and voice prompts.
   a. If cardiac arrest duration estimated >4 minutes and without good quality bystander CPR, perform CPR for 2 minutes prior to AED analysis for defibrillation determination.
   b. If cardiac arrest duration estimated ≤4 minutes, immediate AED analysis for defibrillation determination.
4. Follow all AED manufacturer recommendations for safe, effective, and accurate rhythm analysis and defibrillation.
5. Restart chest compressions while the AED is charging. **DO NOT CONTINUE TO PROVIDE CHEST COMPRESSIONS WHEN THE AED IS DISCHARGING / DEFIBRILLATING.**
6. Resuscitate victims of cardiac arrest per applicable protocol(s), minimizing pauses in chest compressions (see Protocol 4B – Resuscitation Team Roles).

Medical Literature References
4C–Automated External Defibrillation (AED) – Adult & Pediatric

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4D – MANUAL DEFIBRILLATION ADULT & PEDIATRIC

PARAMEDIC

Indication:

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

Contraindications:

Spontaneous pulse.
All cardiac rhythms except ventricular fibrillation/pulseless ventricular tachycardia.

Technique:

1. Power **ON**. (Figure 1)

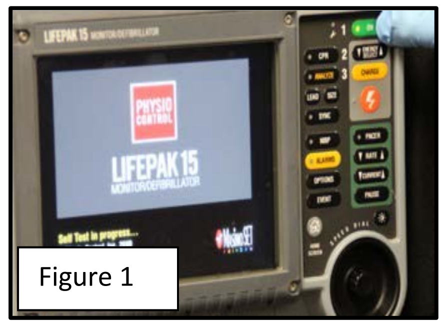

Figure 1

2. Connect the therapy electrodes (defibrillation pads) to the therapy cable and confirm cable connection to the monitor/defibrillator. (Figure 2)


Figure 2

3. Prepare the patient's skin and apply therapy electrodes to the patient in anterior left chest and posterior left chest position. (Figure 3)

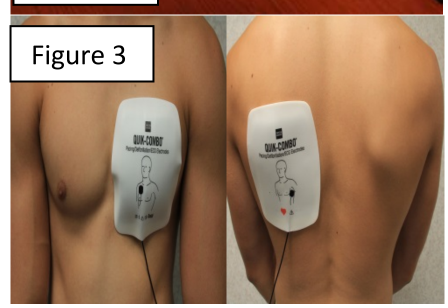
Figure 3

4. Confirm desired energy is selected, or press **ENERGY SELECT** or rotate the **SPEED DIAL** to select the desired energy. (Figure 4)

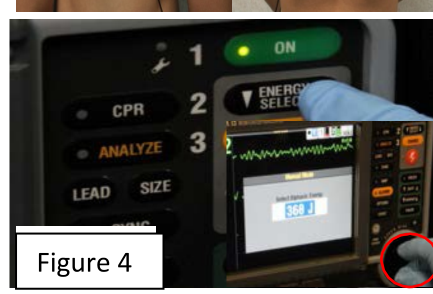

Figure 4

Protocol 4D: Manual Defibrillation, Adult & Pediatric, cont.

5. Press **CHARGE**. While the monitor/defibrillator is charging, a charging bar appears and a ramping tone sounds, indicating the charging energy level. When the monitor/defibrillator is fully charged, the screen displays available energy. (Figure 5).

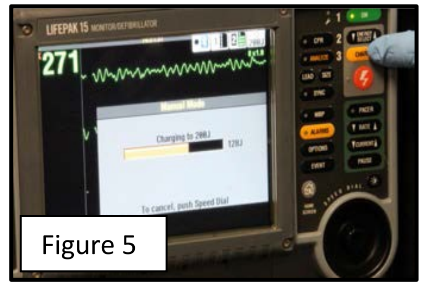

Figure 5

6. Make certain all personnel, including the operator of the monitor/defibrillator, are physically clear of the patient, stretcher, bed and any equipment connected to the patient.

7. Confirm ECG rhythm of ventricular fibrillation or pulseless ventricular tachycardia. Confirm available energy.

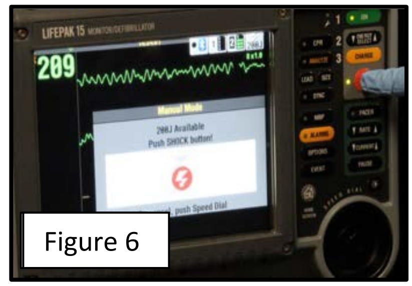

Figure 6

8. Press the (shock) button on the monitor/defibrillator to defibrillate the patient. (Figure 6)

9. **NOTE:** To disarm (cancel the charge), press the SPEED DIAL. The monitor/defibrillator disarms automatically if shock buttons are not pressed within 60 seconds, or if the energy selection is pressed after charging begins. **IF DEFIBRILLATION NOT INDICATED UPON A RHYTHM CHECK, DISARM (CANCEL THE CHARGE) BEFORE RESUMING CHEST COMPRESSIONS TO PREVENT INADVERTANT ELECTRICAL EXPOSURE TO EMS PERSONNEL.**

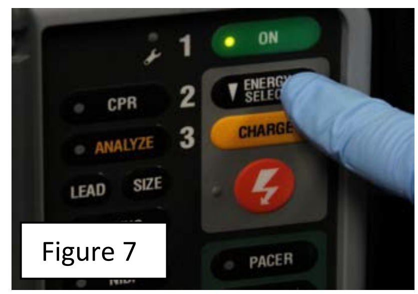

Figure 7

10. Repeat procedure starting from Step 4, when indicated

PEDIATRIC PATIENT:

If patient is less than 4 years of age and/or under 15 kg weight, connect the Quik-Combo® Pediatric Electrodes to the monitor/defibrillator and proceed to Step 3. **NOTE**: Pediatric: Initial defibrillation 2 joules/kg with second and subsequent defibrillations at 4 joules/kg. Prior to determining manual defibrillation settings count prior AED defibrillations.

DEFIBRILLATION CLINICAL PEARLS:

1. In an emergency resuscitation setting that requires defibrillation, if unfamiliar with monitor/ defibrillator available, look for 1-2-3 sequence (Figure 7) that all monitor/defibrillators are labeled with by industry practice. 1 turns on the device; 2 selects energy; 3 charges the device. Typically, immediately next to 3 is the shock or discharge button.

2. In an emergency resuscitation setting that requires defibrillation, do not interrupt or pause chest compressions unless absolutely necessary. **Continue to provide chest compressions while a monitor/defibrillator operator is powering on the monitor/defibrillator, selecting energy and charging the device.**

3. **DO NOT CONTINUE TO PROVIDE CHEST COMPRESSIONS WHEN THE MONITOR/ DEFIBRILLATOR IS DISCHARGING / DEFIBRILLATING.**

Medical Literature References
4D–Manual Defibrillation – Adult & Pediatric

1. Brooks SC, Anderson ML, Bruder E, Daya MR, Gaffney A, Otto CW, Singer AJ, Thiagarajan RR, Travers AH. Part 6: Alternative Techniques and Ancillary Devices for Cardiopulmonary Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S436-43.
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8. Edelson DP, Robertson-Dick BJ, Yuen TC, Eilevstjønn J, Walsh D, Bareis CJ, VandenHoek TL, Abella BS. Safety and efficacy of defibrillator charging during ongoing chest compressions: a multi-center study. *Resuscitation*. 2010 Nov;81(11):1521-6.
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11. Wik L, Hansen TB, Fylling F, Steen T, Vaagenes P, Auestad BH, Steen PA. Delaying defibrillation to give basic cardiopulmonary resuscitation to patients with out-of-hospital ventricular fibrillation: a randomized trial. *JAMA*. 2003 Mar 19;289(11):1389-95.
12. Cobb LA, Fahrenbruch CE, Walsh TR, Copass MK, Olsufka M, Breskin M, Hallstrom AP. Influence of cardiopulmonary resuscitation prior to defibrillation in patients with out-of-hospital ventricular fibrillation. *JAMA*. 1999 Apr 7;281(13):1182-8.

4E – DOUBLE SEQUENTIAL EXTERNAL DEFIBRILLATION ADULT

PARAMEDIC

Indication:

Adult refractory Ventricular Fibrillation/Pulseless Ventricular Tachycardia. See also Protocol 4G - Ventricular Fibrillation & Pulseless Ventricular Tachycardia.

Contraindications:

Spontaneous pulse.
All cardiac rhythms except ventricular fibrillation/pulseless ventricular tachycardia

Technique:

1. If two LifePak12 or 15 monitor/defibrillators are available, power the second one ON.

2. Connect therapy electrodes (defibrillation pads) to therapy cable and confirm cable connection to monitor/defibrillator per Protocol 4D.

3. Prepare the patient's skin and apply second set of therapy electrodes (defibrillation pads) to the patient, in the right parasternal and cardiac apex positions next to, but NOT overlapping the anterior pad of the first set of therapy electrodes (defibrillation pads). (Figure 1)

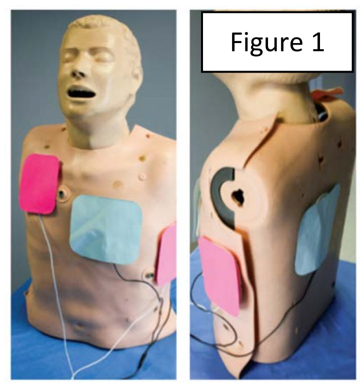
Figure 1

4. Proceed to charge each defibrillator to 360J. Once fully charged, have either one paramedic discharge both defibrillators or if using two paramedics, using a 3-2-1 verbal countdown, **discharge the defibrillators sequentially using a very specific count of "one thousand one" between the discharge of defibrillator one and the discharge of defibrillator two.** ***FAILURE TO ALLOW A ONE SECOND PAUSE BETWEEN SEQUENTIAL DEFIBRILLATIONS CAN IRREVERSIBLY HARM A DEFIBRILLATOR, RENDERING IT PERMANENTLY INOPERABLE.***

5. Throughout the use of double sequential external defibrillation, follow all standard safety measures as with routine defibrillation as outlined in Protocol 4D.

CLINICAL PEARLS:

DO NOT CONTINUE TO PROVIDE CHEST COMPRESSIONS WHEN THE MONITOR/ DEFIBRILLATOR IS DISCHARGING / DEFIBRILLATING.

Medical Literature References
4E – Double Sequential External Defibrillation - Adult

1. Pound J, Verbeek PR, Cheskes S. CPR induced consciousness during out-of-hospital cardiac arrest: a case report on an emerging phenomenon. *Prehosp Emerg Care*. 2017:21(2);252-256.
2. Merlin MA, Tagore A, Bauter R, Arshad FH. A case series of double sequence defibrillation. *Prehosp Emerg Care*. 2016:20(4);550-553.
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10. Hoch DH, Batsford WP, Greenberg SM, et al. Double sequential external shocks for refractory ventricular fibrillation. *J Am Coll Cardiol*. 1994:2;1141-1145.

4F - ASYSTOLE
ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Continuous chest compressions
   - Apply ResQCPR® within 2 minutes
   - 80/min ResQCPR®
   - 110/min standard CPR
2. Evaluate and treat underlying cause(s)
3. Timely vasopressor administration
4. Resuscitation per Protocols 4A & 4B

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

PARAMEDIC

VASOPRESSOR ADMINISTRATION:
ADULT: EPINEPHRINE 1 mg IVP/IOP. REPEAT EVERY 3 – 5 MINUTES
PEDIATRIC: EPINEPHRINE 0.1mg/mL (1:10,000) at 0.01 mg/kg (0.1 mL/kg) IVP/IOP. REPEAT EVERY 3-5 MINUTES

Medical Literature References
4F - Asystole – Adult & Pediatric

1. Tomio, J., Nakahara, S., Takahashi, H., Ichikawa, M., Nishida, M., Morimura, N., & Sakamoto, T. (2017). Effectiveness of Prehospital Epinephrine Administration in Improving Long-term Outcomes of Witnessed Out-of-hospital Cardiac Arrest Patients with Initial Non-shockable Rhythms. Prehospital Emergency Care, 21(4), 432–441. https://doi.org/10.1080/10903127.2016.1274347
2. Brooks SC, Anderson ML, Bruder E, Daya MR, Gaffney A, Otto CW, Singer AJ, Thiagarajan RR, Travers AH. Part 6: Alternative Techniques and Ancillary Devices for Cardiopulmonary Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S436-43.
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5. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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7. de Caen AR, Maconochie IK, Aickin R, Atkins DL, Biarent D, Guerguerian AM, Kleinman ME, Kloeck DA, Meaney PA, Nadkarni VM, Ng KC, Nuthall G, Reis AG, Shimizu N, Tibballs J, Veliz Pintos R; Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators. Part 6: Pediatric Basic Life Support and Pediatric Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S177-203.
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9. Larabee TM, Liu KY, Campbell JA, Little CM. Vasopressors in cardiac arrest: a systematic review. *Resuscitation*. 2012 Aug;83(8):932-9.
10. Idris AH, Guffey D, Aufderheide TP, Brown S, Morrison LJ, Nichols P, Powell J, Daya M, Bigham BL, Atkins DL, Berg R, Davis D, Stiell I, Sopko G, Nichol G. The Relationship Between Chest Compression Rates and Outcomes from Cardiac Arrest. *Circulation*. 2012 Jun 19;125(24):3004-12.
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4G VENTRICULAR FIBRILLATION & PULSELESS VENTRICULAR TACHYCARDIA ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Continuous chest compressions
   - Apply ResQCPR® within 2 minutes
   - 80/min ResQCPR®
   - 110/min standard CPR
2. Timely defibrillation
3. Evaluate and treat underlying cause(s)
4. Timely vasopressor administration
5. Timely antiarrhythmic administration
6. Resuscitation per Protocols 4A & 4B

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

PARAMEDIC

MANUAL DEFIBRILLATION:
PAUSE CPR FOR A SINGLE SHOCK. LIMIT DEFIBRILLATION COMPRESSION PAUSE TO MAXIMUM OF 10 SECONDS.
ADULT: IF PT ESTIMATED WEIGHT < 100 kg ESCALATING DEFIBS AT 200J, 300J, 360J
FOURTH & SUBSEQUENT DEFIBS UTILIZING DOUBLE SEQUENTIAL EXTERNAL DEFIBRILLATION PER PROTOCOL 4E

ADULT: IF PT ESTIMATED WEIGHT ≥ 100 kg FIRST DEFIB AT 360 JOULES
SECOND & SUBSEQUENT DEFIBS UTILIZING DOUBLE SEQUENTIAL EXTERNAL DEFIBRILLATION PER PROTOCOL 4E

PEDIATRIC: INITIAL DEFIB 2 JOULES/kg, SECOND & SUBSEQUENT DEFIBS 4 JOULES/kg
COUNT AED DEFIBRILLATIONS PRIOR TO DETERMINING MANUAL DEFIBRILLATION SETTING

VASOPRESSOR ADMINISTRATION:
ADULT: EPINEPHRINE 1 mg IVP/IOP. REPEAT EVERY 3-5 MINUTES. MAXIMUM CUMULATIVE DOSE 3mg
PEDIATRIC: EPINEPHRINE 0.1mg/mL (1:10,000) at 0.01 mg/kg (0.1 mL/kg) IVP/IOP. REPEAT EVERY 3-5 MINUTES

ANTIARRHYTHMIC ADMINISTRATION:
ADULT: AMIODARONE 300 mg IVP/IOP. REPEAT AT 150 mg IVP/IOP IN 5 MINUTES. MAXIMUM CUMULATIVE DOSE 450 mg.
EPINEPHRINE 1 mg IVP/IOP WITH EVERY AMIODARONE ADMINISTRATION

ADULT: MAGNESIUM SULFATE 1 gram IVP/IOP IF TORSADES (POLYMORPHIC PULSELESS VENTRICULAR TACHYCARDIA)

PEDIATRIC: AMIODARONE 5 mg/kg IVP/IOP SINGLE DOSE.
EPINEPHRINE 0.01 mg/kg (1:10,000. 0.1 mL/kg) WITH AMIODARONE ADMINISTRATION.

IF SUCCESSFUL CONVERSION TO SUSTAINED PULSATILE RHYTHM (RETURN OF SPONTANEOUS CIRCULATION):
ADULT: AMIODARONE 150 mg over 10 minutes (15 mg/min or 0.3 mL/min, **VERY SLOW** IVP/IVPB)
PEDIATRIC: OLMC CONSULT

Medical Literature References
4G - Ventricular Fibrillation/Pulseless Ventricular Tachycardia – Adult & Pediatric

1. Kudenchuk, P. J., Leroux, B. G., Daya, M., Rea, T., Vaillancourt, C., Morrison, L. J., … Dorian, P. (2017). Antiarrhythmic Drugs for Nonshockable-Turned-Shockable Out-of-Hospital Cardiac Arrest:The ALPS Study (Amiodarone, Lidocaine, or Placebo). Circulation. https://doi.org/10.1161/CIRCULATIONAHA.117.028624
2. Kudenchuk PJ, Brown SP, Daya M, Rea T, Nichol G, Morrison LJ, Leroux B, Vaillancourt C, Wittwer L, Callaway CW, Christenson J, Egan D, Ornato JP, Weisfeldt ML, Stiell IG, Idris AH, Aufderheide TP, Dunford JV, Colella MR, Vilke GM, Brienza AM, Desvigne-Nickens P, Gray PC, Gray R, Seals N, Straight R, Dorian P for the Resuscitation Outcomes Consortium Investigators. Amiodarone, lidocaine, or placebo in out-of-hospital cardiac arrest. *NEJM*. 2016:374:1711-22.
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9. de Caen AR, Maconochie IK, Aickin R, Atkins DL, Biarent D, Guerguerian AM, Kleinman ME, Kloeck DA, Meaney PA, Nadkarni VM, Ng KC, Nuthall G, Reis AG, Shimizu N, Tibballs J, Veliz Pintos R; Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators. Part 6: Pediatric Basic Life Support and Pediatric Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S177-203.
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Medical Literature References
4G - Ventricular Fibrillation/Pulseless Ventricular Tachycardia – Adult & Pediatric (cont)

13. Idris AH, Guffey D, Aufderheide TP, Brown S, Morrison LJ, Nichols P, Powell J, Daya M, Bigham BL, Atkins DL, Berg R, Davis D, Stiell I, Sopko G, Nichol G. The Relationship Between Chest Compression Rates and Outcomes from Cardiac Arrest. *Circulation*. 2012 Jun 19;125(24):3004-12.
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18. Wik L, Hansen TB, Fylling F, Steen T, Vaagenes P, Auestad BH, Steen PA. Delaying defibrillation to give basic cardiopulmonary resuscitation to patients with out-of-hospital ventricular fibrillation: a randomized trial. *JAMA*. 2003 Mar 19;289(11):1389-95.
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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

4H – PULSELESS ELECTRICAL ACTIVITY ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Continuous chest compressions
   Apply ResQCPR® within 2 minutes
   80/min ResQCPR®
   110/min standard CPR
2. Evaluate and treat underlying cause(s)
3. Timely vasopressor administration
4. Resuscitation per Protocols 4A & 4B

EMERGENCY MEDICAL DISPATCHER

EMERGENCY MEDICAL RESPONDER

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

PARAMEDIC

VASOPRESSOR ADMINISTRATION:

ADULT: EPINEPHRINE 1 mg IVP/IOP. REPEAT EVERY 3 – 5 MINUTES

PEDIATRIC: EPINEPHRINE 0.1mg/mL (1:10,000) at 0.01 mg/kg (0.1 mL/kg) IVP/IOP. REPEAT EVERY 3-5 MINUTES

Medical Literature References
4H - Pulseless Electrical Activity – Adult & Pediatric

1. Tomio, J., Nakahara, S., Takahashi, H., Ichikawa, M., Nishida, M., Morimura, N., & Sakamoto, T. (2017). Effectiveness of Prehospital Epinephrine Administration in Improving Long-term Outcomes of Witnessed Out-of-hospital Cardiac Arrest Patients with Initial Non-shockable Rhythms. Prehospital Emergency Care, 21(4), 432–441. https://doi.org/10.1080/10903127.2016.1274347
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4I - SPECIFIC CAUSES OF CARDIAC ARREST ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Circulatory support
   - Apply ResQCPR® within 2 minutes
   - Chest compression rate 80/min ResQCPR®
   - Chest compression rate 110/min
   - Appropriate compression depth & full recoil
   - Limit pauses in compressions
   - Timely defibrillation (if indicated)
   - Utilize Res-Q-Pod®
   - If hyperkalemia, calcium chloride first medication

2. Oxygenation/Ventilation support
   - Avoid hyperventilation in rate & volume
   - Use waveform capnography (if equipped)
     **Mandatory use if patient intubated

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMR | EMT

FIND POSSIBLE CAUSES OF CARDIOPULMONARY ARREST & TREAT WHERE APPROPRIATE:

HYPOXIA – OXYGENATION/VENTILATION WITH 100% O2
HYPOKALEMIA – RAPID TRANSPORT
PRE-EXISTING ACIDOSIS – OXYGENATION/VENTILATION WITH 100% O2
PRE-EXISTING HYPOTHERMIA (PROLONGED COLD EXPOSURE) – REWARM PATIENT
CARDIAC TAMPONADE – RAPID TRANSPORT
THROMBOSIS (AMI OR PE) – RAPID TRANSPORT
TRAUMA – SEE APPROPRIATE TRAUMA PROTOCOLS
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE
ADULT: NALOXONE 2 mg IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT ONCE

EMT-I85 | AEMT

FIND POSSIBLE CAUSES OF CARDIOPULMONARY ARREST & TREAT WHERE APPROPRIATE:

HYPOVOLEMIA
ADULT: 1 LITER NS IV/IO BOLUS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: 20 mL/kg NS IV/IO BOLUS IF NO SIGNS OF PULMONARY EDEMA
HYPOGLYCEMIA
ADULT & PEDIATRIC WEIGHT ≥25 kg: IF GLUCOSE <50 mg/dL D50 1 mL/kg IVP/IOP UP TO 50 mL
PEDIATRIC WEIGHT <25 kg: IF GLUCOSE <50 mg/dL D25 2 mL/kg IVP/IOP UP TO 50 mL
CARDIAC TAMPONADE
ADULT: 500 mL NS IV/IO BOLUS IF NO SIGNS OFPULMONARY EDEMA
PEDIATRIC: 10 mL/kg NS IV/IO BOLUS IF NO SIGNS OF PULMONARY EDEMA

ADVANCED EMT OR HIGHER LICENSE:
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE
ADULT: NALOXONE 2 mg IVP/IOP, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IVP/IOP, MAY REPEAT ONCE

PARAMEDIC

FIND POSSIBLE CAUSES OF CARDIOPULMONARY ARREST & TREAT WHERE APPROPRIATE:

HYPERKALEMIA – CALCIUM CHLORIDE 10 mg/kg IVP/IOP (MAX 1 gram) & SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)
PRE-EXISTING ACIDOSIS - SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)
TOXINS/DRUG OVERDOSE – SUSPECTED TRICYCLIC ANTIDEPRESSANT - SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)
TOXINS/DRUG OVERDOSE – SUSPECTED BETA BLOCKERS
ADULT: GLUCAGON 1 mg IVP/IOP
PEDIATRIC: GLUCAGON 0.5 mg IVP/IOP
TOXINS/DRUG OVERDOSE – SUSPECTED CALCIUM CHANNEL BLOCKERS - CALCIUM CHLORIDE 10 mg/kg IVP/IOP (MAX 1 gram)
TENSION PNEUMOTHORAX – NEEDLE THORACOSTOMY (CHEST DECOMPRESSION)

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4J - POST CARDIAC ARREST TREATMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Support oxygenation/ventilation. Avoid hyperventilation. Avoid hyperoxemia (when possible).
2. Identify & treat underlying cause of cardiopulmonary arrest.
3. Achieve systolic blood pressure ≥ 100 mmHg (Adult) using cold saline and / or vasopressor infusion.
4. Initiate therapeutic induced hypothermia (if applicable – receiving hospital must have capability for same).

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
ADVANCED EMT
PARAMEDIC

INCLUSION CRITERIA FOR INDUCTION OF HYPOTHERMIA

- **AGE ≥ 18 YEARS OF AGE**
- **RETURN OF SPONTANEOUS CIRCULATION**
- **NON-TRAUMATIC CARDIAC ARREST**
- **SUPRAGLOTTIC OR INTUBATION AIRWAY IN PLACE**
- **NO PURPOSEFUL RESPONSE TO PAIN**

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 NRB or BVM AS APPLICABLE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped))
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:
EXPOSE PATIENT AND COVER WITH SHEET
PACK AXILLA AND GROIN WITH ICE/COLD PACKS

EMT OR HIGHER LICENSE ONLY:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if patient intubated))
PLACE SUPRAGLOTTIC AIRWAY ONLY IF INDICATED & BVM VENTILATIONS INEFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV/IO ACCESS
IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:
IV/IO COLD (4 DEGREE CELSIUS) NS 30 mL/kg BOLUS UP TO 1 LITER IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
INTERPRET ECG/12-LEAD ECG – TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME AND/OR DYSRHYTHMIA PROTOCOL(S) AS APPLICABLE

ADULT: ACHIEVE SYSTOLIC BLOOD PRESSURE MINIMUM OF 100 mmHg
IV FLUID: NS BOLUS (MAY USE COLD SALINE) UP TO 1 LITER TO ACHIEVE SYS BP ≥ 100 mmHg IF NO SIGNS OF PULMONARY EDEMA

NOREPINEPHRINE 2-4 mcg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED
OR
DOPAMINE 10-20 mcg/kg/min IVPB/IOPB IF IV FLUID INEFFECTIVE OR CONTRAINDICATED

PEDIATRIC: ACHIEVE MINIMUM SYSTOLIC BLOOD PRESSURE OF (70 + 2 x age in years) mmHg
IV FLUID: NS BOLUS OF 20 mL/kg UP TO 60 mL/kg IF NO SIGNS OF PULMONARY EDEMA

OLMC CONSULT FOR PHARMACOLOGIC TREATMENT IF IV FLUID INEFFECTIVE OR CONTRAINDICATED

IF PATIENT MEETS CRITERIA FOR INDUCED HYPOTHERMIA:
SHIVERING CONTROL: MIDAZOLAM 0.1 mg/kg IVP/IOP MAXIMUM DOSE 5 mg

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

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4J – Post Cardiac Arrest Treatment – Adult & Pediatric

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4J – Post Cardiac Arrest Treatment – Adult & Pediatric (cont)

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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

4K - "Do Not Resuscitate"/Advanced Directive Orders, Futility of Resuscitation Initiation, & Termination of Resuscitation Adult & Pediatric

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

"Do Not Resuscitate" & Advanced Directive Orders

Emergency Medical Responders, EMTs and Paramedics shall follow a physician's written Do-Not-Resuscitate (DNR) order, an Oklahoma DNR Consent Form, or an Advanced Health Care Directive accompanied by a written statement from two physicians that the patient is a "qualified" patient.

Situations will arise at scenes wherein persons may present themselves as the patient's family member or friend, stating that no resuscitative measures should be taken. These requests may only be honored if accompanied by appropriate documentation (any of the formats as noted previously in this protocol) or upon a written or verbal order from a physician previously established with the patient.

In any of the above confirmed situations, cease or withhold BVM ventilations, advanced airway placement, defibrillation, CPR, and antiarrhythmic and/or vasopressor medication administration. Provide all other appropriate care in accordance with applicable treatment protocols and procedures if the patient is not in respiratory or cardiac arrest, specifically addressing non-cardiopulmonary arrest conditions and maintaining appropriate comfort care for the patient.

Futility of Resuscitation Initiation

CPR should not be initiated (or continued if initiated by bystanders prior to arrival) by Emergency Medical Responders, EMTs, and paramedics in the following clinical conditions representing "obvious death" (<u>regardless of cause of cardiac arrest</u>):

No pulse AND
No spontaneous respirations AND
Pupils fixed (unreactive to light) AND
One or more of the following:

Rigor mortis.	Decomposition.
Decapitation.	Dependent lividity.

PROTOCOL 4K: "Do Not Resuscitate" Advanced Directive Orders, Futility of Resuscitation, & Termination of Resuscitation – Adult & Pediatric, cont.

Futility of Resuscitation Initiation, cont.

In blunt traumatic cardiac arrest, CPR should not be initiated (or continued if initiated by bystanders prior to arrival) by Emergency Medical Responders, EMTs, and Paramedics in the following clinical conditions:

No pulse AND
No spontaneous respirations AND
No shockable rhythm AND
No organized ECG activity, i.e., (patient is asystolic or PEA <40 beats per minute)

In penetrating traumatic cardiac arrest, CPR should not be initiated (or continued if initiated by bystanders prior to arrival) by Emergency Medical Responders, EMTs, & paramedics in the following clinical conditions:

No pulse AND
No spontaneous respirations AND
Pupils fixed (unreactive to light) AND
No spontaneous movement AND
No organized ECG activity (asystole or PEA <40 beats per minute)

Unless the above death criteria are clearly met, CPR and other resuscitative efforts should be initiated and aggressively delivered to promote the best chance of patient survival. In cases involving relative hypothermia (often involved in water submersion situations), ensure full resuscitative efforts are delivered as outlined in Protocol 11B - Cold Illness/Injury. In cases of lightning strike (without signs of "obvious death" as previously listed in this protocol), ensure full resuscitative efforts.

PROTOCOL 4K: "Do Not Resuscitate" Advanced Directive Orders, Futility of Resuscitation Initiation, & Termination of Resuscitation – Adult & Pediatric, cont.

Termination of Resuscitation

Evidence-based medicine supports the practice of field CPR termination in the following:

<u>**Adult, non-traumatic**</u> cardiac arrest patients who <u>**have not responded to full resuscitative efforts delivered consistent with the 2017 Medical Control Board Treatment Protocols in the following circumstance in which Paramedic (or higher level) care is available within 20 minutes of first EMS contact with the patient:**</u>

An adult patient who has a **non-EMS witnessed, <u>non-traumatic cardiac arrest</u>** and is **found in asystole or PEA upon Paramedic arrival** may be considered a candidate for field termination of resuscitation if they do not respond to full resuscitation efforts AND:

1) Location of cardiac arrest is a private residence or healthcare facility (e.g. nursing home).
2) ALS resuscitative efforts (CPR, successful placement of advanced airway, successful vascular access – IV or IO, and medication administration) have been continuously performed for at least 20 minutes without return of spontaneous circulation (ROSC) or conversion of asystole or PEA to Ventricular Fibrillation/Ventricular Tachycardia at any time during the 20+ minutes of advanced life support.
3) End-tidal carbon dioxide <20 mmHg at time of resuscitation termination.
4) The cardiac arrest did not occur in absolute or relative hypothermia.
5) The cardiac arrest did not occur due to apparent toxic agent exposure.

<u>**Adult, non-traumatic**</u> cardiac arrest patients who <u>**have not responded to full resuscitative efforts delivered consistent with the 2017 Medical Control Board Treatment Protocols in the following circumstance in which Paramedic (or higher level) care is *NOT* available within 20 minutes of first EMS contact with the patient:**</u>

An adult patient who has a **non-EMS witnessed, <u>non-traumatic cardiac arrest</u>** and is **found in a non-AED shockable rhythm upon first care arrival** may be considered a candidate for field termination of resuscitation if they do not respond to full resuscitation efforts AND:

1) Location of cardiac arrest is a private residence or healthcare facility (e.g. nursing home).
2) BLS/ALS (non-Paramedic level) resuscitative efforts (CPR, and the possible inclusion of successful placement of advanced airway, successful vascular access – IV or IO, and limited medication administration) have been continuously performed for at least 20 minutes without return of spontaneous circulation (ROSC) or conversion of a non-AED shockable rhythm to an AED-shockable rhythm at any time during the 20+ minutes of resuscitation.
3) The cardiac arrest did not occur in absolute or relative hypothermia.
4) The cardiac arrest did not occur due to apparent toxic agent exposure.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 4K: "Do Not Resuscitate" Advanced Directive Orders, Futility of Resuscitation, & Termination of Resuscitation – Adult & Pediatric, cont.

Termination of Resuscitation, cont.

If **ALL** of the above criteria are met, then an online medical control physician, the patient's attending physician, or alternatively an Office of the Medical Director paramedic serving in the roles of Director of Clinical Affairs or Director of Critical Care Analytics may be consulted for field termination of cardiac arrest resuscitation. The physician's order may be either by direct voice communication or in writing. The OMD paramedic's order will be by direct voice communication. The order is based upon the physician's or OMD paramedic's decision that the patient's condition is terminal, cardiovascular unresponsiveness has been established despite optimal out-of-hospital ALS emergency medical care, and biologic death has occurred. The EMS professional's decision to stop the resuscitation then shall be based on this physician's or OMD paramedic's order, though to be perfectly clear such order cannot contradict the conditions specified for termination of resuscitation. In the rare instance in which an online medical control physician or the patient's attending physician orders termination of resuscitation inconsistent with this protocol, continue resuscitation and consult the medical director or his/her designee (which may include an OMD paramedic as specified above).

Prior to field termination of resuscitation order requests, logistical factors should be considered such as family expectations, safety of crew and public if resuscitation is halted on scene, factors inhibiting safe patient movement, non-English-speaking family/cultural barriers, private physician order to continue resuscitation and transport, possible correctable causes of cardiac arrest yet untreated. EMS providers on-scene should consider the family member(s) access to resources including clergy, crisis workers, social workers, and other necessary personnel to ensure field termination of resuscitation can be achieved in an efficient, humane manner. Additionally, Oklahoma legal requirements for unattended death must be followed.

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4K – "Do Not Resuscitate"/Advanced Directive Orders, Futility of Resuscitation Initiation & Termination of Resuscitation – Adult & Pediatric

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4L- INTRA-ARREST WAKEFULNESS ADULT

TREATMENT PRIORITIES
1. Safety of self
2. Safety of public safety professionals
3. Safety of patient
4. Continuity of resuscitation

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMR | EMT

ASSIST IN PHYSICAL CONTROL OF PATIENT, INCLUDING APPLYING PHYSICAL RESTRAINTS
ANY RESTRAINT(S) SHOULD MINIMIZE ANY DETRIMENT TO RESPIRATORY OR PERFUSION MECHANICS

USE ADEQUATE NUMBERS OF PUBLIC SAFETY PROFESSIONALS
TO MINIMIZE RISK OF INJURY TO SELF AND OTHERS

SPEAK CALMLY TO PATIENT WITH REASSURANCE THAT HELP IS BEING PROVIDED

CONTINUE RESUCITATION CARE PER APPLICABLE PROTOCOLS

EMT-I85 | AEMT

IV/IO ACCESS
DO NOT RISK SELF INJURY WITH NEEDLESTICK IN IV ACCESS IF PT COMBATIVE

PARAMEDIC

CHEMICAL RESTRAINT:

ALL PATIENTS REQUIRING CHEMICAL RESTRAINT ARE TO BE PHYSICALLY RESTRAINED AS WELL

ADULT: MIDAZOLAM 0.1 mg/kg IVP/IOP TO MAX OF 5 mg. MAY REPEAT ONCE.
OR
ADULT: DIAZEPAM 5 mg IVP/IOP IF MIDAZOLAM NOT AVAILABLE. MAY REPEAT ONCE.
OR
ADULT: LORAZEPAM 2 mg IVP/IOP IF MIDAZOLAM NOT AVAILABLE. MAY REPEAT ONCE.
(MIDAZOLAM STRONGLY PREFERRED DUE TO MOST RAPID ONSET OF ACTION OF BENZODIAZEPINE OPTIONS)

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

4M – ACTIVE COMPRESSION DECOMPRESSION CPR ADULT

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indication:

Adult non-traumatic cardiac arrest.

Contraindications:

Spontaneous circulation/pulse.
Traumatic cardiac arrest (hanging/strangulation is NOT considered traumatic in this context).
Sternotomy less than estimated 6 months time.

Technique:

1. The correct compression/decompression rate is 80 cycles/minute when using the ResQPUMP®. Either the built-in two-tone metronome or an external metronome set to 80 should guide the rate.

2. The correct compression depth is 2 inches in adults when using the ResQPUMP®. Excessive depths can lead to chest wall trauma and chest wall trauma can lead to tension pneumothorax.

3. The correct compression force is whatever occurs at no more than 2 inches of depth in adults when using the ResQPUMP®. In many adults, this will be at or very near 40kg of force as measured on the device's force gauge (which should read as 0kg of force when pulled out for patient use), but let the depth determine the force. Do not start out trying to achieve a certain force regardless of depth. Excessive force can lead to chest wall trauma and chest wall trauma can lead to tension pneumothorax.

4. Any compression with the ResQPUMP® should be directly midline of the sternum. Avoid placing the ResQPUMP® laterally to the sternum. Improper placement can lead to chest wall trauma and chest wall trauma can lead to tension pneumothorax.

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Protocol 4M: Active Compression Decompression CPR, Adult, cont.

Technique (cont):

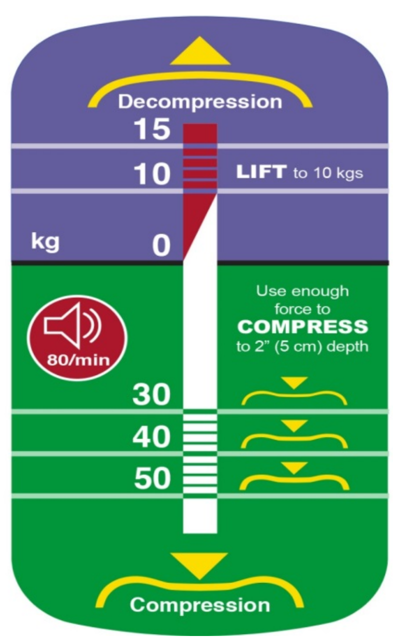
5. The correct compression technique with the ResQPUMP® involves the compressor's shoulders being over and in line with the sternum, producing a direct down (compression) and up (decompression) cycle. Even slight lateral movements of the ResQPUMP® can cause loss of suction between the device and the patient's chest, losing the active decompression advantage of the ResQPUMP®.

6. The correct decompression force of the ResQPUMP® is at 10kg as measured on the device's force gauge. Additional decompression force is unnecessary and could lead to chest wall trauma and chest wall trauma can lead to tension pneumothorax.

7. Avoid any ResQPUMP® use when standing. All ResQPUMP®-assisted compressions should be performed when kneeling immediately next to the patient's side.

8. Avoid any ResQPUMP® use when the patient is in motion. This includes during movement of the patient to the ambulance for transport. This includes during ambulance transport of the patient to an Emergency Department.

9. If unable to achieve consistent chest wall suction and active decompression with the ResQPUMP®, discontinue its use and revert to manual chest compressions at 110 compressions/minute. Strategies to improve chest wall suction include wiping away any moisture on the chest and avoiding placement of therapy electrodes (defibrillation pads) in the compression/decompression site.



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4M – Active Compression Decompression CPR - Adult

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5A – CHEST PAIN – UNCERTAIN ETIOLOGY
ADULT & PEDIATRIC

TREATMENT PRIORITIES

2 in 5 minutes of patient contact:
1. Vital signs
2. ECG rhythm (if paramedic)

5 in 10 minutes of patient contact:
1. Adult - ASA
2. IV (If EMT-I85 or higher)
3. Adult – 12-lead ECG
4. Adult – if ACS per Protocol 5C
5. Repeat vital signs

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADULT: ADVISE ASPIRIN (ASA) 324/325 mg CHEWED BY PT (unless contraindicated).
ADULT: ADVISE NITROGLYCERIN (NTG)
PT SELF-ADMINISTRATION
AS PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB ONLY IF DYSPNEA or PULSE OX <94% AT ROOM AIR
APPLY CARDIAC MONITOR
ADULT: OBTAIN 12-LEAD ECG (if equipped)
ADULT: TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
ADULT: ASA 324/325 mg CHEWED BY PT (hold if taken < 6 hours or contraindicated)
ADULT: ASSIST NTG SELF-ADMINISTRATION 0.4 mg (hold if SYS BP ≤ 100 mmHg)

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

TREAT ANY CARDIAC DYSRHYTHMIAS/SHOCK BY THE RESPECTIVE PROTOCOLS
ADULT: ANALYZE 12-LEAD ECG – TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME IF INDICATED
NOTIFY RECEIVING HOSPITAL IMMEDIATELY IF SUSPECTED STEMI

ADULT: NTG 0.4 mg SL
SEE CONTRAINDICATIONS TO NTG & ERECTILE DYSFUNCTION MEDICATIONS IN PROTOCOLS 5C & 16HH

ADULT: IF CHEST PAIN IMPROVED WITH INITIAL NTG:
IF PT STILL HAVING CHEST PAIN AFTER 3 NTG ADMINISTRATIONS & IF SYS BP > 100 mmHg:
ADDITIONAL NITROGLYCERIN PER PROTOCOL 16HH
AND
FENTANYL 0.5 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 50 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 1.5 mcg/kg or 125 mcg WHICHEVER IS LESSER.

ADULT: IF CHEST PAIN NOT IMPROVED WITH INITIAL NTG: MAY TREAT WITH OPIOID OPTION ABOVE IF INDICATED
PEDIATRIC: CONSULT FOR TREATMENT DIRECTIVE(S) IF INDICATED

Medical Literature References
5A – Chest Pain – Uncertain Etiology – Adult& Pediatric

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5B – ACQUIRING & TRANSMITTING 12–LEAD ECGs ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Respiratory Arrest
2. Dyspnea – Uncertain Etiology
3. Dyspnea – Chronic Obstructive Pulmonary Disease
4. Dyspnea – Congestive Heart Failure
5. Dyspnea – Apparent Life Threatening Event
6. Post Return of Spontaneous Circulation from Cardiac Arrest
7. Chest Pain – Uncertain Etiology
8. Acute Coronary Syndrome
9. Bradycardia
10. Tachycardia – Stable
11. Tachycardia – Unstable
12. Premature Ventricular Contractions
13. Hypertensive Emergency
14. Stroke
15. Syncope
16. Poisonings
17. Conductive Energy Weapon Related Management
18. “Less Lethal” Weapon Related Management
19. Lightning/Electrical Injury

Contraindications:

If transferring facility has already obtained 12-Lead ECG confirming STEMI prior to EMS arrival, transport is not to be delayed in an effort to obtain additional 12-Lead ECG by arriving EMS professionals. Serial 12-Lead ECG(s) for transmission to receiving facilities is/are to be obtained during transport.

Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

Technique (applicable to all 12-Lead ECG devices):

1. Prepare skin for electrode application. This may include hair removal with razor and/or rubbing the skin with a gauze (sterile or non-sterile) to remove oil and sweat. Both actions contribute to better electrode adhesion, leading to better quality 12-Lead ECGs.

2. For standard 12-Lead ECG, apply leads/electrodes as follows (Figures 1 & 2):
   a. RA lead on right upper extremity, preferably distal on the extremity near the wrist on the palm side.
   b. LA lead (mirror image of RA) on the left upper extremity, preferably distal on the extremity near the wrist on the palm side.
   c. RL lead on the right lower extremity, preferably distal on the extremity near the ankle on the outside of the leg.
   d. LL lead (mirror image of RL) on the left lower extremity, preferably distal on the extremity near the ankle on the outside of the leg.
   e. V1 lead to the right of the sternum in the 4th intercostal space.
   f. V2 lead (mirror image of V1) to the left of the sternum in the 4th intercostal space.
   g. V4 lead is placed next and in the mid-clavicular line in the left 5th intercostal space.
   h. V3 lead in the middle of the line now created between leads V2 and V4.
   i. V5 lead in horizontal line with V4 at anterior axillary line of the left axilla.
   j. V6 lead in horizontal line with V5 at mid-axillary line of the left axilla.

3. For a "right-sided" 12-lead ECG to evaluate for right ventricular myocardial infarction in the setting of suspected left ventricular inferior wall ST segment elevation myocardial infarction, simply apply four additional electrodes on the right chest, mirroring V3, V4, V5, and V6. Then move the leads off of V3-V6 and place on their right-sided mirror electrode to create V3R, V4R, V5R, and V6R (Figure 2).

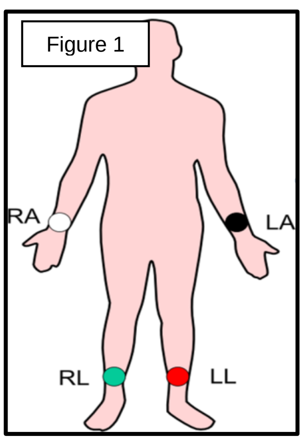

Figure 1

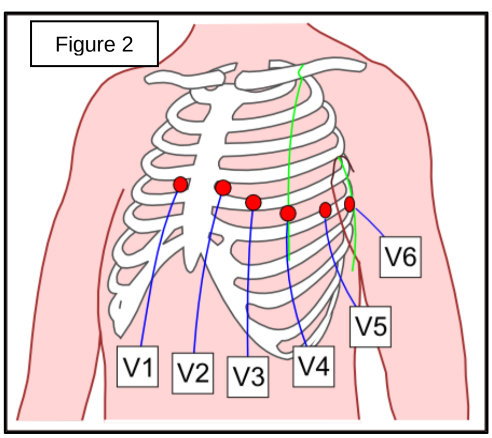

Figure 2

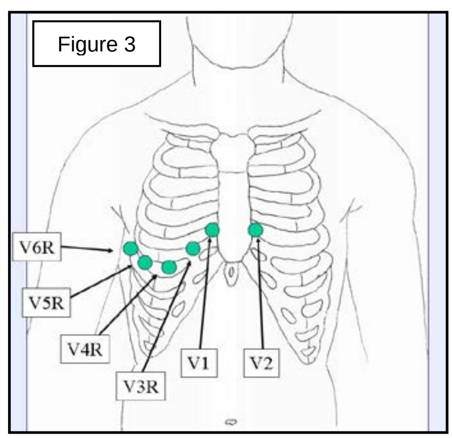

Figure 3

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

Protocol 5B: Acquiring & Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

Technique (Physio-Control LifePak® 15):

To acquire and transmit a 12-lead ECG:

1. Press **ON**. (Figure 4)
2. Insert the lead attachments into the main cable. (Figure 5)
3. Insert the cable connector into the monitor's green ECG connector. (Figure 6)
4. Prepare patient's skin as described above.
5. Apply leads/electrodes as described above.
6. Instruct patient to remain still as possible during 12-Lead ECG acquisition to reduce movement artifact (to improve quality of 12-Lead ECG sent to emergency department).
7. Press **12-LEAD** to acquire ECG and enter patient demographic information of last name, first name, age, sex (gender), incident number (if applicable) using the speed dial.(Figures 7 & 8)
8. Once 12–Lead ECG acquired, press **TRANSMIT**. (Figure 9)
9. In the TRANSMIT window, select 12-Lead **REPORT** to be sent. (Figure 10)
10. In the TRANSMIT window, select **SITE**.
11. In the SITE window, select desired transmission destination, typically a hospital's emergency department. (Figure 11)
12. In the TRANSMIT window, select **SEND**. (Figure 12)
13. The Physio-Control LifePak®15 should connect to the selected destination.
14. Once the transmission is completed a transaction message is automatically printed.
15. If the transmission fails, make at least one additional attempt at transmission.

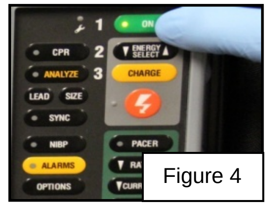

Figure 4

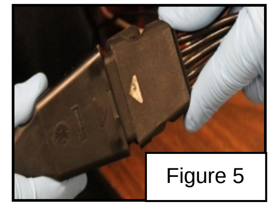
Figure 5

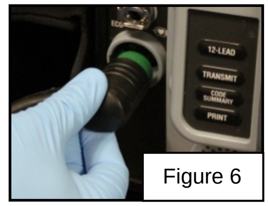

Figure 6

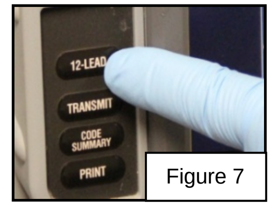

Figure 7

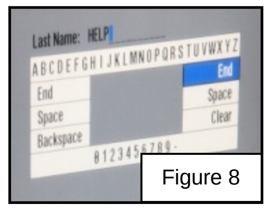

Figure 8

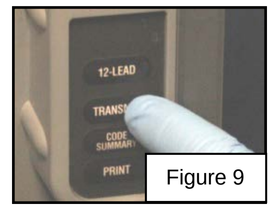

Figure 9

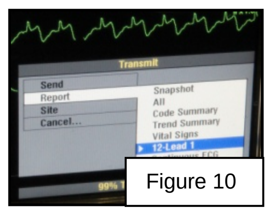

Figure 10

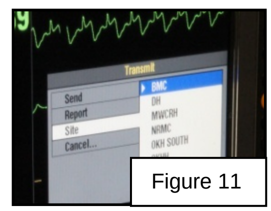

Figure 11

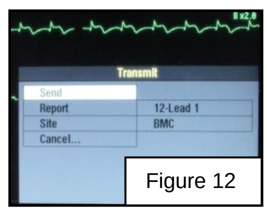

Figure 12

Protocol 5B: Acquiring &Transmitting 12–Lead ECGs – Adult & Pediatric, cont.

NOTE: There are limitations with transmitting data by telecommunications. Successful transmission depends on the access to public or private network services that may or may not always be available. This is especially true for cellular communication that is influenced by many factors, such as:

- Geography
- Location
- Weather
- Cellular service activity load (volume of active users)
- Cellular service availability

Treatment protocols take into account the fact that data transmissions cannot be assured with the use of cellular communications. Therefore early voice communication with the receiving facility is an essential contingency plan for interrupted data transmissions.

Multiple methods of transmitting 12-Lead ECG data exist (proprietary cellular/satellite network systems, data fax transmission, cellular transmission of images, e.g. photographs of the 12-Lead ECG sent via smartphone). Check with local EMS administration officials and medical oversight physician(s) to ensure local practices are understood and follow all applicable laws relating to protected health information.

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5B – Acquiring & Transmitting 12-Lead ECGs – Adult& Pediatric

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5C - ACUTE CORONARY SYNDROME ADULT

TREATMENT PRIORITIES

2 in 5 minutes of patient contact:
1. Vital signs
2. ECG rhythm (if paramedic present)

5 in 10 minutes of patient contact:
1. ASA
2. IV
3. 12 lead ECG
4. NTG or fluids (BP/Inf. MI?)
5. Repeat vital signs

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE ASPIRIN (ASA) 324/325 mg CHEWED BY PT
(unless contraindicated).
ADVISE NITROGLYCERIN (NTG)
PT SELF-ADMINISTRATION
IF PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
AVOID O_2 VIA NC or NRB UNLESS DYSPNEA or PULSE OX <94% AT ROOM AIR
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
ASA 324/325 mg CHEWED BY PT (hold if taken < 6 hours or contraindicated)
ASSIST NTG SELF-ADMINISTRATION 0.4 mg (hold if Sys BP ≤ 100 mmHg)
IF PARAMEDIC OR OLMCP DIAGNOSES ACUTE STEMI, PLACE DEFIB PADS ANTERIOR-POSTERIOR CHEST WALL

EMT-I85 | AEMT

IV ACCESS
IV NS TKO if SYS BP > 100 mmHg
IV NS 250 mL BOLUS if SYS BP ≤ 100 mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

TREAT ANY CARDIAC DYSRHYTHMIAS/SHOCK BY THE RESPECTIVE PROTOCOLS
ANALYZE 12-LEAD ECG – TREAT PER FOLLOWING FLOWCHART
NOTIFY RECEIVING HOSPITAL IMMEDIATELY IF SUSPECTED STEMI
TRANSPORT ASAP PER DESTINATION PROTOCOL

*ACUTE INFERIOR INFARCT?
- YES → OBTAIN/ANALYZE RIGHT-SIDED 12-LEAD ECG ENROUTE → **ACUTE RIGHT VENTRICULAR INFARCT?
  - YES → IF SYS BP < 120 mmHg, IV NS 250 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA → SYS BP > 100 mmHg?
  - NO → SYS BP > 100 mmHg?
- NO → SYS BP > 100 mmHg?

SYS BP > 100 mmHg?
- YES → *** NTG 0.4 mg SL. MAY REPEAT EVERY 5 MIN IF SYS BP > 100 mmHg
- NO → SIGNS OF PULMONARY EDEMA?
  - YES → NOREPINEPHRINE 2-4 mcg/min IVPB TITRATE TO SYS BP ≥ 100 mmHg **OR** DOPAMINE 5-20 mcg/kg/min IVPB TITRATE TO SYS BP ≥ 100 mmHg
  - NO → IV NS 250 mL BOLUS REPEAT UNTIL SYS BP > 100 mmHg IF NO SIGNS OF PULMONARY EDEMA → *** NTG 0.4 mg SL.

IF PT STILL HAVING ACS SYMPTOMS AFTER 3 NTG ADMINISTRATIONS
WITH PERSISTENT CHEST PAIN & IF SYS BP > 100 mmHg:
ADDITIONAL NITROGLYCERIN PER PROTOCOL 16HH
AND
FENTANYL 0.5 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 50 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 1.5 mcg/kg or 125 mcg WHICHEVER IS LESSER.

* ACUTE INFERIOR INFARCT INDICATED BY ST SEGMENT ELEVATION IN AT LEAST 2 OF THESE 3 LEADS: II, III, aVF.

**ACUTE RIGHT VENTRICULAR INFARCT INDICATED BY ST SEGMENT ELEVATION IN AT LEAST 2 OF THESE 4 LEADS: V3R, V4R, V5R, V6R.

***DO NOT GIVE NTG TO PATIENTS TAKING VIAGRA® OR LEVITRA® WITHIN 24 HOURS OR CIALIS® WITHIN 48 HOURS WITHOUT OLMC CONSULT.

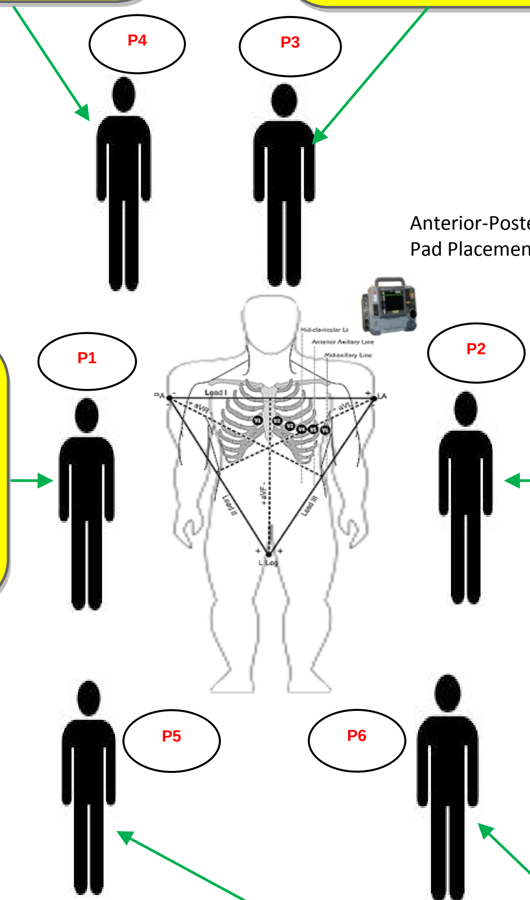
5C – ACS TEAM ROLES
ADULT & PEDIATRIC

Position 4 (P4) Scene Coordination
Always outside ACS "triangle"

- Monitors time intervals of interventions and time from first medical contact
- Avoids direct patient care to maintain supervisory duties if greater than four rescuers throughout.
- Directs "staging" of personnel beyond six rescuers away from immediate treatment area to prevent crowding.
- Assumes duties of P5/P6 if limited to four rescuers throughout (if paramedic) and positions self in P5 or P6 position.

Position 3 (P3) Manage Airway

- Applies capnography
- Applies O2 **ONLY** if indicated
- Airway management as indicated by clinical presentation of patient



Position 1 (P1) Interventional Paramedic
Always on patient's right

- IV access
- ASA
- NTG
- Fentanyl only if indicated
- Fluid and vasopressor management

Position 2 (P2) Efficient Data Acquisition
Always on patients's left

- Vital signs
- Applies 4 lead cables
- Enters patient demographics into monitor/defibrillator
- Obtains 12-Lead ECG
- Applies defibrillation pads ANT-POST

Scene Coordination
Transport Logistics
Efficient Data Acquisition
Manage Airway
Interventional

Position 5 (P5) Transport Logistics
Always outside ACS "triangle"

- Ingress/Egress formulation
- Assists in equipment management

Position 6 (P6) Treatment Implementation Paramedic
Always outside ACS"triangle" at lower 1/2 of patient

- Physical and verbal assessment of patient
- Gathers concise history from patient/family/bystanders
- Maintains overall awareness of ACS dynamics, implements treatment plan based on clinical presentation
- Reviews 12-Lead ECG, determines presence of diagnostic quality and confirms STEMI criteria
- Transmission of diagnostic 12-Lead ECG to receiving facility
- Determines appropriate destination of ACS patient
    - STEMI alert via telephone contact via recorded line to receiving facility

Medical Literature References
5C – Acute Coronary Syndromes – Adult

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4. A Novel Approach to Improve Time to First Shock in Prehospital STEMI Complicated by Ventricular Fibrillation. Osei-Ampofo M, Cheskes S, Byers A, Drennan IR, Buick JE, Verbeek PR. Prehosp Emerg Care. 2016;20(2):278-82.
5. Welsford M, Nikolaou NI, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, O'Connor RE, Pichel DR, Scott T, Walters DL, Woolfrey KG; Acute Coronary Syndrome Chapter Collaborators. Part 5: Acute Coronary Syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation.* 2015 Oct 20;132(16 Suppl 1):S146-76.
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5D - BRADYCARDIA ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Vital Signs
2. IV Access
3. Analyze rhythm
4. Rhythm specific treatment.

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES)

EMR | **EMT**

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB IF DYSPNEA OR PULSE OX < 94% AT ROOM AIR
APPLY CARDIAC MONITOR/OBTAIN 12 – LEAD ECG (if equipped)
TRANSMIT 12 – LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

UNSTABLE (SYMPTOMATIC) bradycardia is defined by any of the following symptoms:

1. Dyspnea
2. Chest pain
3. Weakness
4. Altered mental status
5. Hypoxemia
6. Pulmonary edema

EMT-I85 | **AEMT**

IV ACCESS

PARAMEDIC

ANALYZE & TREAT PER RHYTHM FLOWCHART BELOW

SINUS BRADYCARDIA
FIRST DEGREE AV BLOCK
SECOND DEGREE AV BLOCK, TYPE I (WENCKEBACH)

ADULT & PEDIATRIC: ASYMPTOMATIC – MONITOR ONLY.
ADULT: TREAT IF SYMPTOMATIC AND SYS B/P < 100mmHg.
PEDIATRIC: TREAT IF SYMPTOMATIC AND SYS B/P < (70 + 2x age in years) mmHg.
ADULT: ACS – TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME. AVOID ATROPINE IF HR >40 bpm.
ADULT: NON-ACS – ATROPINE 0.5 mg IVP/IOP. MAY REPEAT EVERY 5 MINUTES TO CUMULATIVE OF 3 mg.
PEDIATRIC: EPINEPHRINE 0.01 mg/kg IVP/IOP. (1:10,000 0.1 mL/kg IVP/IOP). MAY REPEAT ONCE.
IF UNRESPONSIVE TO EPINEPHRINE, ATROPINE 0.02 mg/kg IVP/IOP. MINIMUM DOSE 0.1 mg. MAX SINGLE DOSE 0.5 mg. MAY REPEAT ONCE.

SECOND DEGREE AV BLOCK, TYPE II (CLASSIC)
THIRD DEGREE AV BLOCK (COMPLETE)

ADULT & PEDIATRIC: ASYMPTOMATIC – MONITOR & PLACE PACING PADS.
ADULT: ACS – TREAT PER PROTOCOL 5C - ACUTE CORONARY SYNDROME & PACE AT 60 bpm INSTEAD OF ATROPINE USE.
ADULT: NON-ACS – PACE AT 60 bpm INSTEAD OF ATROPINE USE.
PEDIATRIC: PLACE PACER PADS. CONSULT OLMCP.

Medical Literature References
5D - Bradycardia – Adult & Pediatric

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5E – TRANSCUTANEOUS PACING
ADULT & PEDIATRIC

PARAMEDIC

Indications:

1. Symptomatic 2nd Degree AV Block-Type II (Classic)
2. Symptomatic 3rd Degree AV Block (Complete)
3. Symptomatic Bradycardia in Acute Coronary Syndrome in preference to atropine use
4. Symptomatic Bradycardia unresponsive to non-electrical interventions
5. Symptomatic Bradycardia in pediatric patients (when approved by OLMCP consultation)

Contraindications:

1. Asymptomatic Bradycardia

Technique:
(Physio-Control LifePak® 15):

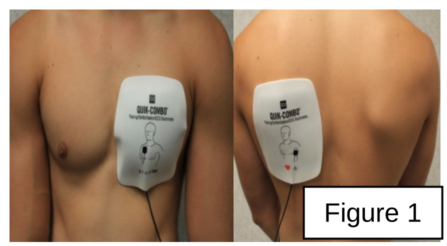

Figure 1

1. Maintain standard ECG monitoring using electrodes/cable.

2. Apply Quik–Combo™pads in anterior/posterior chest wall location illustrated in (Figure 1). Excessive diaphoresis may require drying and/or excessive chest hair may require partial removal to achieve appropriate pad-chest wall adhesion.

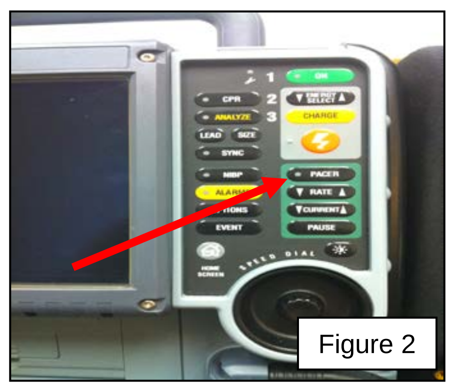

Figure 2

3. Connect Quik-Combo™ pad set to LifePak® monitor/defibrillator via attached cable.

4. Advise patient of impending therapy. Administer sedation if patient condition allows, adults to receive 2-5 mg midazolam IVP as individual patient weight and hemodynamics dictate.

5. Power on the pacing function by pressing the "PACER" button (Figure 2).

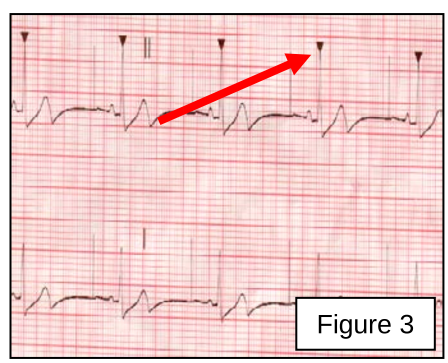

Figure 3

6. Confirm ECG rhythm is sensed by Quik-Combo™ pads, looking for triangular "sense markers" marking QRS complexes (Figure 3). If sense markers do not appear, check for correct Quik-Combo™ pad attachment to LifePak monitor/defibrillator. If sense markers are inconsistently tracking QRS complexes and/or tracking T waves, adjust ECG size or select alternate monitoring lead to achieve correct QRS complex tracking.

PROTOCOL 5E: Transcutaneous Pacing, Adult & Pediatric, cont.

Technique (cont):

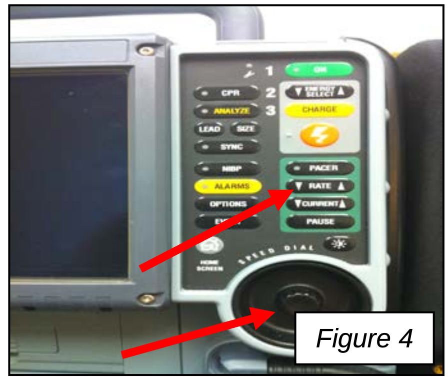
Figure 4

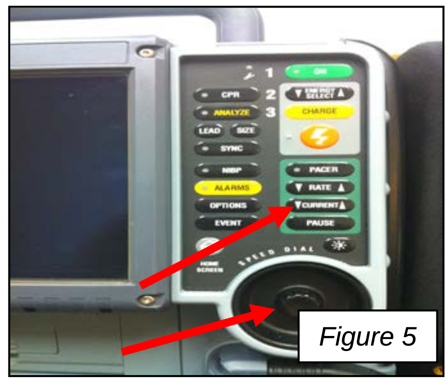
Figure 5

7. Set pacing **rate** at 60 paces per minute (adults) either by pressing the "RATE" switch up arrow to increase rate or down arrow to decrease rate or by rotating the "SPEED DIAL" knob (Figure 4). The "RATE" switch will allow changes in 10 paces per minute increments; the "SPEED DIAL" knob will allow changes in 5 paces per minute increments.

8. Set pacing **current** at minimum level achieving electrical AND mechanical capture. Deliver electrical pacing current either by pressing the "CURRENT" switch up arrow to increase milliAmp (mA) current or down arrow to decrease mA current or by rotating the "SPEED DIAL" knob (Figure 5). The "CURRENT" switch will allow changes in 10 mA increments; the "SPEED DIAL" knob will allow changes in 5 mA increments.

9. Pressing the "PAUSE" button will cause the set pacing rate to decrease by 25% (eg. rate of 60 paces per minute changes to rate of 45 paces per minute) while it is being depressed. This function should not be used without directive from OLMC.

10. If pacing therapy termination is required, power off the pacing function by pressing the "PACER" button (Figure 2).

Pacing-Related Considerations:
(Physio-Control LifePak® 15):

1. In the event of ventricular fibrillation or pulseless ventricular tachycardia, pressing the yellow "CHARGE" button will automatically stop the pacing function. Proceed with defibrillation.

2. If the monitor displays "**ECG LEAD OFF"** during transcutaneous pacing, pacing automatically switches to non – demand and continues at the fixed rate until the ECG lead(s) is reattached. During non – demand pacing, the pacemaker delivers pulses at the set pace rate regardless of any intrinsic beats that the patient may have. The monitor continues to display the pacing rate and the current. To reestablish demand pacing, reattach the ECG lead(s).

3. If the Quik-Combo™ electrodes detach during pacing, the monitor will display "**CONNECT ELECTRODES"** and "**PACING STOPPED"** messages and sound an alarm. The set pacing rate is maintained, but the current resets to 0 mA. Reattaching the Quik-Combo™ electrodes silences the alarm and removes the messages. The current remains at 0 mA until manually adjusted as described above.

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PROTOCOL 5E: Transcutaneous Pacing, Adult & Pediatric, cont.

<u>Pacing-Related Considerations (cont)</u>:

4. Proper electrical capture is displayed by depolarization of the ventricles, reflected as a wide QRS, followed by a distinct, broad T wave (Figures 6 & 7). Absence of these findings immediately following pacing spikes generally indicates failure of consistent electrical and mechanical capture (Figures 8 & 9).

5. With transcutaneous pacing, it may be difficult to see the paced QRS complex due to washout from the pacing stimulus. It is imperative to confirm capture by a physiologic measure such as a pulse.

Figure 6

Figure 7

Figure 8

Figure 9

Medical Literature References
5E – Transcutaneous Pacing – Adult & Pediatric

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5F TACHYCARDIA - STABLE ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. IV Access
3. Analyze rhythm
4. Rhythm specific treatment
5. Consult OLMC for pediatric pts
6. If protocol measures DO NOT control rate of adult PSVT, or convert WIDE COMPLEX TACHYCARDIA, **CONTACT OLMC**
7. OLMC Adult options include:

Narrow Complex Tachycardia
- DILTIAZEM 0.25 mg/kg SLOW IVP over 2 mins
- AMIODARONE 150 mg SLOW IVP/IVPB over 10 mins
- **SYNCHRONIZED** CARDIOVERSION
- MONITOR/TRANSPORT

Wide Complex Tachycardia
- Repeat AMIODARONE 150 mg SLOW IVP/IVPB over 10 mins
- **SYNCHRONIZED** CARDIOVERSION
- ADENOSINE 12 mg RAPID IVP IF REGULAR & MONOMORPHIC
- LIDOCAINE up to 1 mg/kg IVP at < 50 mg/min
- MONITOR/TRANSPORT

UNSTABLE (SYMPTOMATIC) tachycardia is defined by any of the following symptoms:

1. Dyspnea
2. Chest pain
3. Weakness
4. Altered mental status
5. Hypoxemia
6. Pulmonary edema

EMD

ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

EMR | **EMT**

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB IF DYSPNEA OR PULSE OX < 94% AT ROOM AIR
APPLY CARDIAC MONITOR/OBTAIN 12 – LEAD ECG (if equipped)
TRANSMIT 12 – LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT-I85 | **AEMT**

IV ACCESS

PARAMEDIC

ADULT: ANALYZE & TREAT PER FLOWCHART BELOW
PEDIATRIC: CONSULT OLMC FOR TREATMENT PLAN

ADULT HEART RATE ≥ 150/MIN?
AFEBRILE PEDIATRIC HEART RATE ≥ 180/MIN?

- NO → TREATMENT PER OTHER APPLICABLE PROTOCOLS
- YES ↓

UNSTABLE WITH SYMPTOMS **AND**
ADULT: SYS BP <100 mmHg?
PEDIATRIC: SYS BP < (70 + 2x age in years) mmHg?

- YES → TREAT PER PROTOCOL 5G UNSTABLE TACHYCARDIA
- NO ↓

ATRIAL FIBRILLATION **OR** ATRIAL FLUTTER
→ **OLMC ORDER ONLY**
ADULT
DILTIAZEM 0.25 mg/kg
SLOW IVP OVER 2 MINS
MAX DOSE 25 mg UP TO AGE 70 YEARS
MAX DOSE 10 mg AGE 70+ YEARS

PSVT
→ MODIFIED VALSALVA MANUEVER
→ ADENOSINE
12 mg RAPID IVP
MAY REPEAT AT 12 MG

WIDE – COMPLEX TACHYCARDIA UNCERTAIN TYPE **OR** MONOMORPHIC VENTRICULAR TACHYCARDIA
→ AMIODARONE
150 mg OVER 10 MINUTES (**VERY SLOW** IVP/IVPB)

TORSADES
→ MAGNESIUM SULFATE
1 gram SLOW IVP/IOP OVER 1 MINUTE
MAY REPEAT X1

Medical Literature References
5F – Tachycardia - Stable – Adult & Pediatric

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3. Welsford M, Nikolaou NI, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, O'Connor RE, Pichel DR, Scott T, Walters DL, Woolfrey KG; Acute Coronary Syndrome Chapter Collaborators. Part 5: Acute Coronary Syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation.* 2015 Oct 20;132(16 Suppl 1):S146-76.
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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

5G TACHYCARDIA - UNSTABLE ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Vital signs
2. IV Access
3. Analyze rhythm
4. Rhythm specific treatment
5. Synchronized mode utilized each synchronized cardioversion
6. Consult OLMC for pediatric pts
7. If protocol measures DO NOT convert rhythm, control symptoms, and restore blood pressure, **CONTACT OLMC**

UNSTABLE (SYMPTOMATIC) tachycardia is defined by any of the following symptoms:

1. Dyspnea
2. Chest pain
3. Weakness
4. Altered mental status
5. Hypoxemia
6. Pulmonary edema

EMD

ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB IF DYSPNEA or PULSE OX <94% AT ROOM AIR
APPLY CARDIAC MONITOR/OBTAIN 12 – LEAD ECG (if equipped)
TRANSMIT 12 – LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT-I85 | AEMT

IV ACCESS

PARAMEDIC

ADULT: ANALYZE & TREAT PER FLOWCHART BELOW
PEDIATRIC: CONSULT OLMC FOR TREATMENT PLAN (MEDICATION OR ELECTRICAL THERAPY)

ADULT: HEART RATE **>** 150/MIN?
PEDIATRIC: AFEBRILE HEART RATE > 180/MIN?

NO → TREATMENT PER APPLICABLE PROTOCOLS

YES ↓

UNSTABLE WITH SYMPTOMS **AND**
ADULT: SYS BP <100 mmHg?
PEDIATRIC: SYS BP < (70 + 2x age in years) mmHg

NO → TREAT PER PROTOCOL 5F TACHYCARDIA - STABLE

YES ↓

SYNCHRONIZED CARDIOVERSION
DOUBLE CHECK PRIOR TO EACH AND EVERY SYNCHRONIZED CARDIOVERSION
ASSURE "SYNC" MODE IS UTILIZED PRIOR TO ENERGY DELIVERY

ADULT: IF SYS BP > 80 mmHg, PRETREAT WITH MIDAZOLAM 0.1 mg/kg IVP/IOP/INP, Maximum dose 5 mg

BEGIN AT **100J SYNCHRONIZED** IF RHYTHM PERSISTS & PATIENT REMAINS UNSTABLE REPEAT AT **SYNCHRONIZED** ENERGY SETTINGS OF **200J, 300J, 360J**

TACHYCARDIA RESOLVES?

NO → CONSULT OLMC

YES ↓

ADULT: VENTRICULAR TACHYCARDIA ONLY
AMIODARONE
150 mg OVER 10 MINUTES **VERY SLOW** IVP/IVPB

Medical Literature References
5G – Tachycardia - Unstable – Adult & Pediatric

1. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
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3. Welsford M, Nikolaou NI, Beygui F, Bossaert L, Ghaemmaghami C, Nonogi H, O'Connor RE, Pichel DR, Scott T, Walters DL, Woolfrey KG; Acute Coronary Syndrome Chapter Collaborators. Part 5: Acute Coronary Syndromes: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation.* 2015 Oct 20;132(16 Suppl 1):S146-76.
4. de Caen AR, Maconochie IK, Aickin R, Atkins DL, Biarent D, Guerguerian AM, Kleinman ME, Kloeck DA, Meaney PA, Nadkarni VM, Ng KC, Nuthall G, Reis AG, Shimizu N, Tibballs J, Veliz Pintos R; Pediatric Basic Life Support and Pediatric Advanced Life Support Chapter Collaborators. Part 6: Pediatric Basic Life Support and Pediatric Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S177-203.
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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

5H – SYNCHRONIZED CARDIOVERSION ADULT & PEDIATRIC

PARAMEDIC

Indication:

Unstable, symptomatic tachycardia (adult heart rate > 150 beats per minute; afebrile pediatric heart rate > 180 beats per minute) AND hemodynamic compromise adult systolic blood pressure <100 mmHg; pediatric systolic blood pressure < (70 + 2x age in years) mmHg.

Contraindications:

1. Stable tachycardia (Treatment per Protocol 5F – Stable Tachycardia)
2. Normal sinus rhythm
3. Bradycardia
4. Ventricular fibrillation/pulseless ventricular tachycardia

Technique (Physio-Control LifePak® 15):

1. Power **ON**. (Figure 1)

Figure 1

2. Attach patient ECG cable and ECG electrodes. ECG electrodes and cable must be used to monitor the ECG when paddles are used for synchronized cardioversion.

3. Select lead with the greatest QRS complex amplitude positive or negative deflection. (Figure 2)

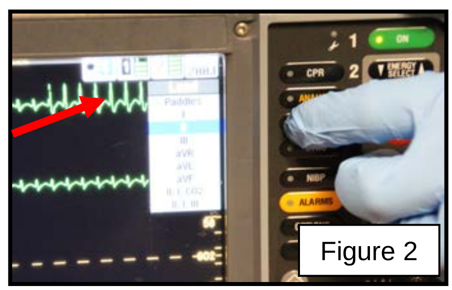
Figure 2

4. Press **SYNC**. The **SYNC MODE** message appears in the message area when **SYNC** is active. (Figure 3)
   a. **NOTE:** To deactivate **SYNC MODE** when not synchronized cardioverting, press **SYNC** again.

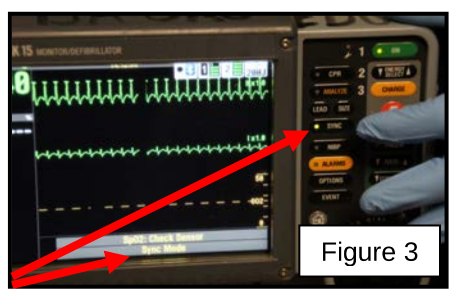
Figure 3

Protocol 5H: Synchronized Cardioversion, Adult & Pediatric, cont.

Technique (cont):

5. Observe the ECG rhythm. Confirm that a triangle sense marker (▼) appears near the MIDDLE of each QRS complex. (Figure 4)
    a. If the sense markers **DO NOT** appear or are displayed in the wrong location **(for example on the T – wave)** adjust **ECG SIZE** or select another lead. It is normal for the sense marker location to vary *slightly* on each QRS.

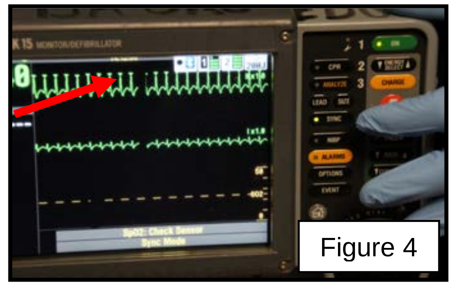

Figure 4

6. Connect the therapy electrodes to the therapy cable and confirm cable connection to the monitor/defibrillator. (Figure 5)

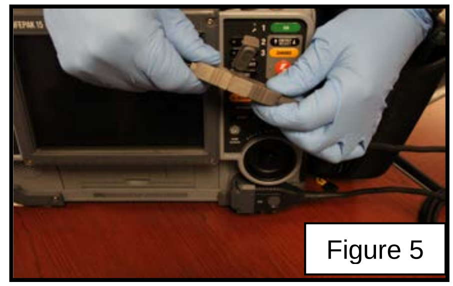

Figure 5

7. Prepare the patient's skin and apply therapy electrodes to the patient in the anterior-posterior chest wall position. (Figure 6)

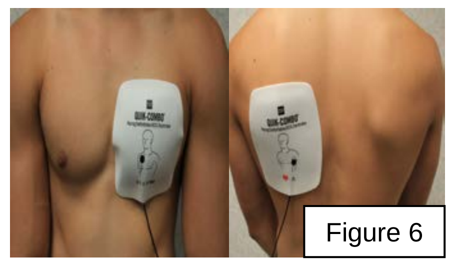

Figure 6

8. Press **ENERGY SELECT** or rotate the **SPEED DIAL** to select the desired energy. (Figure 7) Per Protocol 5G – Tachycardia – Unstable, for adult synchronized cardioversion, begin at 100 joules energy. If unstable tachydysrhythmia persists, repeat synchronized cardioversion at escalating energy settings of 200 joules, 300 joules, 360 joules. For pediatric synchronized cardioversion, consult on-line medical control for treatment plan and energy settings.

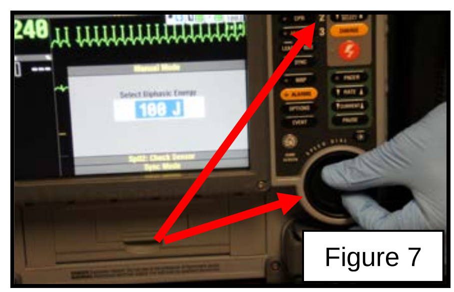

Figure 7

9. Press **CHARGE**. While the monitor/defibrillator is charging a charging bar appears and a ramping tone sounds, indicating the charging energy level. When the monitor/defibrillator is fully charged, the screen displays available energy. (Figure 8)

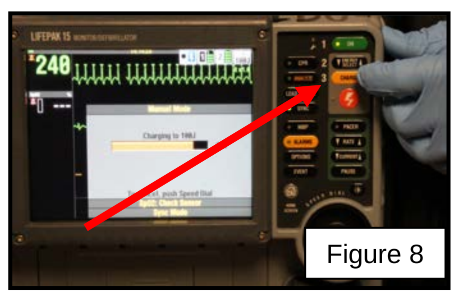

Figure 8

Protocol 5H: Synchronized Cardioversion, Adult & Pediatric, cont.

Technique (cont):

10. Make certain all personnel, including the operator, stand clear of the patient, bed, and any equipment connected to the patient.

11. Confirm ECG rhythm. Confirm available energy. *Prior to delivering synchronized cardioversion, it is paramount to ensure that the **SYNC MODE** message continues to appear. Failure to deliver a "synchronized" cardioversion in this setting could cause ventricular fibrillation cardiac arrest in the patient.* (Figure 9)

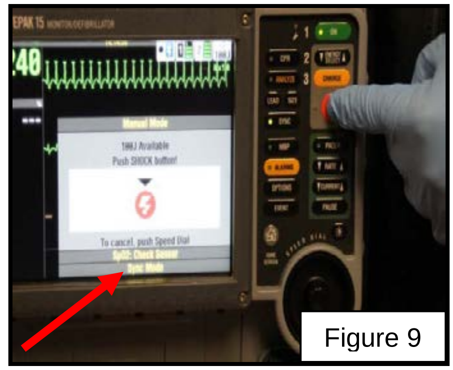

Figure 9

12. Press and hold the (shock) button on the monitor/defibrillator until the **ENERGY DELIVERED** message appears on the screen. (Figure 10)
    a. **NOTE:** To disarm (cancel the charge), press the SPEED DIAL. The energy disarms automatically if shock buttons are not pressed within 60 seconds, or if the energy selection after charging begins.

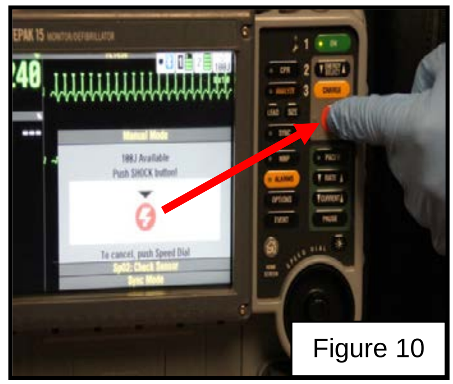

Figure 10

13. Observe patient and ECG rhythm. Repeat procedure starting from Step 4, if necessary.

Medical Literature References
5H – Synchronized Cardioversion – Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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5I - IMPLANTABLE PACEMAKER MANAGEMENT ADULT & PEDIATRIC

PARAMEDIC

Clinical Pearls:

1. Correlate electrical pacing activity with mechanical heart activity (eg. pulses).

2. If electrical pacer spikes seen on the ECG monitor are not consistently and immediately followed by electrical activity of atrial, ventricular, or both atrial and ventricular depolarization, then the pacemaker may be intermittently functioning. This may be normal if the patient's heart rate is above 60 beats per minute, since most pacemakers will be set to a demand mode (pacing only when needed). Alternately, if the patient is bradycardic, the pacemaker may be non-functional (eg. battery failure).

3. The "sensor function" of a pacemaker attempts to anticipate increased metabolic needs and raises heart rate. The most commonly used sensor is an accelerometer which raises pacing rate when motion is detected. Thus, physical motion of the patient (including motion created by riding on the ambulance stretcher enroute to the hospital) can stimulate increasing rates of pacing. If the paced rate is noticeably higher than usual set rates of 60-80 beats per minute, attempt to minimize the patient's physical motion and observe if pacing rates decline.

4. Due to the variety of pacemaker types and settings, pacemaker manufacturers supply patients with a card to be carried (usually in wallet or purse) that identifies the pacemaker by manufacturer, type, and date of implantation.

5. Specific types of pacemaker malfunction include the following:
   a. Failure to pace/output – no pacing spikes seen in a bradycardic patient. (example, oversensing of myopotentials, dead battery)
   b. Failure to sense – pacing becomes asynchronous (example, patient's heart voltage too low for pacer to sense)
   c. Failure to capture – pacing spikes seen without capture (examples, lead becomes dislodged from myocardium or breaks)
   d. Overpacing or "runaway pacing" – pacemaker pacing at fast rates without clear reason (examples, sensor-driven pacing from motion, pacemaker-mediated tachycardia)

6. In the setting of sustained, symptomatic rapid pacing suspected to be related to overpacing (see Item 4 above) tachycardia may be able to be controlled by placing a doughnut-shaped medical magnet over the generator.
7. In the setting of cardiac arrest, treat per usual resuscitation, but avoid placing defibrillation pads over the pacemaker generator.

8. **Consult on-line medical control early in the course of suspected pacemaker management issues for further guidance.**

Medical Literature References
5I – Pacemaker Management – Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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4. McMullan J, Valento M, Attari M, Venkat A. Care of the pacemaker/implantable cardioverter defibrillator patient in the ED. *Am J Emerg Med*. 2007 Sep;25(7):812-22.

5J - IMPLANTABLE CARDIOVERTER/DEFIBRILLATOR (ICD) MANAGEMENT ADULT & PEDIATRIC

PARAMEDIC

Clinical Pearls:

1. Correlate ICD activity with ECG rhythm - ventricular fibrillation/tachycardia?

2. Due to the variety of ICDs, manufacturers supply patients with a card to be carried (usually in wallet or purse) that identifies the ICD by manufacturer, type, and date of implantation.

3. All ICDs have pacemaker function. Some patients have pacing indications and may have normal or abnormal pacemaker function (see 5I – Pacemaker Management) associated with their ICD. Many patients with ICDs, however, do not have a pacemaker indication.

4. Specific types of ICD malfunction include the following:
   a. Inappropriate ICD shocks – Patient is shocked without evidence of arrhythmia (examples, lead fracture, oversensing of t-waves)
   b. Failure to shock ventricular tachycardia/fibrillation - (examples, undersensing of small fibrillatory waves, slow ventricular tachycardia below the ICD's programmed VT zone)

5. If the patient is hemodynamically stable, acquire and transmit a 12-Lead ECG prior to attempting any change in ICD function.

6. In the setting of oversensing, especially if multiple apparently inappropriate ICD discharges occur, the ICD may be temporarily deactivated by placing a doughnut-shaped medical magnet over the ICD generator. Depending upon the exact model of ICD, a beep or sustained tone may be heard with successful magnet application.

7. While the magnet is applied to the ICD, no therapies will be delivered – even when needed for life-threatening arrhythmias. Therefore, PRIOR TO DEACTIVATING AN ICD WITH A MAGNET, THE PATIENT MUST BE ON CONTINUOUS ECG MONITORING AND A DEFIBRILLATOR MUST BE IMMEDIATELY AVAILABLE.

8. In the setting of cardiac arrest, treat per usual resuscitation, but avoid placing defibrillation pads over the ICD generator.

9. **Consult on-line medical control early in the course of suspected ICD management issues for further guidance.**

Medical Literature References
5J – Implantable Cardioverter/Defibrillator (AICD) Management – Adult & Pediatric

1. Travers AH, Perkins GD, Berg RA, Castren M, Considine J, Escalante R, Gazmuri RJ, Koster RW, Lim SH, Nation KJ, Olasveengen TM, Sakamoto T, Sayre MR, Sierra A, Smyth MA, Stanton D, Vaillancourt C; Basic Life Support Chapter Collaborators. Part 3: Adult Basic Life Support and Automated External Defibrillation: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S51-83.
2. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
3. Protocol expert consultant: David Sandler, MD. Oklahoma Heart Institute, Tulsa. Board certified in clinical cardiac electrophysiology, cardiovascular disease, and internal medicine by the American Board of Internal Medicine.
4. Lee JK, Blossfield K. Chapter 24. Automatic Implantable Cardioverter-Defibrillator Assessment. In: Reichman EF, Simon RR, eds. Emergency Medicine Procedures. New York: McGraw-Hill; 2004. http://www.accessemergencymedicine.com/content.aspx?aID=48546. Accessed June 30, 2012.
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5K - PREMATURE VENTRICULAR CONTRACTIONS ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. O2 via NC or NRB if indicated
2. 12-Lead ECG
3. Rhythm Analysis

UNSTABLE (SYMPTOMATIC) premature ventricular contractions are defined by any of the following symptoms:

1. Dyspnea
2. Chest pain
3. Weakness
4. Altered mental status
5. Hypoxemia
6. Pulmonary edema

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

PARAMEDIC

ASYMPTOMATIC PVCs DO NOT REQUIRE ANTI-DYSRHYTHMIC MEDICATION.

TREAT IF UNSTABLE WITH SYMPTOMS AND ADULT SYS BP < 100 mmHg

DO NOT PHARMACOLOGICALLY SUPPRESS PVCs IN 2nd / 3rd DEGREE HEART BLOCKS

ADULT: AMIODARONE 150mg VERY SLOW IVP/IVPB OVER 10 MINUTES.

PEDIATRIC: OLMC CONSULT

Medical Literature References
5K – Premature Ventricular Contractions – Adult & Pediatric

1. Callaway CW, Soar J, Aibiki M, Böttiger BW, Brooks SC, Deakin CD, Donnino MW, Drajer S, Kloeck W, Morley PT, Morrison LJ, Neumar RW, Nicholson TC, Nolan JP, Okada K, O'Neil BJ, Paiva EF, Parr MJ, Wang TL, Witt J; Advanced Life Support Chapter Collaborators. Part 4: Advanced Life Support: 2015 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations. *Circulation*. 2015 Oct 20;132(16 Suppl 1):S84-145.
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5. Marill KA, deSouza IS, Nishijima DK, Stair TO, Setnik GS, Ruskin JN. Amiodarone is poorly effective for the acute termination of ventricular tachycardia. *Ann Emerg Med*. 2006 Mar;47(3):217-24.
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Removed by MCB September 11, 2013

5L - HYPERTENSIVE EMERGENCY
ADULT & PEDIATRIC

Medical Literature References
5L – Hypertensive Emergency – Adult& Pediatric

1. Peacock WF 4th, Hilleman DE, Levy PD, Rhoney DH, Varon J. A systematic review of nicardipine vs labetalol for the management of hypertensive crises. *Am J Emerg Med*. 2012 Jul;30(6):981-93.
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3. Baumann BM, Cline DM, Pimenta E. Treatment of hypertension in the emergency department. *J Am Soc Hypertens*. 2011 Sep-Oct;5(5):366-77.
4. Mayer SA, Kurtz P, Wyman A, Sung GY, Multz AS, Varon J, Granger CB, Kleinschmidt K, Lapointe M, Peacock WF, Katz JN, Gore JM, O'Neil B, Anderson FA; STAT Investigators. Clinical practices, complications, and mortality in neurological patients with acute severe hypertension: the Studying the Treatment of Acute Hypertension Registry. *Crit Care Med*. 2011 Oct;39(10):2330-6.
5. Jauch EC, Cucchiara B, Adeoye O, Meurer W, Brice J, Chan Y-F, Gentile N, Hazinski MF. Part 11: adult stroke: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2010;122(suppl 3):S818–S828.

5M – VENTRICULAR ASSIST DEVICE (VAD) MANAGEMENT ADULT

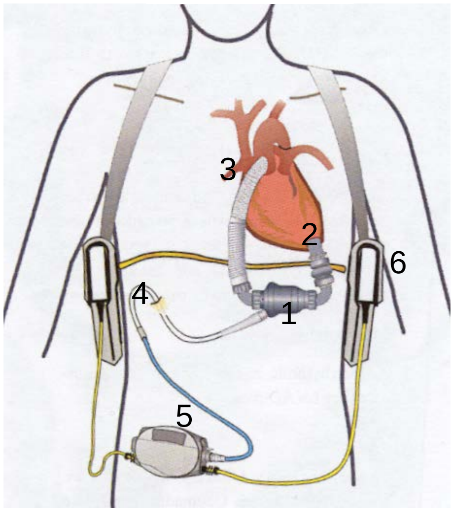
EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

A **Ventricular Assist Device**, or **VAD**, is a mechanical device used to support circulation in a patient with significant cardiac ventricular dysfunction. The VAD, most commonly, is used to support the left side of the heart and provide extra cardiac output to the body. This device is called an LVAD or left ventricular assist device. An LVAD can be placed for short term use to bridge patients until they can receive a heart transplant (bridge to transplant) or long term use for those patients that are not candidates for heart transplant (destination therapy). A destination therapy patient will live for months to years at home with the device in place. A VAD is not a total artificial heart (TAH), which completely supports circulation in a patient whose native heart has been removed.

VADs can assist either the right (RVAD) or left (LVAD) ventricle, or both at once (BiVAD). The choice of device depends on underlying heart disease and the function of the right side of the heart. The most common type of device used is an LVAD.

In Oklahoma the most common VAD in use is the HeartMate® II LVAD. The Heart Mate® II uses a continuous flow pumping action to produce forward circulation. Because of the continuous flow nature of the pump, a patient with a HeartMate II® may not have a palpable pulse even though they are alive. The lack of pulse can also make it difficult, or impossible to obtain a blood pressure.

HeartMate II®



1) *Implanted Pump*
2) *Inflow Cannula*
3) *Outflow Conduit*
4) *Percutaneous Cable*
5) *Controller*
6) *Wearable Battery*

5

6

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Hospital Resources in Oklahoma for Patients with a VAD and TAH:

Integris Baptist Medical Center in Oklahoma City is the only VAD/TAH surgical implant site in Oklahoma at the time of this protocol's release.

Upon arrival to the scene, contact a VAD coordinator for assistance with VAD/TAH related questions. An RN coordinator is available 24-hours a day.

24-hour Integris Baptist Medical Center VAD/TAH phone number: 405-713-7040

Cardiac Arrest Care in Patients with a VAD:

Follow same BLS and ACLS protocols (including defibrillation and cardioversion).

Perform chest compressions only after all other treatments have been applied.

Because of the assistance from the LVAD, patients may not be symptomatic with ventricular arrhythmias. Be sure to assess the patient first prior to intervention.

The LVAD does NOT interfere with the patient's heart rhythm. The native rhythm will appear on the monitor.

Non-Cardiac Arrest Care in Patients with a VAD:

Emergencies in a patient with a VAD can arise due to:

- Problems directly related to the VAD:
  - Power Failure
  - Suspected mechanical malfunctions characterized by frequent alarms emitting from the system controller, an increase or decrease in flow rates
- Focus on switching out the system controller. (see directions below)
- Illness/Injury not related to the VAD - treat per applicable protocol. (i.e. stroke, bleeding, etc.)

Power Failure of a VAD - EMS Assessment & Care:

- A patient experiencing a power failure with their VAD system will present with signs and symptoms of circulatory collapse (dyspnea, hypoxemia, hypotension, dysrhythmias, altered mental status).
- Focus on restoring power to the VAD by switching batteries in the battery pack, connecting to an AC power source, or switching out the system controller.

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

TROUBLESHOOTING: Heart Mate® II

When the Pump Has Stopped

- Check the connections between the controller and the pump and the power source and fix any loose connections.
- If the pump does not restart and the patient is connected to batteries replace the current batteries with a new, fully-charged pair.
- If pump does not restart, change controllers.

Changing Controllers:

1. **To insert the driveline, slide the safety tab back to unlock and expose the red button**

2. **Align the arrow on the controller to the arrow on the driveline cable until they connect, and firmly insert the driveline until it snaps into place**

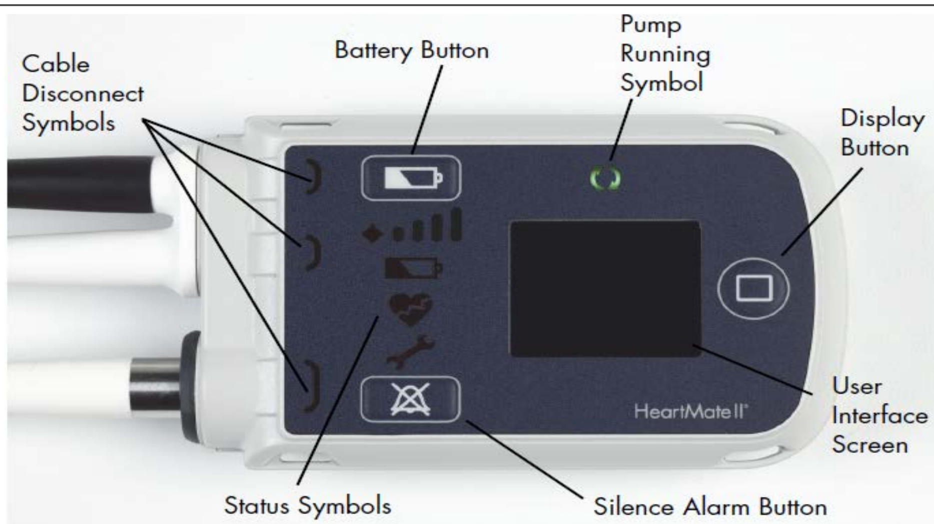
3. **Be sure to slide the safety tab back over the red button, locking the driveline in place.**

4. **Tug gently on the metal portion of the driveline to ensure it is fully engaged.**

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Alarms: Emergency Procedures

Low Battery Alarm 	The red low battery symbol illuminates when less than 5 minutes of battery power remain (applicable only during 14 Volt Lithium-Ion battery-powered operation). This is a **Hazard** alarm. When the red battery symbol illuminates, immediately replace the depleted batteries with a fully-charged pair, or switch to the Power Module.
Yellow Wrench Alarm 	The yellow wrench symbol illuminates when the System Controller detects a mechanical, electrical, or software issue with the system. This is an **Advisory** alarm. When the yellow wrench illuminates, check the screen for troubleshooting instructions.
Red Heart Alarm 	The red heart symbol illuminates when the System Controller detects a problem that could cause serious injury or death. This is a **Hazard** alarm. When the red heart illuminates, check the screen for instructions and take immediate action to resolve the problem.



PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

TROUBLESHOOTING: Heart Mate® II

Changing Batteries

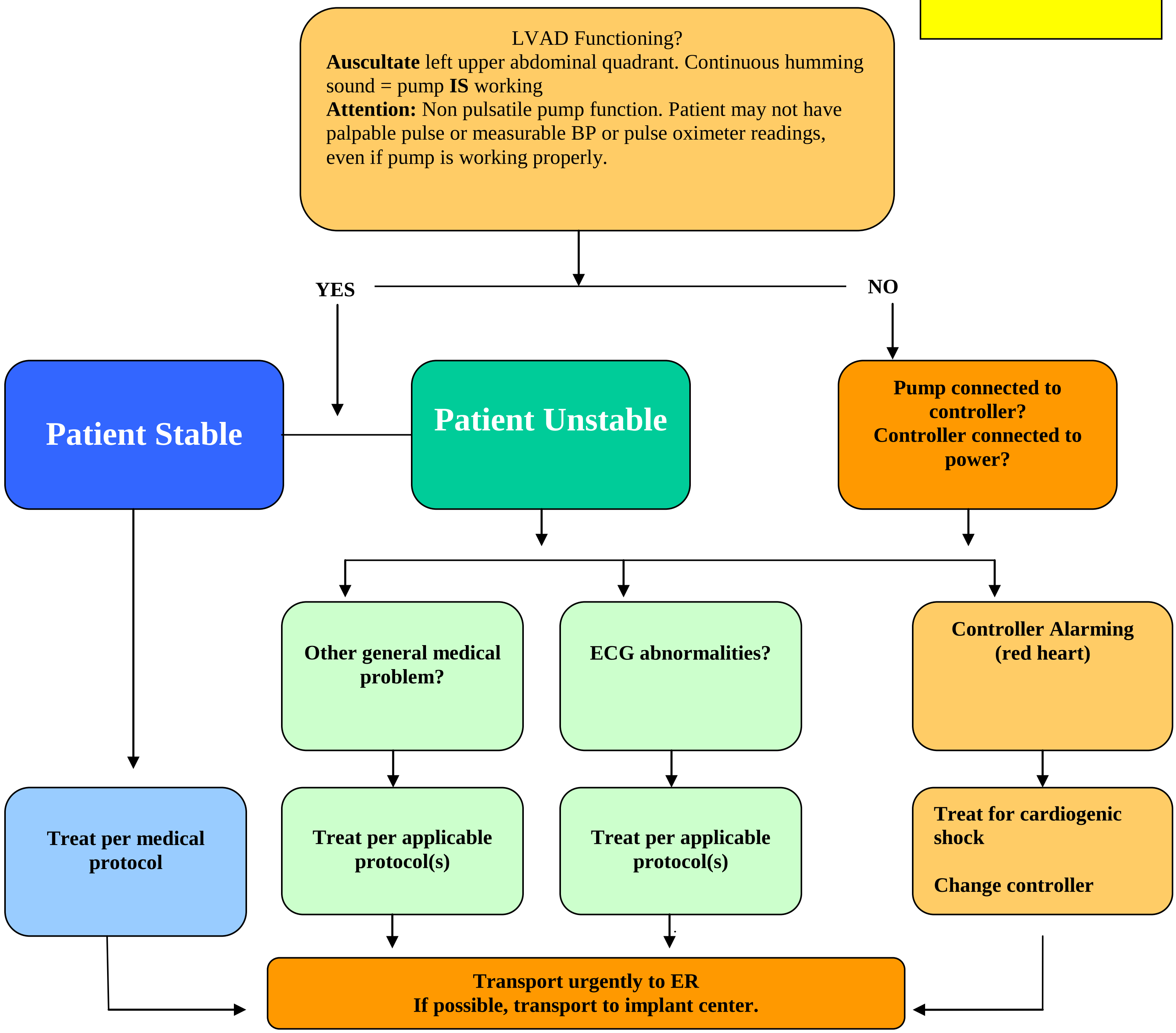
1. Warning: At least one power lead must be connected to a power source at all times.
2. **DO NOT remove** both batteries at the same time or the pump will stop.
3. Obtain two charged batteries from patient's black bag.
4. Check the charge of the battery by pressing the battery gauge button on the end and top of the battery. (Figure 1)
5. Remove **only one battery** from the clip by pressing the tab on the battery clip to release the battery.
6. Controller will start beeping and flashing green lights.
7. Replace with new fully charged battery by lining up the arrows on the battery and the clip and pressing until you hear a "click."
8. Repeat previous steps with the second battery and battery clip. Remove only one battery from the clip by pressing the tab on the battery clip to release the battery.


Figure 1


Figure 2

HeartMate II® LVAD Patient Assessment Protocol

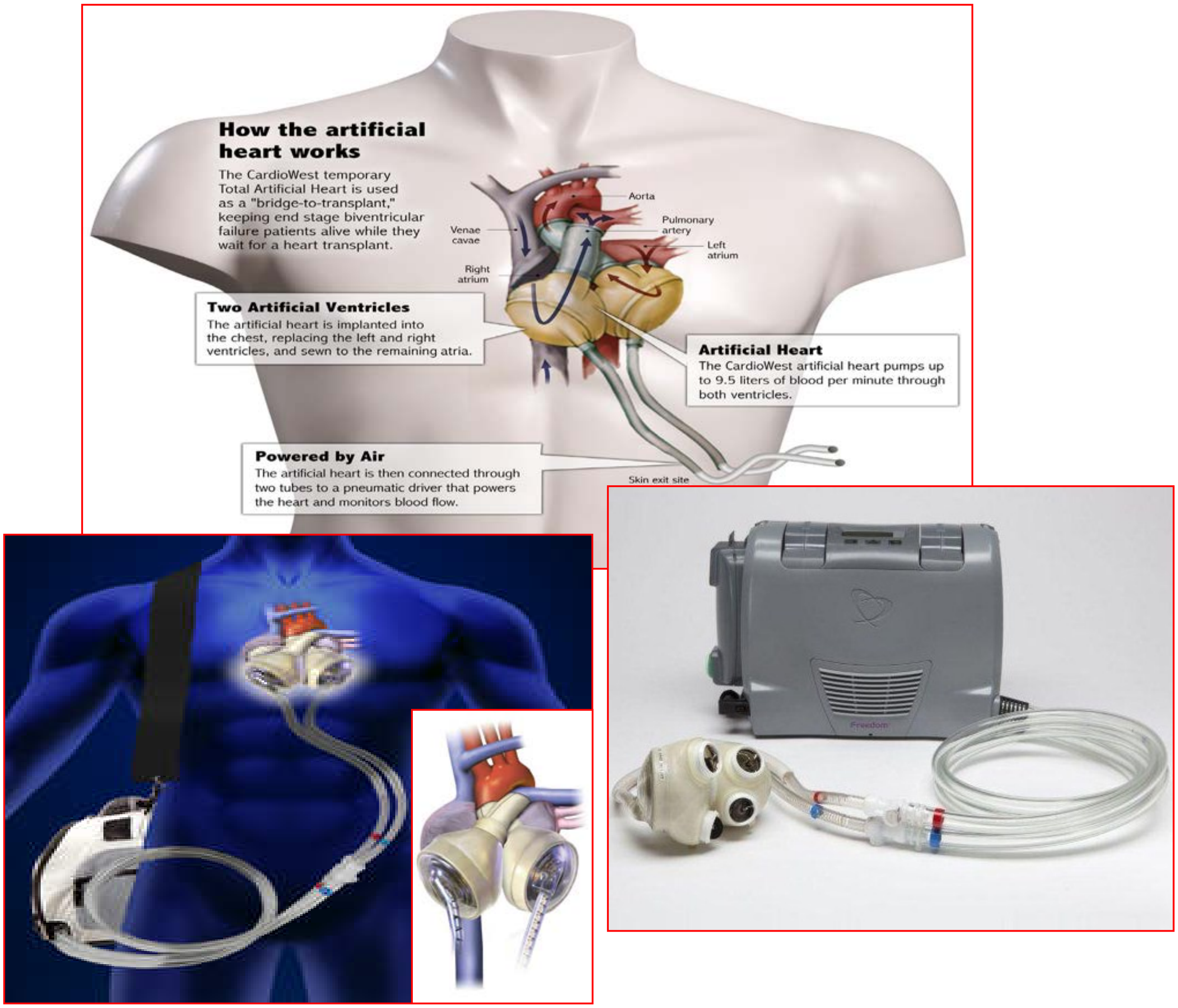
Always call
405-713-7040
for an LVAD Coordinator.
Press Option #1



PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Total Artificial Heart

Overview:



Basic Operations

1. Pump is connected to 2 drivelines (air lines) that are attached to the driver, which runs the pump
2. Do not kink the drivelines.
3. The electrical conduction system of the heart has been removed so a heart rhythm cannot be viewed on the ECG.
4. Batteries last approximately 2 hours for a set.
5. Plug the driver into an outlet as often as possible for power.

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Total Artificial Heart

When the Pump Has Stopped:
Immediately switch to the back-up driver.

Changing to the Back-Up Driver

1. With the Wire Cutter Tool, cut the Wire Tie under the metal release button of the CPC Connector that secures the **red** TAH Cannula to the **red** Freedom Driveline. DO NOT DISCONNECT THE CANNULA FROM THE DRIVELINE 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 Cannula to the **blue** Freedom Driveline. DO NOT DISCONNECT THE CANNULA FROM THE DRIVELINE YET.

CAUTION: Before disconnecting the Drivelines of the primary Freedom Driver, you must have the Drivelines of the backup Freedom Driver within reach. The backup Driver must be turned on by inserting 2 batteries. Perform steps 3 and 4 simultaneously.

3. Disconnect the **red** Cannula from the **red** Driveline of the primary Freedom Driver.
4. Press and hold down the metal release button. (Fig. 11)
5. Pull the **red** Cannula away from the **red** Driveline (Figure 12). **Immediately** insert the **red** Cannula into the new **red** Driveline from the backup Freedom Driver until you hear a click.
6. **Simultaneously** disconnect the **blue** Cannula from the **blue** Driveline of the primary Freedom Driver.
7. Press and hold down the metal release button.
8. Pull the **blue** Cannula away from the **blue** Driveline.
9. **Immediately** insert the **blue** Cannula into the new **blue** Driveline from the back-up Freedom Driver until you hear a click.


Figure 11


Figure 12

PROTOCOL 5M: Ventricular Assist Device (VAD) Management – Adult, cont.

Total Artificial Heart

Treatment Considerations:

1. External chest compressions cannot be performed on a patient with a Total Artificial Heart. Changing to the back-up driver is essential to maintaining circulation. There's no "hand-pump" to operate the Total Artificial Heart manually.

2. If the pump stops, a red fault alarm along with a continuous audio tone will sound.

3. All device settings are preset and cannot be changed in the field.

4. Since the electrical conduction system of the heart has been removed the underlying ECG rhythm will show asystole. The patient with a Total Artificial Heart should not be defibrillated.

5. If the driver pump is connected and functioning properly, the patient will have a pulse.

6. A measurable blood pressure is obtainable using a manual or automated blood pressure device.

7. Use alternative ways to assess the adequacy of perfusion such as pale vs. pink, dry vs. diaphoretic, and alert vs. confused.

8. Incorporate device into assessment.

9. General Supportive Care and initiate treatment per applicable protocol.

10. Listen just below the heart to hear if the device is running and assess for a palpable pulse.

11. If there is no palpable pulse detected, consider the following:
    - The device is not running: Troubleshoot the device and treat per protocol.
    - The device is running, but the patient is still unconscious or unstable:
        - Neurological evaluation: Possible Stroke
        - Expose the patient:
            - Be cautious with trauma shears; don't cut a driveline or cable exiting the patient's body that might be hidden under an article of clothing;
            - Assess the dressings over the driveline exit site (found in the abdominal area) for signs of infection.

Medical Literature References
5M – Ventricular Assist Device Management – Adult

1. The Emergency Management of Ventricular Assist Devices. Robertson J, Long B, Koyman A. Am J Emerg Med. 2016 Jul; 34(7):1294-301
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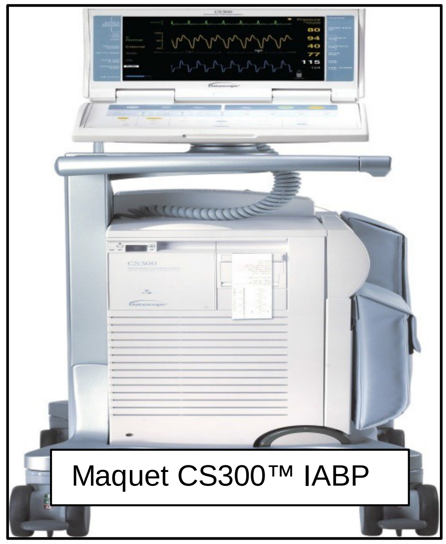
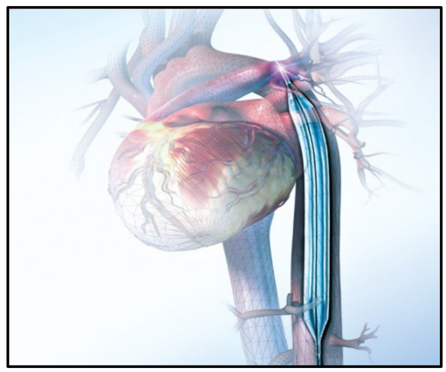
5N – INTRA-AORTIC BALLOON PUMP (IABP) MONITORING - ADULT

PARAMEDIC



Maquet CS300™ IABP



Introduction:

Transfer of patients between hospitals is and will be an increasing demand due to an aging society and the increasing invasiveness of recommended therapies. Intra-aortic balloon pumps are used in mechanical circulatory support. The reduction in size and weight of the respective devices now allows an increasing number of interfacility transfers with continuing mechanical circulation support.

Indications for Intra-Aortic Balloon Pump (IABP):

IABP counter-pulsation support is a recommended option for patients with cardiac failure, mainly due to coronary artery disease or congestive heart failure. Early IABP support is used to accompany acute percutaneous coronary intervention (PCI) or cardiac surgery. In addition, IABP support may function as a bridge prior to invasive procedures if these specialties are unavailable at the initial hospital of admission. If in such a situation inter-hospital transfer is mandatory, IABP support must be maintained in clinical settings that may include refractory unstable angina, impending or acute myocardial infarction, ventricular failure, acute valvular disease, and cardiogenic shock.

Objective of the Transport Team:

1. Provide skilled personnel and the equipment to deliver specialized care needed to stabilize, maintain, and transport critically ill patients with IABP support.

   NOTE: Paramedic may provide, or assist in providing mechanical circulatory support during interfacility transport only if they have completed special additional training in the use of IABP including appropriate continuing education and are properly credentialed by the appropriate local medical oversight physician(s) to operate or assist with IABP.

Protocol 5N: Intra – Aortic Balloon Pump Monitoring (IABP) – Adult, cont.

Before transport of the patient:

1. Together with physician, nurse, or cardiovascular technical staff (as appropriate), ensure that intra-aortic balloon catheter is properly secured, check intra-aortic balloon insertion site for bleeding or drainage, confirm adequacy of distal pulses and perfusion, and record pre-transport intra-aortic balloon pump settings.
   - **NOTE**: IT MAY BE NECESSARY TO USE A DOPPLER STETHOSCOPE TO CONFIRM PULSATILE FLOW IF CARDIOGENIC SHOCK IS SEVERE.
2. Measure and record augmented systolic, mean, and diastolic blood pressure in addition to standard vital signs.
3. If the transport is not accompanied by a physician or nurse, obtain written order for intra-aortic balloon pump settings to be used enroute.
   - **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 ON-LINE MEDICAL CONTROL FOR FURTHER INSTRUCTIONS.
4. Ensure that the intra-aortic balloon pump being used is properly functioning, that an acceptable ECG trigger is present, and that all settings are correct.

During transport of the patient:

1. Continuously monitor augmented systolic, mean, and diastolic blood pressure in addition to standard vital signs.
2. In the event of mechanical failure, and the patient remains stable, attempt to identify and correct the problem.
3. In the event of a clinical emergency, and a physician, nurse practitioner, or physician surrogate IS present, assist with intra-aortic balloon pump management on request, and contact on-line medical control (or duly authorized agent) as soon as possible (without compromising patient safety).
4. In the event of a clinical emergency, and a physician, nurse practitioner, or physician surrogate is **NOT** present, proceed with cardiopulmonary resuscitation as indicated, and contact on-line medical control as soon as possible (without compromising patient safety).
   - **NOTE**: CARDIOPULMONARY RESUSCITATION AND DEFIBRILLATION MAY BE PERFORMED WHILE THE INTRA-AORTIC BALLOON PUMP IS FUNCTIONING.

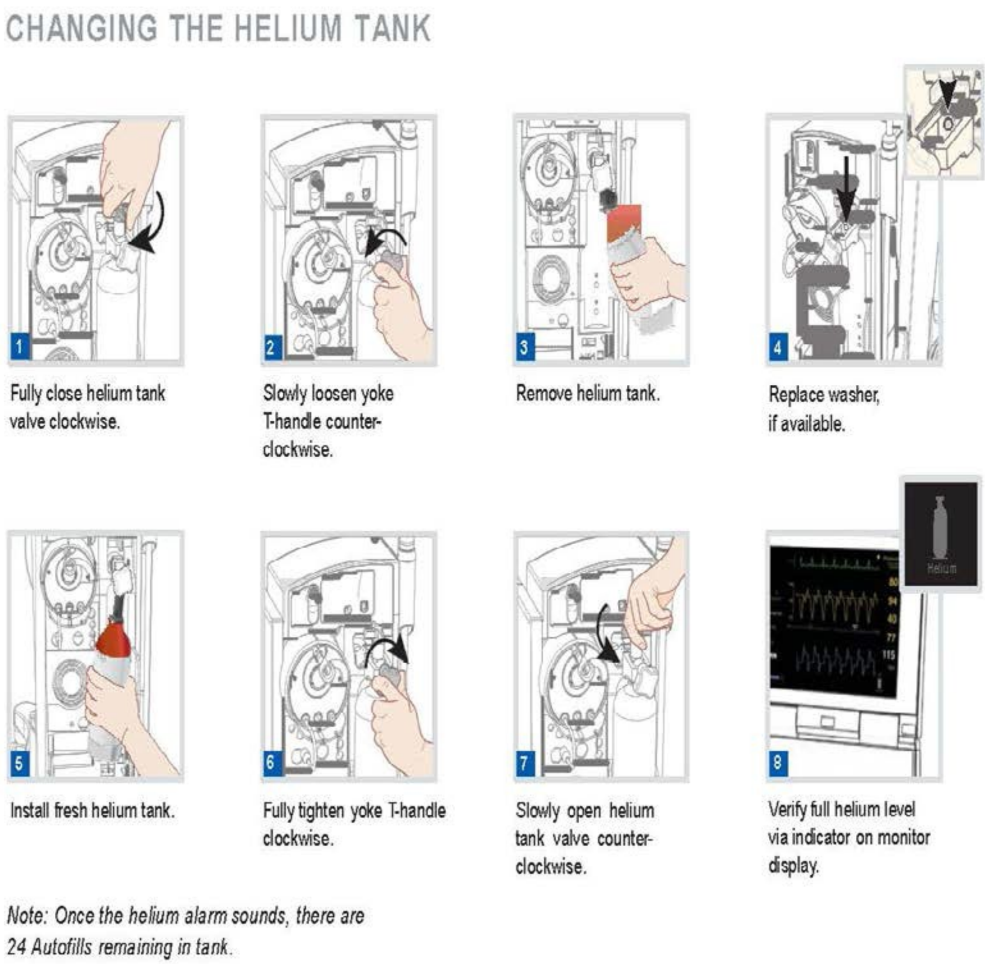
After transport of the patient:

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, as well as any changes in patient condition, modifications in intra-aortic balloon pump settings, and unusual incidents occurring enroute.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

Protocol 5N: Intra – Aortic Balloon Pump Monitoring (IABP) – Adult, cont.

Troubleshooting the Maquet CS300™ IABP – (see protocol Special Note):



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Protocol 5N: Intra – Aortic Balloon Pump Monitoring (IABP) – Adult, cont.

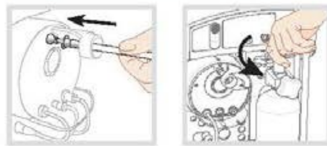
Troubleshooting the Maquet CS 300™ IABP, cont:

ALARMS

Augmentation Below Limit Set

Probable Cause	Corrective Action
Hemodynamic status has changed: ↑HR, ↓SV, ↓MAP.	Treat patient, adjust alarm limit as appropriate.
Alarm limit set too high.	Press AUG. ALARM key, change limit.

Autofill Failure



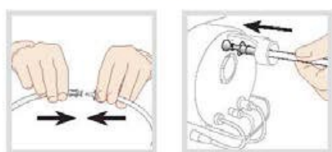
Probable Cause	Corrective Action
IAB disconnected.	Attach IAB catheter.
Helium tank is closed.	Open helium tank.
Helium tank is empty.	Change helium tank.
Incorrect IAB catheter extender tubing length.	Ensure only one IAB catheter extender tubing is connected from IAB to pump.

ALARMS

Check IAB Catheter

Probable Cause	Corrective Action
Kink in IAB catheter or tubing.	Relieve kink if possible, press START.
Membrane has not completely unfolded.	Manually inflate and deflate IAB.
IAB remains in sheath.	Check the markings of the IAB and withdraw sheath if indicated.

IAB Disconnected



Probable Cause	Corrective Action
IAB catheter or extender tubing is disconnected.	Reattach IAB, press START.

Protocol 5N: Intra – Aortic Balloon Pump Monitoring (IABP) – Adult, cont.

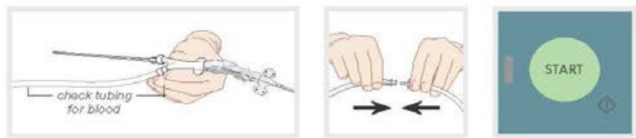
Troubleshooting the Maquet CS300™ IABP, cont:

ALARMS

Prolonged Time in Standby

Probable Cause	Corrective Action
IABP has been in STANDBY mode for an extended period of time.	Verify whether it is appropriate to resume pumping.

Rapid Gas Loss or Leak in IAB Circuit



Probable Cause	Corrective Action
Gas loss has been detected in IAB circuit.	If blood observed - STOP pumping. Prepare for removal of IAB. If blood is not observed, verify connections are leak-free. With Rapid Gas Loss, resume pumping by pressing START key. With Leak in IAB Circuit, press IAB FILL key for 2 seconds to initiate an AUTOFILL, then resume pumping by pressing START key.

ALARMS

Unable to Calibrate IAB Optical Sensor

Probable Cause	Corrective Action
Patient's pulse pressure is inadequate for calibration.	When patient's pulse pressure improves, press ZERO PRESSURE key for 2 seconds while the IABP is assisting. Provide alternate A.P. source (i.e.: radial).
Extender tubing or balloon catheter may be restricted.	Relieve restriction. Attempt calibration by pressing ZERO PRESSURE key for 2 seconds while IABP is assisting.
IAB FILL mode is set to MANUAL.	If appropriate, set IAB FILL mode to AUTO via PUMP OPTIONS menu.

IAB Optical Sensor Calibration Expired

Probable Cause	Corrective Action
A calibration update has been intentionally post-poned because either patient's mean arterial pressure may be too low to pause assist or less than 15 minutes have elapsed since last calibration.	Assess patient to determine if a brief pause in assist would be toler-ated, and if so, press ZERO PRESSURE key for 2 seconds while IABP is assisting. Provide alternate A.P. source (i.e.: radial).
Pump is either in STANDBY or the IAB FILL mode is set to MANUAL.	Verify that IAB FILL mode is set to AUTO. Resume pumping, then press ZERO PRESSURE key for 2 seconds to initiate a calibration.

Protocol 5N: Intra – Aortic Balloon Pump Monitoring (IABP) – Adult, cont.

Troubleshooting the Maquet CS300™ IABP, cont:

ALARMS

A.P. Optical Sensing Module Failure

Probable Cause	Corrective Action
There has been a failure of the A.P. Optical Sensing Module in the pump console.	Replace CS300, if available. If replacement pump not available, an alternate A.P source (i.e.: radial) must be provided. Contact MAQUET Service for optical module repair.

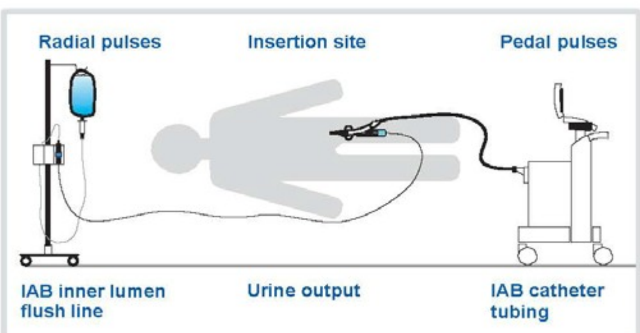
IAB Optical Sensor Failure

Probable Cause	Corrective Action
There has been a failure of the Optical Sensor in the IAB.	Unplug Sensor Connector and reconnect. If problem persists, provide alternate A.P. source (i.e.: radial).

Unable to Update Timing

Probable Cause	Corrective Action
Poor waveform quality.	Check cable connections. Verify transducer was not left vented, if in use. If transducer is in use, aspirate and flush fluid circuit. If problem persists, switch operation mode to SEMI AUTO, verify TRIGGER SOURCE, adjust timing, resume pumping.
Sustained heart rate is less than 30 BPM or greater than 150 BPM.	Switch to SEMI AUTO, verify TRIGGER SOURCE, adjust timing.
Poor diastolic augmentation.	If diastolic augmentation is poor, when AUGMENTATION level is set to MAX, attempt to improve patient's hemodynamic status.

PATIENT ASSESSMENT



Assessment	Corrective Action
Radial pulses Left radial pulse weak or left arm ischemia.	Check position of IAB.
Insertion site Excessive bleeding from insertion site.	Apply pressure, ensure distal flow.
Pedal pulses Limb ischemia detected.	Consider removing IAB, consider insertion via opposite limb.
IAB inner lumen flush line Pressure waveform damped (If using a conventional IAB).	Aspirate inner lumen. If line patent, flush for 15 seconds (with IABP on Standby).
Urine output Urine output low.	Check position of IAB.
IAB catheter tubing Blood observed in catheter tubing.	STOP pumping and prepare for IAB removal.

Medical Literature References
5N – Intra-Aortic Balloon Pump (IABP) Monitoring – Adult

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5O-ZOLL LIFEVEST WEARABLE DEFIBRILLATOR

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

The following will help guide you through your assessment and care of the Zoll LifeVest.

1. The LifeVest wearable cardioverter defibrillator is worn by patients at risk for sudden cardiac arrest, providing protection during their changing condition and while permanent sudden cardiac arrest risk has not been established.
2. Before delivering a treatment shock, the LifeVest tests to see if a patient is conscious by providing the patient an opportunity to press the response buttons to prevent a treatment shock. It is important that only the patient press the response button.
3. The LifeVest therapy pads release a Blue gel prior to a treatment shock to both improve shock conduction and mitigate burning. The gel should remain on the patient as long as the patient is wearing the LifeVest in case additional treatment shocks are required. If you choose to remove the LifeVest from the patient and monitor the patient with external equipment, the gel can be removed with water.
4. After the LifeVest detects a treatable arrhythmia, the time to treatment will be between 25 and 60 seconds depending on the type and rate of the arrhythmia and whether the patient presses the response buttons.
5. No one should touch the patient while a shock is delivered. The LifeVest will warn bystanders with a tactile vibration alarm, a two tone siren alert and a voice command stating “electrical shock possible, do not touch patient,” or “bystanders do not interfere” before a shock is delivered.
6. The monitor should be disconnected from the electrode belt prior to delivering an external defibrillation. The garment and belt do not need to be removed.
7. Never do CPR with the LifeVest turned on. Pull the battery out of the monitor to turn the device off. The garment can be opened from the front if CPR needs to be performed.
8. The tactile vibration alert, the two tone alarm, the voice prompts, and the display on the monitor screen are part of the LifeVest consciousness test, which requires the patient to press the response buttons to avoid a shock. It is important that only the patient press the response buttons.
9. Look at the monitor display if the LifeVest is giving gong alerts. Follow the prompts on the monitor screen. No treatment will be given for gong alerts.

Protocol 5O: Zoll Lifevest Wearable Defibrillator – Cont.

10. The patient should always bring the LifeVest system, the wireless modem / battery charger, and the extra external battery to the hospital. This will allow the patient to download any stored event data from the monitor and change the battery as required.
11. If the LifeVest needs to be turned off, remove the battery from the end of the black monitor. Removing the battery will shut the system off. To turn the system back on, put the battery back in and press the response button to activate device.
12. It is best to leave a patient in their LifeVest if at all possible. Do not remove the LifeVest unless absolutely necessary.
13. This device is a patient belonging and should be treated as a patient valuable. It is a rented durable medical equipment item that must be returned to Zoll and the patient is held liable for missing components. Please keep components in a personal belonging bag and make sure the equipment is kept with the patient or a family member.

Contact Zoll LifeVest to report where the patient was transported and if the patient had alarms or was defibrillated.

1-800-543-3267

Protocol 5O: Zoll Lifevest Wearable Defibrillator – Cont.

Photo 1:

(Boxed in red) is the monitor worn in a holster around the waist and collects ECG data from the sensing electrodes which can later be sent to a doctor via modem.

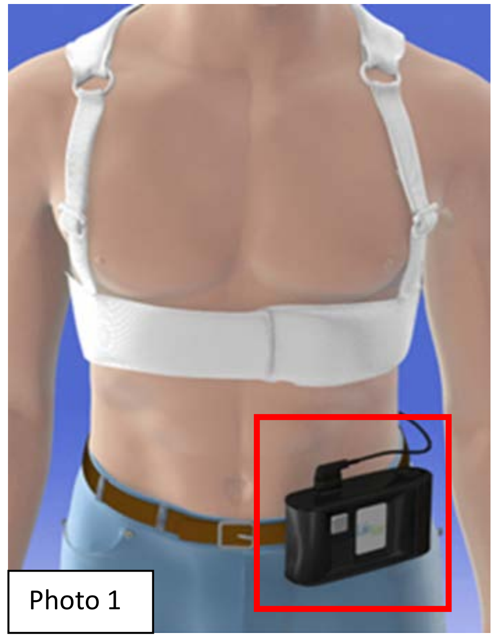

Photo 1

Photo 2:

(Circled in red) Dry, non-adhesive sensing electrodes on this electrode belt continuously monitor patient's heart.

(Boxed in green) These dry therapeutic electrodes will automatically deploy conductive gel prior to delivering a shock.

Photo 2

Approved 1/16/19, Effective 4/1/19, replaces all prior versions

6A - STROKE
ADULT & PEDIATRIC

TREATMENT PRIORITIES

3 in 5 minutes of patient contact:
1. Vital signs
2. O_2 ONLY if indicated
3. Los Angeles Prehospital Stroke Screen

Early transport & ED notification if symptoms <23 hours

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
CONDUCT STROKE SCREENING QUERY IF AUTHORIZED BY LOCAL MEDICAL DISPATCH PROTOCOL.

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM ONLY IF DYSPNEA OR PULSE OX <94% AT ROOM AIR

LOS ANGELES PREHOSPITAL STROKE SCREEN
AGE OVER 45 YEARS?
NO PRIOR HX OF SEIZURE DISORDER?
NEW ONSET OF NEUROLOGIC SYMPTOMS IN LAST 24 HRS?
PATIENT AMBULATORY AT BASELINE [PRIOR TO EVENT]?
BLOOD GLUCOSE 50 TO 400 mg/dL?
FACIAL DROOP; ARM DRIFT; IMPAIRED SPEECH?

EARLY “STROKE ALERT” NOTIFICATION TO RECEIVING EMERGENCY DEPARTMENT WITH DEFINITIVE STROKE SYMPTOMS IF LESS THAN 23 HOURS DURATION
ADVISE TIME OF LAST ACCURATELY KNOWN BASELINE NEUROLOGICAL STATUS (LAST “NORMAL” FOR PT)
OBTAIN CELLPHONE NUMBER(S) OF FAMILY MEMBER(S) TO PROVIDE ED STAFF UPON ARRIVAL

APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS ARE INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED

EVALUATE FOR OTHER ALTERED MENTAL STATUS ETIOLOGIES. TREAT PER APPROPRIATE PROTOCOL(S)
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
6A – Stroke – Adult & Pediatric

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6B - ALTERED MENTAL STATUS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. O_2
3. Dextrose for hypoglycemia
4. Benzodiazepine for sustained, active seizure (refer to 6D Seizure if applicable)

Evaluate differential diagnosis of AMS & treat per protocol(s):

- Hypoxemia (Shock)
- Head Injury
- Stroke
- Seizure
- Infection (Sepsis/ Meningitis)
- Medication/Alcohol
- Heat or Cold Illness

EMD

KEEP PATIENT FREE FROM INJURY HAZARDS
AVOID PLACING ANYTHING IN MOUTH
PLACE IN RECOVERY POSITION POST SEIZURE

EMR | EMT

GENERAL SUPPORTIVE CARE & OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE

TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE
APNEIC/AGONALLY BREATHING
ADULT: NALOXONE 2 mg IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
INEFFECTIVE BREATHING ACTIVITY
ADULT & PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING;
AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

DETERMINE BLOOD GLUCOSE
FOR PATIENT ABLE TO SWALLOW
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO
PEDIATRIC WEIGHT <2 5kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, ½ tube ORAL GLUCOSE (7.5 grams) PO

APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END–TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY
(if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED &
ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 250 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 125 mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED
ADULT & PEDIATRIC: REPEAT DETERMINATION OF BLOOD GLUCOSE POST-DEXTROSE TREATMENT

ADULT: INTUBATE IF INDICATED; DO NOT INTUBATE PATIENTS WITH RAPIDLY REVERSIBLE ETIOLOGY (eg. HYPOGLYCEMIA, OPIATES)

ADVANCED EMT OR HIGHER LICENSE:
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC/AGONALLY BREATHING
ADULT: NALOXONE 2 mg IVP/IOP/IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – INEFFECTIVE BREATHING ACTIVITY
ADULT & PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT OF SUSPECTED AMS ETIOLOGY PER APPLICABLE PROTOCOL(S)
CONSULT OLMC IF ABOVE TREATMENT INEFFECTIVE FOR HYPOGLYCEMIA OR NARCOTIC/OPIATE ETIOLOGY
CONSULT OLMC IF UNCERTAIN OF ETIOLOGY AND TREATMENT PLAN OF AMS

Medical Literature References
6B – Altered Mental Status – Adult & Pediatric

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6C – GLUCOMETRY (BLOOD GLUCOSE DETERMINATION) ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Suspected stroke (as part of Los Angeles Prehospital Stroke Screen)
2. Altered mental status – unclear etiology
3. Seizure
4. Known or suspected diabetes

Contraindications: None

Technique:

1. Calibrate the meter per manufacturer instructions.

2. Use only manufacturer approved test strips.
   a. Run a control test every time a new box of test strips is used.
   b. Store unused test strips in original container and do not use **EXPIRED** test strips.
   c. Do not apply blood to the test strip before inserting the test strip into the meter. If the meter displays a result before applying blood **DO NOT** use that result.
   d. Do not reuse test strips. Once blood is applied to test strip discard it.
   e. If another glucometry reading is required, use a new test strip.
   f. Do not expose strips to heat outside the recommended range, moisture or humidity.

Determining Blood Glucose:

1. Using universal precautions, power on the meter.
2. Insert a test strip into the meter per manufacturer instructions.
3. Position hand palm-side up; choose whichever finger is least calloused.
4. Apply intermittent pressure to the finger to help the blood to flow.
5. Clean the fingertip with alcohol. Start in the middle and work outward to prevent contaminating the area. Allow area to dry.
6. Hold the finger and firmly place a new, sterile lancet **off-center** on the fingertip and firmly press the lancet to puncture the fingertip.
7. Wipe away the first drop of blood with a sterile gauze pad, then apply blood to test strip.
8. Properly dispose of all contaminated supplies.

Medical Literature References
6C – Glucometry (Blood Glucose Determination) – Adult & Pediatric

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6D - SEIZURE ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. O_2
3. Dextrose for hypoglycemia
4. Benzodiazepine for sustained, active seizure

EMD

KEEP PATIENT FREE FROM INJURY HAZARDS
AVOID PLACING ANYTHING IN MOUTH
PLACE IN RECOVERY POSITION POST SEIZURE

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:

MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

DETERMINE BLOOD GLUCOSE
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50 mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED

PARAMEDIC

EVALUATE FOR OTHER ALTERED MENTAL STATUS ETIOLOGIES. TREAT PER APPROPRIATE PROTOCOL(S)

ADULT: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
ADULT: DIAZEPAM 5 mg IVP/IOP or 10 mg IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE.
MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING. **OR**
ADULT: LORAZEPAM 2 mg IVP/IOP/IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE.
MAY REPEAT X 1 IN 10 MINS IF STILL SEIZING.

PEDIATRIC: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP/IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE.
MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING. **OR**
PEDIATRIC: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IOP/IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE
MAY REPEAT X 1 IN 10 MINS IF STILL SEIZING.

OLMC CONSULT IF SEIZURE CONTINUES DESPITE ABOVE TREATMENT

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
6D – Seizure – Adult & Pediatric

1. Clemency BM, Ott JA, Tanski CT, Bart JA, Lindstrom HA. Parenteral midazolam is superior to diazepam for treatment of prehospital seizures. *Prehosp Emerg Care*. 2015 Apr-Jun;19(2):218-23.
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4. Shearer P, Riviello J. Generalized convulsive status epilepticus in adults and children: treatment guidelines and protocols. *Emerg Med Clin North Am*. 2011 Feb;29(1):51-64.
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6E - SYNCOPE
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. O_2
3. Dextrose for hypoglycemia
4. Benzodiazepine for sustained, active seizure (refer to 6D Seizure if applicable)

Evaluate differential diagnosis of Syncope & treat per protocol(s):
- Acute Coronary Syndrome
- Cardiac Dysrhythmia
- Hypotension (Shock)
- Hypoxemia (Shock)
- Head Injury
- Stroke
- Seizure
- Infection (Sepsis/ Meningitis)
- Medication/Alcohol
- Heat or Cold Illness
- Psychogenic/Emotion

EMD

KEEP PATIENT FREE FROM INJURY HAZARDS
AVOID PLACING ANYTHING IN MOUTH
ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES)
PLACE IN RECOVERY POSITION/POSITION OF COMFORT

EMR | EMT

GENERAL SUPPORTIVE CARE; OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
DETERMINE BLOOD GLUCOSE
FOR PATIENT ABLE TO SWALLOW
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, ½ tube ORAL GLUCOSE (7.5 grams) PO

TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE
APNEIC/AGONALLY BREATHING
ADULT: NALOXONE 2 mg IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
INEFFECTIVE BREATHING ACTIVITY
ADULT & PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING;
AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
EMT OR HIGHER LICENSE:
MEASURE END–TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY
(if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED &
ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 250 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50 mL **OR** D10 25 grams in 250 mL of NS IVPB WIDE OPEN UP TO 125 mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED
ADULT & PEDIATRIC: REPEAT DETERMINATION OF BLOOD GLUCOSE POST-DEXTROSE TREATMENT

ADULT: INTUBATE IF INDICATED; DO NOT INTUBATE PATIENTS WITH RAPIDLY REVERSIBLE AMS ETIOLOGY (eg. HYPOGLYCEMIA, OPIATES)
ADVANCED EMT OR HIGHER LICENSE:
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC/AGONALLY BREATHING
ADULT: NALOXONE 2 mg IVP/IOP/IN MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – INEFFECTIVE BREATHING ACTIVITY
ADULT & PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

PARAMEDIC

ADULT: MEDICATION-ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT OF SUSPECTED AMS ETIOLOGY PER APPLICABLE PROTOCOL(S)
CONSULT OLMC IF ABOVE TREATMENT INEFFECTIVE FOR HYPOGLYCEMIA OR NARCOTIC/OPIATE ETIOLOGY
CONSULT OLMC IF UNCERTAIN OF ETIOLOGY AND TREATMENT PLAN OF AMS

Medical Literature References
6E – Syncope – Adult & Pediatric

1. Weber JM, Tataris KL, Hoffman JD, Aks SE, Mycyk MB. Can nebulized naloxone be used safely and effectively by emergency medical services for suspected opioid overdose? *Prehosp Emerg Care*. 2012 Apr-Jun;16(2):289-92.
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4. Grossman SA, Babineau M, Burke L, Kancharla A, Mottley L, Nencioni A, Shapiro NI. Do outcomes of near syncope parallel syncope? *Am J Emerg Med*. 2012 Jan;30(1):203-6.
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6. Shearer P, Riviello J. Generalized convulsive status epilepticus in adults and children: treatment guidelines and protocols. *Emerg Med Clin North Am*. 2011 Feb;29(1):51-64.
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9. Barton ED, Colwell CB, Wolfe T, Fosnocht D, Gravitz C, Bryan T, Dunn W, Benson J, Bailey J. Efficacy of intranasal naloxone as a needleless alternative for treatment of opioid overdose in the prehospital setting. *J Emerg Med*. 2005 Oct;29(3):265-71.
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11. Brieger D, Eagle KA, Goodman SG, Steg PG, Budaj A, White K, Montalescot G; GRACE Investigators. Acute coronary syndromes without chest pain, an underdiagnosed and undertreated high-risk group: insights from the Global Registry of Acute Coronary Events. *Chest*. 2004 Aug;126(2):461-9.
12. Seger DL. Flumazenil--treatment or toxin. *J Toxicol Clin Toxicol*. 2004;42(2):209-16.
13. Bledsoe BE. No more coma cocktails. Using science to dispel myths & improve patient care. *JEMS*. 2002 Nov;27(11):54-60.
14. Hoffman RS, Goldfrank LR. The poisoned patient with altered consciousness. Controversies in the use of a 'coma cocktail'. *JAMA*. 1995 Aug 16;274(7):562-9.
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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

6F – DYSTONIC REACTIONS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. O_2
3. Dextrose for hypoglycemia
4. Benzodiazepine for sustained, active seizure (refer to 6D Seizure if applicable)

Evaluate differential diagnosis of AMS & treat per protocol(s):

- Hypoxemia (Shock)
- Head Injury
- Stroke
- Seizure
- Infection (Sepsis/ Meningitis)
- Medication/Alcohol
- Heat or Cold Illness

EMD

KEEP PATIENT FREE FROM INJURY HAZARDS
AVOID PLACING ANYTHING IN MOUTH

EMR / EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, AS APPROPRIATE

DETERMINE BLOOD GLUCOSE
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, ½ tube ORAL GLUCOSE (7.5 grams) PO

EMT OR HIGHER LICENSE:
MEASURE END–TIDAL CO_2 & MONITOR CAPNOGRAPH (if equipped)

EMT-I85 / AEMT

IV ACCESS

ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50 mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED
ADULT & PEDIATRIC: REPEAT DETERMINATION OF BLOOD GLUCOSE POST-DEXTROSE TREATMENT

PARAMEDIC

ADULT: DIPHENHYDRAMINE 50 mg IM/IVP
PEDIATRIC: DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg

IF NO IMPROVEMENT 15 MINUTES AFTER DIPHENHYDRAMINE ADMINISTRATION & MARKED MUSCLE SPASM/TONE:

ADULT: MIDAZOLAM 2.5 mg IVP/IM/IN **OR**
ADULT: DIAZEPAM 5 mg IVP **OR**
ADULT: LORAZEPAM 2 mg IVP/IM.

PEDIATRIC: MIDAZOLAM 0.1 mg/kg IM/IVP/IN TO MAX OF 2,5 mg **OR**
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IM **OR**
PEDIATRIC: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IM

CONTINUOUS ASSESSMENT & TREATMENT OF SUSPECTED ETIOLOGY PER APPLICABLE PROTOCOL(S)
CONSULT OLMC IF ABOVE TREATMENT INEFFECTIVE

Medical Literature References
6F – Dystonic Reactions – Adult & Pediatric

1. Derinoz O, Caglar AA. Drug-induced movement disorders in children at pediatric emergency department: 'dystonia'. *Emerg Med J*. 2013 Feb;30(2):130-3.
2. Jacobsen RC. Out-of-hospital lingual dystonia resulting in airway obstruction. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):537-40.
3. Clark GT, Ram S. Four oral motor disorders: bruxism, dystonia, dyskinesia and drug-induced dystonic extrapyramidal reactions. *Dent Clin North Am*. 2007 Jan;51(1):225-43, viii-ix.
4. Rodnitzky RL. Drug-induced movement disorders in children and adolescents. *Expert Opin Drug Saf*. 2005 Jan;4(1):91-102.
5. Barach E, Dubin LM, Tomlanovich MC, Kottamasu S. Dystonia presenting as upper airway obstruction. *J Emerg Med*. 1989 May-Jun;7(3):237-40.

7A - BEHAVIORAL DISORDERS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Assess scene safety
2. Safety of self
3. Safety of public safety professionals
4. Safety of patient
5. Observe for uncontrolled agitation, combativeness, AMS impeding necessary medical care or pulling at necessary medical interventions (IV lines, endotracheal tubes)
6. Employ alternative methods to avoid physically restraining the patient
7. Restrain patient if alternatives fail and/or it is necessary to maintain necessary medical intervention or to carry out treatment protocols
8. Treat excited delirium

EMD

KEEP VIOLENT OR SUICIDAL PATIENT ON THE LINE.
IN VOLATILE/CRIMINAL SITUATIONS, FOLLOW APPLICABLE LAW ENFORCEMENT PROTOCOL.
FOR JUMPERS, NOTIFY LAW AND FIRE/RESCUE RESOURCES.

EMR | EMT

GENERAL SUPPORTIVE CARE – DO NOT LEAVE PATIENT ALONE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

IF RESTRAINTS ARE REQUIRED USE SOFT RESTRAINTS and / or KERLIX
RESTRAIN PATIENT TO LONG SPINE BOARD OR ORTHOPEDIC SCOOP

DO NOT TRANSPORT PATIENTS
"SANDWICHED" BETWEEN TWO BACKBOARDS

DURING TRANSPORT OF PATIENTS IN POLICE INSTITUTED LOCKING RESTRAINTS, A POLICE OFFICER SHOULD EITHER ACCOMPANY THE PATIENT OR PROVIDE EMS PERSONNEL MEANS TO UNLOCK THE RESTRAINTS

DETERMINE BLOOD GLUCOSE
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, ½ tube ORAL GLUCOSE (7.5 grams) PO

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY
(if equipped, **Mandatory use if pt intubated)

EMT - I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

DETERMINE BLOOD GLUCOSE
ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D25 2 mL/kg IVP UP TO 50mL
GLUCAGON 0.5 mg IM IF NO VASCULAR ACCESS OBTAINED
ADULT & PEDIATRIC: REPEAT DETERMINATION OF BLOOD GLUCOSE POST-DEXTROSE TREATMENT

PARAMEDIC

CHEMICAL RESTRAINT: SEE PROTOCOL 7C

CONSULT OLMCP IF UNCERTAIN OF ETIOLOGY AND TREATMENT PLAN FOR PSYCHIATRIC PROBLEM OR IF ADDITIONAL RESTRAINT MEASURES NEEDED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
7A – Behavior Disorder – Adult & Pediatric

1. Gonin, P., Beysard, N., Yersin, B., & Carron, P. (2017). CME Information : Excited Delirium : A Systematic Review. Continuing Medical Education in Academic Emergency Medicine. https://doi.org/10.1111/acem.13330
2. Swickhamer C, Colvig C, Chan SB. Restraint use in the elderly emergency department patient. *J Emerg Med*. 2013 Apr;44(4):869-74.
3. Vilke GM, Bozeman WP, Dawes DM, Demers G, Wilson MP. Excited delirium syndrome (ExDS): treatment options and considerations. *J Forensic Leg Med*. 2012 Apr;19(3):117-21.
4. Weiss S, Peterson K, Cheney P, Froman P, Ernst A, Campbell M. The Use of Chemical Restraints Reduces Agitation in Patients Transported by Emergency Medical Service. *J Emerg Med*. 2012 Nov;43(5):820-8
5. Vilke GM, Debard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozeman WP. Excited Delirium Syndrome (ExDS): Defining Based on a Review of the Literature. *J Emerg Med*. 2012 Nov;43(5):897-905.
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8. Strote J, Verzemnieks E, Walsh M, Hutson HR. Use of force by law enforcement: an evaluation of safetyand injury. *J Trauma*. 2010 Nov;69(5):1288-93.
9. Rossi J, Swan MC, Isaacs ED. The violent or agitated patient. *Emerg Med Clin North Am*. 2010 Feb;28(1):235-56, x.
10. Coburn VA, Mycyk MB. Physical and chemical restraints. *Emerg Med Clin North Am*. 2009 Nov;27(4):655-67, ix.
11. Cheney PR, Gossett L, Fullerton-Gleason L, Weiss SJ, Ernst AA, Sklar D. Relationship of restraint use, patient injury, and assaults on EMS personnel. *Prehosp Emerg Care*. 2006 Apr-Jun;10(2):207-12.
12. Brice JH, Pirrallo RG, Racht E, Zachariah BS, Krohmer J. Management of the violent patient. *Prehosp Emerg Care*. 2003 Jan-Mar;7(1):48-55.

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7B – PHYSICAL RESTRAINT ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Reducing likelihood of patient doing harm to self.
2. Reducing likelihood of patient doing harm to others (including EMS professionals).
3. Reducing likelihood of patient disrupting medically necessary interventions.
4. Patient requires/required chemical restraint per Protocol 7C.

Alternatives to physical restraint as outlined below are to be utilized so as to minimize the use of physical restraints. However, if alternatives to physical restraints are unsuccessful, then physical restraints will be applied in an effective and compassionate manner. Throughout the use of alternatives to physical restraint and physical restraint, the patient and the patient's concerned parties (family, friends, co-workers, etc.) shall be treated with respect and informed of the need for these procedures. This protocol is not intended to place EMS professionals at higher risk for injury. If personal safety is compromised or threatened during the course of patient care, appropriate law enforcement personnel should be summoned for assistance. If at any time questions arise as to appropriateness of using alternatives to physical restraint or physical restraint, OLMC should be consulted for direction.

Contraindications:

1. Patient (or patient's legal guardian or medical power of attorney) possesses medical decision making capacity and is refusing evaluation, treatment, and/or transport (in the absence of threatened or actual harm to self or others).
2. Patient is compliant with medically necessary interventions.
3. Reducing likelihood of patient doing harm to self and/or others and reducing likelihood of patient disrupting medically necessary interventions can be successfully accomplished with alternatives to physical restraint in the best judgment of the EMS professional(s) treating the patient.

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PROTOCOL 7B: Physical Restraint – Adult & Pediatric, cont.

Technique:

The following steps shall be taken and documented in determining the need for physical restraints:

1. **Assessment of mental status** - Observe for uncontrolled agitation, combativeness, threats of violence to self or others, disorientation, altered mental status impeding medically necessary interventions, or pulling at necessary medical interventions (eg. oxygen, IV lines, endotracheal tubes).

2. **Alternatives to physical restraint**- Reassurance, support of concerned parties (family, friends, co-workers, etc.), reorientation, diversionary activity, explanation of illness, injury, and medically necessary interventions.

3. **Justification for physical restraint**- Failure of alternatives to physical restraint, reduce likelihood of patient harm to self, reduce likelihood of patient harm to others, enable medically necessary interventions per EMS protocols.

4. **Inform patient and concerned parties of physical restraint use.**

5. **Apply physical restraints.**

Restraints are to be soft and are not to impede airway patency, respiratory mechanics, or circulation. Patients will not be restrained prone unless an impaled object or airway patency necessitates such positioning. Restraints will be applied in an effective, yet compassionate manner. Every effort should be made to avoid injury to the patient during application of physical restraints.

Humane restraints that reduce potential for patient injury from the restraints are those made from roll gauze, soft leather, and those designed as single-patient use, disposable foam with cloth ties. Restraints are to be non-locking unless applied by law enforcement officers in appropriate circumstances and able to be released rapidly if patient condition mandates.

During treatment and transport of a patient in law enforcement-instituted restraints (including handcuffs), EMS professionals should monitor for and advocate for change in restraints that compromise airway patency, respiratory mechanics, or circulation. Patients will not be transported with wrists cuffed to ankles either directly or indirectly (also referred to as “hog-tying”). These positions have been shown to impair respiratory mechanics and pose significant obstacles to definitive airway management if required enroute. During transport of patients in law enforcement-instituted locking restraints, a law enforcement officer should either accompany the patient in the ambulance or provide the treating EMS professionals means to unlock the restraints. This policy allows rapid restraint release should the patient deteriorate to a condition requiring restraint release to properly treat.

Patients restrained using this protocol should generally be restrained to a backboard. This facilitates patient transfer in the emergency department and in the case of airway secretions or vomiting, enables rapid positioning of the patient to reduce aspiration. Patients will not be transported “sandwiched” between two backboards; this positioning impedes patient care and increases risk of aspiration.

PROTOCOL 7B: Physical Restraint – Adult & Pediatric, cont.

Once physical restraints are applied, they will be left in place until the patient is transferred to emergency department personnel. This policy prevents recurrent harm to self, harm to others, and disruption of intact medical devices and treatment. Despite assurance from the patient that they will comply with treatment, restraints are to be left in place unless a direct order from OLMC is given to release the physical restraints. Such an order must be clearly documented on the patient care form.

Medical Literature References
7B – Physical Restraints – Adult & Pediatric

1. Swickhamer C, Colvig C, Chan SB. Restraint use in the elderly emergency department patient. *J Emerg Med*. 2013 Apr;44(4):869-74.
2. Vilke GM, Debard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozeman WP. Excited Delirium Syndrome (ExDS): Defining Based on a Review of the Literature. *J Emerg Med*. 2012 Nov;43(5):897-905.
3. Vilke GM, Bozeman WP, Dawes DM, Demers G, Wilson MP. Excited delirium syndrome (ExDS): treatment options and considerations. *J Forensic Leg Med*. 2012 Apr;19(3):117-21.
4. Otahbachi M, Cevik C, Bagdure S, Nugent K. Excited delirium, restraints, and unexpected death: a review of pathogenesis. *Am J Forensic Med Pathol*. 2010 Jun;31(2):107-12.
5. Rossi J, Swan MC, Isaacs ED. The violent or agitated patient. *Emerg Med Clin North Am*. 2010 Feb;28(1):235-56, x.
6. Coburn VA, Mycyk MB. Physical and chemical restraints. *Emerg Med Clin North Am*. 2009 Nov;27(4):655-67, ix.
7. Cheney PR, Gossett L, Fullerton-Gleason L, Weiss SJ, Ernst AA, Sklar D. Relationship of restraint use, patient injury, and assaults on EMS personnel. *Prehosp Emerg Care*. 2006 Apr-Jun;10(2):207-12.
8. Brice JH, Pirrallo RG, Racht E, Zachariah BS, Krohmer J. Management of the violent patient. *Prehosp Emerg Care*. 2003 Jan-Mar;7(1):48-55.

7C – CHEMICAL RESTRAINT
ADULT & PEDIATRIC

TREATMENT PRIORITIES
1. Asses scene safety
2. Safety of self
3. Safety of public safety professionals
4. Safety of patient
5. Treat excited delirium

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMR | EMT

ASSIST IN PHYSICAL CONTROL OF PATIENT FOR PARAMEDIC TO ADMINISTER CHEMICAL RESTRAINT

USE ADEQUATE NUMBERS OF PUBLIC SAFETY PROFESSIONALS
TO MINIMIZE RISK OF INJURY TO SELF AND OTHERS

UNLESS UNSAFE TO DO SO, PERFORM THE FOLLOWING POST- CHEMICAL RESTRAINT:
GENERAL SUPPORTIVE CARE – DO NOT LEAVE PATIENT ALONE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated))

EMT-I85 | AEMT

IV ACCESS IF PT TEMPORARILY COOPERATIVE
DO NOT RISK SELF INJURY WITH NEEDLESTICK IN IV ACCESS IF PT COMBATIVE

PARAMEDIC

CHEMICAL RESTRAINT:

ALL PATIENTS REQUIRING CHEMICAL RESTRAINT ARE TO BE PHYSICALLY RESSTRAINED AS WELL

ADULT: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg. MAY REPEAT ONCE.
OR
ADULT: DIAZEPAM 5 mg IVP/IOP or 10 mg IM IF MIDAZOLAM NOT AVAILABLE. MAY REPEAT ONCE.
OR
ADULT: LORAZEPAM 2 mg IVP/IOP/IM IF MIDAZOLAM NOT AVAILABLE. MAY REPEAT ONCE.
(MIDAZOLAM STRONGLY PREFERRED DUE TO MOST RAPID ONSET OF ACTION OF BENZODIAZEPINE OPTIONS)
PLUS.
ADULT: HALOPERIDOL 5 mg IM

PEDIATRIC: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg.
OR
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP/IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE.
OR
PEDIATRIC: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IOP/IM FOR ACTIVE SEIZURE IF MIDAZOLAM NOT AVAILABLE.

CONSULT OLMCP IF UNCERTAIN OF ETIOLOGY AND TREATMENT PLAN FOR PSYCHIATRIC PROBLEM
OR IF ADDITIONAL CHEMICAL RESTRAINT MEASURES NEEDED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
7C – Chemical Restraint – Adult & Pediatric

1. Swickhamer C, Colvig C, Chan SB. Restraint use in the elderly emergency department patient. *J Emerg Med*. 2013 Apr;44(4):869-74.
2. Weiss S, Peterson K, Cheney P, Froman P, Ernst A, Campbell M. The Use of Chemical Restraints Reduces Agitation in Patients Transported by Emergency Medical Service. *J Emerg Med*. 2012 Nov;43(5):820-8.
3. Wilson MP, Macdonald K, Vilke GM, Feifel D. A Comparison of the Safety of Olanzapine and Haloperidol in Combination with Benzodiazepines in Emergency Department Patients with Acute Agitation. *J Emerg Med*. 2012 Nov;43(5):790-7
4. Vilke GM, Debard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozeman WP. Excited Delirium Syndrome (ExDS): Defining Based on a Review of the Literature. *J Emerg Med*. 2012 Nov;43(5):897-905.
5. Vilke GM, Bozeman WP, Dawes DM, Demers G, Wilson MP. Excited delirium syndrome (ExDS): treatment options and considerations. *J Forensic Leg Med*. 2012 Apr;19(3):117-21.
6. Strote J, Verzemnieks E, Walsh M, Hutson HR. Use of force by law enforcement: an evaluation of safety and injury. *J Trauma*. 2010 Nov;69(5):1288-93.
7. Ho JD, Dawes DM, Nelson RS, Lundin EJ, Ryan FJ, Overton KG, Zeiders AJ, Miner JR. Acidosis and catecholamine evaluation following simulated law enforcement "use of force" encounters. *Acad Emerg Med*. 2010 Jul;17(7):e60-8.
8. Otahbachi M, Cevik C, Bagdure S, Nugent K. Excited delirium, restraints, and unexpected death: a review of pathogenesis. *Am J Forensic Med Pathol*. 2010 Jun;31(2):107-12.
9. Rossi J, Swan MC, Isaacs ED. The violent or agitated patient. *Emerg Med Clin North Am*. 2010 Feb;28(1):235-56, x.
10. Coburn VA, Mycyk MB. Physical and chemical restraints. *Emerg Med Clin North Am*. 2009 Nov;27(4):655-67, ix.
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7D – EMERGENCY MENTAL HOLD ISSUES ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMS professionals should utilize this protocol and its principles and directives to promote and protect the safety of mentally ill patients, drug or alcohol dependent patients, and other involved parties who may be endangered by the patient's disturbed or altered psychological state to the extent of being subject to an immediate likelihood of serious harm.

Definitions:

1. "Drug Dependent Patient" for the purpose of this protocol means: A patient who is using a controlled substance as presently defined in Section 102 of the Federal Controlled Substances Act and who is in a state of psychic or physical dependence, or both, arising from administration of that controlled substance on an intermittent or continuous basis.

2. "Alcohol Dependent Patient" for the purpose of this protocol means: A patient who uses alcoholic beverages to an extent that it impairs mental or physical health, family life, occupational life, and potentially compromises the health and safety of the community.

3. "Mentally Ill Patient" for the purpose of this protocol means: A patient afflicted with a substantial disorder of thought, mood, perception, psychological orientation or memory that significantly impairs judgment, behavior, capacity to recognize reality or ability to meet the ordinary demands of life. Mental illness may be reflected in a sustained altered mentation secondary to chronic medical condition or prior physical injury.

4. "Immediate likelihood of serious harm" posed by patients either to self or others for the purpose of this protocol means:

   a) a substantial risk of physical harm to self, manifested by active threats of, or attempts at, suicide or intentional bodily harm; **OR**
   b) a substantial risk of physical harm to others manifested by active threats of, or attempts at, homicide or intentional bodily harm; **OR**
   c) actively placing others in reasonable fear of imminent violent behavior or serious physical harm; **OR**

PROTOCOL 7D: Emergency Mental Hold Issues – Adult & Pediatric, cont.

d) causing a prudent EMS professional to believe with reasonable certainty that without immediate medical treatment, severe physical impairment or injury would be sustained by the patient or other involved party as a result of the patient's apparent inability to prevent suicidal activity, homicidal activity, or significant risk of harm to self or others through distorted reality (eg. driving while acutely psychotic or clinically intoxicated).

Emergency Mental Hold Procedures:

1. Upon dispatch to and/or subsequent assessment of a patient representing, in the EMS professional's best judgment, "immediate likelihood of serious harm", the EMS professional should notify dispatch to immediately request the appropriate law enforcement authority. It is the duty of the responding law enforcement officer(s) to determine if the affected person appears to be mentally unstable, alcohol dependent or drug dependent to a degree that immediate emergency action is necessary to prevent the patient from harming self or others. If the law enforcement officer determines that immediate emergency action is necessary, under Oklahoma law, the law enforcement officer must take the person into protective custody. The law enforcement officer(s) can base their decision upon personal observation of the actions of the patient or upon the statement of either EMS professionals or other parties deemed credible.

2. If EMS professionals at the scene believe the patient to be actively mentally ill, alcohol dependent, and/or drug dependent to the extent of being subject to an "immediate likelihood of serious harm" to self or others, representing a medical need to be taken into protective custody by law enforcement, the primary assessing EMS professional shall fill out the "Individual's Affidavit for Emergency Detention" and submit to the law enforcement officer(s) at the scene as may be required to effect such detention.

3. If EMS professionals and the law enforcement officer(s) at the scene cannot reach agreement whether the patient is actively mentally ill, alcohol dependent, and/or drug dependent to the extent of representing an "immediate likelihood of serious harm" to self or others, representing a medical need to be taken into protective custody by law enforcement, the appropriate EMS supervisor(s) and corresponding law enforcement supervisor(s) should be contacted. Supervisor presence at the scene could be required to achieve consensus of actions that promote the patient's and others' safety.

4. If the EMS supervisor determines the patient is actively mentally ill, alcohol dependent, and/or drug dependent to the extent of representing an "immediate likelihood of serious harm" to self or others, representing a medical need to be taken into protective custody by law enforcement and therefore is in need of immediate medical attention, this shall be conveyed to the appropriate law enforcement supervisor. If the law enforcement supervisor does not subsequently place the patient on mental hold, notify the appropriate receiving hospital's On-Line Medical Control Physician (or the System EMS Medical Director) for formal physician consultation, complete an agency-specified Incident Report, and submit it to the Medical Director for review.

PROTOCOL 7D: Emergency Mental Hold Issues – Adult & Pediatric, cont.

5. If it appears that the affected person is mentally ill or suffers chronic altered mentation and does not require emergency medical attention, EMS personnel will stay on scene only until it can be reasonably determined that the person does not suffer from an apparent serious physical condition, illness, or injury requiring emergency medical attention and/or until the law enforcement officers at the scene indicate that they no longer require assistance from EMS.

Emergency Detention (previously referred to as Emergency Order of Detention or EOD) Issues:

1. An affidavit that is completed by anyone (including an EMS professional) who is concerned about the patient's safety or who witnessed concerned behavior that could impact the safety of others, that details the observations and impressions that serve as the basis for involuntary detention of the patient in the safety interests of the patient and others has been commonly referred to as an "EOD" or "Emergency Order of Detention". This is no longer used as a legal term. The correct terminology is a "third party statement" and the statement form as displayed in state documents can be found immediately following this protocol.

2. The "third party statement" must have sufficiently detailed information to justify placing the patient, at least temporarily, into law enforcement custody. (eg. "suicidal" is not enough). A law enforcement officer can refuse to take a patient into custody if he or she determines there is insufficient written evidence contained within the "third party statement".

3. The "third party statement" is the legally recognized documentation that compels a patient to be placed into Emergency Detention (ED) in the safety interests of self and others until emergency psychiatric assessment (and stabilization when applicable) can be conducted. Medical facilities in Oklahoma that can conduct emergency psychiatric assessment and stabilization are referred to as "Emergency Detention (formerly EOD) designated facilities".

4. A patient that is under Emergency Detention by use of a "third party statement" cannot refuse transport to receive an appropriate physician evaluation. EMS professionals treating and transporting patients under Emergency Detention should not let the patient flee from EMS care and supervision, unless the patient poses an immediate, serious physical threat to the EMS professional(s). Utilize law enforcement officers, physical restraint, and if licensed as a paramedic, chemical restraint, as warranted to prevent patients under Emergency Detention from fleeing.

5. Once an appropriate physician, typically a psychiatrist, has evaluated the patient under Emergency Detention through use of a "third party statement", he or she may validate continued involuntary detention of the patient or may release the patient from further involuntary medical detention.

6. EMS professionals should work with their system Medical Director, local medical professionals, and local law enforcement officers to review applicable emergency mental hold issues and resources.

IN RE: THE PROTECTIVE CUSTODY OF:

____

THIRD PARTY STATEMENT

I, ______________________________ the undersigned being ________ years of age, declare: That on the ________ day of ____________________ 20____, I observed (name) ____________________

____

at (location) ______________________________ in ____________________ County, Oklahoma,

and that at ____________ o'clock ____m.

Statement of observation (describe activity or incident personally observed):

____

____

____

____

____

____

____

____

____

That upon such basis, I have a reasonable belief that this person has a mental illness or is alcohol- or drug-dependent to a degree that immediate emergency action is necessary.

I, the undersigned attest to the above statement to be factual and true to the best of my knowledge and that I will testify to the above in court.

Any false statement given to the officer by the person upon whose statement of the officer relies shall be a misdemeanor and subject to the sanctions of Title 21 of the Oklahoma State Statute.

____
Name (please print)

____
Signature

____

____
Address

Medical Literature References
7D – Emergency Mental Hold Issues -Adult & Pediatric

1. Protocol expert consultant: Gerard Clancy, MD. President, University of Oklahoma - Tulsa. Department of Psychiatry, University of Oklahoma School of Community Medicine, Tulsa. Board certified in psychiatry by the American Board of Psychiatry and Neurology.
2. Protocol expert consultant: Lori Whelan, MD. Department of Emergency Medicine, University of Oklahoma School of Community Medicine, Tulsa. Board certified in emergency medicine by the American Board of Emergency Medicine.
3. Oklahoma Department of Mental Health and Substance Abuse Services. Accessed website on 6/25/12: www.ok.gov/odmhsas accessed on 6/25/12.
4. Oklahoma State Law Title 43A.Mental Health. Accessed website on 6/25/12: http://www.ok.gov/odmhsas/documents/2010%20-%2043A.pdf.

EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

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8A - POISONINGS-GENERAL MANAGEMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Self/Others/Scene Safety
2. Vital signs
3. Oxygenation/Ventilation
4. Identify & treat toxin
5. Poison Center/OLMC consult if needed
6. Manage shock, altered mental status, seizures, arrhythmias; CO Poisoning per specific protocol
7. Transport ASAP

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
DO NOT MOVE THE PATIENT UNLESS IN DANGER.
OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING.
DETERMINE NUMBER OF PATIENTS INVOLVED
DECIDE IF ADDITIONAL RESOURCES ARE NEEDED

EMR | EMT

GENERAL SUPPORTIVE CARE; OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE

TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC/AGONALLY BREATHING (see opiate toxidrome in Protocol 8B)
ADULT: NALOXONE 2 mg IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – INEFFECTIVE BREATHING ACTIVITY (see opiate toxidrome in Protocol 8B)
ADULT & PEDIATRIC: NALOXONE 0.5 mg IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT OR HIGHER LICENSE:

MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED ONLY IF BVM VENTILATIONS INEFFECTIVE

USE OF ACTIVATED CHARCOAL FOR ACUTE INGESTED POISONS, (i.e., Acetaminophen, ASA, TCA, Barbiturates)
ADULT/PEDIATRIC: ACTIVATED CHARCOAL 1 gram/kg PO (OLMC ORDER ONLY; USE ONLY IF TRANSPORT TIME WILL EXCEED 30 MINS)

EMT-I85 | AEMT

IV ACCESS
ADULT: INTUBATE IF INDICATED; DO NOT INTUBATE PATIENTS WITH RAPIDLY REVERSIBLE TOXICOLOGY ETIOLOGY (eg. OPIATES)

ADVANCED EMT OR HIGHER LICENSE:

TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – APNEIC/AGONALLY BREATHING (see opiate toxidrome in Protocol 8B)
ADULT: NALOXONE 2 mg IVP/IOP/IN, MAY REPEAT ONCE
PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
TOXINS/DRUG OVERDOSE – SUSPECTED NARCOTIC/OPIATE – INEFFECTIVE BREATHING ACTIVITY (see opiate toxidrome in Protocol 8B)
ADULT & PEDIATRIC: NALOXONE 0.5 mg IVP/IOP/IN, MAY REPEAT TO MAX OF 2 mg
USE NALOXONE TO RESTORE EFFECTIVE BREATHING; AVOID EXCESSIVE DOSING TO PREVENT WITHDRAWAL

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

TOXINS/DRUG OVERDOSE - SUSPECTED ORGANOPHOSPHATE (see cholinergic toxidrome in Protocol 8B)
ADULT: ATROPINE 2 mg IVP/IOP/IM, USE IVP FOR MORE SEVERE PRESENTATIONS. REPEAT EVERY 3-5 MINS IF SYMPTOMS PROGRESSIVE
PEDIATRIC: ATROPINE 0.05 mg/kg IVP/IOP/IM, USE IVP FOR MORE SEVERE PRESENTATIONS. MINIMUM DOSE 0.1 mg. OLMC FOR REPEAT.
ADULT/PEDIATRIC (> 12 years): PRALIDOXIME CHLORIDE 600 mg (1 AUTOINJECTOR) IM, MAY REPEAT TWICE FOR A TOTAL OF 1800 mg; ADMINISTER EACH DOSE 15 MINUTES APART FOR MILD SYMPTOMS OR IN RAPID SUCCESSION FOR MODERATE TO SEVERE SYMPTOMS

TOXINS/DRUG OVERDOSE - SUSPECTED TRICYCLIC ANTIDEPRESSANT (VENTRICULAR DYSRHYTHMIAS, SEIZURES) (see anticholinergic toxidrome in Protocol 8B)
ADULT/PEDIATRIC: SODIUM BICARBONATE 1 mEq/kg IVP/IOP MAX DOSE 50 mEq

TOXINS/DRUG OVERDOSE - SUSPECTED STIMULANT (SEVERE AGITATION, HTN, TACHYCARDIA, DIAPHORESIS) (see hallucinogenic and sympathomimetic toxidromes in Protocol 8B)
ADULT: MIDAZOLAM 0.1 mg/kg IVP/IN/IM TO MAX 5 mg OR DIAZEPAM 2.5-5 mg IVP OR LORAZEPAM 1-2 mg IVP/IM
PEDIATRIC: OLMCP ORDER ONLY

TOXINS/DRUG OVERDOSE - SUSPECTED CALCIUM CHANNEL BLOCKER
ADULT: CALICUM CHLORIDE 10 mg/kg IVP/IOP MAX DOSE 1 gram

TOXINS/DRUG OVERDOSE - SUSPECTED BETA-BLOCKER
ADULT: GLUCAGON 1 mg IVP/IOP
PEDIATRIC: GLUCAGON 0.5 mg IVP/IOP

CONSULT OLMC IF ABOVE TREATMENT INEFFECTIVE FOR TOXINS/DRUG OVERDOSE ETIOLOGY
Poison Information Center Specialists are authorized to direct medical care related to the medical toxicology and/or hazardous material exposure aspects of patient care if contacted for directives

Medical Literature References
8A - Poisonings–General Management - Adult & Pediatric

1. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
2. Shannon MW. Emergency Management of Poisoning: A General Approach to Poisoning. In: Shannon MW, Borron SW, Burns MJ, eds. Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Ed. Philadelphia, PA: Saunders Elsevier; 2007: 13-30.
3. Eldridge DL, Van Eyk J, Kornegay C. Pediatric toxicology. *Emerg Med Clin North Am*. 2007 May;25(2):283-308.
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8B - TOXIDROMES ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER

EMT

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Toxidromes as a Diagnostic Guide in Suspected Overdose

Toxidrome	Signs and symptoms	Vital sign	Classic agents
anticholinergic	delirium, flushed skin, dilated pupils, urinary retention, decreased bowel sounds, memory loss, seizures (mnemonic: "hot as a hare, dry as a bone, red as a beet, blind as a bat, mad as a hatter")	tachycardia hyperthermia hypertension	atropine antihistamines scopolamine tricyclic antidepressants
cholinergic	confusion, weakness, salivation, lacrimation, urination, defecation, gastrointestinal motility, emesis, diaphoresis, muscle fasciculations, miosis, seizures, "Killer Bs": bradycardia, bronchorrhea, bronchospasm	bradycardia hypothermia tachypnea	organophosphates carbamates
hallucinogenic	disorientation, hallucinations, visual illusions, panic reaction, moist skin, hyperactive bowel sounds, seizures	tachycardia tachypnea hypertension	phencyclidine lysergic acid diethylamide cannabis
opiate/narcotic	altered mental status, unresponsiveness, miosis, shock, decreased respiration	bradypnea bradycardia hypothermia hypotension	dextromethorphan opiates: morphine propoxyphene
sedative/hypnotic	coma, stupor, confusion, sedation, CNS dsyfunction	apnea	ethanol barbiturates benzodiazepines anticonvulsants
sympathomimetic	delusions, paranoia, diaphoresis, piloerection, mydriasis, hyperreflexia, seizures, anxiety	tachycardia hypertension hyperthermia	cocaine amphetamines methamphetamine phenylpropanolamine ephedrine pseudoephedrine

Medical Literature References
8B - Toxidromes- Adult & Pediatric

1. Florida Poison Information Center, Jacksonville. Toxidromes. FPICjax.org. http://www.fpicjax.org/toxidromes.htm. Accessed June 17, 2012.
2. Goldstein S. Four steps to diagnosing drug overdose. Emergency Medicine Magazine. emedmag.com. April 2009:17-22.
3. Shannon MW. Emergency Management of Poisoning: A General Approach to Poisoning. In: Shannon MW, Borron SW, Burns MJ, eds. Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Ed. Philadelphia, PA: Saunders Elsevier; 2007: 13-30.
4. Mokhlesi B, Corbridge T. Toxicology in the critically ill patient. *Clin Chest Med*. 2003 Dec;24(4):689-711.

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8C – OKLAHOMA POISON CONTROL CENTER USE

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

A. Real-time consultation on toxic severity of exposure/inhalation/ingestion/snakebites.
B. Real-time consultation regarding no/minimal toxicity exposures for patient follow-up contact and self-treatment advice.
C. Real-time consultation regarding needed hospital resources for patient toxicity.
D. Identification of pills (using imprint letters/numbers on pills).
E. Product ingredient identification and toxic severity potential.

Contraindications:

None

Technique:

To contact the Oklahoma Poison Control Center in Oklahoma City:

Healthcare Professional Access Number: 1-877-271-6998

When calling, identify yourself by name, EMS certification level, and agency/apparatus identification. Have as much patient information and substance/exposure/snake information possible readily available to share with the poison center specialist.

The University of Oklahoma College of Pharmacy administers all operations of the Oklahoma Poison Control Center in cooperation with The Children's Hospital at OU Medical Center.

Calls are answered 24 hours a day by pharmacists and nurses intensively trained in clinical toxicology and designated as specialists in poison information.

EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

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8D - ACUTE ALLERGIC REACTIONS
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Vital signs
2. Epinephrine for anaphylaxis
   **** First two epi doses are standing order. Any additional epi dose requires OLMC consult.**
3. Oxygen administration
4. Bronchodilator for bronchospasm

EMD

ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE
AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE
FOR SAME SYMPTOMS

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
DO NOT MOVE THE PATIENT UNLESS IN DANGER
OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT OR HIGHER LICENSE:

FOR ANAPHYLAXIS ONLY
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000, 0.15 mg (0.15 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, *** Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE
ADULT & PEDIATRIC WEIGHT ≥15 kg: NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg
PEDIATRIC WEIGHT <15 kg: NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg
MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED

EMT- I85 | AEMT

ADULT: INTUBATE IF INDICATED
IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEM
FOR ANAPHYLAXIS ONLY
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg

PARAMEDIC

MILD REACTION (RASH, ITCH, HIVES) ANTIHISTAMINE
ADULT: DIPHENHYDRAMINE 50 mg IM/IVP
PEDIATRIC: DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg

MODERATE REACTION (SOB, WHEEZING) ANTIHISTAMINE + BRONCHODILATOR + STEROID
DIPHENHYDRAMINE ADMINISTRATION AS IN MILD REACTION & BRONCHODILATOR ADMINISTRATION AS IN EMT ABOVE
ADULT: METHYLPREDNISOLONE 125 mg IM/IVP
PEDIATRIC: METHYLPREDNISOLONE 2 mg/kg IM/IVP, MAX 125 mg

SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC
VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE
IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000
ADULT: **EPINEPHRINE 0.1mg/mL 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES)
PEDIATRIC: **EPINEPHRINE 0.1mg/mL 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg
ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
8D – Allergic Reactions - Adult & Pediatric

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2. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
3. Singer E, Zodda D. Allergy and anaphylaxis: principles of acute emergency management. *Emerg Med Pract*. 2015 Aug;17(8):1-19.
4. Nowak R, Farrar JR, Brenner BE, Lewis L, Silverman RA, Emerman C, Hay DP, Russell WS, Schmitz N, Miller J, Singer E, Camargo CA Jr, Wood J. Customizing anaphylaxis guidelines for emergency medicine. *J Emerg Med*. 2013 Aug;45(2):299-306.
5. Jacobsen RC, Toy S, Bonham AJ, Salomone JA, Ruthstrom J, Gratton M. Anaphylaxis Knowledge among Paramedics: Results of a National Survey. *Prehosp Emerg Care*. 2012 Oct-Dec;16(4):527-34.
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8E – SNAKEBITES – PIT VIPERS (RATTLESNAKES, COPPERHEADS, & MOCASSINS) (CROTALINAE ENVENOMATION) ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Vital signs
2. Epinephrine for anaphylaxis
   **** First two epi doses are standing order. Any additional epi dose requires OLMC consult.**
3. OK Poison Center consult
4. Appropriate destination per OK Poison Center consult

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
MOVE AWAY FROM SNAKE(S) IF ABLE
OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

EMR | EMT

GENERAL SUPPORTIVE CARE – MARK EDGE OF SWELLING/TENDERNESS EVERY 15 MINS TO DETERMINE SYMPTOM PROGRESSION
OBTAIN VITAL SIGNS & ADMINISTER O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
IMMOBILIZE/ELEVATE AND AVOID JOINT FLEXION IN EXTREMITY BITTEN TO MINIMIZE SWELLING OF EXTREMITY
DO NOT CUT THE BITE SITE OR ATTEMPT TO “EXTRACT THE VENOM” FROM BITE SITE WITH SUCTION/VACUUM DEVICES
CONSULT OKLAHOMA POISON CONTROL CENTER PER PROTOCOL 8C – DESCRIBE SNAKE APPEARANCE/TYPE AS BEST ABLE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:

FOR ANAPHYLAXIS ONLY (ANAPHYLAXIS FROM SNAKEBITE IS RARE):
**ADULT: ****EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH.
**PEDIATRIC: ****EPINEPHRINE 1mg/mL 1:1000 0.15 mg (0.15 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH.
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, *** Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT- I85 | AEMT

ADULT: INTUBATE IF INDICATED
IV ACCESS

ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

FOR ANAPHYLAXIS ONLY (ANAPHYLAXIS FROM SNAKEBITE IS RARE):
**ADULT: ****EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
**PEDIATRIC: ****EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg

PARAMEDIC

ANTIEMETIC (IF REQUIRED); **ADULT:** ONDANSETRON 4 mg IVP/ODT. MAY REPEAT ONCE IN 10 MINUTES
PEDIATRIC: ONDANSETRON 0.1 mg/kg IVP TO A MAXIMUM SINGLE DOSE OF 4 mg; IF AGE > 2 years, MAY GIVE ONDANSETRON 4 mg ODT

ANALGESIA (IF REQUIRED); OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg
ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY FOR OPIATE ANALGESIA

SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC
**ADULT: ****EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
**PEDIATRIC: ****EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg IM NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000
**ADULT: ****EPINEPHRINE 0.1mg/mL 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES)
**PEDIATRIC: ****EPINEPHRINE 0.1mg/mL 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg
ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
8E – Snakebites (Crotalinae Envenomation)- Adult & Pediatric

1. Latimer, A. J., Husain, S., Nolan, J., Doreswamy, V., Rea, T. D., Sayre, M. R., & Eisenberg, M. S. (2018). Syringe Administration of Epinephrine by Emergency Medical Technicians for Anaphylaxis. Prehospital Emergency Care, 22(3), 319–325. https://doi.org/10.1080/10903127.2017.1392667
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3. Protocol expert consultant: William Banner, MD, PhD. Medical Director, Oklahoma Poison Control Center, Oklahoma City. Board certified in medical toxicology by the American Board of Medical Toxicology. Board certified in pediatrics and pediatric critical care medicine by the American Board of Pediatrics.
4. Protocol expert consultant: Boyd Burns, DO. Department of Emergency Medicine, University of Oklahoma School of Community Medicine, Tulsa. Board certified in emergency medicine by the American Board of Emergency Medicine.
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EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

8F – BEE/WASP STINGS & FIRE ANT BITES (HYMENOPTERA ENVENOMATION) ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Vital signs
2. Epinephrine for anaphylaxis
   **** First two epi doses are standing order. Any additional epi dose requires OLMC consult.**
3. Oxygen administration
4. Bronchodilator for bronchospasm

EMD

ADVISE TO USE EPINEPHRINE AUTOINJECTOR IF AVAILABLE AND PATIENT'S PHYSICIAN HAS PRESCRIBED TO USE FOR SAME SYMPTOMS

ADVISE TO AVOID PHYSICAL EXERTION OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
DO NOT MOVE THE PATIENT UNLESS IN DANGER
OPEN AIRWAY IF NOT ALERT AND INEFFECTIVE BREATHING

EMR | EMT

GENERAL SUPPORTIVE CARE – REMOVE STINGER(S) WITHOUT SQUEEZING IF STILL EMBEDDED IN SKIN
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)

EMT OR HIGHER LICENSE:

FOR ANAPHYLAXIS ONLY
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH.
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000 0.15 mg (0.15 mL) IM OR AUTOINJECTOR ANTERIOR/LATERAL THIGH.
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, *** Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE
ADULT & PEDIATRIC WEIGHT ≥15 kg: NEBULIZED ALBUTEROL 5 mg & IPRATROPIUM BROMIDE 0.5 mg
PEDIATRIC WEIGHT <15 kg: NEBULIZED ALBUTEROL 2.5 mg & IPRATROPIUM BROMIDE 0.25 mg
MAY REPEAT ALBUTEROL ENROUTE X 2 AS NEEDED

EMT- I85 | AEMT

ADULT: INTUBATE IF INDICATED
IV ACCESS

ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

FOR ANAPHYLAXIS ONLY
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
OLMC ORDER ONLY FOR EPINEPHRINE IF PT ≥ 50 YEARS OLD, HEART ILLNESS HISTORY, OR BLOOD PRESSURE > 140/90 mmHg

PARAMEDIC

MILD REACTION (RASH, ITCH, HIVES) ANTIHISTAMINE
ADULT: DIPHENHYDRAMINE 50 mg IM/IVP
PEDIATRIC: DIPHENHYDRAMINE 1 mg/kg IM/IVP TO MAX OF 50 mg

MODERATE REACTION (SOB, WHEEZING) ANTIHISTAMINE + BRONCHODILATOR + STEROID
DIPHENHYDRAMINE ADMINISTRATION AS IN MILD REACTION & BRONCHODILATOR ADMINISTRATION AS IN EMT ABOVE
ADULT: METHYLPREDNISOLONE 125 mg IM/IVP
PEDIATRIC: METHYLPREDNISOLONE 2 mg/kg IM/IVP, MAX 125 mg

SEVERE REACTION/ANAPHYLAXIS (ANY MILD/MODERATE SX AND/OR SYS BP <100 mmHg ADULT OR < (70 + 2x age in years) mmHg PEDIATRIC
VASOCONSTRICTOR + ANTIHISTAMINE + BRONCHODILATOR + STEROID
ADULT: **EPINEPHRINE 1mg/mL 1:1000 0.5 mg (0.5 mL) IM ANTERIOR/LATERAL THIGH
PEDIATRIC: **EPINEPHRINE 1mg/mL 1:1000, 0.01 mg/kg NOT TO EXCEED 0.3 mg IM ANTERIOR/LATERAL THIGH
DIPHENHYDRAMINE ADMINISTRATION & BRONCHODILATOR ADMINISTRATION AS IN MILD REACTION; STEROID ADMINISTRATION AS ABOVE
IF REFRACTORY ANAPHYLAXIS, ADMINISTER INTRAVASCULAR EPINEPHRINE 1:10,000
ADULT: **EPINEPHRINE 0.1mg/mL 1:10,000 1 mg SLOW IV/IOP (OVER 3 MINUTES)
PEDIATRIC: **EPINEPHRINE 0.1mg/mL 1:10,000, 0.01 mg/kg SLOW IV/IOP (OVER 3 MINUTES) NOT TO EXCEED 0.5 mg
ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
8F – Bee/Wasp Stings (Hymenoptera Envenomation)- Adult & Pediatric

1. Latimer, A. J., Husain, S., Nolan, J., Doreswamy, V., Rea, T. D., Sayre, M. R., & Eisenberg, M. S. (2018). Syringe Administration of Epinephrine by Emergency Medical Technicians for Anaphylaxis. Prehospital Emergency Care, 22(3), 319–325. https://doi.org/10.1080/10903127.2017.1392667
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11. Markenson D, Foltin G, Tunik M, Cooper A, Treiber M, Caravaglia K. Albuterol sulfate administration by EMT-basics: results of a demonstration project. *Prehosp Emerg Care*. 2004 Jan-Mar;8(1):34-40.

8G – HAZARDOUS MATERIALS RESPONSE

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

This protocol contains generally accepted principles related to EMS response and activity relating to suspected or actual hazardous materials incidents. The overriding principle is safety, with an emphasis on minimizing, preferably preventing, further hazardous materials exposures and related illness.

Specific practices for individual hazardous material substances are beyond the capability of a general principle protocol and the EMS professional is directed to utilize hazardous material specialists within local fire services as well as hazardous material information found in resources such as:

1) Emergency Response Guidebook (ERG – 2012 edition if available), developed jointly by the US Department of Transportation (DOT), Transport Canada, and the Secretariat of Communications and Transportation of Mexico.

2) Wireless Information System for Emergency Responders (WISER), maintained at the US National Library of Medicine Specialized Information Services. The webpage for WISER is http://wiser.nlm.nih.gov/ and according to this website, “WISER is available for download as a standalone application on Microsoft Windows PCs, Apple iPhone and iPod Touch, Google Android devices, Windows Mobile devices, BlackBerry devices, Palm OS PDAs, and via WebWISER.

When responding to individuals in hazardous materials environment(s) and/or contaminated by hazardous materials, real danger exist that EMS professionals, public safety apparatus, and hospitals may be unable to effectively function if not protected from this contamination. Therefore, appropriate efforts must be made to protect the already apparent patient(s), responding public safety professionals, at-risk citizenry, and the emergency healthcare system from further contamination.

Treatment by unprotected or inappropriately protected EMS professionals should not be attempted until appropriate protective measures can be accomplished and the patient is decontaminated or otherwise determined non-toxic by appropriate authority (eg. Fire Department Hazardous Materials specialist, Oklahoma Poison Control Center specialist, and/or on-line medical control physician).

Protocol 8G: Hazardous Materials Response, cont.

Initial measures of protection for EMS professionals and equipment:

EMS professionals that are initially responding and arriving toward the incident location should perform the following:

1. Park in an anticipated safe area (typically upwind/uphill unless otherwise directed by Hazardous Materials specialists responding or already on-scene).

2. Determine and advise the appropriate communications center of the following (if not previously known):

   a) The exact location of the incident.
   b) The type of incident (transportation accident, fire, explosion, etc.).
   c) Identification/nature of the hazardous materials, if known.
   d) Environmental conditions (estimated wind direction and speed).
   e) Recommended routes to and from the location.
   f) Staging area.
   g) Control line (perimeter) established or recommended to be established by fire service and/or law enforcement professionals
   h) Approximate number of patients (actual number preferred if known).
   i) Number of ambulances needed (estimated transport resources).

3. **DO NOT** rush into a suspected hazardous/contaminated situation until appropriate safety measures are accomplished. If additional public safety professionals have not yet arrived, generally accepted safe practices include:

   a) Do not drive any further into the area. Stay upwind and uphill.
   b) Establish a control line at least 300 feet from the incident and stay outside of it.
   c) Tell approaching persons to stop where they are.
   d) Designate a refuge area for victims already inside the control line and direct those ambulatory to this refuge area.

Additional measures of protection for EMS professionals and equipment:

1. Whenever possible, use portable or disposable medical equipment for treating hazardous materials victims. Check with local policy, but in general a safe practice is to leave any potentially contaminated equipment with the Hazardous Materials team to coordinate decontamination of any potentially contaminated equipment.

2. Open any windows to the patient compartment of the ambulance. Dangerous concentrations of chemicals can develop when unintentionally contaminated victims or rescuers are in the unventilated patient compartment of an ambulance.

3. After decontaminated patients have been treated and/or transported to the emergency department, the EMS professionals should be formally evaluated by emergency health care providers at an emergency department if exhibiting unusual signs or symptoms consistent with hazardous materials exposure since participating in the incident.

Medical Literature References
8G – Hazardous Materials Response

1. Emergency Response Guidebook. Website accessed 6/27/12 at: http://phmsa.dot.gov/hazmat/library/erg
2. Wireless Information System for Emergency Responders. Website accessed 6/27/12 at: http://wiser.nlm.nih.gov/

8H - HYDROFLUORIC ACID
ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety – avoid exposure
2. Patient safety – remove exposure
3. Irrigate if ocular exposure
4. Irrigate & calcium gluconate topical application if dermal exposure
5. Respiratory support if inhalation exposure
6. Water or milk consumption if ingestion exposure

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DIRECT TO MOVE AWAY FROM SUSPECTED SOURCE
IF SAFE TO DO SO
OCULAR EXPOSURE:
DIRECT TO IRRIGATE WITH WATER & DON'T STOP
DERMAL EXPOSURE
DIRECT TO REMOVE INVOLVED CLOTHING
DIRECT TO IRRIGATE/SHOWER & DON'T STOP

EMR | EMT

MAINTAIN PERSONAL & PATIENT SAFETY – UTILIZE HAZMAT SPECIALISTIS IF CONDITIONS WARRANT
GENERAL SUPPORTIVE CARE & OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
OCULAR EXPOSURE: START/CONTINUE IRRIGATION OF EYES FOR A MINIMUM OF15 MINUTES USING TAP WATER OR NS
DERMAL EXPOSURE: START/CONTINE IRRIGATION FOR SEVERAL MINUTES THEN APPLY CALCIUM GLUCONATE 2.5% GEL (if available) LIBERALLY
INHALATION EXPOSURE: RESPIRATORY SUPPORT – TREAT PER PROTOCOL 3B ACUTE DYSPNEA
INGESTION EXPOSURE: IF AWAKE & AIRWAY INTACT, PATIENT TO CONSUME MINIMUM OF 8 OUNCES OF MILK OR WATER

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED
IV/IO ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
AVOID OPIATE/NARCOTIC ANALGESIA ADMINISTRATION – MONITOR EFFECTIVENESS OF ABOVE MEASURES FOR PAIN CONTROL
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
8H – Hydrofluoric Acid - Adult & Pediatric

1. Scalzo AJ and Blume-Odom CM. Hydrofluoric Acid and Other Fluorides. In: Shannon MW, Borron SW, Burns MJ, eds. Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th Ed. Philadelphia, PA: Saunders Elsevier; 2007:1323-1334.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

9A ABDOMINAL PAIN/NAUSEA/VOMITING/DIARRHEA ADULT & PEDIATRIC

TREATMENT PRIORITIES
1. Supportive care
2. IVF if needed for hypotension
3. Antiemetic for active vomiting

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO REST IN COMFORTABLE POSITION
ADVISE NO FOOD OR DRINK
ADVISE TO AVOID MOVEMENT UNLESS NECESSARY

EMR / EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O2 VIA NC OR NRB AS APPROPRIATE

EMT-I85 / AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ANTIEMETIC (IF ACTIVELY VOMITING)
ADULT: ONDANSETRON 4 mg IVP/ODT. MAY REPEAT ONCE IN 10 MINUTES
PEDIATRIC: ONDANSETRON 0.1 mg/kg IVP TO A MAXIMUM SINGLE DOSE OF 4 mg
IF AGE >2 years, MAY GIVE ONDANSETRON 4 mg ODT

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP .
MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
9A – Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult& Pediatric

1. Salvucci AA, Squire B, Burdick M, Luoto M, Brazzel D, Vaezazizi R. Ondansetron is safe and effective for prehospital treatment of nausea and vomiting by paramedics. *Prehosp Emerg Care*. 2011 Jan-Mar;15(1):34-8.
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3. Sharwood LN, Babl FE. The efficacy and effect of opioid analgesia in undifferentiated abdominal pain in children: a review of four studies. *Paediatr Anaesth*. 2009 May;19(5):445-51.
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5. Bailey B, Bergeron S, Gravel J, Bussières JF, Bensoussan A. Efficacy and impact of intravenous morphine before surgical consultation in children with right lower quadrant pain suggestive of appendicitis: a randomized controlled trial. *Ann Emerg Med*. 2007 Oct;50(4):371-8.
6. Gallagher EJ, Esses D, Lee C, Lahn M, Bijur PE. Randomized clinical trial of morphine in acute abdominal pain. *Ann Emerg Med*. 2006 Aug;48(2):150-60, 160.e1-4.
7. Pointer JE, Harlan K. Impact of liberalization of protocols for the use of morphine sulfate in an urban emergency medical services system. *Prehosp Emerg Care*. 2005 Oct-Dec;9(4):377-81.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

9B – SEPSIS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Supportive care
2. IV fluid resuscitation
3. Vasopressor if needed for septic shock refractory to IVF

EMD

ADVISE TO REST IN COMFORTABLE POSITION
ADVISE NO FOOD OR DRINK
ADVISE TO AVOID MOVEMENT UNLESS NECESSARY

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O2 VIA NC OR NRB AS APPROPRIATE

EMT-I85 | AEMT

IV/IO ACCESS IF INDICATED
ADULT: IV NS 250 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: MAY REPEAT ONCE UP TO 20 mL/kg IF NO SIGNS OF PULMONARY EDEMA,
OLMC CONSULT IF ADDITIONAL IV FLUID ORDERS NEEDED

PARAMEDIC

ANTIEMETIC (IF ACTIVELY VOMITING)
ADULT: ONDANSETRON 4 mg IVP/ODT. MAY REPEAT ONCE IN 10 MINUTES

PEDIATRIC: ONDANSETRON 0.1 mg/kg IVP TO A MAXIMUM SINGLE DOSE OF 4 mg
IF AGE >2 years, MAY GIVE ONDANSETRON 4 mg ODT

SEPTIC SHOCK UNRESPONSIVE TO IV/IO FLUIDS AS ABOVE?
ADULT: PHARMACOLOGIC TREATMENT IF SYS BP < 100 mmHg:
NOREPINEPHRINE 2-4 mcg/min TITRATE TO SYS ≥ 100 mmHg
OR
DOPAMINE 5-20 mcg/kg/min TITRATE TO SYS BP ≥ 100 mmHg IF NOREPINEPHRINE NOT AVAILABLE
PEDIATRIC: OLMC CONSULT FOR PHARMACOLOGIC TREATMENT

FEBRILE SEIZURE?
IF SOLITARY AND SHORT DURATION (< 5 MINUTES) – OBSERVE
IF PROLONGED/STATUS EPILEPTICUS, TREAT PER PROTOCOL 6D – SEIZURE

MINIMIZE SCENE TIME IF SEPSIS SUSPECTED
IF CLINICAL CONCERN FOR SEPSIS, NOTIFY RECEIVING ED OF POSSIBLE SEPSIS IN RADIO REPORT
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
9B – Sepsis - Adult & Pediatric

1. Loubani OM, Green RS. A systematic review of extravasation and local tissue injury from administration of vasopressors through peripheral intravenous catheters and central venous catheters. *J Crit Care*. 2015;30:653e9-e17.
2. Ferguson-Myrthil N. Vasopressor use in adult patients. *Cardiol Rev*. 2012 May;20(3):153-8.
3. Vasu TS, Cavallazzi R, Hirani A, Kaplan G, Leiby B, Marik PE. Norepinephrine or dopamine for septic shock: systematic review of randomized clinical trials. *J Intensive Care Med*. 2012 May;27(3):172-8.
4. De Backer D, Aldecoa C, Njimi H, Vincent JL. Dopamine versus norepinephrine in the treatment of septic shock: a meta-analysis. *Crit Care Med*. 2012 Mar;40(3):725-30.
5. Suffoletto B, Frisch A, Prabhu A, Kristan J, Guyette FX, Callaway CW. Prediction of serious infection during prehospital emergency care. *Prehosp Emerg Care*. 2011 Jul-Sep;15(3):325-30.
6. De Backer D, Biston P, Devriendt J, Madl C, Chochrad D, Aldecoa C, Brasseur A, Defrance P, Gottignies P, Vincent JL, SOAP II Investigators. Comparison of dopamine and norepinephrine in the treatment of shock. *N Engl J Med*. 2010 Mar 4;362(9):779-89.
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9C – EPISTAXIS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Epistaxis control
2. Vital signs

EMD

NOSEBLEED CONTROL
PINCH ENTIRE SOFT PART OF NOSE
(RIGHT UNDER NASAL BONE)
HOLD FIRMLY UNTIL HELP ARRIVES
HAVE PATIENT SIT FORWARD AND KEEP STILL
DO NOT SNIFF OR BLOW

EMR | EMT

GENERAL SUPPORTIVE CARE (MEDICAL PT) OR TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE (TRAUMA PT)
HISTORY TO INCLUDE IF PT TAKING ANTIPLATELET AGENT (eg. ASPIRIN) OR ANTICOAGULANT (eg. WARFARIN)

NOSEBLEED CONTROL
POSITION PATIENT SO BLOOD IS NOT SWALLOWED OR ASPIRATED
PINCH ENTIRE SOFT PART OF NOSE RIGHT UNDER NASAL BONE – MAY APPLY NOSE CLAMP TO ASSIST WITH PROLONGED APPLICATION OF DIRECT PRESSURE
IF STILL BLEEDING, HAVE PATIENT BLOW THEIR NOSE TO CLEAR BLOOD CLOTS FROM NASAL PASSAGE
HEMOSTATIC DRESSING IN ANTERIOR NOSTRIL(S) IF INDICATED

OBTAIN VITAL SIGNS

EMT OR HIGHER LICENSE:
ADULT & PEDIATRIC OLDER THAN 12 YEARS OF AGE: PHENYLEPHRINE SPRAY 2 SPRAYS IN AFFECTED NOSTRIL(S)
COMPRESS NOSE IMMEDIATELY AFTER ADMINISTRATION OF PHENYLEPHRINE SPRAY

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
9C – Epistaxis – Adult& Pediatric

1. Smith J, Siddiq S, Dyer C, Rainsbury J, Kim D. Epistaxis in patients taking oral anticoagulant and antiplatelet medication: prospective cohort study. *J Laryngol Otol*. 2011 Jan;125(1):38-42.
2. Rainsbury JW, Molony NC. Clopidogrel versus low-dose aspirin as risk factors for epistaxis. *Clin Otolaryngol*. 2009 Jun;34(3):232-5.
3. Pallin DJ, Chng YM, McKay MP, Emond JA, Pelletier AJ, Camargo CA Jr. Epidemiology of epistaxis in US emergency departments, 1992 to 2001. *Ann Emerg Med*. 2005 Jul;46(1):77-81.
4. Leong SC, Roe RJ, Karkanevatos A. No frills management of epistaxis. *Emerg Med J*. 2005 Jul;22(7):470-2.
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9D – PAIN MANAGEMENT (ACUTE ONSET & CHRONIC TYPE) ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Vital signs
2, Opiate analgesia as clinically appropriate per protocol

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
DO NOT MOVE THE PATIENT UNLESS IN DANGER
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

GENERAL SUPPORTIVE CARE (MEDICAL PT) OR TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE (TRAUMA PT)
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (when available)

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg
REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ANALGESIA (IF REQUIRED – PARAMEDIC DISCRETION, PARTICULARLY WITH CHRONIC PAIN SYMPTOMS)

FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
9D – Pain Management (Acute Onset & Chronic Type) – Adult & Pediatric

1. Karlsen AP, Pedersen DM, Trautner S, Dahl JB, Hansen MS. Safety of intranasal fentanyl in the out-of-hospital setting: a prospective observational study. *Ann Emerg Med*. 2014 Jun;63(6):699-703.
2. Auffret Y, Gouillou M, Jacob GR, Robin M, Jenvrin J, Soufflet F, Alavi Z. Does midazolam enhance pain control in prehospital management of traumatic severe pain? *Am J Emerg Med*. 2014 Jun;32(6):655-9.
3. Bendall JC, Simpson PM, Middleton PM. Effectiveness of prehospital morphine, fentanyl, and methoxyflurane in pediatric patients. *Prehosp Emerg Care*. 2011 Apr-Jun;15(2):158-65.
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5. Middleton PM, Simpson PM, Sinclair G, Dobbins TA, Math B, Bendall JC. Effectiveness of morphine, fentanyl, and methoxyflurane in the prehospital setting. *Prehosp Emerg Care*. 2010 Oct-Dec;14(4):439-47.
6. Yuan Y, Chen JY, Guo H, Zhang Y, Liang DM, Zhou D, Zhao H, Lin F. Relief of abdominal pain by morphine without altering physical signs in acute appendicitis. *Chin Med J* (Engl). 2010 Jan 20;123(2):142-5.
7. Sharwood LN, Babl FE. The efficacy and effect of opioid analgesia in undifferentiated abdominal pain in children: a review of four studies. *Paediatr Anaesth*. 2009 May;19(5):445-51.
8. Thomas SH, Shewakramani S. Prehospital trauma analgesia. *J Emerg Med*. 2008 Jul;35(1):47-57.
9. Bailey B, Bergeron S, Gravel J, Bussières JF, Bensoussan A. Efficacy and impact of intravenous morphine before surgical consultation in children with right lower quadrant pain suggestive of appendicitis: a randomized controlled trial. *Ann Emerg Med*. 2007 Oct;50(4):371-8.
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11. Gallagher EJ, Esses D, Lee C, Lahn M, Bijur PE. Randomized clinical trial of morphine in acute abdominal pain. *Ann Emerg Med*. 2006 Aug;48(2):150-60, 160.e1-4.
12. Kanowitz A, Dunn TM, Kanowitz EM, Dunn WW, Vanbuskirk K. Safety and effectiveness of fentanyl administration for prehospital pain management. *Prehosp Emerg Care*. 2006 Jan-Mar;10(1):1-7.
13. Pointer JE, Harlan K. Impact of liberalization of protocols for the use of morphine sulfate in an urban emergency medical services system. *Prehosp Emerg Care*. 2005 Oct-Dec;9(4):377-81.
14. Thomas SH, Rago O, Harrison T, Biddinger PD, Wedel SK. Fentanyl trauma analgesia use in air medical scene transports. *J Emerg Med*. 2005 Aug;29(2):179-87.
15. McManus JG Jr, Sallee DR Jr. Pain management in the prehospital environment. *Emerg Med Clin North Am*. 2005 May;23(2):415-31.
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9E – DIALYSIS-RELATED ISSUES ADULT & PEDIATRIC

TREATMENT PRIORITIES:

1. Circulatory support
   - External bleeding control
   - Hypotension treatment with fluids and/or vasopressors
   - If hyperkalemia, calcium chloride first medication
   - Vascular access precaution: avoid fistulas/graft/shunt
2. Hypoglycemia care

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

CPR BY EMD INSTRUCTION (if applicable)
CONTROL ANY BLEEDING
WITH DIRECT PRESSURE
ADVISE REST

EMR / EMT

GENERAL SUPPORTIVE CARE
OBTAIN VS

DIALYSIS PORT/CATHETER/FISTULA BLEEDING?
DIRECT PRESSURE
HEMOSTATIC AGENT
TOURNIQUET PROXIMAL TO FISTULA IF BLEEDING SEVERE & UNCONTROLLABLE ON EXTREMITY

ADULT & PEDIATRIC WEIGHT ≥25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO
PEDIATRIC WEIGHT <25 kg HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, ½ tube ORAL GLUCOSE (7.5 grams) PO

EMT - I85 / AEMT

VASCULAR ACCESS?
IN MANY SITUATIONS, DIALYSIS PROFESSIONALS WILL LEAVE CATHETER IN PLACE TO USE AS IV PRN
DO NOT INITIATE IV USING EMS CATHETERS IN FISTULA/GRAFT/SHUNT – VASCULAR DAMAGE CAN OCCUR
USE IO ACCESS IF IV ACCESS UNOBTAINABLE

SYMPTOMATIC HYPOTENSION?
ADULT & PEDIATRIC: 10 mL/kg (MAX OF 500 mL IF ANURIC) NS IV/IO BOLUS IF NO SIGNS OF PULMONARY EDEMA

HYPOGLYCEMIA?
ADULT & PEDIATRIC WEIGHT ≥25 kg: IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP/IOP UP TO 50 mL

PARAMEDIC

CARDIAC ARREST OR VENTRICULAR DYSRHYTHMIA FROM KNOWN/SUSPECTED HYPERKALEMIA?
ADULT/PEDIATRIC: CALCIUM CHLORIDE 10 mg/kg IVP/IOP (MAX 1 gram) & SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)

CARDIAC ARREST FROM PRE-EXISTING METABOLIC ACIDOSIS?
ADULT/PEDIATRIC: SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)

SYMPTOMATIC HYPOTENSION WITHOUT IMPROVEMENT AFTER 10 mL/kg IVF (MAX 500 mL IF ANURIC)?
ADULT: PHARMACOLOGIC TREATMENT IF SYS BP < 100 mmHg:
NOREPINEPHRINE 2-4 mcg/min TITRATE to SYS ≥ 100 mmHg **OR**
DOPAMINE 5-20 mcg/kg/min TITRATE TO SYS BP ≥ 100 mmHg
PEDIATRIC: OLMC CONSULT FOR PHARMACOLOGIC TREATMENT

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
9E – Dialysis-Related Issues - Adult & Pediatric

1. Protocol expert consultant: Sunil Agrawal, MD. Nephrology Specialists of Oklahoma, Tulsa. Board certified in nephrology and internal medicine by the American Board of Internal Medicine.
2. Lin CH, Tu YF, Chiang WC, Wu SY, Chang YH, Chi CH. Electrolyte abnormalities and laboratory findings in patients with out-of-hospital cardiac arrest who have
3. kidney disease. *Am J Emerg Med.* 2013 Mar;31(3):487-93
4. De Backer D, Biston P, Devriendt J, Madl C, Chochrad D, Aldecoa C, Brasseur A, Defrance P, Cottignies P, Vincent J for the SOAP II Invesigators. Comparison of dopamine and norepinephrine in the treatment of shock. *NEJM*. 2010;362:779-89.
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6. Venkat A, Kaufmann KR, Venkat K. Care of the end-stage renal disease patient on dialysis in the ED. *Am J Emerg Med*. 2006 Nov;24(7):847-58.
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9F – INFECTIOUS DISEASE PRECAUTION RECOMMENDATIONS EMS PROFESSIONALS

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

In the course of EMS care of a patient (from time of emergency services request through transport of the patient to the destination location), EMS professionals should be informed, aware, and proactive regarding practices that reduce their exposure to infectious diseases, with a goal of preventing transmission of those infectious diseases to and/or through EMS professionals.

The following recommendations are general guidelines that will assist in reducing exposure to infectious diseases in the commission of EMS treatment of patients.

1. Follow immunization recommendations from Centers for Disease Control Advisory Committee on Immunization Practices (ACIP) (eg. Hepatitis B and Flu vaccinations)
2. Always be prepared for isolation from body substances (blood, respiratory secretions, sputum, saliva, emesis, fecal matter).
3. Wear examination gloves (in most situations, non-sterile type) during patient care activities.
4. If patient conditions tolerate, reduce exposure of suspected infectious respiratory droplets by covering the patient's nose and mouth in oxygen administration (eg. non-rebreather mask) or with a face mask (eg. surgical type face mask) if oxygen administration is not required.
5. When providing airway assessment and management, maximize the functional distance between the patient's nose and mouth and the EMS professional's nose and mouth. The greater the possible distance, the lesser the risk of respiratory illness transmission.
6. Wear appropriate body substance isolation (eye splash protection, mask over nose/mouth, gloves as previously noted, gown to protect personal uniform contamination) as patient suspected illness/injury may dictate.
7. During treatment of the patient, avoid likely trajectories of bleeding, coughing, spitting, vomiting, defecating whenever possible.
8. Exercise extremely diligent action when handling or around the handling of contaminated sharps (eg. IV/IO needles, needle/syringe, glucometry lancets) and have appropriate sharps container readily present at patient side and on ambulance.
9. For all exposures, wash exposed area(s) as soon as possible with copious irrigation and/or antibacterial solution approved for that area(s) use.
10. In the event of exposure, follow general principles as listed in Protocol 9G – Post-Exposure Prophylaxis Recommendations as well as agency-specific policies. Do not delay in reporting and seeking treatment for an infectious disease/body substance exposure of concern.

Medical Literature References
9F – Infectious Disease Precaution Recommendations – EMS Professionals

1. Isakov A, Miles W, Gibbs S, Lowe J, Jamison A, Swansiger R. Transport and management of patients with confirmed or suspected ebola virus disease. *Ann of Emerg Med*. 2015;Sep 66(3):297-306.
2. Torres M, Hansen KN, Jerrard D. Ebola: a review for emergency providers. *Emerg Med Clin North Am*. 2015 May;33(2):e1-18.
3. Lowe JJ, Jelden KC, Schenarts PJ, Rupp LE Jr, Hawes KJ, Tysor BM, Swansiger RG, Schwedhelm SS, Smith PW, Gibbs SG. Considerations for safe EMS transport of patients infected with ebola virus. *Prehosp Emerg Care*. 2015 Apr-Jun;19(2):179-83.
4. Meyers L, Frawley T, Goss S, Kang C. Ebola virus outbreak 2014: clinical review for emergency physicians. *Ann Emerg Med*. 2015 Jan;65(1):101-8.
5. Bledsoe BE, Sweeney RJ, Berkeley RP, Cole KT, Forred WJ, Johnson LD. EMS provider compliance with infection control recommendations is suboptimal. *Prehosp Emerg Care*.2014 Apr-Jun;18(2):290-4.
6. Centers for Disease Control (CDC) resources to prevent Healthcare Associate Infections (HAIs) at http://www.cdc.gov/HAI/prevent/ppe.html accessed 7/1/12.
7. Occupational Safety Health Administration Bloodborne Pathogens Standard. 29 CFR 1910.1030 at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051 accessed 7/1/12.
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9. El Sayed M, Kue R, McNeil C, Dyer KS. A descriptive analysis of occupational health exposures in an urban emergency medical services system: 2007-2009. *Prehosp Emerg Care*. 2011 Oct-Dec;15(4):506-10.
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14. Chapman LE, Sullivent EE, Grohskopf LA, Beltrami EM, Perz JF, Kretsinger K, Panlilio AL, Thompson ND, Ehrenberg RL, Gensheimer KF, Duchin JS, Kilmarx PH, Hunt RC. Postexposure interventions to prevent infection with HBV, HCV, or HIV, and tetanus in people wounded during bombings and other mass casualty events--United States, 2008: recommendations of the Centers for Disease Control and Prevention and Disaster Medicine and Public Health Preparedness. *Disaster Med Public Health Prep*. 2008 Oct;2(3):150-65.
15. Panlilio AL, Cardo DM, Grohskopf LA, Heneine W, Ross CS; U.S. Public Health Service. Updated U.S. Public Health Service guidelines for the management of occupational exposures to HIV and recommendations for postexposure prophylaxis. *MMWR Recomm Rep*. 2005 Sep 30;54(RR-9):1-17.
16. Miller NL, Gudmestad T, Eisenberg MS. Development of model infectious disease protocols for fire and EMS personnel. *Prehosp Emerg Care*. 2005 Jul-Sep;9(3):326-32.
17. Datta SD, Armstrong GL, Roome AJ, Alter MJ. Blood exposures and hepatitis C virus infections among emergency responders. *Arch Intern Med*. 2003 Nov 24;163(21):2605-10.
18. Rinnert KJ, O'Connor RE, Delbridge T. Risk reduction for exposure to blood-borne pathogens in EMS. National Association of Emergency Medical Services Physicians. *Prehosp Emerg Care*. 1998 Jan-Mar;2(1):62-6.

9G – POST-EXPOSURE PROPHYLAXIS RECOMMENDATIONS ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Preventing an exposure is always better than the "cure" for an exposure. Despite careful practices, EMS professionals can experience at least one concerning infectious disease exposure in a career.

Every EMS organization should have a pre-planned course of rapid, clinically-effective action steps (regardless of time of day, day of week) to be followed in the event of EMS professionals sustaining concerning occupational exposures to infectious diseases. The Medical Director should be involved in the planning of post-exposure evaluation and post-exposure prophylaxis (PEP) care.

The following recommendations are general guidelines that can assist in post-exposure evaluation and PEP care:

1. Wash exposed area(s) as soon as possible with copious irrigation and/or antibacterial solution approved for that area(s) use.
2. Gather as much information about the exposure of concern as possible – what body substance (eg. blood, saliva), what route of exposure, timing/amount of exposure, patient demographics, location of the exposure source (e.g. in the emergency department at "any town" hospital), and any related infectious disease medical history of the patient (eg. known HIV or Hepatitis C?).
3. Do not delay in reporting and seeking treatment for an infectious disease/body substance exposure of concern. Regardless of time of day or day or week, seek direction from the appropriate EMS supervisor and/or report to the employer's pre-designated PEP health care facility immediately after the patient's care can be transferred to other healthcare providers. Time to treatment (in hours) is of the essence to reduce transmission of infectious disease.
4. A national resource exists for real-time PEP care. This clinical resource is maintained at the University of California at San Francisco/San Francisco General Hospital. **Treating physicians can access phone advice (PEP line) at 1-888-448-4911 in the evaluation and treatment for occupational events concerning for exposure to HIV, hepatitis, and other blood-borne pathogens. The PEP line is answered from 0800-0100 Central Standard Time except on holidays. Messages left during unanswered hours are returned during the next operational morning.**

PROTOCOL 9G: Post-Exposure Prophylaxis Recommendations – Adult & Pediatric, cont

5. Additional information on PEP care can be obtained at the following website: http://www.nccc.ucsf.edu/clinical-resources/prep-guidelines-and-resources/
6. The Oklahoma State Department of Health has a policy and reporting form for EMS professional use in the event of an occupational exposure to infectious disease of concern. The information and form can be accessed at the following website: https://www.ok.gov/health2/documents/HIV-CommunicableDiseaseRiskExposureReport.pdf A copy of this form (OSDH Form 207) can be found in Section 19 of these protocols.

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9G – Post-Exposure Prophylaxis Recommendations – Adult & Pediatric

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3. OSDH Form 207 at http://www.ok.gov/health/documents/HIV-Communicable%20Disease%20Risk%20Exposure%20Report.pdf accessed 7/1/12.
4. Centers for Disease Control (CDC) resources to prevent Healthcare Associate Infections (HAIs) at http://www.cdc.gov/HAI/prevent/ppe.html accessed 7/1/12.
5. Occupational Safety Health Administration Bloodborne Pathogens Standard. 29 CFR 1910.1030 at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10051 accessed 7/1/12.
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9H - VASCULAR ACCESS - INTRAVENOUS ADULT & PEDIATRIC

EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

1. Vascular access for intravenous administration of crystalloid fluids in hypotension and/or volume insufficiency.
2. Vascular access for intravenous administration of medications for a multitude of medically indicated effects.
3. Vascular access in a patient with an increased potential for needing either of the above indications.

Contraindications:

1. None absolute, though despite aseptic technique and using sterile angiocatheters, there is always a risk of introducing infection when the skin integrity is violated. Do not establish IV access unless directed by applicable treatment protocol(s) or the patient meets one of the indications above.
2. Venous sites distal to a fracture.
3. Venous site underlying cellulitis/abscess.

Technique:

A. Extremity:

1. Apply IV tourniquet proximal to proposed vascular access site.
2. Clean insertion site with ChloraPrep®, Betadine®, or alcohol prep.
3. Stabilize vein in place by applying gentle traction on vein distal to point of entry.
4. Puncture the skin with the bevel of the needle upward about 0.5 - 1 cm from the vein and enter the vein from the side or from above.
5. Note blood return and advance the catheter over the needle.
6. Remove needle and connect IV line. Note: venous blood for laboratory work may be drawn with syringe before connecting IV line.
7. Release IV tourniquet.
8. Open IV tubing clamp full to check flow and placement, then slow rate to TKO or as indicated by applicable treatment protocol.
9. Secure catheter and tubing with tape or commercial device in a manner that reduces traction upon the catheter.
10. Anchor with an arm board or splint if the catheter is likely to be dislodged.
11. Recheck IV patency periodically to minimize occurrence of unrecognized fluid/medication extravasation.

PROTOCOL 9H: Vascular Access - Intravenous – Adult & Pediatric, cont.

Technique:

B. External Jugular Vein – for peripheral venous access in a patient in extremis only.
Anatomical landmarks, including the vein, must be visible – no "blind" sticks.
Avoid multiple attempts and avoid attempts on both sides – use IO access prn.

1. Position the patient supine, head down (this may not be necessary or desirable if congestive heart failure or respiratory distress present). Turn patient's head to opposite side from procedure. (Maintain cervical spine alignment if cervical spinal injury suspected; do not attempt external jugular vein cannulation in suspected cervical spine injury patients.)
2. Expose vein by having patient bear down if possible, and "tourniquet" vein with finger pressure just above clavicle.
3. Clean insertion site with ChloraPrep®, Betadine®, or alcohol prep.
4. Stabilize vein in place by applying gentle traction on vein distal to point of entry.
5. Align the cannula in the direction of the vein, with the point aimed toward the shoulder on the same side.
9. Puncture skin over vein first, then puncture vein itself. Use other hand to traction vein near clavicle to prevent rolling.
10. Proceed as with extremity vein. Do not wrap any tape/retaining device around the circumference of neck to stabilize IV catheter/line.

Complications:

1. Local: hematoma formation, infection, thrombosis, phlebitis.
2. Systemic: bacteremia/sepsis, catheter fragment embolus.

Additional Notes:

A. Antecubital veins are useful access sites for patients in shock, but if possible, avoid areas near joints (or splint well!).
B. The point between the junction of two veins is more stable and often easier to use.
C. Start distally and, if successive attempts are necessary, make more proximal attempts.
D. The most difficult problem with IV insertion is to know when to try and when to stop trying. If the procedure is not accomplished after two attempts or two minutes, the EMT – I85 or higher licensed EMS professional must consider expediting other care, including transport to the emergency department, with further attempts enroute. This does not pertain to the trauma patient where rapid transport is advised with IV's performed enroute to the hospital.
E. Renal dialysis fistulas and surgically implanted ports should not be used for vascular access. Use IO access in critical patient situations otherwise.
F. Saline locks may be utilized in place of crystalloid infusions/IV lines in conditions less likely to require rapid administration of IV fluid.

Medical Literature References
9H - Vascular Access – Intravenous - Adult & Pediatric

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9I - VASCULAR ACCESS - INTRAOSSEOUS
ADULT & PEDIATRIC

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

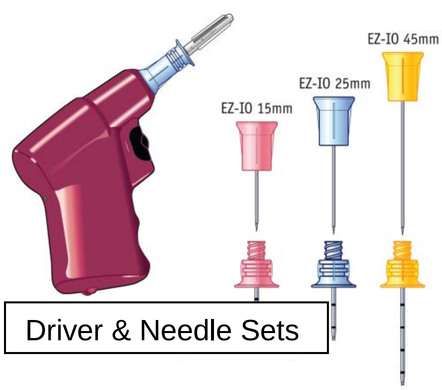
Indications:

1. First-choice access in cardio/pulmonary arrest (unless IV access can be achieved as timely).
2. Second-choice access in dynamic, life-threatening shock or respiratory failure (if IV access cannot be achieved in clinically needed time).

Contraindications:

1. Inability to locate anatomical landmarks (blind insertion contraindicated).
2. Suspected cellulitis at insertion site.
3. Suspected acute or non-healed fracture proximal to foot in same leg (proximal tibial insertion) or proximal to forearm in same arm (humeral head insertion).
4. Suspected total knee arthroplasty/replacement (proximal tibial insertion).
5. Suspected markedly poor circulation extremity (history of amputation, gangrene, bypass).

Technique (EZ-IO® System):



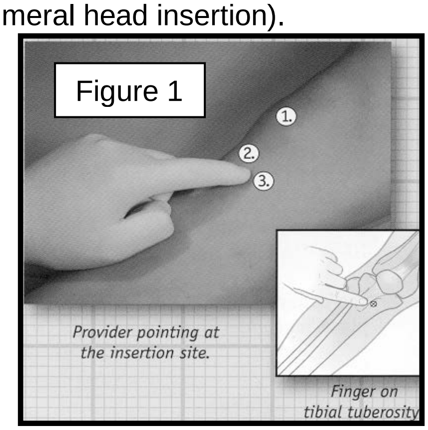
Driver & Needle Sets

A. Assemble following materials:
   1. Driver with Needle Set based on patient size and weight:
      15mm 3-39 kg (PINK);
      25mm 40 kg and greater (BLUE);
      45mm 40 kg and greater (excessive tissue) (YELLOW).
   2. EZ-Connect® 90 degree connection set.
   3. Alcohol wipe (or ChloraPrep® or equivalent if available).
   4. Saline flush syringe.
   5. 1 mg/kg Lidocaine (up to 40mg) for intraosseous push if patient responsive.
   6. Pressure infuser.
   7. EZ-IO®Stabilizer (optional if proximal tibia insertion; required if humeral head insertion).

B. Locate insertion site:
   1. Proximal tibia site (Figure 1).

   2 Palpate patella (1). Palpate tibial tuberosity (2) approximately two fingers widths below patella in adults and adolescents, or one finger width below patella in smaller pediatrics. Insertion (3) at one finger width medial to tibial tuberosity in the tibial plateau.

Figure 1



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PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.

B. Locate insertion site (cont.)

2. Humeral head site. Extra precision should be taken when utilizing this site. The anatomy proves more difficult to locate, the insertion area is smaller, and the IO needle is more prone to dislodgement due to a thinner bony cortex and higher likelihood of inadvertent EMS provider contact with the IO line.

   Position arm in 90 degree flexion, with elbow kept to side of trunk (Figure 2). This position helps to gain maximal "exposure" of the humeral head.

   Palpate and identify the mid-shaft humerus and continue palpating with a thumb proximal toward the humeral head. Near the shoulder, note a small protrusion. This is the base of the greater tubercle insertion site. With the opposite hand "pinching" the anterior and inferior aspects of the humeral head, confirm the identification of the greater tubercle in the midline of the humerus. (Figure 3).

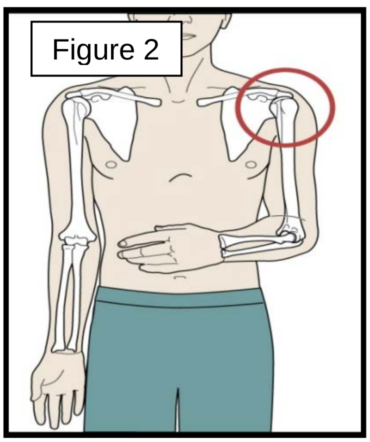
Figure 2

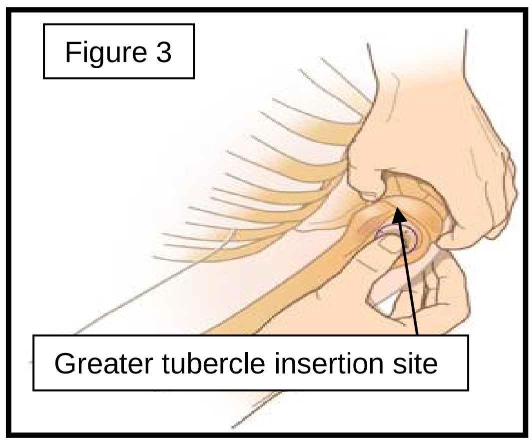
Figure 3

C. Clean insertion site with alcohol wipe, or preferably with ChloraPrep® or equivalent swab.

D. Access the intraosseous space.

1. Stabilize anatomy near the insertion site with non-dominant hand.
2. Position driver at insertion site with needle at 90 degree angle to the surface of the bone. Use driver to insert needle through the skin at the insertion site until you feel the needle tip encounter bone. Allow the driver to perform its function of progressively inserting the needle. Avoid strong, downward pressure on the needle and maintain constant driver drilling speed. (Figure 4 next page – proximal tibia insertion site depicted)
3. Once the bone cortex feels encountered, ensure use of proper sized needle by checking for visualization of at least one 5 mm mark line (solid black circumferential line on the needle). If at least one 5mm mark line is not visible, a longer needle will be required to achieve useable intraosseous access. (Figure 5 next page)

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PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.

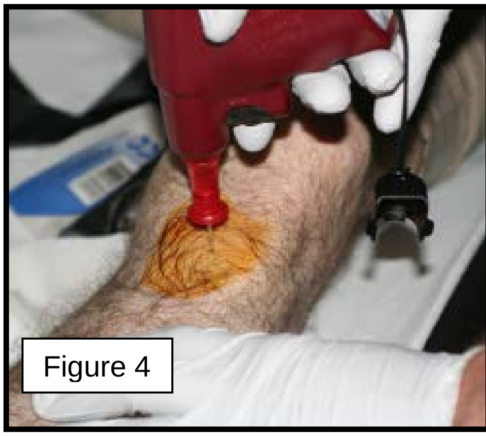

Figure 4

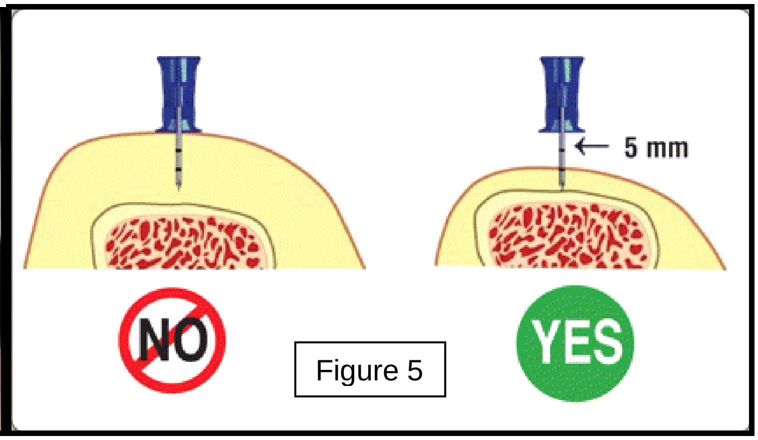

Figure 5

4. Resume use of driver to insert a properly-sized needle through the bony cortex and into the bony marrow (evident with a sudden decrease in resistance to needle insertion), maintaining the 90 degree angle to the surface of the skin. Most typically, properly-sized needles will have their hub resting on the skin surface at the time the needle tip is correctly in the marrow space.

E. While stabilizing the needle hub with a thumb and an index finger, disengage the driver from the needle in a gentle, upward motion.

F. While still stabilizing the needle hub with a thumb and an index finger, remove the stylet by rotating it counterclockwise until disengaged.

G. Do NOT attempt aspiration of blood or marrow via the catheter. Pulling marrow into the catheter may clog the catheter and prevent its use for needed fluid and/or medication administration. Do confirm proper EZ-IO® catheter placement using a combination of the following signs:

   a. IO catheter rests at 90 degree angle and feels firmly in bone when grasping hub.
   b. Blood-tinged marrow oozes spontaneously from hub (may often be absent, yet the catheter is still correctly placed).
   c. Fluid and medication administration is possible without significant resistance and without extravasation.

H. When using the proximal tibia insertion site, use of the EZ-Stabilizer® (Figure 6 – next page) is optional and its use is determined by the EMT-Intermediate's or EMT-Paramedic's judgment. When using the humeral head insertion site, use of the EZ-Stabilizer® is required to reduce the chances of inadvertent dislodgement (refer to earlier discussion of humeral head insertion site). If the EZ-Stabilizer ® is used, it must be applied prior to connecting the 90 degree connector set to the catheter hub.

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PROTOCOL 9I: Vascular Access - Intraosseous, Adult & Pediatric, cont.

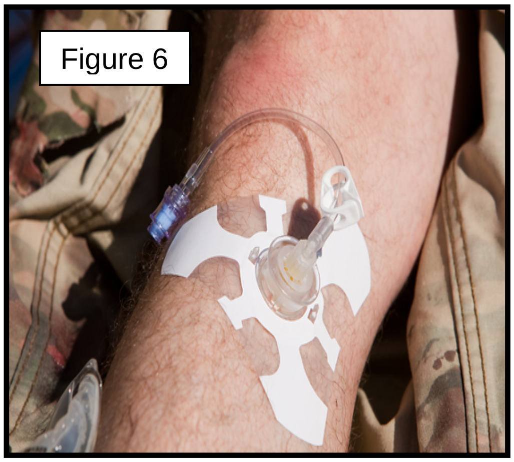
Figure 6

I. The EZ-Connect® 90 degree connector set (also seen in Figure 6) is used to prevent excessive pressure on the catheter when infusing fluids or administering medications. Failure to use the 90 degree connector set can cause inadvertent dislodgement due to excessive pressure down the catheter. Flush the EZ-Connect® set with Normal Saline prior to attaching it to the catheter hub and then flush the line to flush the catheter with 10mL Normal Saline if patient unresponsive or Lidocaine 2% 1 mg/kg up to 40mg slow intraosseous push if the patient is responsive and clearly able to sense pain. If using Lidocaine as directed, follow with 10mL Normal Saline flush.

J. Medication administration is given in the same dosing as with IV administrations.

K. Fluid administration will require the use of a pressure infuser on the IV fluid bag. Due to the increased pressure of the marrow space, IV fluid will not infuse without assistance of the pressure infuser. Inflate pressure infuser until IV fluid is seen infusing with constant flow. Monitor for extravasation and monitor for need to reinflate pressure infuser. Fluid delivery rate may be as high as 1 liter per hour at tibial site and up to 5 liters per hour at humeral head site.

L. In determining the site for IO access, consider knowledge of the anatomy, prior training and comfort in accessing that particular site, and how IO access at that site may or may not interfere with other care events (eg. use of the humeral head site for medication administration in cardiac arrest could disrupt the continuity of chest compressions).

<u>Complications of intraosseous line placement attempts:</u>

Through and through bone penetration – avoid by using correct needle and insertion technique. Extravasation – avoid by using correct needle and insertion technique. Monitor ongoing use and stop at early signs of extravasation. Fracture of bone – avoid by using correct insertion technique (avoid excessive pressure). Infection – avoid by using aseptic technique and do not insert through suspected cellulitis. Growth plate injury in pediatrics – avoid by choosing correct insertion site.

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9J – INDWELLING CENTRAL VASCULAR DEVICE MANAGEMENT ADULT & PEDIATRIC

PARAMEDIC

Indications:

Use and/or monitoring of indwelling central venous devices.

Contraindications:

1. Central venous ports – easily permanently damaged with wrong needle or infected.
2. Suspected infection in the indwelling central venous devices
3. Easy peripheral venous access available or already established.

Technique:

Indwelling central venous devices may become irreversibly damaged if wrong needles and techniques occur. In general, avoid the use of indwelling central venous devices unless already in use (during an interfacility transfer) or in the case of a peripherally inserted central catheter (PICC) line, peripheral venous access is not readily available or already established.

In the setting of interfacility transfer, indwelling central venous device(s) must be reviewed with either the transferring practitioner/physician or appropriate nursing personnel prior to conducting the interfacility transfer. Potential complications during transfer should be discussed and contingency plans reviewed.

During packaging, patient movement, and throughout the interfacility transfer, perform periodic inspection and assessment of indwelling central venous devices and take precautions to avoid inadvertent dislodgement of such devices.

If the need arises to access a PICC line, clean the port with ChloraPrep®, Betadine®, or an alcohol wipe. Aspirate 4 - 5 mL of fluid and discard (to remove any anticoagulant in the line) prior to infusing fluid or administering medication. Flush 10 mL of saline in the PICC line after administering a medication. Maintain aseptic technique throughout all handling of the PICC line.

If a closed cap on the line is required to be removed to access the indwelling central venous device, make sure the line is clamped to avoid introduction of an air embolus.

Contact OLMC early for any needed advice or direction in the use of an indwelling central venous device.

Medical Literature References
9J – Indwelling Central Vascular Device Management – Adult & Pediatric

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9K – MEDICATION ADMINISTRATION
ADULT & PEDIATRIC

Prior to all medication administrations, assure the "5 Rights" are reviewed:

1. **Right Patient**
2. **Right Route**
3. **Right Dose**
4. **Right Time**
5. **Right Medication**

If any one of these "rights" is "wrong", stop and do not administer the medication!

Specific routes of medication administration:

EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

9Ka: Intravenous / Intraosseous – Adult & Pediatric:
1. Assure that the IV / IO line is patent.
2. Cleanse the access port nearest the IV / IO site with alcohol prep.
3. Eject any air from syringe and insert needle or adapter into access port.
4. Pinch the IV /IO line above the medication port. This prevents the medication from traveling toward the IV bag, forcing it instead toward the patient.
5. Inject the medication as specified per appropriate treatment protocol.
6. Remove the needle or adapter and release the tubing.
7. Open the flow regulator to allow 10 – 20 mL fluid flush.

PROTOCOL 9K: Medication Administration – Adult & Pediatric, cont.

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

9Kb: Intramuscular/Subcutaneous Injection – Adult & Pediatric:

1. Use a 1 inch to 1.5 inch long 21 to 25 gauge needle on a syringe.
2. Select injection site (if IM, deltoid, lateral thigh, or upper/outer quadrant of gluteus; if SubQ, arm or lateral thigh).
3. Cleanse the injection site with alcohol prep.
4. Eject any air from syringe.
5. If IM, stretch skin over injection site and insert needle 90 degrees to skin surface, through skin into muscle, aspirate and if no blood return, inject medication.
6. If SubQ, pinch skin in a fold over injection site and insert needle 45 degrees to skin surface, through skin into subcutaneous fatty tissue, aspirate and if no blood return, inject medication.
7. Remove needle and put bandage over the injection site

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

9Kc: Intranasal – Adult & Pediatric, technique:

1. Use a medication nasal atomization device on a syringe.
2. Eject any air from syringe.
3. Place the atomizer tip approximately 1.5 cm within the nostril.
4. Briskly compress the syringe plunger to spray atomized solution into the nasal cavity/onto the nasal mucosa (gently pushing the plunger will not result in atomization).

PROTOCOL 9K: Medication Administration – Adult & Pediatric, cont.

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

9Kd: Sublingual/Oral – Adult & Pediatric:

1. Instruct, assist, or place the tablet or spray under the tongue (sublingual) or in the mouth (oral)/on the tongue (oral dissolving).

PARAMEDIC

9Ke: Ocular – Adult & Pediatric:

1. Don't touch the tip of the medication container to any part of the eye or face.
2. Pull the lower eyelid down while avoiding any ocular (eyeball) pressure.
3. Instill eye drop(s) in the space between the eyelid and the eyeball.

PARAMEDIC

9Kf: Intravascular Infusion Management – Adult & Pediatric:

1. Assure that the IV / IO line is patent.
2. Cleanse the access port nearest the IV / IO site with alcohol prep.
3. Flush any air from infusion line/set and insert needle or adapter into access port.
4. Unless simultaneously giving an IV fluid bolus, close off the IV line above the medication port. This prevents the medication from traveling toward the IV bag, forcing it instead toward the patient.
5. Infuse the medication as specified per appropriate treatment protocol.

Medical Literature References
9K–Medication Administration– Adult & Pediatric

1. Rech MA, Barbas B, Chaney W, Greenhalgh E, Turck C. When to pick the nose: out-of-hospital and emergency department intranasal administration of medications. *Ann Emerg Med*. 2017;70:203-211.
2. Arthur AO, Goodloe JM, Thomas SH. Subcutaneous fluid administration: a potentially useful tool in prehospital care. *Emerg Med Int*. 2012;2012:904521. Epub 2012 May 9.
3. Göransson KE, Johansson E. Indication and usage of peripheral venous catheters inserted in adult patients during emergency care. *J Vasc Access*. 2011 Jul-Sep;12(3):193-9. doi: 10.5301/JVA.2010.5967.
4. Vilke GM, Tornabene SV, Stepanski B, Shipp HE, Ray LU, Metz MA, Vroman D, Anderson M, Murrin PA, Davis DP, Harley J. Paramedic self-reported medication errors. *Prehosp Emerg Care*. 2006 Oct-Dec;10(4):457-62.
5. Abarbanell NR. Prehospital pharmacotherapeutic interventions: recommendations for medication administration by EMT-A and EMT-I personnel. *Am J Emerg Med*. 1994 Nov;12(6):625-30.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 9L - Nasogastric/Orogastric Tube – Adult

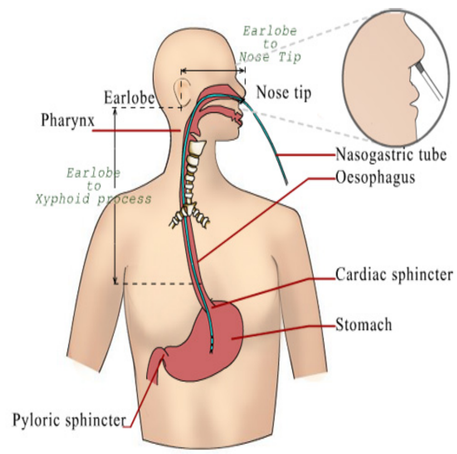
PARAMEDIC

Indications:

1. Decompression of ventilated air in stomach (reduction of gastric distension) in the cardiac arrest patient. (may be placed pre or post intubation)
2. Decompression of ventilated air in stomach (reduction of gastric distension), compromising oxygenation/ventilation in the unconscious, intubated patient.

Contraindications:

1. Suspected basilar skull fracture
2. Suspected mid-facial fractures
3. Known or suspected actively bleeding esophageal varices



Technique:

1. Select correct size gastric tube. Adult patients typically require size 16 to 18 French gastric tubes.
2. Measure length of gastric tube to pass by starting with tip just at xiphoid process, then using distance to earlobe and over to tip of nose (Figure).
3. Mark the measured length of tube with a piece of tape.
4. Lubricate tip of tube with water soluble lubricant if inserting nasally.
5. Nasal insertion: direct gastric tube along the floor of nostril to the posterior nasopharynx, then feed the gastric tube through the oropharynx down the esophagus and into the stomach, stopping when taped mark nears nostril.
6. Oral insertion: direct gastric tube along tongue to posterior oropharynx, then feed the gastric tube down the esophagus and into the stomach, stopping when taped mark nears lips.
7. Confirm correct gastric placement of gastric tube by injecting 10 to 20 mL of air while auscultating over the stomach for a "swoosh" or "burping/bubbling" indicating the gastric tube tip lies within the stomach. Confirm absence of similar sounds in the lungs by auscultating in the mid-axillary line bilaterally while repeating the injection of small mL volumes of air.
8. Tape the tube in place on the nose or on around the mouth. Alternatively, some commercial types of endotracheal tube holders can be used to secure gastric tubes if passed orally.
9. Attach gastric tube to low pressure suction and observe for gastric decompression.

Troubleshooting:

1. Abort gastric tube passage attempts if unsuccessful in three attempts.
2. Repetitive coughing indicates the gastric tube is erroneously passing down the trachea. Tracheal/bronchial stimulation in gastric tube passage will typically provoke strong coughing reflex. Promptly withdraw tracheally placed gastric tubes to avoid aspiration. An endotracheal tube will not prevent inadvertent passage of a gastric tube down the trachea.
3. Avoid lavage or medications via gastric tube. Use is for gastric decompression.

Medical Literature References
9L - Nasogastric/Orogastric Tube – Adult

1. Leschke RR. Chapter 47. Nasogastric Intubation. In: Reichman EF, Simon RR, eds. Emergency Medicine Procedures. New York: McGraw-Hill; 2004. http://www.accessemergencymedicine.com/content.aspx?aID=50768. Accessed June 30, 2012.
2. Witting MD. "You wanna do what?!" Modern indications for nasogastric intubation. *J Emerg Med*. 2007 Jul;33(1):61-4.
3. Metheny N. Achieving successful nasogastric tube placements in emergency situations. *Am J Crit Care*. 2000 Sep;9(5):303-4, 306.

9M – SUSPECTED ABUSE/NEGLECT ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:
1. Concern for child abuse and/or neglect.
2. Concern for adult/elder abuse and/or neglect.

Contraindications:
None

In the course of EMS care of a patient (from time of emergency services request through transport of the patient to the destination location), EMS professionals that become concerned regarding actual or perceived abuse and/or neglect occurring to persons of any age should directly inform any receiving health care professionals and/or involved law enforcement officers of the concerns. If the concerns are regarding abuse and/or neglect of the patient, document such concerns in the patient care report, including specific comments that the receiving health care professional(s) and/or law enforcement officers were directly informed of such concerns in appropriate detail.

If EMS professionals believe an adult or child is being abused or neglected, and/or have concerns regarding the imminent safety of an adult or child due to possible abuse or neglect, there is a legal responsibility to report the beliefs and/or concerns.

Oklahoma Department of Human Services Abuse and Neglect Hotline (Calls Answered 24 Hours a Day/7 Days a Week)

1-800-522-3511

When calling, identify yourself by name, EMS certification level, and agency/apparatus identification. Have as much patient/person information and situational/observation information possible readily available to share with the abuse and neglect hotline specialist.

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10A - HEAD/NECK/SPINE INJURY
ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Spinal stabilization; Avoid spinal traction
2. Hemorrhage control
3. Assessment/Care for life-threatening injuries/ shock/high intracranial pressure
4. Vital signs
5. Appropriate trauma care destination selection

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING ONLY IF SERIOUS
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
SPINAL “STABILIZATION” - DO NOT APPLY SPINAL “TRACTION” DURING MOTION RESTRICTION OR IMMOBILIZATION (if applicable)
STABILIZE IMPALED OBJECTS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)
MAINTAIN EtCO2 LEVELS, 30 – 35 mmHg
DURING SIGNS SUGGESTIVE OF INCREASING INTRACRANIAL PRESSURE
(PROGRESSIVE DECLINE IN MENTAL STATUS, POSTURING, SEIZING, DILATING/NON-REACTIVE/ASYMMETRIC PUPILS)
CONTROLLED HYPERVENTILATION

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE.

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS (IO IF INDICATED) (TWO LINES IF POSSIBLE)
ADULT: IV / IO NS 250 mL BOLUS TO MAINTAIN SYS BP ≥ 100mmHg
ADULT: REPEAT UP TO 2 LITERS IF SYS BP REMAINS < 100 mmHg & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV / IO NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

EVALUATE FOR OTHER ALTERED MENTAL STATUS ETIOLOGIES. TREAT PER APPROPRIATE PROTOCOL(S)

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

ADULT: MIDAZOLAM 5 mg IM/IVP/IN/IOP FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING **OR**
ADULT: DIAZEPAM 5 mg IVP/IOP or 10 mg IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING **OR**
ADULT: LORAZEPAM 1 mg IVP/IM/IOP FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING

PEDIATRIC: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5mg FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING **OR**
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP/IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING OR
PEDIATRIC: LORAZEPAM 0.1 mg/kg IVP/IM/IOP for ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING

OLMC CONSULT IF SEIZURE CONTINUES DESPITE ABOVE TREATMENT

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10A – Head/Neck/Spine Injury – Adult & Pediatric

1. Fischer, P. E., Perina, D. G., Delbridge, T. R., Fallat, M. E., Salomone, J. P., Dodd, J., … Gestring, M. L. (2018). Spinal Motion Restriction in the Trauma Patient - A Joint Position Statement. Prehospital Emergency Care, 3127, 1–3. https://doi.org/10.1080/10903127.2018.1481476
2. Kempena J, Trust MD, Ali S, Cabana JG, Hinchey PR, Brown LH, Brown CV. Prehospital endotracheal intubation vs extraglottic airway device in blunt trauma. *Am J Emerg Med*. 2015 Aug;33(8):1080-3.
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4. Franschman G, Peerdeman SM, Andriessen TM, Greuters S, Toor AE, Vos PE, Bakker FC, Loer SA, Boer C; Amsterdam Lifeliner: Analysis of Results and Methods--Traumatic Brain Injury (ALARM-TBI) Investigators. Effect of secondary prehospital risk factors on outcome in severe traumatic brain injury in the context of fast access to trauma care. *J Trauma*. 2011 Oct;71(4):826-32.
5. Davis DP, Koprowicz KM, Newgard CD, Daya M, Bulger EM, Stiell I, Nichol G, Stephens S, Dreyer J, Minei J, Kerby JD. The relationship between out-of-hospital airway management and outcome among trauma patients with Glasgow Coma Scale Scores of 8 or less. *Prehosp Emerg Care*. 2011 Apr-Jun;15(2):184-92.
6. Swartz EE, Hernandez AE, Decoster LC, Mihalik JP, Burns MF, Reynolds C. Prehospital emergency removal of football helmets using two techniques. *Prehosp Emerg Care*. 2011 Apr-Jun;15(2):166-74.
7. Irvin CB, Szpunar S, Cindrich LA, Walters J, Sills R. Should trauma patients with a Glasgow Coma Scale score of 3 be intubated prior to hospital arrival? *Prehosp Disaster Med*. 2010 Nov-Dec;25(6):541-6.
8. Haut ER, Kalish BT, Cotton BA, Efron DT, Haider AH, Stevens KA, Kieninger AN, Cornwell EE 3rd, Chang DC. Prehospital intravenous fluid administration is associated with higher mortality in trauma patients: a National Trauma Data Bank analysis. *Ann Surg*. 2011 Feb;253(2):371-7.
9. Dumont TM, Visioni AJ, Rughani AI, Tranmer BI, Crookes B. Inappropriate prehospital ventilation in severe traumatic brain injury increases in-hospital mortality. *J Neurotrauma*. 2010 Jul;27(7):1233-41.
10. Zebrack M, Dandoy C, Hansen K, Scaife E, Mann NC, Bratton SL. Early resuscitation of children with moderate-to-severe traumatic brain injury. *Pediatrics*. 2009 Jul;124(1):56-64.
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12. Badjatia N, Carney N, Crocco TJ, Fallat ME, Hennes HM, Jagoda AS, Jernigan S, Letarte PB, Lerner EB, Moriarty TM, Pons PT, Sasser S, Scalea T, Schleien CL, Wright DW; Brain Trauma Foundation; BTF Center for Guidelines Management. Guidelines for prehospital management of traumatic brain injury 2nd edition. *Prehosp Emerg Care*. 2008;12Suppl 1:S1-52.

10B - EYE INJURY ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital signs
2. Eye injury specified care
3. Appropriate trauma care destination selection
4. Analgesia (if required)

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING ONLY IF SERIOUS
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
OBTAIN VITAL SIGNS

BLUNT INJURY/EVISCERATION/LACERATION:
COVER INJURED EYE WITH STERILE, SALINE DAMPENED DRESSING. AVOID DIRECT CONTACT OR PRESSURE ON THE EYEBALL

PENETRATING INJURY/IMPALED OBJECT:
STABILIZE IMPALED OBJECT
COVER INJURED EYE WITH STERILE, SALINE DAMPENED DRESSING. AVOID DIRECT CONTACT OR PRESSURE ON THE EYEBALL

CHEMICAL INJURY:
IF EYEBALL IS INTACT, SOFT IRRIGATION WITH STERILE SALINE OR WATER

ALL EYE INJURIES:
COVER UNINJURED EYE WITH STERILE, SALINE/STERILE WATER DAMPENED DRESSING TO REDUCE STRAIN / CONSENSUAL EYE MOVEMENT

EMT-I85 | AEMT

IV ACCESS

PARAMEDIC

EVALUATE FOR OTHER ALTERED MENTAL STATUS ETIOLOGIES. TREAT PER APPROPRIATE PROTOCOL(S)

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10B – Eye Injury – Adult & Pediatric

1. Khare GD, Symons RC, Do DV. Common ophthalmic emergencies. *Int J Clin Pract*. 2008 Nov;62(11):1776-84.
2. Spector J, Fernandez WG. Chemical, thermal, and biological ocular exposures. *Emerg Med Clin North Am*. 2008 Feb;26(1):125-36, vii.
3. Bord SP, Linden J. Trauma to the globe and orbit. *Emerg Med Clin North Am*. 2008 Feb;26(1):97-123, vi-vii.
4. Bledsoe BE, Ho B. Sight-threatening eye injuries: prehospital management of ophthalmological emergencies. *JEMS*. 2004 Oct;29(10):94-106

10C - DENTAL INJURY/PAIN ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Vital signs
2. Dental injury specified care
3. Appropriate trauma care destination selection
4. Analgesia (if required)

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING ONLY IF SERIOUS
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
OBTAIN VITAL SIGNS

BLUNT INJURY/LACERATION:
DO NOT REMOVE LOOSENED TEETH. IF ACTIVE BLEEDING, POSITION PATIENT TO AVOID ASPIRATION.

PENETRATING INJURY/IMPALED OBJECT:
STABILIZE IMPALED OBJECT. DO NOT REMOVE LOOSENED TEETH. IF ACTIVE BLEEDING, POSITION PATIENT TO AVOID ASPIRATION.

TOOTH FRACTURE:
REPLACE IN SOCKET (IF ABLE WITHOUT ASPIRATION RISK)
IF UNABLE TO REPLACE IN SOCKET, PLACE IN A COMMERCIAL TOOTH CARRIER OR CONTAINER OF MILK (if available)
OTHERWISE, WRAP IN A SALINE OR STERILE WATER DAMPENED STERILE DRESSING

EMT-I85 | AEMT

IV ACCESS IF INDICATED

PARAMEDIC

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10C – Dental Injury/Pain– Adult & Pediatric

1. Andersson L, Andreasen JO, Day P, Heithersay G, Trope M, Diangelis AJ, Kenny DJ, Sigurdsson A, Bourguignon C, Flores MT, Hicks ML, Lenzi AR, Malmgren B, Moule AJ, Tsukiboshi M; International Association of Dental Traumatology. International Association of Dental Traumatology guidelines for the management of traumatic dental injuries: 2. Avulsion of permanent teeth. *Dent Traumatol*. 2012. Apr;28(2):88-96.
2. Bae JH, Kim YK, Choi YH. Clinical characteristics of dental emergencies and prevalence of dental trauma at a university hospital emergency center in Korea. *Dent Traumatol*. 2011 Oct;27(5):374-8.
3. Stewart GB, Shields BJ, Fields S, Comstock RD, Smith GA. Consumer products and activities associated with dental injuries to children treated in United States emergency departments, 1990-2003. *Dent Traumatol*. 2009 Aug;25(4):399-405.
4. Dale RA. Dentoalveolar trauma. *Emerg Med Clin North Am*. 2000 Aug;18(3):521-38.
5. Armstrong BD. Lacerations of the mouth. *Emerg Med Clin North Am*. 2000 Aug;18(3):471-80, vi.

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10D – CHEST/ABDOMEN/PELVIS INJURY ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Hemorrhage control
2. Assessment/Care for life-threatening injuries/shock
3. Needle thoracostomy for tension peumothorax
4. Vital signs
5. Appropriate trauma care destination selection

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING ONLY IF SERIOUS
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
SPINAL "STABILIZATION" - DO NOT APPLY SPINAL "TRACTION" DURING MOTION RESTRICTION OR IMMOBILIZATION (if applicable)
COVER SUCKING CHEST WOUNDS WITH VENTED SEALS
STABILIZE IMPALED OBJECTS
STABILIZE SUSPECTED PELVIC FRACTURE WITH SHEET/BINDER TIED LOW AROUND PELVIS IF DISTAL FRACTURES SUSPECTED
STABILIZE SUSPECTED PELVIC FRACTURE WITH INTERNAL ROTATION & TAPING OF LOWER EXTREMITIES IF NO DISTAL FRACTURES EVIDENT
IF USING IRTOTLE TECHNIQUE, DO NOT CIRCUMFERENTIAL TAPE, DO NOT TAPE OVER BONY PROMINENCES. 4 INCH FOAM TAPE PREFERRED.
COVER EVISCERATED ABDOMINAL/PELVIC ORGANS WITH STERILE, SALINE DAMPENED DRESSING PRIOR TO LAYERING WITH DRY DRESSINGS
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (when available)

EMT OR HIGHER LICENSE:

MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE.

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS (IO IF INDICATED) (TWO LINES IF POSSIBLE)
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

NEEDLE THORACOSTOMY FOR SUSPECTED TENSION PNEUMOTHORAX
ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg
ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10D – Chest/Abdomen/Pelvis Injury – Adult & Pediatric

1. McMullan J, Rodriquez D, Hart KW, Lindsell CJ, Vonderschmidt K, Wayne B, Branson R. Prevalence of prehospital hypoxemia and oxygen use in trauma patients. *Mil Med*. 2013 Oct;178(10):1121-5.
2. Hampton DA, Fabricant LJ, Differding J, Diggs B, Underwood S, De La Cruz D, Holcomb JB, Brasel KJ, Cohen MJ, Fox EE, Alarcon LH, Rahbar MH, Phelan HA, Bulger EM, Muskat P, Myers JG, del Junco DJ, Wade CE, Cotton BA, Schreiber MA; PROMMTT Study Group. Prehospital intravenous fluid is associated with increased survival in trauma patients. *J Trauma Acute Care Surg*. 2013 Jul;75(1 Suppl 1):S9-15.
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6. Wigginton JG, Roppolo L, Pepe PE. Advances in resuscitative trauma care. *Minerva Anestesiol*. 2011 Oct;77(10):993-1002.
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9. Williams-Johnson J, Williams E, Watson H. Management and treatment of pelvic and hip injuries. *Emerg Med Clin North Am*. 2010 Nov;28(4):841-59.
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11. Nabaweesi R, Arnold MA, Chang DC, Rossberg MI, Ziegfeld S, Sawaya DE, Bathurst MA, Colombani P, Abdullah F. Prehospital predictors of risk for pelvic fractures in pediatric trauma patients. *Pediatr Surg Int*. 2008 Sep;24(9):1053-6.
12. Yaghoubian A, Lewis RJ, Putnam B, De Virgilio C. Reanalysis of prehospital intravenous fluid administration in patients with penetrating truncal injury and field hypotension. *Am Surg*. 2007 Oct;73(10):1027-30.
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10E – NEEDLE THORACOSTOMY – TENSION PNEUMOTHORAX DECOMPRESSION ADULT & PEDIATRIC

PARAMEDIC

Indications:

Suspected tension pneumothorax

Clinical signs of tension pneumothorax:

Increasing respiratory insufficiency in a susceptible patient:

1. Spontaneous pneumothorax
2. CPR with appearance of PEA, increased difficulty bagging patient
3. Sucking chest wound which has been covered and which has not responded to removal of the seal/dressing
4. Chest trauma with suspected pneumothorax AND

Adult systolic blood pressure less than 100 mmHg (or pediatric systolic blood pressure less than 70 + (2 x age in years) mmHg **AND**
Three or more of the following:

1. "Air Hunger"
2. Cyanosis
3. Decreased breath sounds on affected side(s)
4. Jugular venous distension
5. Tracheal shift away from affected side – extremely late sign – do not wait as indication for needle thoracostomy if other signs are developing

Etiologies of tension pneumothorax include:

1. Trauma (blunt or penetrating) - disruption of either visceral or parietal pleura; often associated with rib fractures (rib fractures not necessary for tension pneumothorax to occur)
2. Barotrauma secondary to positive-pressure ventilation, especially when using high amounts of positive end-expiratory pressure (PEEP)
3. Unsuccessful attempts to convert an open pneumothorax to a simple pneumothorax in which the occlusive dressing functions as a 1-way valve
4. Chest compressions during cardiopulmonary resuscitation

Contraindications:

None absolute. Do not place a needle thoracostomy through an area of suspected cellulitis, using instead an alternative site – 5th intercostal space mid-axillary line.

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PROTOCOL 10E: Needle Thoracostomy -Tension Pneumothorax Decompression - Adult & Pediatric, cont.

Precautions:

1. A SIMPLE pneumothorax causes some degree of respiratory distress and chest pain, and MAY be associated with decreased or absent breath sounds on the side of the collapse and with subcutaneous air if the cause is traumatic. TENSION pneumothorax is associated with progressive respiratory distress, dropping BP, "drum-like" hyperexpanded chest, distended neck veins, and patient deterioration. Tracheal shift may be present, but is a late sign and needle decompression should be accomplished before waiting for the appearance of tracheal shift.

2. Pneumothorax rarely presents with tension on initial assessment. Be particularly suspicious with deterioration during transport, and with patients requiring assisted ventilation.

3. In patients who are being ventilated by bag-valve mask or ventilator, caution should be exercised when performing needle decompression. If the presumptive diagnosis of a tension pneumothorax is incorrect, the insertion of the needle may create a pneumothorax, which may be converted into a tension pneumothorax by positive-pressure ventilation.

4. If a previously covered sucking chest wound is present, remove the seal and allow chest pressures to equilibrate. No further treatment is often necessary.

Technique:

A. Expose the entire chest.
B. Locate landmark on affected side(s) second intercostal space just superior to third rib, (Figure 1 illustrates the right side of the chest as the affected side).
C. Clean area of insertion with ChloraPrep®, Betadine®, or alcohol prep.
D. Attach 10 mL or larger syringe to a 15 gauge pneumothorax catheter or a 14 gauge angiocatheter. If using an angiocatheter, the length of the needle should be at least 3.25 inches to promote decompression of the pleural space. Thick chest wall musculature may prevent entry into the pleural space if using a shorter needle.
E. Decisively locate the second or third intercostal space in the mid-clavicular line.
F. Insert the needle through the skin at near or at 90 degrees and advance until tip hits the top of the rib below the intercostal space. Continue to advance angling over the top of the rib margin – advance just over the lower rib avoid the neurovascular bundle running horizontally along the lower border of the upper rib.

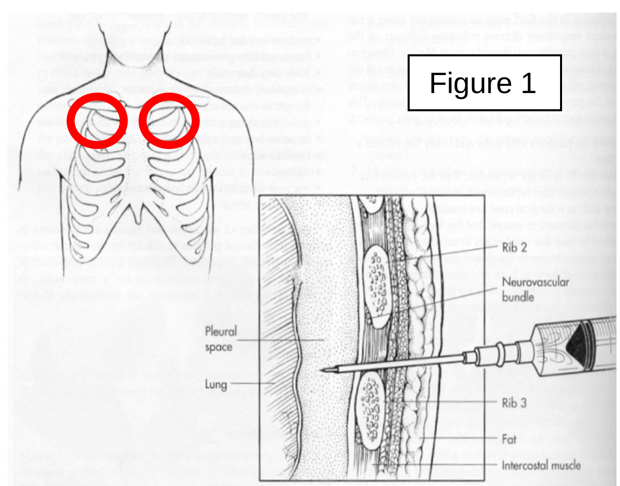

Figure 1

G. Advance needle tip into the pleural space. A slight "pop" is usually felt when the needle pierces the outside pleural membrane, or parietal pleura.

PROTOCOL 10E: Needle Thoracostomy - Tension Pneumothorax Decompression - Adult & Pediatric, cont.

Technique, cont.:

H. When tension is present, syringe plunger will typically dislodge back out of syringe, or an immediate hiss of air escaping will be heard.
I. Remove the syringe and needle and leave the catheter in the pleural space.
J. If recurrent decompensation of the patient occurs related to suspected redevelopment of tension pneumothorax, repeat the procedure next to the previously successful needle thoracostomy site.

Complications:

1. Creation of pneumothorax if none existed previously. This is an unfortunate occurrence if needle thoracostomy is done too aggressively. Do not hesitate to relieve a strongly suspected tension pneumothorax, but perform an accurate assessment to validate the suspicion of tension pneumothorax.
2. Laceration of lung, which is rare, can cause significant pulmonary injury. Avoid excessive length needles.
3. Hemothorax from vascular injury. Avoid needle thoracostomy medial to the mid-clavicular line. Avoid needle thoracostomy just inferior to a rib, where the intercostal vessels run underneath the rib margin.
4. Infection. Minimize risk by clean insertion site and maintaining aseptic technique, using sterile catheters/needles.

Note:

Studies show that needle thoracostomy in the 5th or 6th intercostal space at the mid-axillary line is effective in the release of tension pneumothorax. Utilize this location if the traditional sites of the 2nd or 3rd intercostal space at the mid-clavicular line do not improve the respiratory or hemodynamic conditions of a patient with a strongly suspected tension pneumothorax, especially if using shorter angiocatheters. The chest wall musculature is thinner in this alternate location.

Medical Literature References
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10F – CHEST TUBE MONITORING ADULT & PEDIATRIC

PARAMEDIC

Indications:

Interfacility transfer of patient with chest tube thoracostomy.

Technique:

The chest tube thoracostomy-related device(s) must be reviewed with either the transferring practitioner/physician or appropriate nursing personnel prior to conducting the interfacility transfer. Potential complications during transfer should be discussed, such as in the possibility of recurrent pneumothorax, and contingency plans reviewed, such as releasing the occlusive dressing around the chest tube or performing a needle thoracostomy per Protocol 10E – Needle Thoracostomy. If the Paramedic feels unable to safely monitor and maintain the chest tube, he or she is to request appropriate resources from the transferring hospital to accompany the patient during transfer.

Under these conditions, EMS personnel will not begin the transfer until such request is accommodated.

During packaging, patient movement, and throughout the interfacility transfer, perform periodic inspection and assessment of the chest tube.

The chest tube may be attached to a one-way valve (Heimlich valve) that allows for air or fluid passage from the chest to the outside, often contained within a simple bag container. If a Heimlich valve is present, keep it attached to the chest tube.

The chest tube may alternatively be attached to a multi-chamber container that can be attached to low suction. This container can be used for collection of blood drainage from the chest for auto-transfusion and/or to measure how much blood or other fluid is being drained from the chest tube. The chamber connecting to the chest tube is for fluid collection. The second chamber contains a small volume of water, establishing a water seal, creating a one-way flow of air from the chest, and keeping the pressure in the chest less than atmospheric pressure. The third chamber is a suction chamber, designed to limit excessive wall suction effect on the chest. Keep the container upright to keep fluid collection measurement accurate and avoid any loss in function of the device.

Persistent bubbling in the chamber(s) indicates an air leak in the chest tube system. This may be due to a loose connection in the tube/chamber/suction circuit or due to a perforation in the airway (e.g. bronchiole). Check the visible connections of the chest tube system. If bubbling prior to transfer, discuss with transferring practitioner/physician.

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10G – EXTREMITY/AMPUTATION INJURY ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Hemorrhage control
2. Assessment/Care for life-threatening injuries/shock
3. Vital signs
4. Splint suspected fractures
5. Analgesia (if required)
6. Appropriate trauma care destination selection

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING ONLY IF SERIOUS
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
SPINAL “STABILIZATION” - DO NOT APPLY SPINAL “TRACTION” DURING MOTION RESTRICTION OR IMMOBILIZATION (if applicable)
APPLY TOURNIQUET FOR HEMORRHAGE UNCONTROLLED BY DIRECT PRESSURE PER PROTOCOL 10H - TOURNIQUET
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB AS APPROPRIATE
SPLINT SUSPECTED FRACTURES INCLUDING JOINT ABOVE AND BELOW AREA OF INJURY
COVER AMPUTATED ANATOMY WITH SALINE-MOISTENED GAUZE
PLACE AMPUTATED ANATOMY IN A CLEAN PLASTIC BAG
PLACE AMPUTATED ANATOMY OVER ICE, AVOIDING DIRECT CONTACT OF AMPUTATED ANATOMY WITH ICE
STABILIZE IMPALED OBJECTS
APPLY CARDIAC MONITOR (if equipped)

EMT-I85 | AEMT

IV ACCESS (IO IF INDICATED)

IV ACCESS (IO IF INDICATED) (TWO LINES IF POSSIBLE)
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 50 mcg

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10G – Extremity/Amputation Injury – Adult & Pediatric

1. Kragh JF Jr, Beebe DF, O'Neill ML, Beekley AC, Dubick MA, Baer DG, Blackbourne LH. Performance improvement in emergency tourniquet use during the Baghdad surge. *Am J Emerg Med*. 2013 May;31(5):873-5.
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10H – TOURNIQUET ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indication: Life-threatening extremity hemorrhage unable to be controlled by direct pressure or immediately obvious that direct pressure alone will not provide control.

Contraindication: None

Technique (Combat-Application-Tourniquet® - C-A-T®):

The C-A-T® (Figure 1) windlass uses a free moving internal band to provide circumferential pressure to an injured and uncontrollably bleeding extremity. Once placed, keep the tourniquet secure, but uncovered so that the bleeding site can be clearly monitored as well as the tourniquet itself. The time of tourniquet application (Figure 7, e.g. TK 0145) is to be written on a piece of adhesive tape and secured to the tourniquet. Conscious patients may experience pain related to tourniquet use. In such instances, follow the pain management protocol if the patient is hemodynamically stable.

Figure 1

Step 1 (Figure 2):

The C-A-T® is applied over the extremity proximal to the bleeding site routing the self – adhering band around the extremity. Lower extremity wounds require feeding the strap through the outside slit of the buckle. Upper extremity wounds feed the strap through the outside slit of the buckle.


Figure 2

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PROTOCOL 10H: Tourniquet, Adult & Pediatric, cont.

<u>Step 2 (Figure 3)</u>:

For all lower extremity wounds (and any upper extremity wounds desired), pass the band through the outside slit of the buckle utilizing the friction adaptor buckle which will lock the band in place.


Figure 3

<u>Step 3 (Figure 4)</u>:

Pull the self - adhering band tight and secure the band back on itself with the velcro adhesive strap.


Figure 4

<u>Step 4 (Figure 5)</u>:

Twist the windlass until the bleeding has stopped. This will typically be at or less than 3 complete rotations of the windlass. More could be required, but be careful not to exert too much torque on the windlass to avoid breakage.


Figure 5

<u>Step 5 (Figure 6)</u>:

Lock the rod in place with the windlass clip.


Figure 6

<u>Step 6 (Figure 7)</u>:

Secure the rod with the strap by pulling it tight and adhering it to the opposite hook on the windlass hook. Indicate the time of tourniquet application on tape.

Figure 7

PROTOCOL 10H: Tourniquet, Adult & Pediatric, cont.

Using Generation 7 C-A-T® tourniquets, all applications are made passing the self-adhering band through the single slit of the buckle.

If one tourniquet correctly applied does not completely control hemorrhage, in addition to direct pressure, an additional tourniquet may be applied just proximal to the first tourniquet.

Once bleeding has been controlled by a tourniquet, the usual and customary practice is to leave the tourniquet in place throughout the remainder of scene care and transport to an emergency department. In infrequent circumstances, if pain control becomes an issue, the tourniquet may be loosened to see if bleeding will stay controlled. If bleeding resumes, promptly re-tighten the tourniquet to its effective tightness.

Medical Literature References
10H – Tourniquet– Adult & Pediatric

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5. Kragh JF Jr, Littrel ML, Jones JA, Walters TJ, Baer DG, Wade CE, Holcomb JB. Battle casualty survival with emergency tourniquet use to stop limb bleeding. *J Emerg Med*. 2011 Dec;41(6):590-7.
6. Sambasivan CN, Schreiber MA. Emerging therapies in traumatic hemorrhage control. *Curr Opin Crit Care*. 2009 Dec;15(6):560-8.
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10I – HEMOSTATIC AGENTS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Hemorrhage control
2. Vital signs

EMD

BLEEDING CONTROL
ADVISE DIRECT PRESSURE ON BLEEDING WOUND
HOLD FIRMLY UNTIL HELP ARRIVES

EMR / EMT

GENERAL SUPPORTIVE CARE (MEDICAL PT) OR TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE (TRAUMA PT)
HISTORY TO INCLUDE IF PT TAKING ANTIPLATELET AGENT (eg. ASPIRIN) OR ANTICOAGULANT (eg. WARFARIN)

BLEEDING CONTROL
IF EXTREMITY WOUND AND TOURNIQUET INDICATED, TREAT PER PROTOCOL 10H – TOURNIQUET
APPLY DIRECT PRESSURE AS INDICATED – MANUAL &/OR VIA PRESSURE DRESSING
IF DIRECT PRESSURE INSUFFICIENT & BLEEDING IS ARTERIAL/BRISK, PACK WOUND WITH HEMOSTATIC AGENT
MAINTAIN DIRECT PRESSURE WHEN USING HEMOSTATIC AGENT
ADVISE RECEIVING PHYSICIANS/NURSES IF HEMOSTATIC AGENT USE WAS REQUIRED & TYPE USED

EMT-I85 / AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg
PEDIATRIC: REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: IN SETTING OF HEMORRHAGIC SHOCK FROM TRAUMA LESS THAN 3 HOURS OLD,
WITH SUSPECTED NEED FOR MASSIVE BLOOD TRANSFUSION DUE TO MARKED INTERNAL OR EXTERNAL BLOOD LOSS

CRITERIA FOR TRANEXAMIC ACID ADMINISTRATION:

SUSTAINED TACHYCARDIA 110 BEATS PER MINUTE OR GREATER **AND**
SUSTAINED HYPOTENSION SYSTOLIC BP 90 mmHg OR LESS

TRANEXAMIC ACID (TXA) 1 GRAM IVPB OVER 10 MINS. ADMINISTER IN 100 mL or 250 mL NS.

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10I – Hemostatic Agents– Adult & Pediatric

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10J – COMPARTMENT SYNDROME ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Vital signs
2. 5 Ps exam
3. Hospital notification of concern regarding limb circulation compromise
4. Analgesia (if required)

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
CONTROL BLEEDING WITH DIRECT PRESSURE
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
OBTAIN VITAL SIGNS

HISTORY OF TRAUMA IN EXTREMITY IN PAST DAYS OR ACUTELY THAT COULD CAUSE PRESSURE TO BUILD IN DEEP SPACES OF EXTREMITY? (MUSCLE OR TISSUE SWELLING? DEEP SPACE BLEEDING?)

EVALUATE EXTREMITY FOR "5 Ps" OF COMPARTMENT SYNDROME:
PAIN OUT OF PROPORTION TO ASSESSED INJURY (APPEARS MINOR INJURY, PATIENT IN EXCRUCIATING PAIN)?
PARESTHESIA (NUMBNESS DUE TO NERVE COMPRESSION)?
PRESSURE (SKIN/MUSCLE FEELS TENSE DUE TO INCREASING FORCE WITHIN COMPARTMENT)?
PARALYSIS (LATE SIGN DUE TO NERVE COMPRESSION - DON'T WAIT ON PARALYSIS TO REPORT CONCERN)
PULSELESSNESS IN DISTAL EXTREMITY (LATE SIGN OF COMPARTMENT SYNDROME - DON'T WAIT ON ABSENT PULSE TO REPORT CONCERN)

IN SUSPECTED COMPARTMENT SYNDROME, POSITION EXTREMITY TO PROMOTE CIRCULATION TO DISTAL EXTREMITY

EMT-I85 | AEMT

IV ACCESS

PARAMEDIC

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10J – Compartment Syndrome– Adult & Pediatric

1. Taylor RM, Sullivan MP, Mehta S. Acute compartment syndrome: obtaining diagnosis, providing treatment, and minimizing medicolegal risk. *Curr Rev Musculoskelet Med*. 2012 September; 5(3): 206–213.
2. Mabvuure NT, Malahias M, Hindocha S, Khan W, Juma A. Acute compartment syndrome of the limbs: current concepts and management. *Open Orthop J*. 2012;6:535-43.
3. Tekwani K, Sikka R. High-risk chief complaints III: abdomen and extremities. *Emerg Med Clin North Am*. 2009 Nov;27(4):747-65, x.
4. Olson SA, Glasgow RR. Acute compartment syndrome in lower extremity musculoskeletal trauma. *J Am Acad Orthop Surg*. 2005 Nov;13(7):436-44.
5. Grottkau BE, Epps HR, Di Scala C. Compartment syndrome in children and adolescents. *J Pediatr Surg*. 2005 Apr;40(4):678-82.

EMERGENCY MEDICINE
UNIVERSITY OF OKLAHOMA
EMS SECTION

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

10K – CRUSH INJURY SYNDROME ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. USAR (OK TF1) if needed
4. Vital signs
5. Hospital notification of concern regarding trunk/ limb circulation compromise
6. OLMCP consult on treatment plan prior to crush release (if > 2hours crush)
7. Hyperkalemia prophylaxis (If required)

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DO NOT MOVE THE PATIENT UNLESS IN DANGER
CONTROL BLEEDING WITH DIRECT PRESSURE
DO NOT ATTEMPT TO SPLINT INJURIES

EMR | EMT

PERSONAL & PATIENT SAFETY
MOBILIZATION OF LOCAL FIRE-RESCUE PROFESSIONALS FOR TRAPPED PATIENTS REQUIRING HEAVY/COMPLICATED EXTRICATION
MOBILIZATION OF URBAN SEARCH & RESCUE SPECIALIST TEAM IF NUMEROUS TRAPPED PATIENTS/LARGE BUILDING OR TRENCH COLLAPSE
(OKLAHOMA TASK FORCE 1 IS BASED & SUPPORTED AT OKLAHOMA CITY FIRE DEPARTMENT & TULSA FIRE DEPARTMENT)

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
OBTAIN VITAL SIGNS

HISTORY OF ONGOING AND/OR PROLONGED CRUSH MECHANISM ON TRUNK OR PROXIMAL EXTREMITY
EVALUATE EXTREMITY FOR “5 Ps” OF COMPARTMENT SYNDROME PER PROTOCOL 10K
ECG MONITOR (if equipped)

EMT-I85 | AEMT

IV ACCESS (IO IF INDICATED)

IF CRUSH ≥ 4 HRS IN DURATION:
ADULT: IV NS 1 LITER BOLUS THEN 250 mL/HR RATE IF NO SIGNS OF PULMONARY EDEMA
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS THEN 5 mL/kg/HR RATE IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg NS IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

IF CRUSH ≥ 4 HRS IN DURATION:
JUST PRIOR TO CRUSH MECHANISM REMOVAL, ADMINISTER HYPERKALEMIA PROPHYLAXIS:
IV FLUID HYDRATION AS ABOVE
CALCIUM CHLORIDE 10 mg/kg IVP/IOP (MAX 1 gram)
SODIUM BICARBONATE 1 mEq/kg IVP/IOP (MAX 50 mEq)

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg
ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.
PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT FOR TIMING/NEED FOR HYPERKALEMIA PROPHYLAXIS IF CRUSH < 4 HRS IN DURATION OR IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10K – Crush Injury Syndrome– Adult & Pediatric

1. Burns K, Cone DC, Portereiko JV. Complex extrication and crush injury. *Prehosp Emerg Care*. 2010 Apr-Jun;14(2):240-4.
2. Newton EJ, Love J. Acute complications of extremity trauma. *Emerg Med Clin North Am*. 2007 Aug;25(3):751-61, iv.
3. Sever MS, Vanholder R, Lameire N. Management of crush-related injuries after disasters. *N Engl J Med*. 2006 Mar 9;354(10):1052-63.

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10L - BURNS
ADULT & PEDIATRIC

TREATMENT PRIORITIES
1. Thermal Burn
   - Stop burning process
   - Flood with water only if flames not extinguished; smoldering present; significant heat being dissipated
   - Determine possibility of smoke/toxic inhalation
2. Chemical Burn
   - Brush off dry chemicals
   - Flush with water for minimum of 15 minutes
3. Electrical Burn
   - Evaluate airway and cardiac status
4. Do not delay transport for on scene IV fluids or medication

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

IF PT CLOTHES ARE BURNING OR SMOLDERING, DOUSE THEM WITH WATER IMMEDIATELY.
IF WATER IS NOT AVAILABLE,
THEN ROLL PT ON THE GROUND OR SMOTHER THE FIRE
DO NOT TOUCH ANYTHING OR PICK UP DEBRIS

EMR | EMT

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
STOP THE BURNING PROCESS
SPINAL “STABILIZATION” - DO NOT APPLY SPINAL “TRACTION” DURING IMMOBILIZATION (IF EXPLOSIVE MOI & if applicable)
STABILIZE IMPALED OBJECTS (IF EXPLOSIVE MOI)
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE FOR RESPIRATORY SYMPTOMS
COVER BURNED AREA WITH BURN DRESSING (if equipped) THEN APPLY DRY SHEET
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
FOR RESPIRATORY SYMPTOMS,
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE.

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV/ IO ACCESS IF INDICATED
ADULT: IV NS; FOR MAJOR THERMAL BURNS, 500 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF NO SIGNS OF PULMONARY EDEMA
SEE WEIGHT BASED FLUID RESUSCITATION TABLE TO AVOID EXCESSIVE FLUID

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 50 mcg

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

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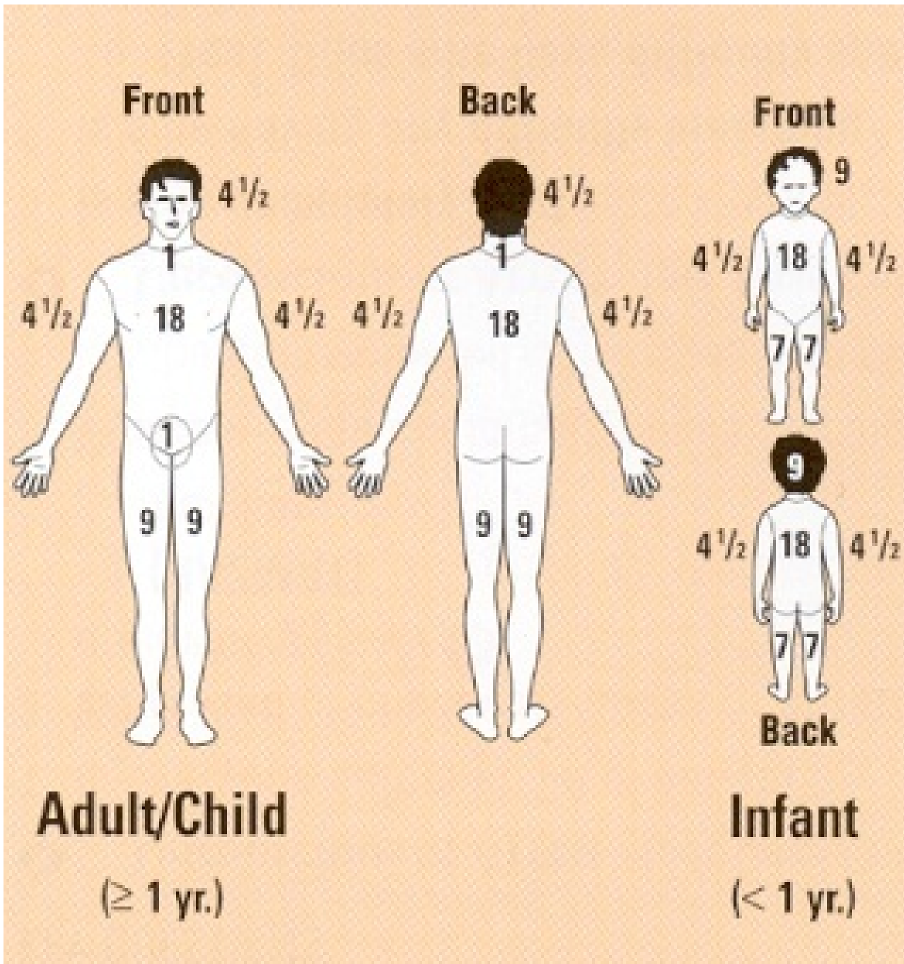
PROTOCOL 10L: Burns - Adult &Pediatric, cont,

% Body Surface Area (BSA) Estimation Chart

Count only Second and Third Degree Burns when calculating estimated %BSA



An alternate method of calculating %BSA involvement is to use the size of the patient's entire hand equal to 1% of their BSA. This is a useful method when calculating smaller burn areas.

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Wt (Kg)	Burn Surface Area %												
	20	25	30	35	40	45	50	55	60	65	70	75	80
2	10	15	15	20	20	25	25	30	30	35	35	40	40
4	20	25	30	35	40	45	50	55	60	65	70	75	80
6	30	40	45	50	60	70	75	80	90	100	105	115	120
8	40	50	60	60	80	90	100	110	120	130	140	150	160
10	50	65	75	75	100	115	125	135	150	165	175	190	200
12	60	75	90	105	120	135	150	165	180	195	210	225	240
15	75	100	115	130	150	170	190	210	225	250	280	285	300
17	85	110	130	150	170	190	215	235	255	275	300	320	340
20	100	125	150	175	200	225	250	275	300	325	350	375	400
22	110	140	165	200	220	250	275	300	330	360	385	415	440
25	125	160	190	220	250	280	315	350	375	400	440	470	500
27	135	170	200	240	270	300	340	370	405	440	470	500	540
30	150	190	225	260	300	340	375	410	450	490	525	560	600
35	175	220	260	300	350	400	440	480	525	570	610	660	700
40	200	250	300	350	400	450	500	550	600	650	700	750	800
50	250	315	375	440	500	560	625	690	750	810	875	940	1000
60	300	375	450	525	600	675	750	825	900	975	1050	1125	1200
70	350	450	525	620	700	800	875	1000	1050	1150	1225	1325	1400
75	375	500	550	650	750	850	950	1050	1150	1200	1300	1400	1500
100	500	625	750	875	1000	1125	1250	1375	1500	1625	1750	1875	2000

Fluid resuscitation for 2nd and 3rd degree burns totalling greater than 20% BSA

Milliliters of fluid to be given during first hour based on Parkland Formula

4mL x kg x BSA% = Total Fuid over 24 Hrs

Half of total should be given over the first 8 Hrs

Medical Literature References
10L – Burns – Adult & Pediatric

1. Pham TN, Cancio LC, Gibran NS. American burn association practice guidelines burn shock resuscitation. J Burn Care Res. 2008;29(1):257-266. doi:10.1097/BCR.0b013e31815f3876.
2. ABLS Advisory Committee. Advanced Burn Life Support Course Provider Manual. 2015;60611(312). doi:10.1097/00004630-199901000-00006.
3. Hostler D. Scorched skin. A guide to prehospital burn management. J Emerg Med Serv. 2015;40(4):57-61.
4. Eastman AL, Arnoldo BA, Hunt JL, Purdue GF. Pre-burn center management of the burned airway: do we know enough? *J Burn Care Res*. 2010 Sep-Oct;31(5):701-5.
5. Singer AJ, Taira BR, Thode HC Jr, McCormack JE, Shapiro M, Aydin A, Lee C. The association between hypothermia, prehospital cooling, and mortality in burn victims. *Acad Emerg Med*. 2010 Apr;17(4):456-9.
6. Mlcak R, Cortiella J, Desai MH, Herndon DN. Emergency management of pediatric burn victims. *Pediatr Emerg Care*. 1998 Feb;14(1):51-4.
7. Nagel TR, Schunk JE. Using the hand to estimate the surface area of a burn in children. *Pediatr Emerg Care*. 1997 Aug;13(4):254-5.
8. Crawford ME, Rask H. Prehospital care of the burned patient. *Eur J Emerg Med*. 1996 Dec;3(4):247-51.

10M – CONDUCTED ELECTRICAL WEAPON RELATED MANAGEMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Physical Restraint
4. Chemical Restraint (if indicated)
5. Vital signs
6. Probe removal
7. Return probe to law enforcement

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

SUPPORT LAW ENFORCEMENT OPERATION

EMR | EMT-B

MAINTAIN PERSONAL AND PATIENT SAFETY
ENSURE LAW ENFORCEMENT OFFICER DISCONNECTS EMBEDDED PROBES FROM WEAPON
IF PROBE IS REMOVED DO NOT DISCARD, ENSURE SAFE RETURN TO LAW ENFORCEMENT FOR EVIDENCE
TREAT PER APPLICABLE SECTION 7 PROTOCOLS – PSYCHIATRIC/BEHAVIORAL DISORDERS

REMOVE PROBES UNLESS EMBEDDED IN FACE, NECK, GENITALS, SPINE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)

EMT-INTERMEDIATE 85 | ADVANCED EMT

ADULT: INTUBATE IF INDICATED

IV ACCESS

TREAT PER APPLICABLE SECTION 7 PROTOCOLS – PSYCHIATRIC/BEHAVIORAL DISORDERS

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

CHEMICAL RESTRAINT IF INDICATED PER PROTOCOL 7C – CHEMICAL RESTRAINT

CONSULT OLMC IF UNCERTAIN OF ETIOLOGY AND TREATMENT PLAN FOR PSYCHIATRIC PROBLEM OR IF ADDITIONAL RESTRAINT MEASURES NEEDED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10M – Conductive Energy Weapon Related Management– Adult & Pediatric

1. Bozeman WP, Teacher E, Winslow JE. Transcardiac Conducted Electrical Weapon (TASER) Probe Deployments: Incidence and Outcomes. *J Emerg Med*. 2012 Dec;43(6):970-5.
2. Vilke GM, Debard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozeman WP. Excited Delirium Syndrome (ExDS): Defining Based on a Review of the Literature. *J Emerg Med*. 2012 Nov;43(5):897-905.
3. Kunz SN, Grove N, Fischer F. Acute pathophysiological influences of conducted electrical weapons in humans: A review of current literature. *Forensic Sci Int*. 2012 Sep 10;221(1-3):1-4.
4. Vilke GM, Bozeman WP, Dawes DM, Demers G, Wilson MP. Excited delirium syndrome (ExDS): treatment options and considerations. *J Forensic Leg Med*. 2012 Apr;19(3):117-21.
5. Kroll MW, Lakkireddy D, Rahko PS, Panescu D. Ventricular fibrillation risk estimation for conducted electrical weapons: critical convolutions. *Conf Proc IEEE Eng Med Biol Soc*. 2011;2011:271-7.
6. Pasquier M, Carron PN, Vallotton L, Yersin B. Electronic control device exposure: a review of morbidity and mortality. *Ann Emerg Med*. 2011 Aug;58(2):178-88.
7. Vilke GM, Bozeman WP, Chan TC. Emergency department evaluation after conducted energy weapon use: review of the literature for the clinician. *J Emerg Med*. 2011 May;40(5):598-604.
8. Ho JD, Dawes DM, Nelson RS, Lundin EJ, Ryan FJ, Overton KG, Zeiders AJ, Miner JR. Acidosis and catecholamine evaluation following simulated law enforcement "use of force" encounters. *Acad Emerg Med*. 2010 Jul;17(7):e60-8.
9. Moscati R, Ho JD, Dawes DM, Miner JR. Physiologic effects of prolonged conducted electrical weapon discharge in ethanol-intoxicated adults. *Am J Emerg Med*. 2010 Jun;28(5):582-7.
10. Otahbachi M, Cevik C, Bagdure S, Nugent K. Excited delirium, restraints, and unexpected death: a review of pathogenesis. *Am J Forensic Med Pathol*. 2010 Jun;31(2):107-12.
11. Strote J, Verzemnieks E, Walsh M, Hutson HR. Use of force by law enforcement: an evaluation of safetyand injury. *J Trauma*. 2010 Nov;69(5):1288-93.
12. Brice JH, Pirrallo RG, Racht E, Zachariah BS, Krohmer J. Management of the violent patient. *Prehosp Emerg Care*. 2003 Jan-Mar;7(1):48-55.

10N – "LESS LETHAL" WEAPON RELATED MANAGEMENT ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Physical Restraint
4. Chemical Restraint (if indicated)
5. Vital signs
6. Appropriate trauma care destination selection

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

SUPPORT LAW ENFORCEMENT OPERATION

EMR | EMT

MAINTAIN PERSONAL AND PATIENT SAFETY
HISTORY FROM LAW ENFORCEMENT OFFICER(S) REGARDING WEAPON BALLISTICS
(eg. RUBBER BULLETS, BEAN BAG PROJECTILES)

TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
TREAT PER OTHER APPLICABLE SECTION 10 PROTOCOLS - TRAUMA
TREAT PER APPLICABLE SECTION 7 PROTOCOLS – PSYCHIATRIC/BEHAVIORAL DISORDERS

APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)

EMT - I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

CHEMICAL RESTRAINT IF INDICATED PER PROTOCOL 7C – CHEMICAL RESTRAINT

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10N – "Less Lethal" Weapon Weapon Related Management– Adult & Pediatric

1. Bozeman WP, Teacher E, Winslow JE. Transcardiac Conducted Electrical Weapon (TASER) Probe Deployments: Incidence and Outcomes. *J Emerg Med*. 2012 Dec;43(6):970-5
2. Vilke GM, Debard ML, Chan TC, Ho JD, Dawes DM, Hall C, Curtis MD, Costello MW, Mash DC, Coffman SR, McMullen MJ, Metzger JC, Roberts JR, Sztajnkrcer MD, Henderson SO, Adler J, Czarnecki F, Heck J, Bozeman WP. Excited Delirium Syndrome (ExDS): Defining Based on a Review of the Literature. *J Emerg Med*. 2012 Nov;43(5):897-905.
3. Vilke GM, Bozeman WP, Dawes DM, Demers G, Wilson MP. Excited delirium syndrome (ExDS): treatment options and considerations. *J Forensic Leg Med*. 2012 Apr;19(3):117-21.
4. Kroll MW, Lakkireddy D, Rahko PS, Panescu D. Ventricular fibrillation risk estimation for conducted electrical weapons: critical convolutions. *Conf Proc IEEE Eng Med Biol Soc*. 2011;2011:271-7.
5. Pasquier M, Carron PN, Vallotton L, Yersin B. Electronic control device exposure: a review of morbidity and mortality. *Ann Emerg Med*. 2011 Aug;58(2):178-88.
6. Vilke GM, Bozeman WP, Chan TC. Emergency department evaluation after conducted energy weapon use: review of the literature for the clinician. *J Emerg Med*. 2011 May;40(5):598-604.
7. Strote J, Verzemnieks E, Walsh M, Hutson HR. Use of force by law enforcement: an evaluation of safetyand injury. *J Trauma*. 2010 Nov;69(5):1288-93.
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10O – SPLINTING OF INJURIES ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

10Oa: Spinal Motion Restriction – Adult & Pediatric:

Many patients evaluated by EMS professionals are placed in a cervical collar and onto a long spine backboard based as much upon "tradition" that this practice is without risk and the benefit is without question. Like many medical practices scrutinized over time, evidence-based medicine reveals it is with risk (pain, tissue damage leading to pressure sores, and concerns about risks of aspiration and impaired breathing mechanics). Similarly, the benefit is not certain. Few "real" injuries are so unstable that the process of spinal motion restriction as performed in EMS is the difference-maker between paralysis and ambulation.

This protocol does not seek to avoid spinal motion restriction when clinically indicated. This protocol rather seeks to provide an evidence-based approach that directs the careful practice of spinal motion "restriction" in situations where history, exam findings, and/or patient interaction limitations make the possible benefit outweigh the risks. When the benefit does not outweigh the risks, patients should not incur clinically unnecessary collars and boards.

When applying spinal motion restriction, include the following:

1. Avoid traction being placed on the spine in any direction.
2. Correctly size the cervical collar to additionally avoid traction being placed on the spine.
3. Maintain the spinal column alignment integrity when rolling the patient onto a long back board, using a scoop stretcher, or placing/moving in any other spinal motion restriction device.
4. Secure the torso and extremities to the backboard first, the head/neck last.
5. Remove from the long spine backboard once on the stretcher, unless CPR is ongoing or anticipated during transport.

Documentation of spinal motion restriction should include a neurologic assessment before and after the process, which includes the application of a cervical collar, noting any movement using a backboard/scoop stretcher, and indicating prompt removal from the backboard/scoop stretcher unless CPR ongoing/anticipated. In the seated patient that is hemodynamically stable and requiring spinal motion restriction, assist the patient in pivoting and lying supine onto the stretcher and/or use a spinal motion restriction device to achieve the same, whichever involves less anticipated spinal motion.

PROTOCOL 10O: Splinting of Injuries, cont.

10Oa - Spinal Motion Restriction – Adult & Pediatric, cont.

***SPINAL "IMMOBILIZATION" INCLUDING BACKBOARD ONLY IF SPINAL INJURY EVIDENT (PARALYSIS, PRIAPISM, OR NEURO SHOCK)

MECHANISM OF INJURY COMPATIBLE WITH POSSIBLE SPINAL INJURY

↓

AGE <12 OR >65 YEARS? — Yes → SPINAL MOTION RESTRICTION

No ↓

GCS <15? — Yes → SPINAL MOTION RESTRICTION

No ↓

SYNCOPE/ALTERED MENTAL STATUS? — Yes → SPINAL MOTION RESTRICTION

No ↓

LANGUAGE BARRIER? — Yes → SPINAL MOTION RESTRICTION

No ↓

ETOH/ DRUG INTAKE IN PAST 6 HOURS? — Yes → SPINAL MOTION RESTRICTION

No ↓

DISTRACTING PAIN? — Yes → SPINAL MOTION RESTRICTION

No ↓

FOCAL NEURO DEFICIT ON PHYSICAL EXAM? — Yes → SPINAL MOTION RESTRICTION

No ↓

SPINAL/ PARASPINAL PAIN OR DEFORMITY ON PHYSICAL EXAM? — Yes → SPINAL MOTION RESTRICTION

No ↓

SPINAL/ PARASPINAL PAIN WITH RANGE OF MOTION? — Yes → SPINAL MOTION RESTRICTION

No ↓

COMPLICATING FACTORS (STRESS, ANXIETY, HIGH-ENERGY MECHANISM SUCH AS EJECTION FROM VEHICLE, MOTORCYCLE COLLISION GREATER THAN ESTIMATED 20 MPH, PEDESTRIAN/BICYCLIST STRUCK GREATER THAN ESTIMATED 20 MPH, DIVING INJURY, OR FALL GREATER THAN 3 TIMES PATIENT HEIGHT? — Yes → SPINAL MOTION RESTRICTION

No ↓

PATIENT MAY BE TRANSPORTED WITHOUT SPINAL MOTION RESTRICTION

PROTOCOL 10O: Splinting of Injuries, cont.
10Oa - Spinal Motion Restriction – Adult & Pediatric, cont.

Comments regarding the Selective Spinal Motion Restriction Process:

1. The process of EMS-performed selective spinal motion restriction constitutes a formal step-wise screening of individuals suffering from mechanisms of injury compatible with possible injury to the spine. This process, now increasingly widely adopted in EMS systems across the United States, is designed from research-verified assessments, identifying individuals that may be safely transported to an emergency department, without spinal immobilization, for further appropriate physician evaluation. IT DOES NOT CONSTITUTE FORMAL "CLEARING" OF THE SPINE.

2. When following the decision flowchart in this protocol, there is no validated benefit to applying a cervical collar to patients who do not have any indication for spinal motion restriction and risks of pain, skin trauma, and compromise of respiratory mechanics may result if placed and left on a long spine backboard.

3. The process of EMS-performed selective spinal motion restriction, while continuing to involve placement of a cervical collar, no longer requires continuous use of a long spine backboard. While the long spine backboard is one option to assist a patient supine onto a stretcher, in the absence of ongoing or imminent CPR, patients should be removed off the long spine backboard as soon after movement onto the stretcher as possible.

4. Patients with penetrating trauma have been shown to have worse outcomes with continuous use of the long spine backboard, in part due to prolonged scene times relating to extensive spinal motion restriction actions. Victims of penetrating trauma (stabbings, gunshot wounds) to the head, neck, and/or torso SHOULD NOT receive spinal motion restriction unless there is one or more of the following:
   - Obvious neurologic deficit to the extremities
   - Priapism
   - Neurogenic shock
   - Anatomic deformity to the spine secondary to injury

5. Patients with any form of trauma may experience reduction in pulmonary mechanics (ease of oxygenation/ventilation) when placed onto a long spine backboard. Continuous use of the long spine backboard should be limited to situations involving ongoing or imminent CPR.

6. Patients at age extremes are prone to unreliable history and physical assessments. Patients under the age of 12 years or over the age of 65 years, if they have suffered a mechanism of injury compatible with possible spinal injury, are to be placed in spinal motion restriction.

7. The designation of a Glasgow Coma Scale score of 15 includes an assessment that no neurological deficits exist. If a patient is complaining of motor and/or sensory loss following a mechanism of injury compatible with possible spinal injury, that patient is to be placed in a cervical collar with verbal reinforcement that they limit movement of their cervical spine, keeping the spine in natural/neutral alignment.

PROTOCOL 10O: Splinting of Injuries, cont.
10Oa - Spinal Motion Restriction – Adult & Pediatric, cont.

Comments regarding the Selective Spinal Motion Restriction Process (cont):

8. At any point from sustaining an acute mechanism of injury compatible with possible spinal injury through EMS care, if the patient has a reported loss of consciousness or altered mental status, regardless of normal mental status upon EMS contact and assessment, that patient is to be placed in spinal motion restriction.

9. A language barrier exists if the EMS professional and the patient cannot fluently communicate. Fragmented communication ("broken" language) or the use of a family member or bystander to communicate with the patient does not constitute fluent communication. If the EMS professional has a language barrier with the patient following an injury involving a mechanism compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.

10. Regardless of apparent "soberness" on assessment, if a patient has ingested ethanol or mental-status altering drugs (e.g. narcotics, benzodiazepines, barbiturates, marijuana, cocaine) within six hours prior to a mechanism of injury compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.

11. Distracting pain or injury is best defined as an injury in which the patient is repetitively fixated upon to the extent the history and physical assessment is frequently interrupted to address that injury. The EMS professional must use his or her best judgment and anytime a concern exists that an injury may prove distracting to a patient with a mechanism of injury compatible with possible spinal injury, that patient is to be placed in spinal motion restriction.

12. In circumstances of acute vomiting and/or third trimester pregnancy, the patient is preferentially transported left lateral recumbent to reduce aspiration of emesis and when in advanced stages of pregnancy, to avoid compromising venous return to the chest.

13. If the supine positioning of the patient wearing a cervical collar is compromising respiratory mechanics and/or causing the patient to have dyspnea, the head of the stretcher may be elevated approx 15 degrees to assist respiratory status.

14. If a patient suffering a mechanism of injury compatible with possible spinal injury complains of pain in the spinal or paraspinal area anywhere from the base of the skull to the coccyx, that patient is to be placed in spinal motion restriction.

15. In the physical examination of a patient suffering a mechanism of injury compatible with possible spinal injury, if the EMS professional discovers spinal or paraspinal pain or deformity upon palpation or with patient flexion, extension, or lateral rotation of the neck or back, that patient is to be placed in spinal motion restriction.

PROTOCOL 10O: Splinting of Injuries, cont.
10Oa - Spinal Motion Restriction – Adult & Pediatric, cont.

Comments regarding the Selective Spinal Motion Restriction Process (cont):

17. If the EMS professional judges a complicating factor (e.g. patient stress or anxiety, the energy or nature of the mechanism of injury) to be present or significantly concerning, that patient is to be placed in spinal motion restriction. If any doubt exists in the view of the EMS professional as to whether to spinal motion restrict the patient, that patient is to be placed in spinal motion restriction.

18. An instance may occur when a patient has been deemed safe for transport without spinal motion restriction using this protocol and the patient subsequently develops neck or back pain in the ambulance during transport to an emergency department. The EMS professional must use his or her best judgment factoring the degree of pain verbalized and the remaining transport route and time in deciding when to spinal motion restrict the patient. As a guideline, if the remaining route involves unusually rough highway or will be prolonged beyond several minutes duration, the EMS crew should temporarily stop transportation and apply spinal motion restriction to the patient in the ambulance unless the patient's condition is otherwise unstable and requires continued emergency transport. As a guideline, if the arrival at the destination emergency department is imminent, the patient may be spinal motion restricted upon hospital arrival. In each instance, the EMS professional should inform the receiving nurse or physician of the events and timing of spinal motion restriction and appropriately reflect the events in the patient care report.

19. Any utilization of the selective spinal motion restriction protocol should be clearly documented in the patient care report, with each requirement in this process denoted.

20. An instance may occur when a patient that is to be spinal motion restricted by this protocol absolutely refuses a cervical collar and other such movement limitations. These are, indeed, difficult circumstances. If repeated attempts to secure the cooperation of the patient fail, guidance from OLMC should be sought. If such a patient is transported without spinal motion restriction by the direction of the OLMC, detailed documentation of the spinal motion restriction attempts, OLMC consultation and direction, and subsequent actions is to be contained in the patient care report.

21. For pediatric patients found in car seats and involved in motor vehicle collisions, use the following if spinal motion restriction indicated:

    - Infants restrained in a rear-facing car seat may remain in and be extricated in the car seat if secure and his/her condition allows (no signs of respiratory distress or shock)
    - Children restrained in a car seat (with a high back) may remain in and be extricated in the car seat.
    - Children restrained in a booster seat (without a back) need to be extricated and cared for following standard spinal motion restriction procedures.

PROTOCOL 10O: Splinting of Injuries, cont.

10Ob – Extremity – Adult & Pediatric:

When applying extremity splinting, include the following:

1. Assess and document the assessment of distal vascular (pulse) and nerve (motor/sensation) function, before and after splinting.

2. In general, immobilize the joint on either side of the suspected fracture area.

3. Pad splints whenever possible to avoid tissue pressure from splints.

4. In the setting of that an extremity is pulseless distal to a markedly angulated fracture, make one gentle attempt to place the angulated extremity in near-normal alignment. Document the distal vascular and nerve function before and after any such maneuver.

5. Prioritize timely transport to an appropriate emergency department for extremity injuries with pulselessness distal to the suspected fracture/injury.

Medical Literature References
10O – Splinting of Injuries– Adult & Pediatric

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10P – BLAST INJURY
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. SAFETY, SAFETY, SAFETY
2. Hemorrhage control
3. Assessment/Care for life-threatening injuries/shock
4. Vital signs
5. Analgesia (if required)
6. Appropriate trauma care destination selection

EMD

OBTAIN AVAILABLE SCENE HAZARD INFORMATION
FOR RESPONDER SAFETY
DO NOT MOVE PATIENTS UNLESS IN DANGER
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
CONTROL BLEEDING BY DIRECT PRESSURE

EMR | EMT

SCENE SAFETY CONSIDERATIONS – FLAMMABLE ENVIRONMENT? TERRORISM CAUSE – SECONDARY DEVICES?
MASS CASUALTY INCIDENT MANAGEMENT/TRAUMA AND HYPOVOLEMIC SHOCK SUPPORTIVE CARE
EXPECT HEARING DIFFICULTY/DEAFNESS IN PATIENTS DUE TO PRIMARY BLAST INJURY OF RUPTURED EAR TYMPANUM
APPLY TOURNIQUET FOR HEMORRHAGE UNCONTROLLED BY DIRECT PRESSURE PER PROTOCOL 10H - TOURNIQUET
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB AS APPROPRIATE
SPLINT SUSPECTED FRACTURES INCLUDING JOINT ABOVE AND BELOW AREA OF INJURY
COVER AMPUTATED ANATOMY WITH SALINE-MOISTENED GAUZE
PLACE AMPUTATED ANATOMY IN A CLEAN PLASTIC BAG
PLACE AMPUTATED ANATOMY OVER ICE, AVOIDING DIRECT CONTACT OF AMPUTATED ANATOMY WITH ICE
STABILIZE IMPALED OBJECTS
APPLY CARDIAC MONITOR (if equipped)

EMT-I85 | AEMT

IV ACCESS (IO IF INDICATED)

IV ACCESS (IO IF INDICATED) (TWO LINES IF POSSIBLE)
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg IF SYS BP REMAINS < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP, MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
10P – Blast Injury – Adult & Pediatric

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11A - HEAT ILLNESS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Early cooling therapy
2. Vital signs
3. Fluid resuscitation

EMD

REMOVE ANY SOURCES OF HEAT.
REMOVE OUTER CLOTHING.
APPLY COOL WATER TO ENTIRE SKIN SURFACE WHILE FANNING.
TURN ON AN AIR CONDITIONER OR FAN.

EMR | EMT

GENERAL SUPPORTIVE CARE
REMOVE FROM HOT ENVIRONMENT
COOL BODY INCLUDING HEAD WITH WATER OR SALINE
APPLY ICE PACKS TO GROIN, NECK, AXILLA
DIRECT FAN ON PATIENT TO PROMOTE EVAPORATIVE COOLING/AVOID SHIVERING
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS 500 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA.
USE CHILLED NS (when available) IF HEAT STROKE SUSPECTED
ADULT: REPEAT UP TO 2 LITERS NS IF FATIGUE, ALTERED MENTAL STATUS, &/OR HYPOTENSION < 100 mmHg PERSISTS IF NO SIGNS OF PULMONARY EDEMA

PEDIATRIC: IV NS 20 mL/kg BOLUS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg IF FATIGUE, ALTERED MENTAL STATUS, &/OR HYPOTENSION < (70 + 2x age in years) mmHg PERSISTS IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

ADULT: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
OR
ADULT: DIAZEPAM 5 mg IVP/IOP or 10 mg IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
OR
ADULT: LORAZEPAM 2 mg IVP/IOP/IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 10 MINS IF STILL SEIZING.

PEDIATRIC: MIDAZOLAM 0.1 mg/kg IM/IVP/IN/IOP TO MAX OF 5 mg FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
OR
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP/IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 5 MINS IF STILL SEIZING.
OR
PEDIATRIC: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IOP/IM FOR ACTIVE SEIZURE. MAY REPEAT X 1 IN 10 MINS IF STILL SEIZING.

OLMCP CONSULT IF SEIZURE CONTINUES DESPITE ABOVE TREATMENT

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
11A – Heat Illness – Adult & Pediatric

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11B - COLD ILLNESS/INJURY ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Warming therapy
2. Vital signs
3. Modified cardiac arrest resuscitation (when applicable)

EMD

PROTECT FROM COLD
REMOVE WET CLOTHING
WARM WITHOUT RUBBING AFFECTED AREAS
DO NOT GIVE ALCOHOL TO DRINK

EMR / EMT

GENERAL SUPPORTIVE CARE
REMOVE FROM COLD ENVIRONMENT
REMOVE WET/RESTRICTIVE CLOTHING
APPLY HEAT PACKS TO GROIN, NECK, AXILLA
COVER PATIENT WITH BLANKETS TO EXTENT CLINICALLY POSSIBLE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE (WARM & HUMIDIFIED O_2 if equipped)
APPLY CARDIAC MONITOR (if equipped)

UNRESPONSIVE HYPOTHERMIA PATIENT STATUS?
ASSESS BREATHING/PULSE FOR UP TO 45 SECONDS
PERFORM CPR IF IN CARDIOPULMONARY ARREST
IF DEFIBRILLATION ADVISED BY AED, LIMIT TO ONE DEFIBRILLATION UNTIL WARMED

FROSTBITE?
APPLY LOOSE STERILE DRESSINGS AND SPLINT INVOLVED EXTREMITIES

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, **Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 / AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS (WARMED UP TO 43°C (109°F) if available) 500 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA.
ADULT: REPEAT UP TO 2 LITERS NS IF PT TEMP <30°C (<86°F), ALTERED MENTAL STATUS, &/OR HYPOTENSION < 100 mmHg PERSISTS IF NO SIGNS OF PULMONARY EDEMA

PEDIATRIC: IV NS 20 mL/kg BOLUS (WARMED AS PER ADULT if available) IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: REPEAT UP TO 60 mL/kg IF PT TEMP <30°C (<86°F), ALTERED MENTAL STATUS, &/OR HYPOTENSION < (70 + 2x age in years) mmHg PERSISTS IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

HYPOTHERMIC CARDIAC ARREST?

ADULT/PEDIATRIC: WITH BODY TEMPERATURE <30°C (<86°F)
CONTINUE CPR, WITHHOLD MEDICATIONS, LIMIT TO A SINGLE DEFIBRILLATION FOR VENTRICULAR FIBRILLATION/PULSELESS VT

ADULT/PEDIATRIC: WITH BODY TEMPERATURE ≥30°C (≥86°F)
CONTINUE CPR, ADMINISTER DYSRHYTHMIA APPLICABLE MEDICATIONS AT 10 MINUTE INTERVALS AS CORE TEMPERATURE RISES, DEFIBRILLATE PER NORMAL BODY TEMPERATURE INTERVALS

CONTINUE REWARMING MEASURES UNTIL ROSC OR OLMCP AUTHORIZES TERMINATION OF RESUSCITATION

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
11B – Cold Illness/Injury – Adult & Pediatric

1. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
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3. McIntosh SE, Opacic M, Freer L, Grissom CK, Auerbach PS, Rodway GW, Cochran A, Giesbrecht CG, McDevitt M, Imray CH, Johnson EL, Dow J, Hackett PH; Wilderness Medical Society. Wilderness Medical Society practice guidelines for the prevention and treatment of frostbite: 2014 update. *Wilderness Environ Med*. 2014 Dec;25(4 Suppl):S43-54.
4. Henriksson O, Lundgren JP, Kuklane K, Holmér I, Bjornstig U. Protection against cold in prehospital care-thermal insulation properties of blankets and rescue bags in different wind conditions. *Prehosp Disaster Med*. 2009 Sep-Oct;24(5):408-15.
5. Lundgren JP, Henriksson O, Pretorius T, Cahill F, Bristow G, Chochinov A, Pretorius A, Bjornstig U, Giesbrecht GG. Field torso-warming modalities: a comparative study using a human model. *Prehosp Emerg Care*. 2009 Jul-Sep;13(3):371-8.
6. Cagle A, Hubbard R. Cold-related cardiac mortality in King County, Washington, USA 1980-2001. *Ann Hum Biol*. 2005 Jul-Aug;32(4):525-37.
7. Ulrich AS, Rathlev NK. Hypothermia and localized cold injuries. *Emerg Med Clin North Am*. 2004 May;22(2):281-98.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

11C - ELECTRICAL/LIGHTNING INJURY ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Oxygenation/Ventilation
4. Chest compressions and defibrillation (when applicable)
5. Vital signs
6. Red/Priority 1 patient, even in setting of MCI

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

SEND FOR AED IF AVAILABLE FOR UNCONSCIOUS PATIENT
BEWARE OF ELECTRICAL RISKS AND ELECTRIFIED WATER
TURN – OFF ELECTRICAL POWER IF SAFELY CAPABLE
ATTEMPT RESCUE ONLY IF SAFELY CAPABLE
CPR BY EMD INSTRUCTION IF INDICATED

EMR | EMT

MAINTAIN PERSONAL AND PATIENT SAFETY
STOP BURNING PROCESS
GENERAL SUPPORTIVE CARE/CARDIOPULMONARY RESUSCITATION PER APPLICABLE PROTOCOLS
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT
COVER BURNED AREA WITH BURN DRESSING (if equipped) THEN APPLY DRY SHEET

EMT OR HIGHER LICENSE:
MEASURE END – TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped, ** Mandatory use if pt intubated)
PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS TKO; FOR MAJOR THERMAL BURNS, 250 mL BOLUS IF NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO; FOR MAJOR THERMAL BURNS, 20 mL/kg BOLUS IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

TREAT CARDIAC ARREST AND SPECIFIC RHYTHM MANAGEMENT PER APPLICABLE PROTOCOL(S)

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

ANALGESIA IF REQUIRED
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
HYDROMORPHONE 0.5 - 1 mg SLOW IVP .
MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
11C – Lightning/Electrical Injury – Adult & Pediatric

1. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
2. Davis C, Engeln A, Johnson E, McIntosh SE, Zafren K, Islas AA, McStay C, Smith WR, Cushing T; Wilderness Medical Society. Wilderness medical society practice guidelines for the prevention and treatment of lightning injuries: 2014 update. *Wilderness Environ Med*. 2014 Dec;25(4 Suppl):S86-95.
3. Pfortmueller CA, Yikun Y, Haberkern M, Wuest E, Zimmermann H, Exadaktylos AK. Injuries, sequelae, and treatment of lightning-induced injuries: 10 years of experience at a swiss trauma center. *Emerg Med Int*. 2012;2012:167698. Epub 2012 May 13.
4. Ritenour AE, Morton MJ, McManus JG, Barillo DJ, Cancio LC. Lightning injury: a review. *Burns*. 2008 Aug;34(5):585-94.
5. Maghsoudi H, Adyani Y, Ahmadian N. Electrical and lightning injuries. *J Burn Care Res*. 2007 Mar-Apr;28(2):255-61.

11D - WATER SUBMERSION EVENTS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Rescue safety
2. Oxygenation/Ventilation
3. Assessment/Care for life-threatening injuries and/or cardiac arrest
4. Vital signs
5. Appropriate trauma care destination selection if injury present

EMD

RESCUE ONLY IF SAFE TO ATTEMPT
IF DIVING ACCIDENT, AVOID ALL UNNECESSARY MOVEMENT
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE

UTILIZE APPROPRIATE PRECAUTIONS USING POWERED DEVICE(S) ON WET PATIENT
APPLY CARDIAC MONITOR (if equipped)

EVALUATE ETIOLOGY OF WATER SUBMERSION – TREAT PER APPLICABLE PROTOCOL(S)
WATER SUBMERSION CARDIAC ARREST: INITIATE RESUSCITATION/TRANSPORT WITH REWARMING IF KNOWN SUBMERSION LESS THAN:
1. 60 MINUTES IF WATER TEMPERATURE GREATER THAN 6^0 CELCIUS (42.8^0 F)
2. 90 MINUTES IF WATER TEMPERATURE LESS THAN 6^0 CELCIUS (42.8^0 F)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped; **Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

ESTABLISH IV ACCESS

PARAMEDIC

TREAT CARDIAC ARREST SPECIFIC RHYTHM MANAGEMENT PER APPLICABLE PROTOCOL(S)

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Approved 9/11/19, Effective 9/11/19, No prior version, new protocol

11E – HEAT STROKE – ATHLETIC PARTICIPANTS WITH FIELD COOLING CAPABILITIES ON-SITE AT EVENT

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indication: Life-threatening heat stroke by clinical assessment requiring rapid cooling of core body temperature

Contraindication:
- Cardiac Arrest
- Respiratory Arrest
- Unstable Airway
- Inability to Maintain Normal Oxygenation

Technique (Ice Bath Immersion or Commercially Produced Body Cooling Wraps):

Athletic trainers and sports medicine physicians most typically are able to identify athletes at increased risk of heat stroke, stopping their activity and initiating cooling measures before heat stroke occurs. Athletic trainers most typically know their assigned athletes well, work in consultation with sports medicine physicians, and are valuable resources on the scene of an athletic-related medical emergency.

Field cooling with ice bath immersion or using commercially produced body cooling wraps, typically performed in a training room area adjacent to the actual “field” of play, can lower core body temperature more rapidly than ice packs to the groin and axilla as traditionally used in EMS care or Emergency Department based care. The reality is that no local Emergency Department has measures that can lower core body temperature more rapidly than effective field cooling.

After initial Paramedic assessment of the patient, consult with an OMD physician (Dr. Goodloe or Dr. Knoles) or OMD paramedic (Duffy McAnallen, David Howerton, or Matt Cox) is mandatory to help guide efficient, effective patient management, including field cooling.

Essential steps in any field cooling include: rapid activation of 911-based EMS care, continuous attention to airway/breathing/circulation, organized ongoing assessment and care throughout cooling, ability to accurately and continuously measure core body temperature by rectal thermometry, and packaging/moving the patient for timely ambulance transport once field cooling has achieved core body temperature less than 103F (rectally).

Heat Stroke – Athletic Participants with Field Cooling Capabilities On-Site at Event (cont.)

Appropriate hospital destinations for patients requiring emergent field cooling once cooled:

- Tulsa area: St. Johns Medical Center, Saint Francis Hospital, Hillcrest Medical Center, OSUMC
- Oklahoma City area: The Children's Hospital, Integris Baptist Medical Center, Integris Deaconess Hospital, Integris Southwest Medical Center, OU Medical Center, St. Anthony Hospital

Step 1 (Figure 1):

The patient will most likely be encountered immersed in an ice bath or within the commercial cooling wrap device. Rectal thermometry should already be in place as well. Initial assessment includes confirmation of pulse – best practice would be to have continuous access to one wrist, and effective breathing. Any patient requiring active airway management beyond positioning the head above the ice bath should be removed from cooling and transported as quickly as possible.

Figure 1

Step 2 (Figure 2):

The Paramedic should establish location near the patient's airway throughout cooling. Attach waveform capnography to continuously measure spontaneous circulation, respiratory rate, and ventilatory effects. Notify OMD for patient consultation of care.

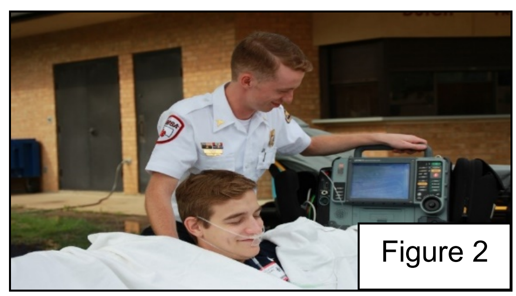

Figure 2

Step 3 (Figure 3):

Cooling impact should be rapid, being able to see decrease in core body temperature on the rectal thermometer screen. Be prepared for sudden alertness, and often vomiting, once the core temperature approaches 103F. If initial temperature shows 107.9F, realize the actual temperature is likely higher, as most available rectal thermometers will only read to 107.9F.

Figure 3

Heat Stroke – Athletic Participants with Field Cooling Capabilities On-Site at Event (cont.)

Step 4 (Figure 4):

Prior to patient alertness, pass a lifting tarp under the patient to assist in safely lifting the patient, particularly if immersed in an ice bath.

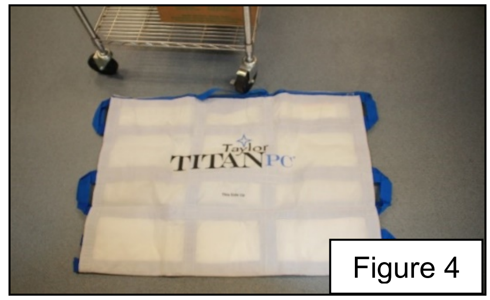

Figure 4

Step 5 (Figure 5):

Once a core body temperature of 103F is achieved, the patient should be removed from ice immersion and packaged on the EMS stretcher for timely transport to a destination identified in this guidance document. Any patient with emergent field cooling mandates an Emergency Department evaluation.


Figure 5

12A – FIREGROUND REHABILITATION CONCEPTS ADULT

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

Active fireground operations in which physiologic stress is exerted upon firefighters.

Contraindications:

None

Clinical Pearls:

1. Fireground operations place significant physiologic stress upon firefighters. Even in seemingly "normal" weather (absence of temperature extremes, absence of precipitation) during operations on even terrain, conducted by ample numbers of firefighters, the elevated body temperatures and physical stress experienced from exertion while wearing heavy protective clothing should not be underestimated. Early and effective rehabilitation promotes desired fire fighter safety on the fireground.

2. The "basics" of effective fireground rehabilitation include:
    a. medical monitoring of fire fighters at rehab entry, during rehab, and at rehab release;
    b. returning body temperatures to near normal (cooling in heat; warming in cold);
    c. hydration and electrolyte replacement;
    d. Incident Command support of preventing fire fighter return to fireground duty until medically appropriate.

3. Fireground rehabilitation operations conducted by EMS organizations should be performed in close cooperation with involved fire departments and with knowledge of the rehabilitation policies of those fire departments. Section 19 contains current fireground rehabilitation policies utilized by the Tulsa Fire Department as resource documents in assisting other EMS organizations and fire departments in Oklahoma (courtesy Tulsa Fire Department).

11D - WATER SUBMERSION EVENTS ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Rescue safety
2. Oxygenation/Ventilation
3. Assessment/Care for life-threatening injuries and/or cardiac arrest
4. Vital signs
5. Appropriate trauma care destination selection if injury present

EMD

RESCUE ONLY IF SAFE TO ATTEMPT
IF DIVING ACCIDENT, AVOID ALL UNNECESSARY MOVEMENT
STABILIZE HEAD AND NECK IN POSITION FOUND
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE

UTILIZE APPROPRIATE PRECAUTIONS USING POWERED DEVICE(S) ON WET PATIENT
APPLY CARDIAC MONITOR (if equipped)

EVALUATE ETIOLOGY OF WATER SUBMERSION – TREAT PER APPLICABLE PROTOCOL(S)
WATER SUBMERSION CARDIAC ARREST: INITIATE RESUSCITATION/TRANSPORT WITH REWARMING IF KNOWN SUBMERSION LESS THAN:
1. 60 MINUTES IF WATER TEMPERATURE GREATER THAN 6^0 CELCIUS (42.8^0 F)
2. 90 MINUTES IF WATER TEMPERATURE LESS THAN 6^0 CELCIUS (42.8^0 F)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped; **Mandatory use if pt intubated)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

ESTABLISH IV ACCESS

PARAMEDIC

TREAT CARDIAC ARREST SPECIFIC RHYTHM MANAGEMENT PER APPLICABLE PROTOCOL(S)

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
11D – Water Submersion Events – Adult & Pediatric

1. Lavonas EJ, Drennan IR, Gabrielli A, Heffner AC, Hoyte CO, Orkin AM, Sawyer KN, Donnino MW. Part 10: Special Circumstances of Resuscitation: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation*. 2015 Nov 3;132(18 Suppl 2):S501-18.
2. Dyson K, Morgans A, Bray J, Matthews B, Smith K. Drowning related out-of-hospital cardiac arrests: Characteristics and outcomes. *Resuscitation*. 2013 Jan 29.
3. Ferguson JD, De Guzman J. Cardiac arrest in special populations. *Emerg Med Clin North Am*. 2012 Feb;30(1):169-78.
4. Diamond W, MacDonald RD. Submersion and early-onset acute respiratory distress syndrome: a case report. *Prehosp Emerg Care*. 2011 Apr-Jun;15(2):288-93.
5. Youn CS, Choi SP, Yim HW, Park KN. Out-of-hospital cardiac arrest due to drowning: An Utstein Style report of 10 years of experience from St. Mary's Hospital. *Resuscitation*. 2009 Jul;80(7):778
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7. Szpilman D, Bierens JJLM, Handley A, Orlowski JP. Drowning. NEJM. 2012. 366 (22): 2102 - 2110
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10. Nordberg P, Ivert T, Dalen M, Forsberg S, Hedman A. Surviving two hours of ventricular fibrillation in accidental hypothermia. Prehosp Emerg Care. 2014. 18 (3): 446 – 449
11. Kulkarni RG, Thomas SH. Severe accidental hypothermia: the need for prolonged aggressive resuscitative efforts. Prehosp Emerg Care. 2009. 3 (3): 254 – 259
12. Lee CH, Gelder CV, Burns K, Cone DC. Advanced cardiac life support and defibrillation in severe hypothermic cardia arrest. Prehosp Emerg Care. 2009. 13 (1): 85 - 89

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

12B – SMOKE INHALATION
ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Vital signs
   (including EtCO2, if equipped)
4. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
5. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
6. Nebulization therapy
   - Albuterol

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DIRECT TO MOVE AWAY FROM SMOKE IF SAFE TO DO SO
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
IF AWAKE, AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
IF PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

EMR | EMT

MAINTAIN PERSONAL & PATIENT SAFETY
GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)
TREAT PER 12C – CARBON MONOXIDE &/OR 12E – CYANIDE AS APPLICABLE

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

ADULT & PEDIATRIC WEIGHT **≥15 kg**: NEBULIZED ALBUTEROL 5 mg
PEDIATRIC WEIGHT **<15 kg**: NEBULIZED ALBUTEROL 2.5 mg
MAY REPEAT ALBUTEROL ENROUTE X 1 AS NEEDED

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

12A – FIREGROUND REHABILITATION CONCEPTS
ADULT

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

Active fireground operations in which physiologic stress is exerted upon firefighters.

Contraindications:

None

Clinical Pearls:

1. Fireground operations place significant physiologic stress upon firefighters. Even in seemingly "normal" weather (absence of temperature extremes, absence of precipitation) during operations on even terrain, conducted by ample numbers of firefighters, the elevated body temperatures and physical stress experienced from exertion while wearing heavy protective clothing should not be underestimated. Early and effective rehabilitation promotes desired fire fighter safety on the fireground.

2. The "basics" of effective fireground rehabilitation include:
   a. medical monitoring of fire fighters at rehab entry, during rehab, and at rehab release;
   b. returning body temperatures to near normal (cooling in heat; warming in cold);
   c. hydration and electrolyte replacement;
   d. Incident Command support of preventing fire fighter return to fireground duty until medically appropriate.

3. Fireground rehabilitation operations conducted by EMS organizations should be performed in close cooperation with involved fire departments and with knowledge of the rehabilitation policies of those fire departments. Section 19 contains current fireground rehabilitation policies utilized by the Tulsa Fire Department as resource documents in assisting other EMS organizations and fire departments in Oklahoma (courtesy Tulsa Fire Department).

PROTOCOL 12A: Fireground Rehabilitation Concepts, cont.

4. In addition to the medical literature references for this protocol, additional fireground rehabilitation resources are available through the US Fire Administration, National Fire Protection Agency, International Association of Fire Chiefs, and International Association of Fire Fighters. Suggested resources that may prove helpful in designing and conducting effective fireground rehabilitation operations include:

   U.S. Fire Administration, Emergency Incident Rehabilitation, February 2008
   https://www.usfa.fema.gov/downloads/pdf/publications/fa_314.pdf

   NFPA 1584: Standard on the Rehabilitation Process for Members During Emergency Operations and Training Exercises, 2015 Edition

   www.firerehab.com

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

12B – SMOKE INHALATION ADULT & PEDIATRIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Vital signs (including EtCO2, if equipped)
4. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
5. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
6. Nebulization therapy
   - Albuterol

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

DIRECT TO MOVE AWAY FROM SMOKE IF SAFE TO DO SO
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
IF AWAKE, AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).
ADVISE PT SELF-ADMINISTRATION OF MEDICATIONS
(eg. ALBUTEROL INHALER)
IF PREVIOUSLY PRESCRIBED FOR SIMILAR SYMPTOMS

EMR | EMT

MAINTAIN PERSONAL & PATIENT SAFETY
GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC, NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)
ASSIST PT WITH PT'S OWN ALBUTEROL INHALER/NEBULIZER (when applicable)
TREAT PER 12C – CARBON MONOXIDE &/OR 12E – CYANIDE AS APPLICABLE

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

ADULT & PEDIATRIC WEIGHT **≥15 kg**: NEBULIZED ALBUTEROL 5 mg
PEDIATRIC WEIGHT **<15 kg**: NEBULIZED ALBUTEROL 2.5 mg
MAY REPEAT ALBUTEROL ENROUTE X 1 AS NEEDED

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
12B – Smoke Inhalation - Adult & Pediatric

1. Dries DJ, Endorf FW. Inhalation injury: epidemiology, pathology, treatment strategies. *Scand J Trauma Resusc Emerg Med*. 2013 Apr 19;21:31.
2. Bledsoe BE, Anderson E, Hodnick R, Johnson L, Johnson S, Dievendorf E. Low-fractional oxygen concentration continuous positive airway pressure is effective in the prehospital setting. *Prehosp Emerg Care*. 2012 Apr-Jun;16(2):217-21.
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4. Warner GS. Evaluation of the effect of prehospital application of continuous positive airway pressure therapy in acute respiratory distress. *Prehosp Disaster Med*. 2010 Jan-Feb; 25(1): 87-91.
5. Cone DC, MacMillan D, Parwani V, Van Gelder C. Threats to life in residential structure fires. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):297-301.
6. Borron SW, Baud FJ, Barriot P, Imbert M, Bismuth C. Prospective study of hydroxocobalamin for acute cyanide poisoning in smoke inhalation. *Ann Emerg Med*. 2007 Jun;49(6):794-801, 801.e12.
7. Hall AH, Dart R, Bogdan G. Sodium thiosulfate or hydroxocobalamin for the empiric treatment of cyanide poisoning? *Ann Emerg Med*. 2007 Jun;49(6):806-13.
8. Eckstein M, Maniscalco PM. Focus on smoke inhalation--the most common cause of acute cyanide poisoning. *Prehosp Disaster Med*. 2006 Mar-Apr;21(2):s49-55.
9. Guidotti T. Acute cyanide poisoning in prehospital care: new challenges, new tools for intervention. *Prehosp Disaster Med*. 2006 Mar-Apr;21(2):s40-8.
10. Madnani DD, Steele NP, de Vries E. Factors that predict the need for intubation in patients with smoke inhalation injury. *Ear Nose Throat J*. 2006 Apr;85(4):278-80.
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12C – CARBON MONOXIDE ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Vital signs (including CO & EtCO2, if equipped)
4. Oxygenation support
   - O_2 by NC, NRB
   - BVM, Bi/CPAP, ETT if indicated
5. Ventilation support
   - BVM, Bi/CPAP, ETT if indicated
6. OLMC consult for hyperbaric oxygen use direction in serious exposures

EMD

DIRECT TO MOVE AWAY FROM SUSPECTED SOURCE
IF SAFE TO DO SO
OPEN AIRWAY IF NOT ALERT & INEFFECTIVE BREATHING
IF AWAKE, AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

EMR | EMT

MAINTAIN PERSONAL & PATIENT SAFETY
GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 HIGH LITER PER MINUTE FLOW (15 LPM +) VIA NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

MEASURE CARBON MONOXIDE LEVEL – %spCO (if equipped)
IF spCO% NORMAL & NO SYMPTOMS, TREAT PER OTHER APPLICABLE PROTOCOL(S)
IF spCO% ABNORMAL, EVALUATE IF SYMPTOMS INCLUDE ALTERED MENTAL STATUS? PT PREGNANT?
OLMC CONSULT TO DISCUSS HYPERBARIC OXYGEN THERAPY FOR GCS ≤ 13 OR IF PREGNANT

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

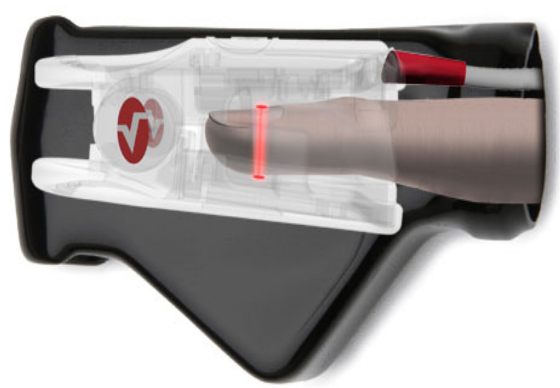
PROTOCOL 12C: Carbon Monoxide, cont.

%SpCO	Expected Signs & Symptoms – * may not correlate w/ individual pt symptoms
0-3%	None - Normal
4-9%	Minor Headache (**Normal for Smokers)
10-19%	Headache, Shortness of Breath
20-29%	Headache, Nausea, Dizziness, Fatigue
30-39%	Severe Headache, Vomiting, Vertigo, AMS
40-49%	AMS, Syncope, Tachycardia
50-59%	Seizures, Shock, Apnea, Coma
60% +	Coma, Death

Technique (Masimo RAD-57™ - see protocol Special Note):

Fingertip Sensor Placement Using Light Shield:

- Using the light shield with correct placement of finger is **VERY IMPORTANT** for accuracy of reading
- Clean and dry finger
- Orient equipment and finger to replicate diagram
- When possible, use ring finger, non-dominant hand (using the dominant hand of smokers has been shown to result in higher level readings that do not correlate with body-wide levels of CO)
- Insert finger until the tip of finger hits the stop block
- Sensor should NOT rotate or move freely on finger
- LED's (red light) should pass through mid-nail, not cuticle
- Connecting cable should be on top (nail side)



PROTOCOL 12C: Carbon Monoxide, cont.

Startup Sequence:

- Place sensor on finger (clean/dry skin)
- Press “POWER” button
- Verify all LED’s light up and a 1 second tone is heard
- Startup mode begins
- All preset configurations are displayed
- Scrolling zeroes 0 – 0 – 0 and flashes dashed lines
- May take up to 25 seconds
- Do not move sensor during startup
- When complete, reading is displayed
- Begin patient monitoring
- Defaults to pulse rate and oxygen saturation reading
- “PI” bar graph displays strength of arterial perfusion

Power Button. Press "ON", Hold for "OFF"

Each green LED window below Power Button that illuminates indicates 25% battery power

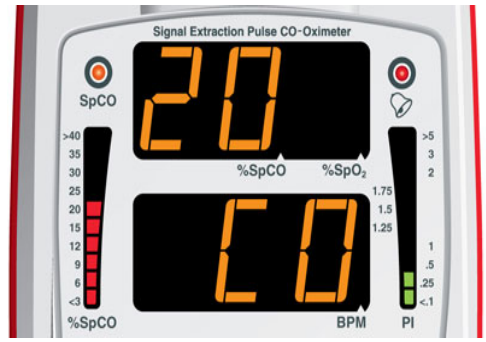
Operation / Pulse Oximetry & Pulse Rate:

- Displays after startup sequence described above
- Oxygen Saturation on top in red numbers
- Pulse Rate on bottom in green numbers
- Low Signal I.Q.® (SIQ) LED lit indicates poor pulse ox signal quality - evaluate finger/sensor, use alternate finger
- Press “DISPLAY” to display %spCO
- Press “Bell” to silence alarms (if needed)

PROTOCOL 12C: Carbon Monoxide, cont.

Operation / Carbon Monoxide (Carboxyhemoglobin) Measurement:

- Press “DISPLAY” button as described above to toggle display to show %SpCO reading (to toggle back to pulse oximetry and pulse rate mode, press “DISPLAY” again)
- Carboxyhemoglobin displayed in % on top in numbers
- “CO” displayed on bottom confirming mode
- Real-time SpCO indicator continuously reads SpCO
- Confirm abnormal readings by taking several measurements on different fingers and average the readings



Operation / Troubleshooting:

Error Messages:
- “NO Cbl” = cable not seated properly into device or defective cable
- “SEN OFF” = sensor off finger or misaligned
- “bAd CbL” = defective cable (cable most likely needs replaced)
- “CbL” = incompatible cable (change to appropriate cable)
- “bAd SEN” = defective sensor (sensor most likely needs replaced)
- “SEN” = unrecognized sensor (change to appropriate sensor)
- "Err" = return for service

Will not power on = check battery compartment and replace batteries
Continuously in startup mode (Scrolling zeroes 0 – 0 – 0 and flashes dashed lines) = shield sensor from flashing lights, strobes or high ambient light with Light Shield (best accurate practice is to always use the Light Shield); try another finger

Using Physio-Control LifePak® 15 with Masimo sensing to measure %SpCO:

- Power on, connect pulse oximetry cable to monitor/defibrillator and sensor, place sensor on patient
- To display %SpCO, use the SPEED DIAL to select the pulse oximetry display area
- Select PARAMETER from menu
- Select SpCO. Selected value displays for 10 seconds. If %SpCO is elevated, an advisory event occurs and elevated value flashes and alarm tone sounds

Medical Literature References
12C – Carbon Monoxide - Adult & Pediatric

1. Roth D, Bayer A, Schrattenbacher G, Malzer R, Herkner H, Schreiber W, Have C. Exposure to carbon monoxide for patients and providers in an urban emergency medical service. *Prehosp Emerg Care. 2013 Jul-Sep;17(3):354-60.*
2. Sebbane M, Claret PG, Mercier G, Lefebvre S, Théry R, Dumont R, Maillé M, Richard JP, Eledjam JJ, de La Coussaye JE. EMERGENCY DEPARTMENT MANAGEMENT OF SUSPECTED CARBON MONOXIDE POISONING: ROLE OF PULSE CO-OXIMETRY. *Respir Care*. 2013 Mar 19. [Epub ahead of print]
3. Weaver LK, Churchill SK, Deru K, Cooney D. False positive rate of carbon monoxide saturation by pulse oximetry of emergency department patients. *Respir Care*. 2013 Feb;58(2):232-40.
4. Hampson NB. Noninvasive pulse CO-oximetry expedites evaluation and management of patients with carbon monoxide poisoning. *Am J Emerg Med*. 2012 Nov;30(9):2021-4.
5. Touger M, Birnbaum A, Wang J, Chou K, Pearson D, Bijur P. Performance of the RAD-57 pulse CO-oximeter compared with standard laboratory carboxyhemoglobin measurement. *Ann Emerg Med*. 2010 Oct;56(4):382-8.
6. Cone DC, MacMillan D, Parwani V, Van Gelder C. Threats to life in residential structure fires. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):297-301.
7. Wolf SJ, Lavonas EJ, Sloan EP, Jagoda AS; American College of Emergency Physicians. Clinical policy: Critical issues in the management of adult patients presenting to the emergency department with acute carbon monoxide poisoning. *Ann Emerg Med*. 2008 Feb;51(2):138-52.
8. Silver S, Smith C, Worster A; BEEM (Best Evidence in Emergency Medicine) Team. Should hyperbaric oxygen be used for carbon monoxide poisoning? *CJEM*. 2006 Jan;8(1):43-6.
9. Kao LW, Nañagas KA. Toxicity associated with carbon monoxide. *Clin Lab Med*. 2006 Mar;26(1):99-125.
10. Kao LW, Nañagas KA. Carbon monoxide poisoning. *Med Clin North Am*. 2005 Nov;89(6):1161-94.
11. Gilmer B, Kilkenny J, Tomaszewski C, Watts JA. Hyperbaric oxygen does not prevent neurologic sequelae after carbon monoxide poisoning. *Acad Emerg Med*. 2002 Jan;9(1):1-8.

12D – HYPERBARIC OXYGEN THERAPY CONSIDERATIONS ADULT & PEDIATRIC

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Indications:

Carbon monoxide (CO) toxicity (as determined through Protocol 12C – Carbon Monoxide).

Contraindications:

Absence of carbon monoxide toxicity.

Clinical Pearls:

1. In the care of the suspected CO poisoned patient, exercise personal safety and avoid becoming CO poisoned.

2. The hallmarks of effective EMS care of the suspected CO poisoned patient include removal of the patient from the CO source and oxygenation with near 100% oxygen (via high flow through non-rebreather mask with good seal, non-invasive positive pressure ventilation, or through bag-valve-mask or bag-valve-artificial airway connected to an oxygen reservoir).

3. The vast majority (nearly all) of suspected CO poisoned patients may be appropriately transported to an emergency department that does not have direct access to hyperbaric oxygen (HBO) therapy.

4. Contact the nearest HBO capable facility's on-line medical control for EMS to discuss the advisability of transport for HBO therapy consideration if either of the following distinct clinical situations in which suspected/measured CO toxicity is the primary medical issue of concern:
   a. Glasgow Coma Scale score ≤ 13
   b. Pregnancy

5. Consultation and/or transport to a HBO-capable facility does not compel use of HBO therapy by the medical staff at that facility.

6. In Oklahoma, emergency facilities with direct access to HBO therapy (at least part-time) include:
   a. Oklahoma City – Integris Baptist Medical Center
   b. Tulsa – OSU Medical Center (cannot give HBO therapy to intubated patients)

Medical Literature References
12D– Hyperbaric Oxygen Therapy Considerations - Adult & Pediatric

1. Touger M, Birnbaum A, Wang J, Chou K, Pearson D, Bijur P. Performance of the RAD-57 pulse CO-oximeter compared with standard laboratory carboxyhemoglobin measurement. *Ann Emerg Med*. 2010 Oct;56(4):382-8.
2. Cone DC, MacMillan D, Parwani V, Van Gelder C. Threats to life in residential structure fires. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):297-301.
3. Wolf SJ, Lavonas EJ, Sloan EP, Jagoda AS; American College of Emergency Physicians. Clinical policy: Critical issues in the management of adult patients presenting to the emergency department with acute carbon monoxide poisoning. *Ann Emerg Med*. 2008 Feb;51(2):138-52.
4. Silver S, Smith C, Worster A; BEEM (Best Evidence in Emergency Medicine) Team. Should hyperbaric oxygen be used for carbon monoxide poisoning? *CJEM*. 2006 Jan;8(1):43-6.
5. Kao LW, Nañagas KA. Toxicity associated with carbon monoxide. *Clin Lab Med*. 2006 Mar;26(1):99-125.
6. Kao LW, Nañagas KA. Carbon monoxide poisoning. *Med Clin North Am*. 2005 Nov;89(6):1161-94.
7. Gilmer B, Kilkenny J, Tomaszewski C, Watts JA. Hyperbaric oxygen does not prevent neurologic sequelae after carbon monoxide poisoning. *Acad Emerg Med*. 2002 Jan;9(1):1-8.

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12E – CYANIDE
ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Personal safety
2. Patient safety
3. Cardiac arrest resuscitation (if applicable)
4. Oxygenation/Ventilation
5. Hydroxocobalamin administration
   Enclosed space?
   Soot in mouth/nose?
   Altered mental status?

EMD

DIRECT TO MOVE AWAY FROM SUSPECTED SOURCE
IF SAFE TO DO SO
CPR BY EMD INSTRUCTION (if applicable)
IF AWAKE, AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

EMR | EMT

MAINTAIN PERSONAL & PATIENT SAFETY
RESUSCITATION PER SECTION 4 (CARDIAC ARREST) PROTOCOLS (if applicable)
GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 HIGH LITER PER MINUTE FLOW (15 LPM +) VIA NRB, OR BVM AS APPROPRIATE
APPLY CARDIAC MONITOR (if equipped)

EMT OR HIGHER LICENSE:
MEASURE END-TIDAL CO_2 & MONITOR WAVEFORM CAPNOGRAPHY (if equipped)
ADULT: APPLY Bi/CPAP IF INDICATED (if equipped)

PLACE SUPRAGLOTTIC AIRWAY IF INDICATED & ONLY IF BVM VENTILATIONS INEFFECTIVE

EMT-I85 | AEMT

ADULT: INTUBATE IF INDICATED
IV/IO ACCESS – START TWO LINES
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

AEMT or HIGHER LICENSE:
FOR HYDROXOCOBALAMIN, USE SEPARATE LINE FROM ALL OTHER MEDICATIONS
ADULT: HYDROXOCOBALAMIN 5 grams IVPB IN 15 MINS – ADMINISTER WITHOUT DELAY
PEDIATRIC: HYDROXOCOBALAMIN 70 mg/kg IVPB TO A MAX OF 5 grams IN 15 MINS – ADMINISTER WITHOUT DELAY

PARAMEDIC

ADULT: MEDICATION ASSISTED INTUBATION IF INDICATED
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
12E– Cyanide - Adult & Pediatric

1. Holstege CP, Kirk MA. Cyanide and hydrogen sulfide. In: Hoffman RS, Howland M, Lewin NA, Nelson LS, Goldfrank LR, eds. Goldfrank's toxicologic emergencies. 10e ed. New York, NY: McGraw Hill;2015. http://accessemergencymedicine.mhmedical.com/content.aspx?bookid=1163&Section-id=65102837. Accessed 12/17/2015.
2. Desai S, Su M. Cyanide poisoning. UpToDate Website. www.uptodate.com. Published 9/29/2015. Updated 2015. Accessed 12/17/2015.
3. Anseeuw K, Delvau N, Burillo-Putze G, De Iaco F, Geldner G, Holmström P, Lambert Y, Sabbe M. Cyanide poisoning by fire smoke inhalation: a European expert consensus. *Eur J Emerg Med*. 2013 Feb;20(1):2-9.
4. Bebarta VS, Pitotti RL, Dixon P, Lairet JR, Bush A, Tanen DA. Hydroxocobalamin versus sodium thiosulfate for the treatment of acute cyanide toxicity in a swine (Sus scrofa) model. *Ann Emerg Med*. 2012 Jun;59(6):532-9.
5. O'Brien DJ, Walsh DW, Terriff CM, Hall AH. Empiric management of cyanide toxicity associated with smoke inhalation. *Prehosp Disaster Med*. 2011 Oct;26(5):374-82.
6. Cone DC, MacMillan D, Parwani V, Van Gelder C. Threats to life in residential structure fires. *Prehosp Emerg Care*. 2008 Jul-Sep;12(3):297-301.
7. Borron SW, Baud FJ, Barriot P, Imbert M, Bismuth C. Prospective study of hydroxocobalamin for acute cyanide poisoning in smoke inhalation. *Ann Emerg Med*. 2007 Jun;49(6):794-801, 801.e1-2.
8. Hall AH, Dart R, Bogdan G. Sodium thiosulfate or hydroxocobalamin for the empiric treatment of cyanide poisoning? *Ann Emerg Med*. 2007 Jun;49(6):806-13.
9. Eckstein M, Maniscalco PM. Focus on smoke inhalation--the most common cause of acute cyanide poisoning. *Prehosp Disaster Med*. 2006 Mar-Apr;21(2):s49-55.
10. Guidotti T. Acute cyanide poisoning in prehospital care: new challenges, new tools for intervention. *Prehosp Disaster Med*. 2006 Mar-Apr;21(2):s40-8.
11. Kuo DC, Jerrard DA. Environmental insults: smoke inhalation, submersion, diving, and high altitude. *Emerg Med Clin North Am*. 2003 May;21(2):475-97, x.

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13A – CHILDBIRTH - ROUTINE

TREATMENT PRIORITIES

1. Supportive Care
2. Vital signs
3. Transport left lat recumbent if prior to delivery
4. OLMCP consultation for cases of complicated delivery:
   - Cord prolapse
   - Limb presentation
   - Breech delivery
   - Neonatal resuscitation
5. Transport directly to labor and delivery if directed/usual hospital destination practice
6. Post Delivery Infant Care
   - Stimulate/dry/perform oral nasal suctioning
   - Prevent hypothermia
   - O2 administration

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO NOT TRY TO PREVENT THE BIRTH
ADVISE NOT TO SIT ON TOILET
PATIENT TO ASSUME POSITION OF COMFORT
ADVISE PATIENT TAKE DEEP BREATHS BETWEEN CONTRACTIONS

EMR | EMT

GENERAL SUPPORTIVE CARE

CEPHALIC (HEAD FIRST) PRESENTATION:
POSITION MOTHER SUPINE/KNEES WIDELY SEPARATED/ BUTTOCKS ELEVATED W/PILLOW/BLANKET
PLACE STERILE PAD/SHEET UNDER AND AROUND VAGINA

PLACE ONE HAND OVER FETAL HEAD
APPLY MINIMAL STABILIZING PRESSURE TO PREVENT EXPLOSIVE BIRTH

SUCTION MOUTH THEN EACH NOSTRIL WITH BULB SYRINGE IF NEEDED TO CLEAR AIRWAY

ALLOW HEAD TO ROTATE NATURALLY
DELIVER THE REST OF INFANT – MAY REQUIRE GENTLE DOWNWARD PRESSURE ON ANTERIOR (UPPER SHOULDER & GENTLE UPWARD PRESSURE ON POSTERIOR (LOWER) SHOULDER FOR EASIER DELIVERY

CLAMP/CUT UMBILICAL CORD
ASSESS INFANT/CALCULATE APGAR SCORE AT ONE AND FIVE MINUTES POST DELIVERY USING TABLE

EMT-I85 | AEMT

IV ACCESS
IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

APGAR SCORING (SIGN)	0	1	2
APPEARANCE	BLUE OR PALE	BODY PINK, EXTREMITIES BLUE	COMPLETELY PINK
HEART RATE (BPM)	ABSENT	≤100	>100
GRIMACE (REACTION TO CATHETER IN NARES)	NO RESPONSE	GRIMACE	COUGH OR SNEEZE
MUSCLE TONE	LIMP	SOME FLEXION	ACTIVE MOTION
RESPIRATORY RATE	ABSENT	SLOW/IRREGULAR	GOOD, CRYING

Medical Literature References
13A – Childbirth - Routine

1. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.
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13B – CHILDBIRTH - COMPLICATED

TREATMENT PRIORITIES

1. Supportive Care
2. Vital signs
3. Transport left lat recumbent if prior to delivery
4. OLMC consultation for cases of complicated delivery:
   - Cord prolapse
   - Limb presentation
   - Breech delivery
   - Neonatal resuscitation
5. Transport directly to labor and delivery if directed/usual hospital destination practice
6. Post Delivery Infant Care
   - Stimulate/dry/perform oral nasal suctioning
   - Prevent hypothermia
   - O2 administration

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

EMD

ADVISE TO NOT TRY TO PREVENT THE BIRTH
ADVISE NOT TO SIT ON TOILET
PATIENT TO ASSUME POSITION OF COMFORT
ADVISE PATIENT TAKE DEEP BREATHS BETWEEN CONTRACTIONS

EMR / EMT

GENERAL SUPPORTIVE CARE

CORD PROLAPSE:
PLACE MOTHER IN TRENDELENBERG POSITION
ELEVATE BUTTOCKS TO RELIEVE PRESSURE ON CORD
PLACE GLOVED HAND INTO VAGINA PUSHING UP ON HEAD TO RELIEVE COMPRESSION ON CORD
MAINTAIN POSITION UNTIL RELIEVED BY ANOTHER HEALTH PROFESSIONAL OR DELIVERY OCCURS

BREECH OR LIMB PRESENTATION:
PLACE MOTHER IN TRENDELENBERG POSITION
IMMEDIATE PRIORITY I TRANSPORT
EARLY HOSPITAL NOTIFICATION

CEPHALIC (HEAD FIRST) PRESENTATION:
POSITION MOTHER SUPINE/KNEES WIDELY SEPARATED/ BUTTOCKS ELEVATED W/PILLOW/BLANKET
PLACE STERILE PAD/SHEET UNDER AND AROUND VAGINA

PLACE ONE HAND OVER FETAL HEAD
APPLY MINIMAL STABILIZING PRESSURE TO PREVENT EXPLOSIVE BIRTH

AS HEAD DELIVERED CHECK FOR **NUCHAL CORD** WRAPPED AROUND FETAL NECK – IF PRESENT, SLIP CORD EITHER OVER HEAD OR DOWN OVER SHOULDER OR CLAMP/CUT

SUCTION MOUTH THEN EACH NOSTRIL WITH BULB SYRINGE IF NEEDED TO CLEAR AIRWAY

ALLOW HEAD TO ROTATE NATURALLY
DELIVER THE REST OF INFANT – MAY REQUIRE GENTLE DOWNWARD PRESSURE ON ANTERIOR (UPPER SHOULDER & GENTLE UPWARD PRESSURE ON POSTERIOR (LOWER) SHOULDER FOR EASIER DELIVERY

CLAMP/CUT UMBILICAL CORD
ASSESS INFANT/CALCULATE APGAR SCORE AT ONE AND FIVE MINUTES POST DELIVERY USING TABLE

EXCESSIVE POSTPARTUM BLEEDING – MASSAGE UTERUS

EMT-I85 / AEMT

IV ACCESS
IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS IF NO SIGNS OF PULMONARY EDEMA,
REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ECLAMPSIA: MAGNESIUM SULFATE 1 gram IVP/IOP
MAY REPEAT EVERY 2-3 MINUTES UNTIL SEIZURE ABATES
MAXIMUM CUMULATIVE DOSE IS 4 grams
CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

APGAR SCORING (SIGN)	0	1	2
APPEARANCE	BLUE OR PALE	BODY PINK, EXTREMITIES BLUE	COMPLETELY PINK
HEART RATE (BPM)	ABSENT	≤100	>100
GRIMACE (REACTION TO CATHETER IN NARES)	NO RESPONSE	GRIMACE	COUGH OR SNEEZE
MUSCLE TONE	LIMP	SOME FLEXION	ACTIVE MOTION
RESPIRATORY RATE	ABSENT	SLOW/IRREGULAR	GOOD, CRYING

Medical Literature References
13B – Childbirth - Complicated

1. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.
2. Verdile VP, Tutsock G, Paris PM, Kennedy RA. Out-of-hospital deliveries: a five-year experience. *Prehosp Disaster Med*. 1995 Jan-Mar;10(1):10-3.

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13C – VAGINAL BLEEDING/DISCHARGE ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Supportive care
2. IVF if needed for hypotension

EMD

ADVISE TO REST IN COMFORTABLE POSITION
ADVISE NO FOOD OR DRINK
ADVISE TO AVOID MOVEMENT UNLESS NECESSARY

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O2 VIA NC OR NRB, AS APPROPRIATE

EXTERNAL GENITALIA EXAM ONLY IF ONGOING, ACTIVE BLEEDING WITH CONCERNS OF HEMODYNAMIC INSTABILITY

PLACE ABD PAD/VAGINAL PAD AS NEEDED

REPORT ANY CONCERNS/SUSPICIONS OF SEXUAL ASSAULT TO RECEIVING FACILITY PERSONNEL

EMT-I85 | AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS IF NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg IF NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
13C – Vaginal Bleeding/Discharge – Adult & Pediatric

1. Schmitz G, Tibbles C. Genitourinary emergencies in the nonpregnant woman. *Emerg Med Clin North Am*. 2011 Aug;29(3):621-35.
2. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.
3. Daniels RV, McCuskey C. Abnormal vaginal bleeding in the nonpregnant patient. *Emerg Med Clin North Am*. 2003 Aug;21(3):751-72.

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13D – COMPLICATIONS OF PREGNANCY ADULT

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES

1. Vital Signs
2. Dextrose for hypoglycemia
3. Magnesium for eclampsia

EMD

ADVISE TO AVOID PHYSICAL EXERTION
OR ENVIRONMENTAL STRESS (TEMP EXTREMES).

EMR | EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O_2 VIA NC or NRB AS INDICATED
APPLY CARDIAC MONITOR/OBTAIN 12-LEAD ECG (if equipped)
TRANSMIT 12-LEAD ECG TO RECEIVING EMERGENCY DEPARTMENT

DETERMINE BLOOD GLUCOSE
HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, 1 tube ORAL GLUCOSE (15 grams) PO

EMT-I85 | AEMT

IV ACCESS
HYPOGLYCEMIA CARE:
IF GLUCOSE <50 mg/dL, D50 1 mL/kg IVP UP TO 50 mL
GLUCAGON 1 mg IM IF NO VASCULAR ACCESS OBTAINED

PARAMEDIC

ECLAMPSIA: MAGNESIUM SULFATE 1 gram IVP/IOP
MAY REPEAT EVERY 2-3 MINUTES UNTIL SEIZURE ABATES
MAXIMUM CUMULATIVE DOSE IS 4 grams

Medical Literature References
13D – Complications of Pregnancy – Adult

1. Marik PE, Rivera R. Hypertensive emergencies: an update. *Curr Opin Crit Care*. 2011 Dec;17(6):569-80.
2. Baumann BM, Cline DM, Pimenta E. Treatment of hypertension in the emergency department. *J Am Soc Hypertens*. 2011 Sep-Oct;5(5):366-77.
3. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.
4. Mateos Rodriguez AA, Benito Vellisca MA. Management of eclampsia in the prehospital setting. *Emerg Med J*. 2007 Jul;24(7):504.

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13E – PELVIC PAIN ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Supportive care
2. IVF if needed for hypotension

EMD

ADVISE TO REST IN COMFORTABLE POSITION
ADVISE NO FOOD OR DRINK
ADVISE TO AVOID MOVEMENT UNLESS NECESSARY

EMR / EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O2 VIA NC OR NRB, AS APPROPRIATE

REPORT ANY CONCERNS/SUSPICIONS OF SEXUAL ASSAULT
TO RECEIVING FACILITY PERSONNEL

EMT-I85 / AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 ml BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

ANTIEMETIC (IF ACTIVELY VOMITING)
ADULT: ONDANSETRON 4 mg IVP/ODT. MAY REPEAT ONCE IN 10 MINUTES

PEDIATRIC: ONDANSETRON 0.1 mg/kg IVP TO A MAXIMUM SINGLE DOSE OF 4 mg
IF AGE >2 years, MAY GIVE ONDANSETRON 4 mg ODT

ANALGESIA (IF REQUIRED)
FOR OPIATE USE, ADULT MUST HAVE SYS BP ≥ 100 mmHg; PEDIATRIC MUST HAVE SYS BP ≥ (70 + 2x age in years) mmHg

ADULT: FENTANYL 1 mcg/kg SLOW IVP/IM/IN, MAXIMUM DOSE 100 mcg. MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 3 mcg/kg or 250 mcg WHICHEVER IS LESSER.
OR
ADULT: MORPHINE SULFATE 2 - 4 mg SLOW IVP, MAY REPEAT 2 - 4 mg EVERY 5 MINUTES TO A TOTAL OF 10 mg.
OR
ADULT: HYDROMORPHONE 0.5 - 1 mg SLOW IVP .
MAY REPEAT EVERY 10 MINUTES TO MAXIMUM CUMULATIVE DOSE OF 2 mg.

PEDIATRIC: OLMCP ORDER ONLY

OLMCP CONSULT IF FURTHER ANALGESIA REQUIRED

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
13E – Pelvic Pain – Adult& Pediatric

1. Schmitz G, Tibbles C. Genitourinary emergencies in the nonpregnant woman. *Emerg Med Clin North Am*. 2011 Aug;29(3):621-35.
2. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.

13F – ALLEGED SEXUAL ASSAULT ADULT & PEDIATRIC

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

TREATMENT PRIORITIES
1. Supportive care – physical/emotional
2. IVF if needed for hypotension
3. Sexual assault exam capable destination

EMD

ADVISE TO REST IN COMFORTABLE POSITION
ADVISE NO FOOD OR DRINK
ADVISE TO AVOID MOVEMENT UNLESS NECESSARY

EMR / EMT

GENERAL SUPPORTIVE CARE
OBTAIN VITAL SIGNS
O2 VIA NC OR NRB, AS APPROPRIATE

INSTRUCT PATIENT NOT TO CHANGE CLOTHING OR URINATE/DEFECATE

WHEN TRANSPORTING, PREFERENCE TO UTILIZE TREATING PROFESSIONAL SAME GENDER AS PATIENT

TRANSPORT TO FACILITY THAT PERFORMS SEXUAL ASSAULT EXAMS.

REPORT ANY CONCERNS/SUSPICIONS OF SEXUAL ASSAULT TO RECEIVING FACILITY PERSONNEL

EMT-I85 / AEMT

IV ACCESS
ADULT: IV NS TKO IF SYS BP ≥ 100 mmHg WITHOUT HYPOTENSIVE SYMPTOMS
ADULT: IV NS 250 mL BOLUS IF SYS BP <100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA,
ADULT: REPEAT UP TO 2 LITERS NS IF SYS BP REMAINS < 100 mmHg WITH HYPOTENSIVE SYMPTOMS & NO SIGNS OF PULMONARY EDEMA
PEDIATRIC: IV NS TKO IF SYS BP ≥ (70 + 2x age in years) mmHg
PEDIATRIC: IV NS 20 mL/kg BOLUS IF SYS BP < (70 + 2x age in years) mmHg & NO SIGNS OF PULMONARY EDEMA

PARAMEDIC

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

Medical Literature References
13F – Sexual Assault – Adult& Pediatric

1. Linden JA. Clinical practice. Care of the adult patient after sexual assault. *N Engl J Med*. 2011 Sep 1;365(9):834-41.
2. Greenwald IB, Keady MT. Obstetric and Gynecologic Emergencies. In: Cone DC, O'Connor RE, Fowler RL, eds. Emergency Medical Services: Clinical Practice and Systems Oversight. Clinical Aspects of Prehospital Medicine. Dubuque, IA: Kendall Hunt Professional; 2009: 298-304.
3. DeVore HK, Sachs CJ. Sexual assault. *Emerg Med Clin North Am*. 2011 Aug;29(3):605-20.

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14A – STAGING CONSIDERATIONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

The Medical Control Board firmly supports all appropriate operations designed to protect public safety professionals (law enforcement, fire, and EMS) from physical assault in the course of fulfilling their respective duties. While the vast majority of Medical Control Board Treatment Protocols focus upon patient care and beneficence, it is never their intent that public safety professionals purposefully compromise their personal safety in the commission of these protocols.

Enroute to a scene of threatened, alleged, or actual violence, non-law enforcement/tactical fire and EMS professionals are to stage an appropriately safe distance away and not to proceed to the patient(s) until the scene is declared safe by appropriate law enforcement professionals. In the event of structural fire, non-fire EMS professionals are to stage at a perimeter assigned by appropriate fire suppression professionals and to take further access as directed by fire suppression professionals when hazards are appropriately mitigated. In all cases involving staging pending hazard mitigation, dispatch should be notified when the scene has been declared safe to ensure timely information transmission to the assigned field professionals. Further specific details related to any hazard staging communication procedure should be the responsibility of centralized communications for each responding agency.

<u>General Principles Regarding Threatened or Alleged Violent Scenes</u>:

A. While enroute to a scene where violence might be involved, check to see whether law enforcement officer(s) are also enroute to the scene. Responding EMS professionals should be advised by dispatch to stage when a known violent incident has not been declared safe for EMS entry by appropriate law enforcement professionals.
B. While still an anticipated safe distance from the reported incident location, turn off all emergency warning devices if being used (emergency lights and sirens).
C. Avoid crossing the line of sight of the reported incident address while responding and park out of sight of the address when staging.

PROTOCOL 14A: Staging Considerations, cont.

D. Advise dispatch of the staging location (exact address if known). If on the first arriving unit, advise dispatch of an anticipated safe approach route to the area for all other incoming emergency responders.

E. Anytime encountering a previously unidentified scene of threatened or alleged violence, rapidly promote personal safety and the safety of fellow emergency professionals. Advise dispatch for law enforcement assistance (emergency response/assistance if violence is ongoing). Withdraw to a position of safety until the scene can be appropriately secured by appropriate law enforcement. If the alleged assailant is reported to have left the scene and patient injuries are critical, utilize best judgment in whether to attempt rapid extrication and transport of casualties

Medical Literature References
14A – Staging Considerations

1. Brice JH, Studnek JR, Bigham BL, Martin-Gill C, Custalow CB, Hawkins E, Morrison LJ. EMS Provider and Patient Safety during Response and Transport: Proceedings of an Ambulance Safety Conference. *Prehosp Emerg Care*. 2012 Jan;16(1):3-19.
2. Lucas R. Violence in the prehospital setting. *Emerg Med Clin North Am*. 1999 Aug;17(3):679-83, vii.
3. Eckstein M, Cowen AR. Scene safety in the face of automatic weapons fire: a new dilemma for EMS? *Prehosp Emerg Care*. 1998 Apr-Jun;2(2):117-22.

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14B – ACTIONS TO PRESERVE CRIME SCENES

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

This protocol has been developed to promote proper emphasis on patient care while simultaneously promoting law enforcement ability to conduct effective and thorough crime scene investigation.

A. Only assigned EMS units should respond. Excess numbers of EMS professionals on scene may lead to inadvertent evidence destruction.

B. When approaching a crime scene protected by law enforcement, EMS professionals should request entry into the area to determine life status of the individual. The highest licensed EMS professional (eg. Paramedic if on scene) is to enter in cases of probable irreversible death to minimize scene disturbance. Attempt scene entry and exit by same route to minimize scene disturbance.

C. If law enforcement professionals refuse EMS access into the crime scene, do not become confrontational. Follow applicable operational procedures in consulting with an appropriate Supervisor.

D. Refer to Protocol 4K -"Do Not Resuscitate"/Advanced Directive Orders, Futility of Resuscitation Initiation & Termination of Resuscitation – Adult & Pediatric for information regarding when to withhold resuscitation.

E. To obtain an ECG tracing when the probable irreversibly dead patient is prone:

> (If using a 4-lead cable) place the left arm electrode on the left arm or upper left back. Place the right arm electrode on the right arm or upper right back. Place the left leg electrode on the lower portion of the left back or on the left leg. Place the right leg electrode on the lower portion of the right back or on the right leg. Alternatively, use monitoring/defibrillation pads. Place the sternum electrode on the upper right back and the apex electrode on the lower left back.

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PROTOCOL 14B: Actions to Preserve Crime Scenes, cont.

F. If the patient has signs of life, aggressive resuscitative efforts should be initiated. During scene resuscitation:

1. Keep EMS professionals and medical equipment close to the victim.
2. Keep out of any blood that has pooled.
3. Minimize destruction of the patient's clothing. If the patient's clothing has a puncture, do not use the hole to start cutting and do not cut "through" the hole.

G. In crime victim resuscitation, work to move the victim to the ambulance expeditiously.

H. If the patient relates any information relating to the crime, report this information to the appropriate law enforcement professionals.

Special Notes:

1. **DO NOT** go through the victim's personal effects (if the victim has expired).
2. **DO NOT** cover the body with a sheet or other material (if the victim has expired).
3. **DO NOT** move or handle any object at the scene unless absolutely essential for life-saving medical care. Inform law enforcement professionals of any such movement or handling, preferably before doing so.
4. **DO NOT** take any object from the scene unless absolutely essential for life-saving medical care (eg. impaled object).
5. **DO NOT** clean the body of blood, etc. (if the victim has expired)
6. **DO NOT** wander around the crime scene; return to the emergency vehicle.
7. **DO NOT** litter the crime scene with medical equipment, dressings, bandages, etc.

Medical Literature References
14B – Actions to Preserve Crime Scenes

1. Sharma BR. Clinical forensic medicine--management of crime victims from trauma to trial. *J Clin Forensic Med*. 2003 Dec;10(4):267-73.
2. Lucas R. Violence in the prehospital setting. *Emerg Med Clin North Am*. 1999 Aug;17(3):679-83, vii.

14C – OTHER HEALTH PROFESSIONALS ON SCENES

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Licensed EMS professionals must at all times act utilizing appropriate medical authority. Formats of appropriate medical authority include verbal physician medical orders, written physician medical orders, and standing orders in the form of the Medical Control Board Treatment Protocols. Licensed EMS professionals are authorized to accept medical directives from the following:

1. EMS System Medical Director.
2. Principles of accepted standard of care practice by EMS professionals, as defined by the Medical Control Board Treatment Protocols.
3. Verbal order from an On-Line Medical Control Physician (OLMCP) or approved designate (OLMC).
4. Verbal or written order signed by a physician (M.D. or D.O.) present with the patient in the medical office, clinic, or specialized treatment facility (eg. dialysis center).
5. Bystander physician that presents a valid M.D. or D.O. Oklahoma License Card.
6. Oklahoma Poison Control Center Specialists acting under the standing orders of the Physician Medical Director of the Oklahoma Poison Control Center.

Compliance with Physician's Verbal or Written Orders:

1. Verbal or written orders that are signed by the physician are acceptable.
2. If a physician (M.D. or D.O.) directs an EMS professional to provide treatment that is not clearly defined in the Medical Control Board Treatment Protocols that EMS professional may carry out the order to the best of his or her ability as long as the ordered treatment or procedure falls within his or her authorized scope of EMS practice.
3. If an EMS professional receives a physician order for care that he or she does not feel comfortable with, or feels the order does not represent the appropriate standard of care for the patient’s assessed condition, he or she should advise the ordering physician of the Medical Control Board Treatment Protocols that he or she is required to uphold. Request to be allowed to continue further patient care under these standing orders. Should the ordering physician dissent to using these standing orders at that time, contact the appropriate OLMCP, brief the OLMCP on the situation, including the patient’s assessed condition and the physician orders of

PROTOCOL 14C: Other Health Care Professionals on Scene, cont.

Compliance with Physician's Verbal or Written Orders, cont.:

concern and allow the physicians to directly discuss further treatment of the patient. At no time should critical patient care as specified in these standing medical orders be delayed while resolution of the situation is occurring.

4. Poison Control Center Specialists are authorized to direct medical care related to the medical toxicology and/or hazardous material exposure aspects of patient care if contacted for directives.

General Principles for Working with Other Health Care Professional(s) On-Scene

1. Conduct all conversations and operations with the standards of professional demeanor and respectful attitude.

2. Make every reasonable effort to carry out orders within appropriate standards of care given by on-scene physician(s).

3. Orders by nurses, nurse practitioners, and physician assistants are not applicable to EMS professionals. Proceed with managing the patient according to established protocol.

4. If doubt exists as to whether the “physician” is indeed a validly licensed Oklahoma M.D. or D.O., ask to see the physician's registration card from the Oklahoma State Board of Medical Licensure and Supervision. If the physician cannot verify this status, EMS professionals are to proceed with managing the patient according to established protocol.

Medical Literature References
14C – Other Health Professionals on Scene

1. Barishansky RM, O'Connor KE, Perkins TJ. "Is there a doctor in the house?" Addressing bystander physician involvement on scene. *Emerg Med Serv*. 2005 Jan;34(1):87-90.
2. Benitez FL, Pepe PE. Role of the physician in prehospital management of trauma: North American perspective. *Curr Opin Crit Care*. 2002 Dec;8(6):551-8.
3. Rottman SJ, Schriger DL, Charlop G, Salas JH, Lee S. On-line medical control versus protocol-based prehospital care. *Ann Emerg Med*. 1997 Jul;30(1):62-8.

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14D – INFORMED PATIENT CONSENT/REFUSAL

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

A. Competent adults are entitled to make decisions about their health care. They have the right to refuse medical care after they have been properly informed of the benefits, risks, and alternatives to the recommended care. This protocol defines the mechanisms by which a patient who summoned EMS care, or for whom EMS care was summoned, may refuse care and/or transport.

B. To safely allow a patient (or their legal representatives) to exercise their rights while protecting yourself and your organization, you need to follow the following steps – each and every time, with each patient who is ultimately not treated or transported:

1. Perform a complete assessment, maintaining suspicion of serious illness or injury.
2. Evaluate the differential of possible medical conditions. Avoid tunnel-vision on only one explanation for the patient's condition. Assume worst case possibilities. You should be thinking of "ruling in" rather than "trying to explain away" worrisome findings. These worst case possibilities must be communicated clearly to the patient (or their legal representatives).
3. Ascertain the patient's mental status. The patient must be alert and oriented to time, place, and events. You must determine the patient's ability to make an informed refusal, dependent upon their ability to evaluate choices, understand risks and benefits of those choices, and have the capacity to make rational decisions. Factors that could impede or impair comprehension and decision making capacity include clinical, physical, and emotional disturbances. If a patient's legal representative is making a refusal request, similar evaluation of that person's mental status must be accomplished.
4. The patient (or their legal representatives) must be offered transport in a polite and unqualified manner. Discouragement of EMS transport, intentional or not, may represent a breach of duty.

PROTOCOL 14D: Informed Patient Consent/Refusal, cont.

C. For the purpose of this protocol, legal representatives of patients (by legal custody or Durable Power of Attorney for Health Care), or parents of minor patients may refuse medical care if they:

1. Have capacity to make medical decisions = able to understand the nature of the potential injury or illness and the consequences of refusing medical care and/or transportation to an emergency department.

AND

2. At least one of the following:
    - Adult = 18 years of age or older.
    - An emancipated minor = <18 years of age, but living away from parents or guardians and financially responsible for self.
    - Married minor.
    - Minor in the military.

Pregnant minors must still have adult consent (unless the emergency medical care being requested or refused is directly related to the pregnancy) if they do not meet one of the above minor exceptions.

D. At no time may a spouse or relative who is not the legal representative of the patient make a decision to refuse evaluation, treatment, or transportation of the patient.

E. The following patients may be considered **NOT** to have capacity to make medical decisions:

1. Altered level of consciousness, including, but not limited to alcohol/drug use or head injury.

2. Attempted or threatened suicide (verbally or otherwise) recently and related to the call.

3. Suspected cerebral hypoxia due to, but not limited to, head injury or prolonged seizure(s).

4. Adults with sustained severely altered vital signs (pulse >120 or <40; respirations >30or <8 per min; pulse oximetry <85% if history of chronic respiratory illness or <90% if previously healthy; systolic BP >220mmHg or <90mmHg).

PROTOCOL 14D: Informed Patient Consent/Refusal, cont.

5. Children with sustained severely altered vital signs (pulse >160 or <40; respirations >45 or <12 per min; pulse oximetry <90%; systolic BP >140 mmHg or < 70 + 2 x years of age).

6. Hypoglycemia defined as blood glucose <50 mg/dL.

7. Making largely irrational decisions in the presence of an obvious life or limb threatening condition (e.g. near amputation, ST elevation acute myocardial infarction), including persons who are emotionally unstable.

8. Under mental hold (Emergency Detention) which has been invoked by a person authorized to invoke such a hold.

9. Known mental retardation or deficiency to the degree of being unable to care for self without constant assistance or supervision.

F. An appropriate Supervisor or OLMC must be contacted for all incidents when:

1. EMS has been requested; AND
2. Patient contact has been established (occurs when EMS personnel are physically with the patient and inquire to the patient's well-being), the patient has evidence of acute medical condition (verbalized symptoms or physical exam findings)**,** but further EMS assessment, treatment, and/or transport has been refused; AND
3. Any one of the following:

   a) Patient does NOT have medical decision making capacity to refuse (see E 1-9 immediately above); **OR**
   b) Age < 2 years or > 65 years; **OR**
   c) Minors (unemancipated or not in military) without ability to contact parent/guardian; **OR**
   d) Communication barrier (language or handicap) to extent patient's understanding of condition and recommended treatment/transport cannot be verified; **OR**
   e) Refusal of further assessment, treatment, and/or transport in the EMS professional's judgment places the patient at significant risk.

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PROTOCOL 14D: Informed Patient Consent/Refusal, cont.

G. After the EMS Supervisor and/or OLMC has been informed of the situation, the EMS Supervisor and/or OLMC should communicate directly with the patient, on a recorded line, to establish the patient's intent. To validate the refusal, the EMS Supervisor and/or OLMC should inform the patient or patient's legal representative of:

1. The patient's condition to the extent EMS assessment allows, specifically noting that EMS assessment is limited in scope and not a replacement for physician evaluation.
2. Given the apparent patient condition, the corresponding potential risks of refusal.
3. EMS will transport the patient to an appropriate emergency department for further assessment and care regardless of the financial status of the patient.
4. Alternate forms of treatment or transport that can be offered.
5. A clear statement that the patient (or patient's legal representative) is voluntarily assuming all health risks that may result from the refusal for care at this time.
6. A clear statement that EMS can be recalled anytime if medical assistance is desired.

H. If the EMS Supervisor and/or OLMC cannot successfully intervene to affect further assessment, treatment, and transport in an obvious life or limb threatening condition (e.g. near amputation, ST elevation acute myocardial infarction), AND on-scene personnel believe physically restraining the patient at this juncture to be unsafe or otherwise ill-advised, the EMS Supervisor and/or OLMC should consult the EMS System Medical Director or his/her designee for further consultative directives.

I. If a patient is determined to NOT have medical decision making capacity, the patient should be treated by implied consent. If this patient continues to refuse assessment, treatment, and/or transportation, all reasonable measures, including law enforcement assistance and/or appropriate use of physical restraint should be used to assess, treat, and transport the patient. The Medical Control Board does not expect EMS professionals to place themselves in physical danger in this process. If a physical threat is imminent, withdraw to a position of safety, requesting additional appropriate resources, while attempting to leave the patient in the care of a responsible adult.

J. All patients (or their legal representatives) who are allowed to refuse further assessment, treatment, and/or transport must have the risks, benefits, and alternatives of their decisions explained to them by EMS personnel and demonstrate an understanding of this discussion. The reason(s) of refusal stated to EMS, benefits of recommended treatment and/or transport, alternatives to initially recommended care and/or transport, and risks of the refusal explained to the patient (or their legal representatives) and the reactions to this explanation must be documented in the patient care report in addition to the patient's chief complaint, vital signs and physical assessment.

K. All patients (or their legal representatives) who are allowed to refuse further assessment, treatment, and/or transport must be advised to seek further medical examination and care by a licensed physician (M.D. or D.O.). The limitations of EMS scope of assessment and practice must be explained. Document this information as it was explained.

PROTOCOL 14D: Informed Patient Consent/Refusal, cont.

L. All patients (or their legal representatives) who are allowed to refuse further assessment, treatment, and/or transport are to sign a refusal statement. A witness (preferably a friend or relative of the patient) is to countersign the refusal to verify its accuracy. The signature of release may or may not actually “release” an EMS professional or EMS organization from liability. One of the many purposes of using a release, however, is to further demonstrate good faith and diligence in meeting responsibilities to the patient. Together, with prudent actions, it helps to defend against assertions of abandonment. If the patient (or their legal representative) refuses to sign a valid refusal form, EMS professionals should also document the details of this encounter, including reasons for refusal to sign. EMS professionals should also document on the refusal form “Patient refused to sign.” with at least one colleague signing as a witness.

M. Leave the patient (or their legal representatives) any applicable medical care instruction sheets. Document in the patient care report what instruction sheet(s) were given.

N. All dispatches not resulting in the transport of a patient require completion of the appropriate no transport information.

<u>Additional Notes</u>:

1. **DO NOT** ignore clues to potentially serious injuries or illnesses, such as abnormal vital signs, unconsciousness which may be followed by a transient lucid stage (head injury with epidural hematoma), concern of family members or witnesses, or inconsistencies in information obtained from different sources.

2. A red flag needs to be raised anytime with thoughts such as “this patient is just a drunk”, “it’s not that bad, this patient can’t afford an ambulance”, or “an ambulance shouldn’t be tied up on this type of call”. These rationalizations encourage underestimating the patient’s condition and treatment shortcuts, resulting in substandard patient care and patient endangerment.

3. Refusal of assessment, treatment, and/or transport situations are often emotionally and potentially legally charged situations. Maintain duty to act in the best interests of all patients by avoiding any potentially discouraging tone, language, or body positioning that conveys unwillingness to provide humane, compassionate patient care.

4. Every patient has a right to EMS full service and attention. While a perception of “system demands” may be commendable, it cannot supersede a patient’s needs and rights unless in the most dire of disaster conditions. Take patients one at a time and give them the best care morally, ethically, and legally possible.

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PROTOCOL 14D: Informed Patient Consent/Refusal, cont.

Special Considerations in Care of Minors

A. If a minor aged patient presents with life or limb threatening condition, but no parent or guardian is present, do not delay indicated care. Provide treatment and transport per applicable protocol(s) and assign other public safety colleagues the task of notifying the child's parent/legal guardian of the incident, any obvious illness/injury, and hospital to which the child was transported.

B. If a minor needs medical treatment, but no parent or guardian is present, EMS professionals may treat per applicable protocol(s) if the parent or guardian cannot be reached after reasonable attempts and the minor gives verbal and physical consent.

C. IF THE PARENT/GUARDIAN CANNOT BE REACHED AFTER REASONABLE ATTEMPTS AND THE MINOR REFUSES TREATMENT:

1. Consult an appropriate EMS Supervisor for advice, which may include, but is not limited to:

   - Police assistance, taking the minor into their protective custody.
   - Utilization of family members outside the immediate parents/legal guardians.
   - Utilization of reliable adults with prior knowledge of the minor
   - As a last resort, allowing the minor refusal of service under the same requirements and procedures as listed above for adult patients (or their legal representatives).

Medical Literature References
14D – Informed Patient Consent Refusal

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14E – ON-LINE MEDICAL CONTROL PHYSICIANS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

The Medical Control Board supports EMS professionals in the field having the availability of On-Line Medical Control Physicians (OLMCP). The OLMCP represents the Medical Director in "real-time" system operations.

The OLMCP is the resource available 24 hours per day for consultation contemporaneous with patient care.

OLMCP consultation, when desired or required, is to be made at the earliest appropriate point in the patient's assessment and treatment in order to facilitate appropriate patient care.

Radio reports to the OLMCP should follow Protocol 14H - Radio Report Communications. It is the responsibility of the consulting EMS professional to ensure a brief, yet pertinent report to meet the needs of the patient and the treating EMS professional(s). If the lead EMS professional is involved in performing critical interventions, other personnel may make the report under the guidance of the lead EMS professional as may be beneficial for accuracy. Communications should ideally be established via a recorded communication method.

Contact with OLMCP will be made in the following circumstances:

- All situations in which consultation is specifically required in these treatment protocols.
- Any situation in which the treating EMS professional(s) feel it in the best interest of the patient to obtain physician consultation, ensuring the most accurate EMS care possible for the patient's condition.
- Any situation in which the EMS professional(s) feels extensive modification is required from the standard treatment and/or procedure protocols.
- All patients in whom a refusal of care and/or transport would, in the EMS professional's judgment, place the patient, the EMS professional, and/or the EMS system at risk after appropriate attempts fail to produce needed results..

PROTOCOL 14E: On-Line Medical Control Physicians, cont.

Acceptable modification to the sequence of drugs or procedures must be justified as being appropriate for field management of critically ill or injured patients in unusual circumstances and therefore, should be an uncommon event.

EMS providers complying with orders which exceed their level of licensure and/or authorized scope of EMS practice may be subject to disciplinary action by the Oklahoma State Department of Health (as well as locally applicable action) which may include, but is not limited to, indefinite suspension or permanent revocation of licensure and authorization to provide patient care.

Medical Literature References
14E – On-Line Medical Control Physicians

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14F – HELICOPTER EMS (HEMS) CONSIDERATIONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Medical literature to date demonstrates no significant survival benefit utilizing medical helicopter transport for patients in densely populated, urban settings. The Medical Control Board and the University of Oklahoma Department of Emergency Medicine EMS Section provide the following information regarding the clinically appropriate utilization of medical helicopters to maximize patient benefit and protect the safety of patients, aeromedical professionals, and ground EMS professionals.

"No Fly" Patient Conditions
Medical helicopter utilization rarely affects outcome in already moribund patients or in the converse, stable patients without apparent serious illness/injury. A medical helicopter should NOT be utilized for the following patients:

1. Medical or Traumatic Cardiac Arrest without Return of Spontaneous Circulation;
2. Trauma Patients with minimal traumatic injury, without apparent risk of life/limb loss;
3. Patients with stable vital signs and without signs of serious illness/injury.

"No Fly" Zones
Medical helicopter utilization is very rarely indicated within an approximate 30 minute radius of an appropriate destination hospital unless there are extenuating circumstances. These "extenuating circumstances" include the following:

1. Hazardous or impassible road conditions resulting in significant ground transport delays for seriously injured or ill patients;
2. Multiple casualty incidents with high numbers of red/priority 1 patients, overwhelming available ground EMS units;
3. A combination of lengthy extrication and extended ground transportation (traffic conditions, weather conditions) of a priority 1 or priority 2 patient at the lead EMS professional's careful discretion.

PROTOCOL 14F: Helicopter EMS (HEMS) Considerations, cont.

Medical Helicopter Utilization:

At incidents greater than 30 minutes from the appropriate destination hospital, the decision to activate a medical helicopter response should be based upon an EMS professional's assessment of the patient's clinical condition, factoring in apparent and/or suspected illness or injury, mechanisms of injury – if applicable, anticipated scene time, and anticipated ground transport time to an appropriate destination hospital (eg. cardiac catheterization capable hospital or trauma center). Medical helicopters should not be activated until an EMS professional or medically-trained law enforcement officer has assessed the patient. Further utilization concepts include:

1. EMS professionals on scene may elect to activate a medical helicopter if flight time to the incident, flight scene time, and return flight time would still allow a critical patient to arrive at an appropriate destination hospital significantly faster by air.
2. If ground EMS transport capability is not on scene and a decision is being factored as to ground or air transport, the on scene EMS professionals should first request an ETA for the ground transport unit. If the on scene EMS professionals then judge transport time by ground will be detrimental to the patient clinical condition, a medical helicopter response can be activated. This decision should be communicated to ground EMS agency to keep all responding apparatus crews aware of scene and patient dynamics.
3. If uncertain whether medical helicopter activation is in the best interest of the patient, contact OLMC at the anticipated destination hospital for consultation and determination of transport mode and destination.
4. The primary determinant of helicopter transport mode is to achieve getting the critical patient to the most appropriate definitive care hospital in the shortest amount of time. The medical helicopter to be utilized is the medical helicopter appropriate for the patient's needs and closest to the incident location.

Cancellation of Medical Helicopter Activation:

An EMS professional may cancel a medical helicopter response after being activated if patient condition significantly improves or deteriorates to meet "no fly" criteria. Keep in mind, though, that once a medical helicopter is responding to the scene, it is generally unwise to cancel that response. EMS professionals should avoid requesting a medical helicopter response, canceling the response, and then having to request the helicopter again. Such a situation prolongs scene time and helicopter response time in addition to conveying indecisive patient care.

Landing Zone:

Appropriate fire or law enforcement personnel will be responsible for establishing and maintaining a safe landing zone.

PROTOCOL 14F: Helicopter EMS (HEMS) Consideration, cont.

Utilization Review:

All medical helicopter activations may undergo utilization review by the Medical Director and/or his/her designee and by the medical director of the aeromedical organization. This is to specifically promote optimal medical helicopter utilization and not to be interpreted as discouraging appropriate medical helicopter utilization per this protocol.

Medical Literature References
14F – Helicopter (HEMS) Considerations

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14G – PATIENT PRIORITIZATION

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

While each patient will receive the best possible EMS care in a humane and ethical manner, proper patient prioritization ensures that patients most dependent upon rapid and critical medical interventions receive expeditious field treatment and that destination hospitals receive early notification.

Red/Priority I: Patient condition expected to require immediate intervention upon Emergency Department arrival. Examples include:

- Inability to successfully oxygenate and/or ventilate;
- Acute dyspnea in adults requiring CPAP;
- Acute Myocardial Infarction with ST elevation on 12-Lead ECG;
- Acute Congestive Heart Failure with hypotension (Cardiogenic Shock);
- Acute Stroke with positive LAPSS with symptom onset < 3 hours in duration;
- Status epilepticus;
- Deep penetrating trauma (e.g. gunshot wound) to head, neck, or trunk;
- Trauma in adults with systolic blood pressure <90 mmHg;
- Trauma in pediatrics with systolic blood pressure < (70 + 2 X age in years) mmHg.

Red/Priority I patients are typically transported to the Emergency Department with red lights and sirens.

Yellow/Priority II: Patient condition expected to require intervention within 15 minutes upon Emergency Department arrival. Yellow/Priority II patients have potential time sensitive problems, are currently stable, but at risk for sudden deterioration. Examples include:

- Acute dyspnea in adults and pediatrics with normalizing vital signs;
- Acute non-traumatic chest pain in adults improving with protocol specified treatment;
- High force traumatic injuries with normal and stable vital signs.

Yellow/Priority II patients may be transported to the hospital red lights and sirens if time of transport would otherwise create marked risk to patient recovery. In most situations, though, the safety risk of red lights and sirens transport of these patients is unwarranted.

PROTOCOL 14G: Patient Prioritization, cont.

Green/Priority III: Patient condition expected to require routine timeliness of intervention upon Emergency Department arrival. Green/Priority III patients do not appear to require further emergent medical intervention and do not appear to have life/organ threatening conditions. Examples include:

- Asthma exacerbation dyspnea resolved with bronchodilator nebulization;
- Nausea/non-bloody vomiting with normal and stable vital signs;
- Isolated orthopedic injury with intact neurovascular function.

Green/Priority III patients should be transported to the hospital without red lights and without sirens. The safety risk of red lights and sirens transport of these patients is unwarranted.

Black or Blue: Obvious death or illness/injury severity incompatible with successful resuscitation given concurrent system demands (such as in multiple casualty responses).

Adult trauma patients are determined to be **Red/Priority I** by either vital signs and level of consciousness (systolic BP < 90 mmHg, sustained tachycardia, respiratory rate <10 or >29 breaths per minute, GCS ≤ 13, cool, diaphoretic skin) or any of the following anatomical injury:

- Penetrating injury of head, neck, torso, extremities proximal to elbow or knee;
- Amputation proximal to the wrist or ankle;
- Paralysis or suspected spinal fracture with neurological deficit;
- Flail chest;
- Two or more suspected proximal long - bone fractures;
- Open or suspected depressed skull fracture;
- Unstable pelvis or suspected pelvic fracture;
- Tender and/or distended abdomen;
- Burns associated with other Priority I Trauma;
- Crushed, degloved, or mangled extremity, proximal to the wrist or ankle.
- Pulseless extremity

Adult trauma patients are determined to be **Yellow/Priority II** from events with risk of severe injury despite normal and stable vital signs without change in usual mentation or usual neurologic function, or respiratory distress. Adult trauma patients may also be determined to be Yellow/Priority II if exhibiting a single system injury as noted:

- High risk auto crash (intrusion > 12 inches in occupant site; intrusion > 18 inches in any site; ejection (partial or complete) from automobile; death in same passenger compartment);
- Auto v. pedestrian/bicyclist thrown, run over, or with significant (>20 mph) impact;
- Motorcycle crash > 20 mph;
- Falls > 20 feet in height (one building story is 10 feet in height);
- Significant force alleged assault;
- Isolated closed head trauma with resolved altered mental status (Neuro System);
- Positive seatbelt sign or handlebar mark;
- Fractures/dislocation; lacerations/avulsions with extensive tissue damage;
- High voltage electrical injury;
- Pregnancy > 20 weeks.

PROTOCOL 14G: Patient Prioritization, cont.

Adult Priority II Determining Criteria, cont.

Adult trauma patients are determined to be **Yellow/Priority II** from events with risk of severe injury despite normal and stable vital signs without change in usual mentation or usual neurologic function, or respiratory distress. Adult trauma patients may also be determined to be Yellow/Priority II if exhibiting a single system injury as noted:

- Facial lacerations; fractured facial bones; avulsed teeth (Maxillofacial/Dental);
- Select & isolated hand injuries ("isolated" defined by the level of suspected injury involvement being no further proximal than the elbow).
  - Only certain hand injuries require rapid treatment to avoid unfavorable outcomes. These "select" Priority II injuries include:
    - Vascular injuries that involve significant arterial hemorrhage;
    - Nerve injuries that cause loss of motor function;
    - Amputations;
    - High-pressure injection injuries;
    - Flexor tendon injuries of hand.

Adult trauma patients may be determined to be **Discretionary Red/Priority I or Yellow/Priority II** if clinical suspicion of significant injury and heightened by any single or particularly a combination of the following patient attributes:

- Age > 55;
- Anticoagulation, bleeding disorders and/or significant comorbidities;
- Time sensitive extremity injury.

Discretionary Red/Priority I or Yellow/Priority II adult trauma patient radio and care reports should clearly indicate to the receiving Trauma Center personnel the rationale for the Discretionary Red/Priority I or Yellow/Priority II assignment.

Level III Trauma Centers are intended to receive adult patients at risk for severe injury with normal, stable vital signs or patients with no significant anatomical injuries.

Adult trauma patients are determined to be **Green/Priority III** from events with normal and stable vital signs, without change in usual mentation or usual neurologic function, and without new or significant organ system dysfunction. Green/Priority III adult trauma may include:

- Single proximal or distal long bone fractures without dislocation;
- Minor puncture wounds/lacerations/abrasions;
- Isolated neck pain without new neurological deficit;
- Isolated extremity pain;
- Isolated abdominal pain.

PROTOCOL 14G: Patient Prioritization, cont.

Level IV Trauma Centers may receive adult patients without physiologic instability, altered mentation, neurological deficit or significant anatomical injuries and have also not been involved in a significant mechanism of injury incident for expected care at that facility. Patients in other categories (eg. with physiologic instability) should be expected to be transferred to a higher level trauma center after immediate care needs are addressed (eg. invasive airway management).

Pediatric trauma patients are prioritized **Red/Priority I** by either physiological criteria (systolic BP < (70 + 2 x age of patient in years) mmHg, sustained tachycardia >160 bpm, respiratory rate <12 or >40, pulse oximetry<95% without supplemental oxygen, or GCS ≤ 12)

- Penetrating injury of head, neck, torso, extremities proximal to elbow or knee;
- Amputation proximal to the wrist or ankle;
- Paralysis or suspected spinal fracture with neurological deficit;
- Flail chest;
- Unstable pelvis or suspected pelvic fracture;
- Crushed, degloved, or mangled extremity, proximal to the wrist or ankle;
- Pulseless extremity;
- Two or more open fractures.

Pediatric trauma patients are prioritized **Yellow/Priority II** from "high-energy" events with risk of severe injury despite normal and stable vital signs without change in usual mentation or usual neurologic function, or respiratory distress. Pediatric trauma patients may also be determined to be Yellow/Priority II if exhibiting any of the adult trauma priority II single system injury criteria.

Pediatric trauma patients may be determined to be **Discretionary Red/Priority I or Yellow/Priority II** if clinical suspicion of significant injury warrants and is heightened by any of the following patient attributes:

- GCS of 13-14;
- Extrication time > 20 mins, *death in same vehicle, speed >40 mph, rollover mechanism, vehicle external intrusion >20" or compartment intrusion >12";
- Fall criteria for pediatric trauma Red/Priority I is >10 feet or 2 – 3 times the height of the child;
- Two or more suspected proximal long - bone fractures;
- Open or suspected depressed skull fracture;
- Tender and/or distended abdomen/positive seatbelt sign or handlebar mark;
- Suspected or known Non-Accidental Trauma in pediatric patients;
- Tenderness to spine with palpation;
- Isolated open fracture (excluding hand);
- Significant laceration or soft tissue injury;
- High voltage electrical injury;
- Anticoagulation and bleeding disorders and/or significant comorbidities.

PROTOCOL 14G: Patient Prioritization, cont.

Discretionary Red/Priority I or Yellow/Priority II pediatric trauma patient radio and care reports should clearly indicate to the receiving Trauma Center personnel the rationale for the Discretionary Red/Priority I or Yellow/Priority II assignment.

Pediatric trauma patients are determined to be **Green/Priority III** from events with normal and stable vital signs, without change in usual mentation or usual neurologic function, and without new or significant organ system dysfunction. Green/Priority III pediatric trauma may include any of the adult trauma Green/Priority III injury criteria as previously listed in this protocol.

- Single bone fractures from a same level fall;
- Minor puncture wounds/lacerations/abrasions;
- Isolated extremity pain;
- Abdominal pain without bruising;
- Back pain;

SEE ALSO SECTION 19 RESOURCE: OKLAHOMA MODEL TRAUMA TRIAGE ALGORITHM

Pediatric (Age < 16 years of age) general medical patients are determined **Red/Priority I** to be if the following organ system dysfunction is evidenced by acute symptoms or physical exam signs:

Pulmonary System:

- Respiratory arrest;
- Respiratory distress and inability to maintain O_2 sat > 95% on 100% supplemental O_2;
- Stridor with inability to phonate, weak cry, altered mental status, or pallor.

Cardiovascular System:

- Cardiac arrest (or history of pre-arrival CPR) or bradycardia requiring chest compression;
- Multiple shock signs (pallor, cool, slow capillary refill, weak pulse, altered mental status);
- Persistent tachycardia > 200/min or bradycardia< 80/min (without athletic fitness level).

Neurologic System

- Status epilepticus;
- Acute sustained altered mental status without apparent etiology;
- Acute focal neurological deficits.

Metabolic System/Toxicology (Overdose)

- Ingestion of a tricyclic antidepressant;
- Ingestion, inhalation, or contact exposure causing altered mental status, respiratory distress, or shock.

PROTOCOL 14G: Patient Prioritization, cont.

Pediatric (Age $\leq$ 16 years of age) general medical patients are determined to be **Green/Priority III** if there does not appear to be an acute medical problem of life/organ threatening severity.

Specialized Burn Care
In Oklahoma, the following burn care specialty centers exist:

Oklahoma City:	Adult - Integris Baptist Medical Center
	Pediatric - OU Medical Center Childrens
Tulsa:	Adult/Pediatric - Hillcrest Medical Center.

Patients with the following burn injuries (without additional trauma center criterion injuries) should either be transported directly to a burn care specialty center or be referred to such after initial emergency department evaluation:

- Partial thickness(second degree) burns >10% total body surface area (TBSA);
- Full thickness (third degree) burns;
- Partial or full thickness burns of the face, hands, feet, genitalia/perineum, or major joints;
- Electrical burns (includes lightning injury), inhalation burns, chemical burns;
- Burn injury in patients with preexisting medical disorders compromising healing and survival (cardiac disease, chronic respiratory illness, diabetes);
- Multisystem trauma with partial or full thickness burn as the predominant injury.

If the burn patient cannot be oxygenated or ventilated, transport the patient to the nearest appropriate emergency department for airway management.

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14G – Patient Prioritization

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14H – RADIO REPORT COMMUNICATIONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Radio Report Format:

A. Identification (Apparatus ID, Personnel Last Name & Licensure) & Estimated Time of Arrival
B. Patient Priority – Red/Priority 1; Yellow/Priority 2; Green/Priority 3
C. Objective of communication - Notification of transport only or request for on-line medical control. Be specific in what orders will be requested from on-line medical control so that the physician (or designate) will be oriented to the request as he/she is listening to the report
D. Patient Information – Age/Sex/Chief Complaint or Condition/Pertinent Past Medical History
E. Patient Condition – LOC/Vital Signs/Exam Findings/ECG Interpretation
F. Treatment and response to treatment.

Notes:

A. All communications should be brief and orderly. Radio reports should rarely take longer than one or two minutes per patient and should be made on a recorded line.

B. Describe the patient condition in enough detail to explain treatment initiated and rationale for any request(s). Remember while the patient's condition may be visually obvious, the nurse or physician on the radio or phone is completely dependent on the EMS professional's ability to verbally "paint the picture of the patient".

C. It is critical to notify the receiving emergency department at the earliest opportunity to describe the patient's illness/injury and condition so that emergency department personnel can be appropriately prepared for the patient's arrival, including preparing resources to ensure continuity of care (eg. respiratory care, cardiac pacing, trauma surgery notification). In many instances, the earliest opportunity for a radio report will occur even before discovering the full extent of illness or injury in the critical patient. It is important that the "lead EMS professional" or his/her designee make the report at this time, especially to report a STEMI Alert, Stroke Alert, or Trauma Alert rather than wasting several minutes of hospital pre-arrival notification trying to make a "more complete" report.

D. Particularly critical objective findings, (eg. cardiac arrest, critically abnormal vital signs, gunshot wound to chest) need to take precedence in a radio report and should be reported after the identification/ETA and patient priority statements.

Medical Literature References
14H – Radio Report Communications

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Approved 9/12/18, Effective 1/15/19, replaces all prior versions

14I – INTERHOSPITAL TRANSFERS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

A patient may require a transfer from one hospital to another hospital if:

1. Patient evaluation at the original hospital reveals care needs unavailable at that hospital
2. Another hospital is preferred by the patient, the patient's legal representative, or the patient's established physician(s)

A hospital must agree to facilitate a patient transfer (regardless of patient's financial status) if the patient meets any of the above criteria.

Any interhospital transfer must be arranged as a practitioner/physician-to-physician transfer in accordance with Federal regulations.

Prior to any interhospital transfer, the EMS professional must receive appropriate transfer paperwork, including an adequate summary of the patient's condition, current treatment (including nursing and practitioner/physician evaluation notes, lab results, radiology results and films, possible complications that could occur during transfer, and any further medical information deemed necessary by the EMS professional or physician(s). Any anticipated interhospital transfer treatment orders are to be written and signed by the transfer initiating practitioner/physician.

Prior to any interhospital transfer, if the EMS professional is concerned that the patient is not stabilized <u>to the extent possible</u> for transport, the EMS professional shall review his /her concerns with the transferring practitioner/physician with a goal to ensure appropriate clinical care is performed to further stabilize the patient. In the **rare** instance in which the EMS professional and transferring practitioner/physician cannot agree on the stability of the patient and/ or further care necessary prior to the interhospital transfer, the EMS professional is to consult with the accepting physician at the receiving hospital to review these concerns. If in such situation the receiving hospital has automatically accepted the patient for care to the "emergency group/doctor", the EMS professional is to discuss concerns with the on-duty emergency physician at that hospital. If the EMS professional cannot rapidly resolve the situation with the transferring practitioner/physician and receiving physician, the EMS professional is to notify the medical director for intervention, ideally via a recorded line.

PROTOCOL 14I: Interhospital Transfers, cont.

The overriding principle for all aspects of interhospital transfer is matching patient needs with adequate provider knowledge and skill, equipment and infrastructure that provide continued patient safety during transport.

It the professional and ethical responsibility of an EMS professional as well as of an EMS organization to not accept or perform an interhospital transfer that involves monitoring and treatment exceeding their scope of authorized practice, training, and/or ability.

An EMS professional must be licensed as an EMT – I85 or higher to verify patency of vascular access. IV fluid type and flow rate must be specified in written practitioner/physician orders and verified prior to interhospital transfer. Any IV fluid bag supplied must contain enough solution to accommodate the expected interhospital transport time.

Any IV infusion medications must be specified in written practitioner/physician orders and verified prior to interhospital transfer. The paramedic is to verify all IV infusion medications ordered during the interhospital transfer are on the pre-approved list contained in this protocol. Medications that are not on the pre-approved list must be specifically approved by one of the receiving hospital's on-line medical control emergency physicians or the accepting physician prior to transport. There is a limit of 4 concurrent IV infusion medications for paramedic-only accompanied interhospital transfers.

All interhospital transfer patients with IV infusion medications will be continuously cardiac monitored, including monitoring pulse oximetry during transport. Waveform capnography should be utilized as indicated by appropriate protocols. Blood pressure monitoring will be at least as frequently as every 10 minutes with a minimum of two blood pressure recordings. The interhospital transfer orders may specify more frequent measurements.

During interhospital transfer, should the patient experience signs or symptoms of intolerance (significant side effects) to the IV infusion medication(s) or the IV infusion pump indicates an error not easily addressed by the paramedic, stop the infusion and consult the transferring hospital's on-line medical control for direction.

Mechanical ventilation settings must be confirmed with either the transferring practitioner/physician or a respiratory therapist. The paramedic must review and confirm ventilation rate, tidal volume, FiO2 (50% or 100%), and positive-end expiratory pressure (PEEP) settings. If at any time during interhospital transfer mechanical ventilation malfunctions, institute bag-valve assisted ventilations with 100% O2 while troubleshooting the mechanical ventilator and airway circuit. Ensure the patient receives appropriate oxygenation and ventilation continuously.

All indwelling devices and lines (e.g. chest tube(s), naso/orogastric tube, PEG/G/J-tube, surgical drain(s), intra-aortic balloon pump (IABP), ventricular assist device (VAD), wound vacuum) must be reviewed with either the transferring practitioner/physician or appropriate nursing personnel. Potential complications during transfer should be discussed and contingency plans reviewed. If the paramedic feels unable to safely monitor and maintain any indwelling device, he or she is to request appropriate nursing or ancillary personnel from the transferring hospital to accompany the patient during transfer.

PROTOCOL 14I: Interhospital Transfers, cont.

Under these conditions, EMS personnel will not begin the transfer until such request is accommodated.

***For specialized patients not ordinarily transported by EMS professionals (e.g., high-risk obstetrical patients, neonates) or for any patient with a condition requiring interhospital assessment and/or treatment beyond expected EMS professional scope of practice, an appropriately trained healthcare professional is to accompany the transporting EMS professionals to best provide interhospital transfer care.

For acute stroke patients either having received alteplase (tPA®) just prior to interhospital transfer or that will be continuing to receive alteplase during interhospital transfer, specific documentation and treatment should include:

1. Vital signs prior to transport and every 10 minutes enroute. Verify that systolic blood pressure is less than 180 mmHg and diastolic blood pressure is less than 105 mmHg. If blood pressure exceeds these limits, the transferring hospital is to lower the blood pressure via anti-hypertensives for further vascular stabilization prior to transport.

2. Stroke neuro-exam at time of interhospital transfer, utilizing the Los Angeles Prehospital Stroke Screen.

3. Oxygen administration via NC or NRB if dyspnea or SpO2 <94% at room air.

4. Head of cot elevated at approximately 15 degrees if tolerated and low risk of aspiration.

5. Patient NPO status, including medications, to protect against aspiration.

6. Documentation of total dose and time of IV alteplase bolus (if dose is completed prior to transfer) and when infusion started (and completed, if applicable).

7. Infuse all alteplase from tubing by infusing saline through same tubing set following alteplase dose.

    - When bottle appears empty, there is still some alteplase left in the tubing which must be infused.
    - Remove the IV tubing connector from the bottle and attach it to a newly spiked bag of normal saline and re-start infusion at the previous rate used. This will ensure that the remainder of the alteplase is infused.

8. Anti-hypertensive therapy adjustment enroute:
    - If labetalol IV infusion started at sending facility: Increase infusion rate by 2 mg/min every 10 minutes (to maximum of 8 mg/min) until desired decrease in BP:
      Sys BP <180 mmHg and Dia BP <105 mmHg
    - If nicardipine IV infusion started at sending facility: Increase infusion rate by 2.5 mg/hr every 10 minutes (to maximum of 15 mg/hr) until desired decrease in BP:
      Sys BP <180 mmHg and Dia BP <105 mmHg
    - Discontinue anti-hypertensive infusion for any one of the following:
      Sys BP <140 mmHg, Dia BP <80 mmHg, or heart rate <50 per minute

PROTOCOL 14I: Interhospital Transfers, cont.

OSDH Pre-Approved IV Medications During Interhospital Transfer
(Infusions are continuation of infusions started at the transferring facility, not initiations)

Class of Medication	Significant Side Effects
Sedatives	
Diazepam (Valium®) Diprivan (Propofol®) Lorazepam (Ativan®) Midazolam (Versed®)	Respiratory depression, Hypotension
Opiate Analgesics	
Fentanyl (Sublimaze®) Hydromorphone (Dilaudid®) Meperidine (Demerol®) Morphine Nalbuphine (Nubain®)	Respiratory depression, Hypotension
Hypertension Control Agents	
Labetalol (Normodyne®, Trandate®) Nicardipine (Cardene®) Nitroprusside(Nipride®)	Hypotension, Symptomatic bradycardia Symptomatic tachycardia, Ventricular dysrhythmias
Acute Coronary Syndrome Agents	
Anti-platelet (Clot Inhibitors) Abciximab (ReoPro®) Eptifibatide (Integrilin®)	Bleeding
Anti-coagulant (Clot Inhibitors) Heparin	Bleeding
Thrombolytic (“Clot Buster”) Alteplase (tPA®) Reteplase (Retavase®) Tenectaplase (TNKase®)	Bleeding
Anti-anginal (Coronary Vasodilator) Nitroglycerin (Tridil®)	Hypotension

PROTOCOL 14I: Interhospital Transfers, cont.

OSDH Pre-Approved IV Medications during Interhospital Transfer, cont.
(Infusions are continuation of infusions started at the transferring facility, not initiations)

Class of Medication	Significant Side Effects
Cardiac Anti-arrhythmics	
Amiodarone (Cordarone®, Pacerone®) Diltiazem (Cardizem®) Lidocaine Procainamide	Hypotension, Symptomatic bradycardia Symptomatic tachycardia, Ventricular dysrhythmias
Vasopressors (Hypotension Treatment)	
Dobutamine (Dobutrex®) Dopamine (Intropin®) Epinephrine Norepinephrine (Levophed®) Phenylephrine (Neosynephrine®)	Hypertension, Symptomatic tachycardias Ventricular dysrhythmias
Volume Expanders (Hypovolemia Treatment)	
Albumin Dextran Hetastarch (Hespan®) Plasma protein fraction (Plasmanate®)	Allergic reactions ranging from itching only to more serious reactions of hives, (urticaria), respiratory distress (typically bronchospasm), tachycardia, and hypotension (evidence of anaphylaxis).
Blood Products (Anemia or Coagulopathy Treatment)	
Cryoprecipitate Frozen Plasma (FFP) Packed Red Blood Cells (PRBC) Platelets Whole Blood	Allergic reactions ranging from itching only to more serious reactions of hives, (urticaria), respiratory distress (typically bronchospasm), tachycardia, and hypotension (evidence of anaphylaxis).
Gastrointestinal Bleeding Control Agents	
Esomeprazole (Nexium® – acid reducer) Octreotide (Sandostatin®–varices constrictor) Pantoprazole (Protonix® – acid reducer)	None
Acid-Base Metabolism Agents	
Sodium Bicarbonate	None

PROTOCOL 14I: Interhospital Transfers, cont.

OSDH Pre-Approved IV Medications during Interhospital Transfer, cont.
(Infusions are continuation of infusions started at the transferring facility, not initiations)

Class of Medication	Significant Side Effects
Hyperglycemia Control Agents	
Insulin	Hypoglycemia-related complications
Electrolyte Replacement	
Potassium chloride (KCL)	Ventricular dysrhythmias
Seizure Control Agent	
Fosphenytoin (Cerebyx®) Magnesium (for eclampsia) Phenytoin (Dilantin®) Phenobarbital	Respiratory depression, Hypotension, Symptomatic bradycardia
Bronchospasm Control Agents	
Aminophylline (Theophylline®)	Symptomatic tachycardias, Hypertension
Pregnancy - Related Agents	
Oxytocin (Pitocin®–stimulates uterine contraction Inducing labor and controls uterine bleeding)	Hypotension (if rapid infusion), Symptomatic tachycardias, Hypertension
Antimicrobials/Antibiotics	
Aminoglycosides (e.g. gentamicin) Antifungals (e.g. fluconazole) Anti-TB (e.g. isoniazid - INH) Anti-viral (e.g. acyclovir) Carbapenams (e.g. imipenem) Cephalosporins (e.g. cetriaxone) Macrolides (e.g. azithromycin) Penicillins (e.g. ampicillin; piperacillin) Quinolones (e.g. levofloxacin) Sulfonamides (e.g. TMP-SMX, Bactrim®) Other categories (e.g. clindamycin, vancomycin)	Allergic reactions ranging from itching only to more serious reactions of hives (urticaria), respiratory distress (typically bronchospasm), tachycardia, and hypotension (evidence of anaphylaxis). In some cases, a localized phlebitis (pain at infusion site with redness of vein) may occur due to irritation cause by the infusion itself. While the infusion is to be stopped, this usually is not a true allergy.

PROTOCOL 14I: Interhospital Transfers, cont.

Priority and Timing for Interfacility Transfer Requests:

Priority 1 Clinical Condition – Immediate Life Critical Intervention at Receiving Hospital Facility
Time Standard is 911 Call to Arrival = Response 10:59 or less with use of Red Lights & Sirens (RLS)
Once ambulance is assigned cannot be re-assigned unless closer unit and only one re-assignment total

Acute ST Elevation Myocardial Infarct
- Transferring Facility – No Interventional Cardiology
- Receiving Facility – Interventional Cardiology/Cardiac Cath Lab

Acute Thromboembolic Stroke
- Transferring Facility – No Interventional Neurology
- Receiving Facility – Interventional Neurology & Procedure Imminent

Acute Aortic Dissection
- Transferring Facility – No Vascular Surgery
- Receiving Facility – Vascular Surgery & Surgery Imminent

Acute GI Bleeding with Hemodynamic Instability
- Transferring Facility – No Gastrointestinal/Colorectal Capability
- Receiving Facility – Gastrointestinal/Colorectal Capability and Endoscopy Imminent

Acute Amputation with Limb Salvage Attempt/Limb Ischemia/Arterial Occlusions
- Transferring Facility – No Vascular Surgery/Interventional Radiology
- Receiving Facility – Vascular Surgery/Interventional Radiology and Intervention Imminent

Suspected or Confirmed Ectopic Pregnancy with Hemodynamic Instability
- Transferring Facility – No Obstetric Surgery
- Receiving Facility – Obstetric Surgery & Surgery Imminent

Active Labor with Evidence for Complicated Delivery – Breech/Limb Position by Ultrasound
- Transferring Facility – No Obstetric Surgery
- Receiving Facility – Obstetric Surgery & Surgery Imminent

Acute Angle Closure Glaucoma/Acute Retinal Artery Occlusion/Acute Vision Loss Imminent
- Transferring Facility – No Ophthalmology
- Receiving Facility – Ophthalmology & Intervention Imminent

Level I/II Trauma with Hemodynamic Instability
- Transferring Facility – No Trauma Surgery/Capability
- Receiving Facility – Trauma Surgery/Capability

Priority 2 Clinical Condition – No Immediate Time Critical Intervention at Receiving Hospital Facility
Time Standard is 911 Call to Arrival = Response 24:59 or less without use of Red Lights & Sirens

PROTOCOL 14I: Interhospital Transfers, cont.

Once ambulance is assigned cannot be re-assigned unless Priority 1 Call and only one re-assignment total

Post Cardiac Arrest with Hemodynamic Stability
Transferring Facility – No ICU and/or Cardiology Services
Receiving Facility – ICU and Cardiology Services

Active Labor with Routine Delivery Planned
Transferring Facility – No Obstetric Surgery
Receiving Facility – Obstetric Surgery

Dialysis Required with Hemodynamic Stability
Transferring Facility – No Dialysis Capability
Receiving Facility – Dialysis Capability with Dialysis Imminent

Ground Component of Air Ambulance Transport Assist
Estimated Landing Time 25 Mins or Less

Priority 3 Clinical Condition – No Immediate Time Critical Intervention at Receiving Hospital/Facility
Time Standard is 911/non-911 Call to Arrival = Response 59:59 or less without use of Red Lights & Sirens
Once ambulance is assigned cannot be re-assigned unless Priority 1 or 2 Call and only two re-assignments total

Hospital ED or Inpatient Transfer
Transferring Facility – Limit of Care Capabilities/Course of Treatment Reached
Receiving Facility – Higher Care Capabilities/Ongoing Course of Treatment Possible

Hospital ED to Residence/Nursing Facility Post ED Evaluation and Treatment

Priority 4 Clinical/Logistic Condition – No Immediate Time Critical Intervention at Receiving Hospital/Facility
Time Standard is 911/non-911 Call to Arrival = 15 minutes within scheduled pick-up appointment time
Once ambulance is assigned cannot be re-assigned unless Priority 1, 2, or 3 Call and only four re-assignments total

Scheduled Outpatient Dialysis Care

Hospital Inpatient to Residence/Nursing Facility Post ED Evaluation and Treatment

Inpatient Bed Shortages and Hospital to Hospital or Facility to Facility Patient Movement Due to Bed Shortage

PROTOCOL 14I: Interhospital Transfers, cont.

Once ambulance is assigned cannot be re-assigned unless Priority 1 Call and only one re-assignment total

Post Cardiac Arrest with Hemodynamic Stability
Transferring Facility – No ICU and/or Cardiology Services
Receiving Facility – ICU and Cardiology Services

Active Labor with Routine Delivery Planned
Transferring Facility – No Obstetric Surgery
Receiving Facility – Obstetric Surgery

Dialysis Required with Hemodynamic Stability
Transferring Facility – No Dialysis Capability
Receiving Facility – Dialysis Capability with Dialysis Imminent

Ground Component of Air Ambulance Transport Assist
Estimated Landing Time 25 Mins or Less

Priority 3 Clinical Condition – No Immediate Time Critical Intervention at Receiving Hospital/Facility
Time Standard is 911/non-911 Call to Arrival = Response 59:59 or less without use of Red Lights & Sirens
Once ambulance is assigned cannot be re-assigned unless Priority 1 or 2 Call and only two re-assignments total

Hospital ED or Inpatient Transfer
Transferring Facility – Limit of Care Capabilities/Course of Treatment Reached
Receiving Facility – Higher Care Capabilities/Ongoing Course of Treatment Possible

Hospital ED to Residence/Nursing Facility Post ED Evaluation and Treatment

Priority 4 Clinical/Logistic Condition – No Immediate Time Critical Intervention at Receiving Hospital/Facility
Time Standard is 911/non-911 Call to Arrival = 15 minutes within scheduled pick-up appointment time
Once ambulance is assigned cannot be re-assigned unless Priority 1, 2, or 3 Call and only four re-assignments total

Scheduled Outpatient Dialysis Care

Hospital Inpatient to Residence/Nursing Facility Post ED Evaluation and Treatment

Inpatient Bed Shortages and Hospital to Hospital or Facility to Facility Patient Movement Due to Bed Shortage

Medical Literature References
14I – Interhospital Transfers

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14J - SCENE COORDINATION

Emergency Medical Services in Metropolitan Oklahoma City and Tulsa are provided by several agencies that must interact cooperatively to achieve the goal of quality patient care. Interactions between on-scene personnel must be predictable and consistently professional. The following protocol has been developed to facilitate optimal scene coordination including transfer of care and timeliness of patient transport. Additional benefits include promoting a collaborative practice of EMS medicine and improved scene safety for patients and EMS professionals.

If a disagreement regarding patient care occurs, protocol, OMD or OLMC guidance is to be sought, avoiding any unnecessary delay in transport of critical patients.

The following guidelines are most commonly applicable to scenes involving a single or limited number of patients. Mass casualty incidents should be managed per Protocol 15A: Multiple Patient Scene/Mass Casualty Event Concepts.

1. The first arriving crew will bring all indicated mobile medical equipment to the patient side.
2. The first arriving crew will relay information regarding current level of provider (EMT, EMT-I, AEMT, Paramedic), scene safety/staging, scene access, and equipment needs, as appropriate, to additional responding crews through 800 MHz radio systems, shared frequencies or relay through respective communication centers.
3. The transporting crew will bring all indicated mobile medical equipment and the stretcher to the patient side, unless otherwise notified by crew(s) on-scene.
4. The first on duty EMS provider on-scene will assume charge of and direct patient care. If a paramedic is not present, the officer or designated person in charge will brief the first arriving paramedic on assessment and treatment of the patient(s). The paramedic will verbally acknowledge receiving the patient-centered briefing, then assume charge of and direct patient care.
5. On arrival of the transporting unit, the officer or designated person in charge will brief the transporting paramedic on assessment and treatment of the patient(s). The transporting paramedic will verbally acknowledge receiving the patient-centered briefing, then assume charge of and direct patient care. In the event the transporting paramedic and an EMR paramedic arrive on scene simultaneously, the transporting paramedic will assume charge of and direct patient care.
6. If the transporting paramedic is first on-scene, as soon as it is clinically practical, the transporting paramedic will brief subsequent arriving providers on assessment and treatment of the patient(s) and assign tasks consistent with treatment protocols.
7. Avoid unnecessarily repeating questions to the patient that have been answered.
8. All personnel will assist each other in every possible way (i.e. moving/gathering of equipment, lifting and movement of stretcher).
9. Once charge of patient care is appropriately transferred, a confirmatory patient assessment by the transport paramedic may be necessary. As a routine practice, such reassessments should not delay ongoing care and/or timely transport. Transport should not be delayed or interrupted for patient care documentation.

Protocol 14J: Scene Coordination, cont.

10. If a patient has been loaded into the ambulance prior to additional crew arrival(s), at least one additional crew will inquire with the transporting paramedic if they can be of assistance.
11. All personnel will work cooperatively and in a professional manner to ensure ongoing high quality of patient care. If any EMS personnel on-scene believes patient condition requires additional support, including accompanying the patient during transport, this shall be discussed with the transporting paramedic.
12. The transport crew will accept response cancellations from EMR crew's on-scene when clinically appropriate. Conversely if EMR personnel are informed by the on-scene transporting crew that no clinical assistance is required the EMR units will cancel their response, unless non-clinical scene characteristics dictate a continued response.
13. The EMS System for Metropolitan Oklahoma City and Tulsa supports the National Incident Management System guidelines, even in single patient encounters. Be familiar with NIMS (See Protocol 15A: Multiple Patient Scenes/Mass Casualty Event Concepts) and be able to utilize when indicated.

15A – MULTIPLE PATIENT SCENES/ MASS CASUALTY EVENT CONCEPTS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

A Multi-Patient Scene (MPS) occurs when an incident involves more than one patient, but less than 5 critical patients and less than 10 total patients.

A Mass Casualty Incident (MCI) occurs when an incident involves several patients, specifically including five or greater critical patients or ten or more total patients, regardless of patient priority composition.

Incident command at multiple patient scenes (MPS) or mass casualty incidents (MCI) will be assigned according to the National Incident Management System (NIMS) guidelines and a unified command team consisting of representatives of police, fire, and EMS should be rapidly assigned and coordinated to ensure safe, efficient, and effective operations.

Multi-Patient Scene Tasks:

1. Initial Size-up Actions: (these are the same for Mass Casualty Incidents)

   a. Park initial arriving apparatus in safe location at scene perimeter to avoid loss of its availability/use.
   b. Advise dispatch:
      i. Incident location (if different from initial dispatch)
      ii. Incident type (transportation accident, fire, etc. if different from initial dispatch)
      iii. Estimated number of patients.
      iv. Numbers & types of additional resources needed.
      v. Any hazardous conditions (weather, electrical, structural, toxic chemicals, etc).
      vi. Identify a “HOT ZONE”/”Immediate Danger Zone” if applicable
      vii. Best route & access to scene (if appropriate).
      viii. Staging area location (if staging indicated).

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Multi-Patient Scene Tasks, cont.:

c. Check in with Incident Command to determine ICS role. The medical treatment and transport of injured patients will normally be done through the position of Medical Branch Director and subordinate positions headed by Group Supervisors. However, the Incident Commander will determine which positions, if any, he or she feels needs to be filled.

2. Medical Branch Director:

a. Reports to the Operations Section Chief.
b. Don identification vest for position
c. Establishes Triage, Treatment, and Transport Areas (if indicated) and assigns individuals to the role of Group Supervisors (unit leader) for each area.
d. Maintains adequate span of control within Medical Branch
e. Establish appropriate EMS communications with appropriate response elements (ie. Annex H, MERC, staging, logistics,)
f. Establish and maintains communications with assigned Group Supervisors (unit leader)
g. Oversees the triage, treatment, transportation and accountability of patients created by incident.
h. Monitors the potential or actual effect of the incident on the existing medical infrastructure and communicates such with the Operations Section Chief, MERC, and/or Annex H
i. Determines resource requirements to meet the medical needs of the incident and communicates needs to Operations Section Chief or designated response element.
j. Determines the need for specialized medical resources and processes requests for such elements through appropriate channels.
k. Provides situation updates and reports to the Operations Section Chief, MERC, and/or Annex H

3. Group Supervisor (Unit Leader):

a. Establishes Area to perform assigned tasks
b. Determine resource and staffing needs for Area of responsibility and communicates needs to Medical Branch Director
c. Follows assigned duties as outline in Agency Plan, Task Cards, or Job Action Sheets.
d. Provides situational updates and reports to the Medical Branch Director
e. Establish communications with the Medical Branch Directors and other needed response elements.
f. Monitors safety and welfare of patients and assigned personnel
g. Ensures patient tracking and accountability of injured patients in assigned Area.

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Mass Casualty Incident Tasks, con't:

Triage Area Tasks:

1. Initial triage is at casualty locations unless hazards indicate that rapid extrication or casualty self-extrication should occur to a designated area safe for triage operations. In some instances, the use of priority-specific colored tape (red, yellow, green, black/blue) may be utilized to mark patients in the absence of readily usable triage tags.
2. Perform first pass (initial) triage. Do not perform any treatment in first pass triage other than very quick, simple and extremely urgent measures (i.e., open the airway by positioning). Move quickly to ensure all casualties are identified and triaged to minimize loss of life and limb.
3. Attach tag to patient using the string loop directly on their body. Over the head or on the upper arm works well. The left extremities should be utilized unless extremely injured. This will make it easier to utilize the triage tag during transport.
4. Use a reliable method to count the number of patients in each category. This information will need to be relayed to the Triage Group Supervisor (Unit Leader) officer, and in turn, the Medical Branch Director.
5. Direct ambulatory patients to the GREEN Treatment Area when it is established. Use discretion in allowing GREEN patients to assist in caring for the YELLOW and RED patients while those more serious casualties are awaiting extrication to the treatment areas. ALL persons involved in the incident are to be triaged and tagged - those without apparent injuries should be tagged GREEN.
6. Report number of casualties in each category and in total to the Triage Group Supervisor (Unit Leader).
7. Repeat triage sequence when possible and note changes in any casualty's condition. Perform a more detailed assessment, provide treatment, and write-in information on the tag while casualties are being extricated to the Treatment Area.

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Mass Casualty Incident Tasks, con't:

Treatment Area Tasks:

1. Establish treatment area in consultation with the Medical Branch Director regarding location. Think BIG to allow adequate space to treat casualties. Ensure the location promotes relative ease of ambulance loading and egress.
2. Request, assign, utilize, and oversee appropriate clinical personnel caring for patients.
3. Assemble into crews of at least 2 personnel equipped with a backboard and straps for assignment by the treatment officer to perform BASIC packaging and extrication of triaged casualties into the Red, Yellow, and Green treatment areas. The treatment officer may choose to have separate personnel perform treatment once inside the Treatment Area, depending on the logistics of the particular call. All persons involved in the incident triaged Green due to very minor or no apparent injury are to be kept in the Green Treatment Area until more fully evaluated. These individuals will be released at an appropriate time by the Transport Group Supervisor (Unit Leader). Depending on the circumstances, the Green casualties may be transported early or in large groups using alternative transport means
4. On the clinical side of the triage tag, circle injuries on the body diagram (if present), note the BP, pulse, and respirations. Note any IM or IV medication given and the time it was given. On the administrative side of the tag, note the time, date, patient name, address, city, state, and past medical history and prescriptions. Record the primary EMS caregiver.
5. If a casualty's condition worsens (e.g. Yellow to Red; Green to Yellow) inside the Treatment Area, apply a new triage tag indicating the more serious condition (leaving the original tag in place to indicate a change in condition occurred) and move the patient to the appropriate location in the Treatment Area. Notify the Treatment Group Supervisor (Unit Leader) of any change in casualty condition so that this may be recorded for overall patient accountability and reported to the Medical Branch Director.

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Mass Casualty Incident Tasks, con't:

Transportation Area Tasks:

1. Establish patient loading zone. Consider proximity to treatment area and ambulance approach AND exit routes. Establish ambulance traffic routes that prevent ambulances from having to back-up to load patients. This makes for safer and more efficient transport operations. While multiple ambulances may be in staging, minimize the number of ambulances in the immediate load zone. This makes for more accurate and efficient transport operations. Work with staging to ensure at least 1 ambulance is always in the loading zone. Ensure vehicle operators stay with their ambulances to ensure as soon as patients are loaded, the ambulance leaves.
2. Assign Unit Leaders to appropriate needed subordinate roles such as tracking and communications. The Transportation Area will likely require the coordinated effort of several people and can quickly overwhelm one individual. Loss of patient accountability can be the result of an inadequately staffed Transportation Area.
3. Communicate with Treatment Group Supervisor (Unit Leader) when ambulances are available for transport. NO MORE THAN ONE CATEGORY RED PATIENT PER AMBULANCE. May take another patient if yellow/green in category.
4. Supervise the assignment and loading of patients into available transport.
5. Communicate with response elements (Annex H, MERC, Communications Center) to determine hospital capacity and appropriate destination of patients based upon clinical condition(s) and vehicle operator familiarity with destination.
6. Consider the use of alternate means of transportation if indicated (busses, specialty vans)
7. Before patient leaves the scene to destination, the accountability process should be completed by whatever means being used (triage tag identifier slip, patient log).
8. Notify the Medical Branch Director when all patients have been cleared from the scene and transported. Maintain and secure records for the Medical Branch Director and secure the patient loading area.

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Mass Casualty Incident Tasks, con't:

Staging Group Supervisor Tasks:

1. If not already established and/or determined by Incident Command, establish staging area for medical transportation resources. Staging area should be an area large enough to contain numerous transportation assets, be far enough away so units don't get caught in incident, but close enough to loading zone to allow for short drive times.
2. Select and communicate a desired travel route for resources assigned to the Staging Area. This route should allow for easy access, but should take units away from the impacted area.
3. Staging Area for medical assets may be co-located with staging for other response assets, or may be a stand-alone area, depending on the desire of the Incident Commander. If co-located with other response assets, ensure medical assets are grouped together for accountability and an accurate assessment of available resources.
4. The Staging Group Supervisor (Unit Leader) should coordinate an orderly arrangement of arriving apparatus to allow for ease of ambulance ingress to the transport loading zone. Medical equipment assets (cache, trailers) should also be organized to allow for rapid deployment upon request.
5. The Staging Group Supervisor (Unit Leader) or the officer's designee should maintain a log of available resources in staging and communicate with the Medical Branch Director resource levels as appropriate and as requested by the Medical Branch Director.
6. The Staging Officer or the officer's designee should assure ambulance or specialty transport crews stay with their assigned vehicles to assure rapid availability of the asset when requested at the transport loading zone.
7. Deliver equipment needed in the treatment area that is requested from staging in an organized cache with a minimum of personnel leaving the staging area to deliver this equipment. Alternatively, all the requested equipment may be sent to the treatment area on one designated vehicle.
8. Assign and deploy transportation assets to the loading zone(s) per the request of the Medical Branch Director or the Transportation Group Supervisor depending on the established communication pathways.

PROTOCOL 15A: Multi-Patient Scenes/Mass Casualty Incident Concepts (cont.)

Mass Casualty Incident Tasks, con't:

Mass Casualty Medical Communications:

1. Medical communications during a mass casualty incident, like all other incident communications, are of critical importance and often will determine the level of effectiveness and success of the operation. Basic communication principals should be used during an incident.
   a. Use of interoperable radio channels so all agencies are able to communicate.
   b. Following the overall incident communications plan established by the Incident Commander.
   c. Establishing assigned, clear, and understood lines of communications; who will communicate with whom, for what reason, and by what method.
   d. Use of multiple and redundant means of communications including, but limited to, radio, data, phone, runners, face-to-face, and even hand signals.
   e. Preparation for communications failure and immediately switching over to one of the established redundant communication means.
   f. Ensuring communications sent receive a response of some manner to ensure the loop has been closed.
2. Medical communications from the scene of an MCI, depending on complexity and command structure, often involves up to three different levels of communications:
      i. Communications (internal) with other Incident Command System elements
      ii. Operations Section Chief or designee(s)
      iii. Unified Command medical representatives
      iv. Logistics, Planning, Admin/Finance if appropriate
   b. Communications (internal) within the scene medical response infrastructure
      i. Triage, Treatment, Transportation, Staging Group Supervisors
   c. Communications (external) with local, county, or regional medical coordination entities
      i. Local Emergency Response Coordinator (LERC)
      ii. County Public Health Annex H Representative
      iii. Medical Emergency Response center (MERC)
3. After assigning support positions, one of the first activities of the Medical Branch Director should to establish redundant communications pathways with the ICS structure, subordinate Group Supervisors (Unit Leader), and other medical response elements by:
   a. Obtaining the ICS Communication Plan (incident channels etc).
   b. Determine reporting lines and redundant means of communication with Groups Supervisors (Unit Leader). Example: Transport requesting assets through Medical Branch or directly to Staging.
   c. Establishing and communicating manner for all communications acknowledgments.
   d. Establish communications via radio, e-mail, or phone with outside medical coordination entities
   e. Advise the ICS infrastructure of communication pathways for incorporation into updated ICS communication plan.

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15B – REGIONAL EMS SYSTEM (REMSS) ACTIVATION PROCEDURE

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

All requests for REMSS deployment will need to be validated through information provided on the request form contained within this protocol. The REMSS deployment request form can also be found within the Oklahoma REMSS Ambulance Strike Team (AST) Guidelines.

Medical Branch Request for REMSS Assistance is accomplished in the following sequence:

1. Before any REMSS assets can be requested, a functioning Incident Command Structure (ICS) with an identified Medical Branch will need to exist.

2. Depending upon local county emergency operational procedures, the Medical Branch can request REMSS assets through one of the following means:

   a. through the ICS to the county Emergency Operations Center (EOC) and Annex H – Health and Medical Representative (if EOC in operation)
   b. through direct contact with Regional Medical Emergency Response Center (MERC) in Regions 1,3,5,6,7,8 or the Regional Multiple Agency Coordination Center (MACC) in Regions 2, 4
   c. calling the Incident Resource Hotline at 1-800-800-2481 ("top down" method)

3. Any request for a REMSS team will need to be accompanied by:
   a. Specific number/types of ambulances and trailers needed (Who/What needs to go?)
   b. Reason for request (Why are they needed?)
   c. Expected mission for REMSS team (What will they do?)
   d. Staging location for REMSS team upon incident arrival (Where will they go?)
   e. Known scene or access to scene hazards (What hazards do they need to expect?)
   f. Contact name and phone number(s) for updates/requests for additional information (Who should be contacted during the REMSS response and upon arrival?)

Protocol 15B: Regional EMS System (REMSS) Activation Procedure:

Once a valid request, containing the above information, is received for REMSS deployment, the following sequence of actions occurs to effect the deployment:

1. Oklahoma State Office of Emergency Management (OEM) receives a call from the Incident Resource Hotline (1-800-800-2481) for REMSS assistance. An OEM representative will give the request to the Emergency Support Function 8 - Public Health and Medical Services (ESF-8) desk at the State Operations Center (Oklahoma State Department of Health) and notify the Regional Response Coordinator from the Oklahoma Office of Homeland Security.

2. ESF-8 personnel will contact MERC in regions 1,3,5,6,7,8, or the MACC in regions 2, 4 for validation.

3. MERC/MACC professionals will contact the Medical Branch at the scene to validate the request for assets. That contact will also include the affected county's Annex H Representative if the county EOC has been activated.

4. Once the request is validated, MERC/MACC will contact REMSS regional representative in affected region to determine ability of REMSS team to respond based upon the parameters of a validated request.

5. If a REMSS team can be formed from within the affected region, it will respond to the validated request.

6. MERC/MACC will notify state ESF-8 personnel and state Regional Response Coordinator of intra-regional response. ESF-8 will notify Oklahoma State Department of Health EMS Division and the County Health Administrator for the affected area.

7. If the REMSS team from the affected region is already engaged or otherwise unavailable, ESF-8 personnel will be notified and will contact the MERC/MACC in the adjoining region.

8. The next involved MERC/MACC will repeat the contacting process and determination of an available team.

9. Once a REMSS team able to respond from another region has been identified, ESF-8 personnel will be notified, and in conjunction with the state Regional Response Coordinator, will dispatch that REMSS team as an inter-regional response asset. ESF-8 personnel will make notifications to Oklahoma State Department of Health EMS Division.

15C – CHEMICAL WEAPONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Communication Center Principles:

911 calls present the first opportunity to identify that a potential weapon of mass destruction (WMD) - chemical incident exists. Identifying the incident, relaying potential threat information, and advising precautionary measures to ***all*** of the responding public safety professionals may be a key to saving lives of responding public safety professionals.

Indicators of a Possible Chemical Weapons Incident:

1. Explosion with little or no structural damage;
2. Reports of a device that dispersed a mist or vapor;
3. Multiple casualties exhibiting similar symptoms (may be without apparent reason);
4. Reports of unusual odors, liquids, spray devices, or cylinders;
5. Dead animals;
6. Discarded personal protective equipment (PPE).

Potential Notifications (actual notification needed if chemical weapon event confirmed):

1. Local Law Enforcement
2. Local Federal Bureau of Investigation (FBI) office – WMD Coordinator;
3. Local/State Office of Emergency Management (OEM);
4. Local Health Department

Initial Actions/On – Scene Arrival:

1. Approach upwind and uphill of the incident;
2. Stop at an apparent safe distance away from incident location;
3. Alert subsequent arriving responders;
4. Direct all personnel to use full PPE, including self-contained breathing apparatus (SCBA)
    a. At a minimum, respiratory protection;
5. Be aware of possible secondary devices;
6. Treat as a crime scene/Consider that alleged perpetrator may still be on the scene;
7. Avoid contact with liquids;
8. Request appropriate resources (HazMat specialists, law enforcement officers, etc.)

PROTOCOL 15C: Chemical Weapons, cont.:

Establishing Incident Command: (Follow Specific Directives of Incident Commander)

Follow National Incident Management System (NIMS) practices as reflected in local policies.
Utilize a Unified Command structure, promoting effective and efficient multi-agency communications and operations.
Further information through NIMS courses can be accessed at this website:
https://www.fema.gov/national-incident-management-system

Casualty Rescue: (Follow Specific Directives of Incident Commander)

As many ambulatory casualties as possible should be removed from the area without rescuers entering the incident site. It should be expected, though, that live, non-ambulatory casualties will be present at any chemical incident.

1. Use bull horns and vehicle public address (PA) system to give directions;
2. Be alert for secondary devices;
3. Determine if there are live victims in the contaminated area;
4. Use PPE appropriate for safe rescue – PPE level most likely determined by HazMat specialists advising the Incident Commander (IC). The IC evaluates the chemical threat, potential to save lives, risk to responders, and time constraints to achieve each level of responder protection before determining what level of PPE to use to perform rescue operations;
5. When safe and appropriate, assist/direct all victims to decontamination and triage area.

Decontamination: (Follow Specific Directives of Incident Commander)

The theories and procedures referred to by the Chemical Weapons Improved Response Program (CWIRP) are based on decontaminating victims using large volumes of water.

Establish decontamination location(s) upwind and uphill of the incident:

1. Decontamination personnel must wear appropriate PPE, likely to include SCBA.
2. Be alert for secondary devices, weapons, and perpetrators:
3. Avoid contact with unknown liquids.
4. Decontaminate **(immediately)** casualties with liquid contamination on their skin or clothing. For dry contamination, substance should be brushed off casualty immediately.
5. Clothing removal is often the most effective decontamination. Encourage victims to remove clothing at least down to their undergarments;
6. Prioritize asymptomatic, symptomatic, and non-ambulatory casualties:
    a. Coordinate decontamination with EMS triage activities.
    b. Establish separate technical decontamination for responders away from mass-casualty decontamination.

The diagrams on the following page are provided to illustrate commonly recognized methods of mass “wet” decontamination. Follow the directives of the Incident Commander and HazMat specialists in charge of decontamination.

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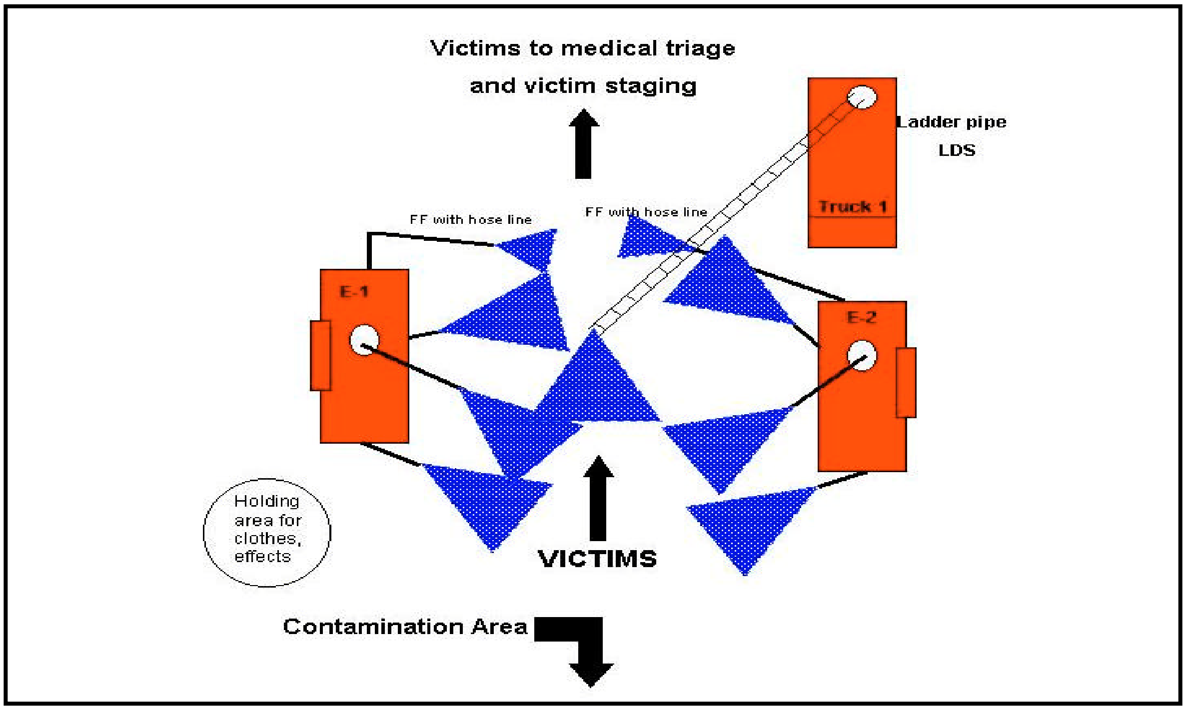
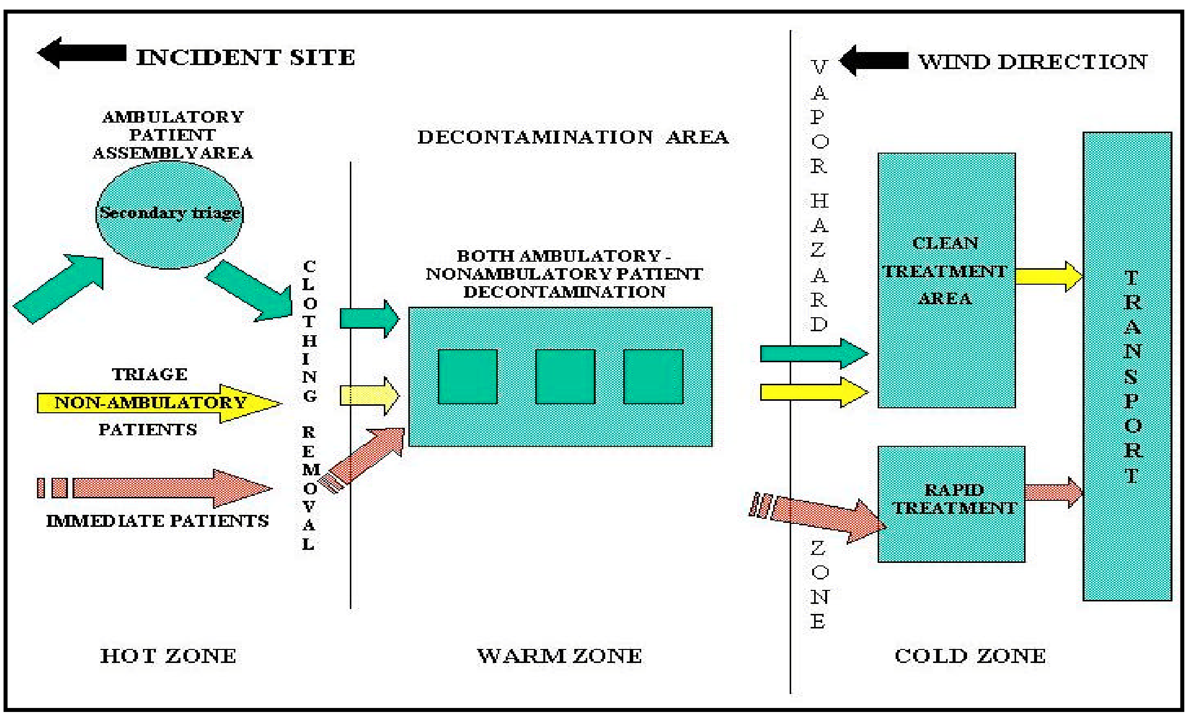
PROTOCOL 15C: Chemical Weapons, cont.:

LADDER PIPE DECONTAMINATION SYSTEM (LDS)



EMERGENCY DECONTAMINATION CORRIDOR SYSTEM (EDCS)



Protocol 15C: Chemical Weapons, cont.:

Types of Decontamination:

a. Passive (clothing removal) – often the simplest and effective method
b. Dry agents
    i. Dirt - Flour
    ii. Baking powder - Sawdust
    iii. Charcoal - Silica gel
c. Wet agents
    i. Soap and water
    ii. Water (only)
    iii. Bleach (for equipment decontamination)
d. Air decontamination (positive pressure ventilation [PPV]/portable fans)

EMS Principles: (Follow Specific Directives of Incident Commander)

One of the primary challenges facing EMS on a chemical weapons incident will be the number of casualties (eg. trauma and agent exposure) and segregating these casualties by severity of illness/injury as well as attempting to segregate the "worried well" from actual exposed victims.

Work with appropriate HazMat specialists to determine proper level of PPE and respiratory protection needed for EMS personnel and what areas are appropriate for EMS care activities.

a. Be alert for secondary devices and perpetrators;
b. Avoid contact with liquids other than non-contaminated water;
c. Rapid prioritization of number of patients;
d. Triage victims based on medical necessity, using MCI protocols;
e. Establish patient identification and tracking.
f. Establish:
    i. Communications with command post and hospitals;
    ii. Staging for EMS personnel, ambulances, supplies, and resources;
    iii. Transportation area – avoid transporting any contaminated patient(s).

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15D – CHEMPACK DEPLOYMENT ACTIVATION PROCEDURE

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

If an incident appears to have the possibility of a nerve agent, organophosphate or radiological incident, the Incident Commander on the scene should notify the Oklahoma Poison Control Center (OPCC).

To contact the Oklahoma Poison Control Center in Oklahoma City:

Healthcare Professional Access Number:
1-877-271-6998

When calling, identify yourself by name, EMS certification level, and agency/apparatus identification. Have as much patient information and substance information possible (may be limited in early phase of potential mass casualty incident) readily available to share with the poison center specialist.

Based on the outcome of the call, if it is a plausible chemical or radiological event, OPCC will activate the nearest CHEMPACK site and notify the appropriate Regional Medical Emergency Response Center (MERC) (also referred to as the Regional CHEMPACK Coordinator).

The Regional CHEMPACK Coordinator will assume coordination and determine additional support facilities, transport modes if needed (coordinating with local Emergency Management, medical facilities, the nearest CHEMPACK site and Oklahoma Highway Patrol), and contact the facilities to determine their level.

The selected site(s) can be placed on three (3) different levels: *Standby* - Level 1, *Alert* - Level 2 and *Activation* - Level 3. During *Activation* - Level 3, the cache site will open the container and access the material. If pre-defined at the time of container receipt from the CDC, the container contents will be separated and prepared for delivery to hospital emergency departments and/or EMS.

CHEMPACK assets are to be utilized as a second line of defense. It is expected that existing supplies of nerve agent antidotes will be utilized before opening CHEMPACK containers unless EMS and/or hospitals anticipate exhausting their existing cache of these agents, at which time CHEMPACK containers may be opened.

15E - NERVE AGENTS

EMERGENCY MEDICAL DISPATCH
EMERGENCY MEDICAL RESPONDER
EMT-BASIC
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

NERVE AGENT EXPOSURES

Comments

1. Nerve agent exposure should be considered at multiple causality incidents in which patients are exhibiting the DUMBELS constellation of symptoms and signs. In particular, nerve agent exposure should be considered while responding to any reports of multiple casualties at a location of high occupancy (should malls, stadiums, etc), high visibility (crowds gathered for public speeches, protests, etc), or high political symbolism (places of worship, governmental offices, etc).
2. Immediate countermeasures to nerve agent exposure with developing DUMBELS symptoms and signs are administration of the DuoDote® auto-injectors, auto-injector-as indicated and evacuation from the exposure are for decontamination.
3. Any personnel exposed to a nerve agent and requiring treatment with the DuoDote® auto-injectors is restricted from providing patient care and should be promptly transported for emergency physician evaluation.
4. Atropine is utilized in nerve agent exposure treatment to dry secretions, reduce bronchospasm, and decrease gastrointestinal motility. If significant bronchorrhea continues after three DuoDote® auto-injector have been administered in the adult patient, further atropine may be given by paramedic as follows until the bronchorrhea subsides:

   Adult – 1 mg atropine IVP every 3-5 minutes
   Adult – 2 mg atropine IM every 5 minutes

5. In the case of nerve agent exposure with bronchorhea, there is no maximum atropine dosing in the adult patient, though atropine should be withheld in the case of developing ventricular tachydysrhythmias. In this case, treat the ventricular tachydysrhythmia according to 5G Tachycardia – Unstable – Adult & Pediatric or 4G Ventricular Fibrillation/Pulseless Ventricular Tachycardia – Adult & Pediatric as applicable.

PROTOCOL 15E: Nerve Agents, cont.

6. DuoDote® is utilized in nerve agent exposure to reverse the nerve agent effect on acetylcholinesterase, the enzyme responsible for neurotransmitter regulation. Refer also to Protocol 16M for self/buddy care using DuoDote®.

7. Patients contaminated by vapor-only nerve agent exposures should be decontaminated by clothing removal (dry decon). Patients contaminated by liquid nerve agent exposures should be decontaminated by clothing removal and thoroughly washed with soap and water (wet decon).

8. In the absence of DUMBELS symptoms and signs, nerve agent exposure has not occurred. The DuoDote® auto-injectors are not authorized for patients not exhibiting DUMBELS symptoms and signs.

9. Pediatric patients (<25 kg) with DUMBELS symptoms and signs in the setting of suspected nerve agent exposures should be treated with one DuoDote® auto-injector kit and OLMCP should be contacted for further direction in relation to any further atropine and/or 2-PAM usage.

10. Patients treated with DuoDote® auto-injector kits should either have the auto-injector hooked to their clothing or a prominent vertical mark on their forehead for each kit administered to indicate to further healthcare providers the number of DuoDote® auto-injector kits the patient has received.

PROTOCOL 15E: Nerve Agents, cont.

Nerve Agents Exposure

❑ Mild ✓ Miosis ✓ Lacrimation ✓ Rhinorrhea (nasal secretions)	❑ Moderate ✓ Mild symptoms + N/V, Dyspnea, Wheezing	❑ Severe ✓ Moderate symptoms + extreme dyspnea; seizures; cardiac arrest may occur
❑ One DuoDote® Auto-Injector IM ✓ Atropine 2 mg ✓ 2-Pam 600 mg	❑ Two DuoDote® Auto-Injectors IM ✓ (Alternate Thighs) ✓ Atropine 4 mg ✓ 2-Pam 1200 mg	❑ Three DuoDote® Auto-Injectors IM ✓ (Alternate Thighs) ✓ Atropine 6 mg ✓ 2-Pam 1800 mg
❑ Self-evacuate immediately	❑ Self-evacuate/call for aid immediately	❑ Evacuate patient immediately
❑ Re-evaluate for symptom progression every 3-5 minutes. Treat with additional DuoDote® as indicated	❑ Re-evaluate for symptom progression every 3-5 minutes. Treat with additional DuoDote® as indicated	❑ Re-evaluate for symptom progression every 3-5 minutes. Treat with additional DuoDote® as indicated

LOOK FOR "DUMBELS" SIGNS AND SYMPTOMS

D: DIARRHEA
U: URINATION
M: MIOSIS (PINPOINT PUPILS)
B: BRONCHOSPASM, BRONCHORRHEA (COPIOUS RESPIRATORY SECRETIONS)
E: EMESIS (NAUSEA/VOMITING)
L: LACRIMATION (TEARING)
S: SALIVATION

Additional resources regarding nerve agents can primarily be accessed through the Centers for Disease Control at www.bt.cdc.gov/agent/nerve.

National Disaster Life Support training also includes nerve agent education in:
- Basic Disaster Life Support (one day classroom course)
- Advanced Disaster Life Support (two day classroom/practical exercise course)

15F – BIOLOGICAL WEAPONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

While a multitude of biological agents exist that have possibility in weapon use, the Centers for Disease Control categorizes these agents into priority of concern and probable use. Category A agents include organisms that pose a risk to national security due to easy dissemination or person to person transmission, high mortality rates, high impact upon public health, ability to cause public panic and social disruption, and require special action for public health preparedness.

Category A agents and their diseases include:

Bacillus anthracis – Anthrax
Clostridium botulinum toxin – Botulism
Yersinia pestis – Plague
variola major – Smallpox
Francisella tularensis – Tularemia
filoviruses (eg. Ebola, Marburg); arenaviruses (eg. Lassa, Machupo) – Viral hemorrhagic fevers

Of particular concern among these agents is anthrax. While anthrax is a naturally occurring disease among animal skin handlers, the bacteria has already been successfully used in domestic terrorism in the United States. Concern about anthrax prompts responses by public safety agencies, including EMS in some locales, to investigate these concerns and in some cases, acute onset of symptoms, in response to exposure to “suspicious white powder”. The following information serves as one resource in preplanning responses to such substances in efforts to protect EMS and other safety professionals.

Additional resources regarding biologic weapons can primarily be accessed through the Centers for Disease Control at www.bt.cdc.gov/bioterrorism.

PROTOCOL 15F: Biological Weapons, cont.

Suspicious Powder Response Model Procedure – Follow Local HazMat Directives

Definitions:

Isolation Perimeter – The designated crowd control line surrounding the Hazard Control Zones. The isolation perimeter is always the line between the general public and the Cold Zone.

Field Test – A procedure that will be determined by on-scene FD Hazmat and PD personnel to check the presence of radiological, biological, chemical, and volatility (flammability) in or around a package.

ID Test – FD procedure to obtain information to identify a specific substance (i.e., salt, sugar, flour, etc) or chemical compound. Testing to identify a substance is more geared toward dry product or liquids without water content. The test signature of water overrides/masks the graph spikes preventing identification.

Procedures:

The following actions should be taken at incidents involving a package suspicious for anthrax:

1. Once law enforcement (LE) arrives on scene and decides that FD is needed, HazMat resource mobilization should be considered.
2. If the first arriving FD company is not a Hazmat Unit and receives information that the incident may be a potential chemical or biological threat, the OIC should:
    a. Not make entry or attempt to mitigate the incident
    b. Establish an isolation perimeter of at least 100 feet
    c. Should keep all citizens on the outside of the isolation perimeter
    d. Call for the Hazmat Team
    e. Wait upwind until arrival of Hazmat Team
    f. Operate in a support role for the Hazmat Team upon their arrival
3. The Hazardous Materials Team OIC will be either Command or Hazmat Branch as appropriate.

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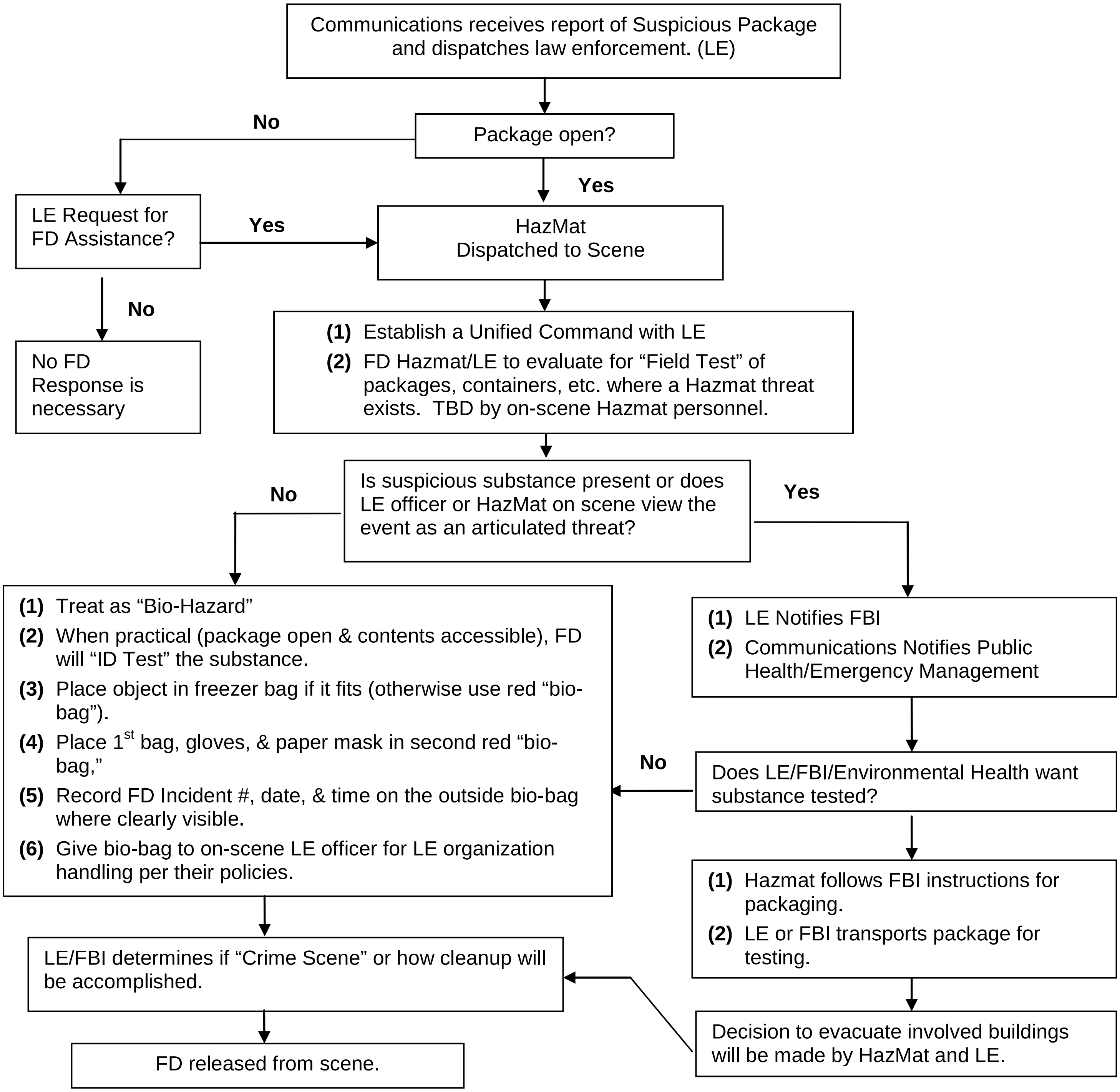
PROTOCOL 15F: Suspicious Power Response Procedure, cont.

Suspicious Package Flowchart



15G – RADIOLOGICAL WEAPONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

1. Potential radiologic weapon devices in the United States include:
   a. Simple radiation emitting devices (example would be dumping radioactive waste in a water supply – typically NOT a significant threat due to dilution effect of large amount of water)
   b. Conventional explosive device containing radiation ("dirty bomb") – typically NOT a significant threat due to the fact that explosions are very inefficient in producing radioactive particles of a size that are easily inhaled

2. Either of the above devices may be utilizing radioactive isotopes initially manufactured for medical use (eg. nuclear imaging).

3. Radiation types include the following:
   a. Irradiation = gamma radiation passing through a body
   b. External contamination = radioactive "dust" particles falling on a body
   c. Internal contamination = radioactive "dust" particles being ingested or inhaled

4. Protection takes the simple format of:
   a. Reducing time of exposure
   b. Increasing distance from exposure source – biggest factor in protection. Radiation does not travel far, but contamination can.
   c. Shielding device use to minimize exposure uptake. Airborne illness PPE protection is excellent for radiation protection as well). Think of radioactive particles as "dirt" that shouldn't be inhaled (wear N95 masks) and shouldn't be in contact with skin.

5. Three **myths** that can paralyze medical response:
   a. "Radioactive contamination is highly dangerous & requires extraordinary protective measures." (see above)
   b. "Decon is highest medical priority." Decon is actual very simple = remove clothing and shower. Most of radiation goes away with removal of clothing.
   c. "Special skills are needed to handle radioactive patients." (see above)

PROTOCOL 15G: Radiological Weapons, cont.

6. Multiple resources exist to aid in the understanding and response planning for radiological weapons. The following are suggested resources:

   Radiation Emergency Medical Management
   www.remm.nlm.gov

   National Alliance for Radiation Readiness (NARR)
   www.radiationready.org

   Society of Nuclear Medicine and Molecular Imaging
   www.snmmi.org

   Health Physics Society
   www.hps.org

   National Disaster Life Support training
      Basic Disaster Life Support (one day classroom course)
      Advanced Disaster Life Support (two day classroom/practical exercise course)

Special acknowledgement to John C. White, CNMT, Radiation Safety Officer, The University of Texas Southwestern Medical Center at Dallas for material integral to this protocol's preparation.

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15H – NUCLEAR WEAPONS

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

1. Potential nuclear weapon devices impacting the United States include:
   a. Improvised nuclear device.
   b. 1 kiloTon "suitcase nuke."
   c. Tactical weapons of 5-50 kiloTons.
   d. Electromagnetic pulse detonation = nuclear weapon detonation in atmosphere wherein gamma waves hit radio waves, causing phones, pagers, radios, etc go down.
   e. Ballistic missile attack.
   f. 250 kiloTon nuclear bomb = "city killer."

2. Nuclear detonation = 50% blast effect; 35% thermal effect; 10% fallout; 5% ionizing radiation effect.

3. Mass blindness is a concern due to retinal burns (non-thermal) from viewing detonation.

4. Radiation types include the following:
   a. Irradiation = gamma radiation passing through a body.
   b. External contamination = radioactive "dust" particles falling on a body.
   c. Internal contamination = radioactive "dust" particles being ingested or inhaled.
5. Protection takes the simple format of:
   a. Reducing time of exposure.
   b. Increasing distance from exposure source – biggest factor in protection. Radiation does not travel far, but contamination can.
   c. Shielding device use to minimize exposure uptake. Airborne illness PPE protection is excellent for radiation protection as well). Think of radioactive particles as "dirt" that shouldn't be inhaled (wear N95 masks) and shouldn't be in contact with skin.

PROTOCOL 15H: Nuclear Weapons, cont.

6. Three **myths** that can paralyze medical response:
    a. "Radioactive contamination is highly dangerous & requires extraordinary protective measures." (see above)
    b. "Decon is highest medical priority." Decon is actual very simple = remove clothing and shower. Most of radiation goes away with removal of clothing.
    c. "Special skills are needed to handle radioactive patients." (see above)

7. Multiple resources exist to aid in the understanding and response planning for nuclear weapons. The following are suggested resources:

    Radiation Emergency Medical Management
    www.remm.nlm.gov

    National Alliance for Radiation Readiness (NARR)
    www.radiationready.org

    Nuclear Regulatory Commission
    www.nrc.gov

    Society of Nuclear Medicine and Molecular Imaging
    www.snmmi.org

    Health Physics Society
    www.hps.org

    Planning Guidance for Response to a Nuclear Detonation June 2010 – Second Edition
    www.remm.nlm.gov/PlanningGuidanceNuclearDetonation.pdf

    National Disaster Life Support training
    Basic Disaster Life Support (one day classroom course)
    Advanced Disaster Life Support (two day classroom/practical exercise course)

Special acknowledgement to John C. White, CNMT, Radiation Safety Officer, The University of Texas Southwestern Medical Center at Dallas for material integral to this protocol's preparation.

16A – ACTIVATED CHARCOAL

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Adsorbant

Actions/Pharmacodynamics: Activated charcoal is a liquid suspension that adsorbs many drugs and chemicals. It acts by binding / adsorbing toxic substances, thereby inhibiting their GI absorption, uptake into the liver, and thus, their presence in the bloodstream for action, also called "bioavailability". Activated charcoal has a tremendous surface area, allowing for a large amount of adsorption. The combined complex formed by the adsorption process is excreted from the body in the feces. It is a general purpose emergency treatment of poisoning by most drugs and chemicals, e.g., acetaminophen, aspirin, atropine, barbiturates, digitalis, glycosides, phenytoin, propoxyphene, strychnine, and tricyclic antidepressants, among many others.

Indications: Poisonings - General Management (8A)

Contraindications: Activated charcoal is contraindicated for treatment of poisoning by cyanide, mineral acids, caustic alkalis, organic solvents, iron, ethanol, and methanol. Activated charcoal may not be administered in patients with current or suspected imminent altered mental status, dysphagia, or vomiting to prevent elevated risk of aspiration of charcoal.

Pharmacokinetics: Nonabsorbed; onset immediate; peak, duration, and half – life: unknown.

Side Effects: GI: vomiting following rapid ingestion of high doses, abdominal cramping, abdominal bloating, constipation (diarrhea from sorbitol additive).

Dosage: **Poisonings - General Management - Adult & Pediatric (8A)**
1 gram/kg PO (**OLMC or OK Poison Center order required**; Consult for order only if transport time estimated to exceed 30 mins)

How Supplied: 25 grams of activated charcoal in aqueous suspension in bottle. (Always check concentration and dose per container at time of patient medication administration)

Special Comment: Activated charcoal, while historically often administered in the setting of ingested poisonings, is no longer utilized with frequency. The American Board of Medical Toxicology does not recommend administering activated charcoal to all suspected ingested poisonings. The purpose of OLMC or OK Poison Center order requirement is to prevent unnecessary use of activated charcoal and the side effects its use can create - especially vomiting and aspiration.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16B – ADENOSINE (ADENOCARD®)

PARAMEDIC

Class: Anti-Tachydysrhythmic (Purine Nucleoside)

Actions/Pharmacodynamics: Slows electrical conduction through the cardiac atrioventricular (AV) node, with ability to interrupt reentry pathways through the AV and sinoatrial (SA) nodes. Adenosine is administered to convert paroxysmal supraventricular tachycardia (PSVT) to normal sinus rhythm.

Indications: Tachycardia - Stable (5F)
PSVT (sustained regular, narrow-complex tachycardia >150 bpm in adults) & systolic BP ≥ 100mmHg, failed valsalva maneuver.

Contraindications: 2nd/3rd degree AV Blocks (may induce asystole)
Known Wolff-Parkinson-White Syndrome (may increase heart rate)
Known Sick Sinus Syndrome (may induce asystole)
Bradycardia (may induce symptomatic hypotension)

Pharmacokinetics: Onset of action within 10-20 seconds after IV administration. Very rapid metabolism (and duration of effect) within 10-20 seconds after IV administration.

Side Effects: Common, though transient, symptoms include chest pain, palpitations of irregular bradycardia, dyspnea, lightheadedness, numbness, and sweating. A constellation of these side effects may produce significant patient apprehension and/or sense of impending doom. The patient should be advised of these possibilities prior to adenosine administration and given reassurance such symptoms will be short-lived in duration of seconds. Transient asystolic or profound, irregular bradycardic rhythms may be observed on ECG monitoring.

Dosage: **Tachycardia - Stable - Adult (5F)** (PSVT as described above)
12 mg rapid IVP (1 – 2 seconds) followed rapidly by 10 mL saline flush.
May repeat once at 12 mg.

****OLMC Order Only for use in pediatric patients.**

OLMC may direct use of adenosine in evaluating etiology of regular, monomorphic wide complex tachycardia.

How Supplied: 12 mg/4 mL in prefilled syringe.
(Always check concentration and dose per container at time of patient medication administration)

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16C – ALBUTEROL (PROVENTIL®, VENTOLIN®)

EMERGENCY MEDICAL DISPATCHER	Self-Administration Phone Directive - 3B 3C 3D 12B
EMERGENCY MEDICAL RESPONDER	Assist Pt with Self Administration - 3B 3C 3D 12B
EMT	
EMT-INTERMEDIATE 85	
ADVANCED EMT	
PARAMEDIC	

Class: Sympathomimetic Bronchodilator

Actions/Pharmacodynamics: Albuterol is a relatively selective beta$_2$ adrenergic stimulant. Albuterol causes relaxation of the smooth muscles of the bronchial tree thus decreasing airway resistance, facilitating mucus drainage, and increasing vital capacity. It exerts mild effects on beta$_1$ (heart) or alpha (peripheral vasculature) receptors. In therapeutic doses, albuterol, by inhibiting histamine release from mast cells, also reduces the mucus secretion, capillary leaking, and mucosal edema caused by an allergic response in the lungs.

Indications: Dyspnea - Uncertain Etiology (3B)
Dyspnea - Asthma (3C)
Dyspnea - Chronic Obstructive Pulmonary Disease (3D)
Acute Allergic Reactions (8D)
Bee/Wasp Stings (8F)
Smoke Inhalation (12B)

Contraindications: Known hypersensitivity to albuterol. Albuterol should not be used if the sole etiology of dyspnea is strongly suspected to be CHF, as albuterol-induced tachycardia may worsen the compromised cardiac output in CHF.

Pharmacokinetics: Onset within 5 – 15 minutes; peak effect in 1 – 1.5 hours; duration of effect is up to 3 – 6 hours; half – life is less than 3 hours. Distribution: When inhaled, albuterol is distributed to muscle cells along the bronchial tree. Very little is systemically absorbed and distributed.

Side Effects: Tremors, anxiety, dizziness, headache, cough, reflex bronchospasm, palpitations, tachycardia, and hypertension.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 16C: Albuterol (Proventil®, Ventolin®)

Dosage:

Dyspnea - Uncertain Etiology - Adult & Pediatric Weight ≥ 15kg (3B)
Smoke Inhalation - Adult & Pediatric Weight ≥ 15kg (12B)
5 mg nebulized, may repeat once

Dyspnea - Uncertain Etiology - Pediatric Weight < 15kg (3B)
Smoke Inhalation - Pediatric Weight < 15kg (12B)
2.5 mg nebulized, may repeat once

Dyspnea - Asthma - Adult & Pediatric Weight ≥ 15kg (3C)
Dyspnea - Chronic Obstructive Pulmonary Disease - Adult (3D)
Acute Allergic Reactions - Adult & Pediatric Weight ≥ 15kg (8D)
Bee/Wasp Stings - Adult & Pediatric Weight ≥ 15kg (8F)
5 mg nebulized (with ipratropium bromide 0.5 mg), may repeat twice

Dyspnea - Asthma - Pediatric Weight < 15kg (3C)
Acute Allergic Reactions - Pediatric Weight < 15kg (8D)
Bee/Wasp Stings - Pediatric Weight < 15kg (8F)
2.5 mg nebulized (with ipratropium bromide 0.25 mg), may repeat twice

How Supplied: 2.5 mg/3 mL (0.083%) in nebulizer vials.
(Always check concentration and dose per container at time of patient medication administration)

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16D – AMIODARONE (CORDARONE®, NEXTERONE®)

PARAMEDIC

Class: Class III Anti-Dysrhythmic (Vaughn William Classification)

Actions/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 (5F)
  - Wide-Complex Tachycardia of Uncertain Type or
    - Monomorphic VentricularTachycardia (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) ****OLMC Order Only**
- Tachycardia - Unstable (5G)
  - Post-Cardioverion of Ventricular Tachycardia
- Premature Ventricular Contractions (5K)
  - Symptomatic Premature Ventricular Contractions (with BP < 100mmHg in adults due to frequent non-conducted ventricular impulses and in absence of 2nd/3rd degree AV blocks)

Contraindications:
- 2nd/3rd degree AV blocks (may induce asystole)
- Bradycardia (may induce symptomatic hypotension)

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

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-dysrythmics 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.

PROTOCOL 16D: Amiodarone (Cordarone®, Nexterone®), cont.

Dosage:

Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)
(refractory to initial defibrillation attempt)
300 mg IVP/IOP. Repeat at 150 mg IVP/IOP in 5 minutes to maximum cumulative dose of 450 mg. Epinephrine 1 mg (1:10,000) IVP/IOP is to be given with every amiodarone administration.

Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)
(refractory to initial defibrillation attempts)
5 mg/kg IVP/IOP in single dose. Epinephrine 0.01 mg/kg (1:10,000, 0.1 mL/kg) IVP/IOP is to be given with every amiodarone administration.

Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)
(post return of sustained spontaneous circulation)
150 mg over 10 minutes (15 mg/minute or 0.3 mL/minute very slow IVP/IOP/IVPB) IF maximum cumulative dose of 450 mg has not been achieved.

Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)
(post return of sustained spontaneous circulation)
Tachycardia - Stable - Pediatric (5F)
(wide-complex tachycardia of uncertain type or monomorphic ventricular tachycardia; narrow-complex tachycardia)
Tachycardia - Unstable - Pediatric (5G)
Premature Ventricular Contractions - Pediatric (5K)
****OLMC Consult & Order Only**

Tachycardia - Stable - Adult (5F)
(wide–complex tachycardia of uncertain type - standing order;
monomorphic ventricular tachycardia - standing order;
narrow complex - **OLMC order only)
Tachycardia - Unstable - Adult (5G)
(post cardioversion of ventricular tachycardia)
Premature Ventricular Contractions - Adult (5K)
150 mg over 10 minutes (15 mg/minute or 0.3 mL/minute very slow IVP/IOP/IVPB).

How Supplied:
150 mg/3 mL in vial, ampule, or pre-filled syringe.
150 mg/100 mL pre-mixed infusion.
(Always check concentration and dose per container at time of patient medication administration)

16E – ASPIRIN

EMERGENCY MEDICAL DISPATCHER	Self-Administration Phone Directive - 5A 5C
EMERGENCY MEDICAL RESPONDER	Assist Pt with Self Administration - 5A 5C
EMT	
EMT-INTERMEDIATE 85	
ADVANCED EMT	
PARAMEDIC	

Class: Anti-Platelet

Actions/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 (5A)
Acute Coronary Syndrome (5C)

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

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

Side Effects: Typically none from single EMS dosing. Rare instances of nausea or allergic reaction could be encountered. Treat allergic reaction per Protocol 8D - Acute Allergic Reactions.

Dosage: **Chest Pain - Uncertain Etiology - Adult (5A)**
Acute Coronary Syndrome - Adult (5C)
324 OR 325 mg chewed by patient (hold if taken 324+mg within 6 hours)

How Supplied: 81 mg tablets
325 mg tablets
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: Aspirin is indicated even if the patient is taking warfarin sodium (Coumadin®), clopidogrel (Plavix®), or other anticoagulant or antiplatelet agents on a daily basis.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16F – ATROPINE SULFATE

PARAMEDIC

Class: Parasympatholytic

Actions/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 (5D)
Poisonings – General Management (Organophosphate) (8A)

Contraindications: None absolute in indicated situations.

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

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

Adult organophospate poisoning: 2 mg IVP/IOP/IM. Use IVP for more severe presentations. May repeat as often as every 3-5 minutes if symptoms progressive or persistent.

Dosage:

Bradycardia – Symptomatic & Systolic BP < 100 mmHg (Sinus, First Degree, 2nd Degree Type I) - Adult (5D)
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 (5D)
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 (8A)
2 mg IVP/IOP/IM. Use IVP for more severe presentation.
Repeat every 3-5 minutes if symptoms progressive.

PROTOCOL 16F: Atropine Sulfate, cont.

Dosage, cont:

Poisonings – General Management (Organophosphate) – Pediatric (8A)
0.05 mg/kg IVP/IOP/IM. Use IVP for more severe presentation.
Minimum dose 0.1 mg.
Consult with OLMCP for repeat dosing needs.

How Supplied:
1 mg/10 mL prefilled syringe
1 mg/1 mL vial
0.25 mg/5 mL prefilled syringe for pediatric use
(Always check concentration and dose per container at time of patient medication administration)

16G – CALCIUM CHLORIDE

PARAMEDIC

Class: Electrolyte

Actions/Pharmacodynamics: Calcium causes a significant increase in myocardial contractility and in ventricular automaticity. It is used as an antidote for some electrolyte imbalances (eg. 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) (4I)
Poisonings - General Management (Calcium Channel Blocker Overdose) (8A)
Dialysis-Related Issues (Hyperkalemia) (9E)
Crush Injury Syndrome (Hyperkalemia Prophylaxis) (10K)

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.

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

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

Dosage: **Specific Causes of Cardiac Arrest (Hyperkalemia) - Adult & Pediatric (4I)**
Poisonings - General Management (Calcium Channel Blocker Overdose) - Adult & Pediatric (8A)
Dialysis-Related Issues (Hyperkalemia) - Adult & Pediatric (9E)
Crush Injury Syndrome (Hyperkalemia Prophylaxis) - Adult & Pediatric (10K)
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)

Special Comments: Calcium chloride will interact with sodium bicarbonate and form a precipitate. Do not give both medications via the same vascular access line unless giving a copious flush of NS - approximately 50+ mL - between medications. In general, use an 18-20 gauge angiocatheter in a proximal IV site or use an IO line and test line patency before administration. In non-cardiac arrest or non-impending cardiac arrest settings, administer at 0.5 -1.0 mL per minute to reduce chances of venous irritation and extravasation.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16H DEXTROSE (50% as D50; 25% as D25; 10% as D10)

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

Class: Carbohydrate

Actions/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. Dextrose 10% IVPB is the treatment of choice for hypoglycemic patients in which vascular access is limited to small gauge angiocatheters (smaller than 20 ga.) or in any other situations in which there is a higher risk for extravasation. The lower concentration of D10 results in less extravasation tissue damage than D50.

Indications:
Respiratory Arrest (3A)
Specific Cause of Cardiac Arrest (4I)
Altered Mental Status (6B)
Seizure (6D)
Syncope (6E)
Dystonic Reaction (6F)
Behavioral Disorder (7A)
Poisonings - General Management (8A)
Dialysis -Related Issues (9E)
Complications of Pregnancy (13D)
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.

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. Medical literature shows speed of hypoglycemia reversal to be near clinically equivalent when comparing D10 infusion wide open with D50 IVP.

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.

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PROTOCOL 16H: Dextrose (50% as D50; 25% as D25; 10% as D10)

Dosage:

Respiratory Arrest - Adult & Pediatric weight ≥ 25 kg (3A)
Altered Mental Status - Adult & Pediatric weight ≥ 25 kg (6B)
Seizure - Adult & Pediatric weight ≥ 25 kg (6D)
Syncope - Adult & Pediatric weight ≥ 25 kg (6E)
Dystonic Reaction - Adult & Pediatric weight ≥ 25 kg (6F)
Behavioral Disorder - Adult & Pediatric weight ≥ 25 kg (7A)
Dialysis -Related Issues - Adult & Pediatric weight ≥ 25 kg (9E)
Complications of Pregnancy - Adult & Pediatric weight ≥ 25 kg (13D)
For hypoglycemia (blood glucose < 50 mg/dL):
Dextrose 50% (D50) 1 mL/kg IVP up to 50 mL
Dextrose 10% (D10) 25 grams in 250mL of NS IVPB wide open up to 250mL

Respiratory Arrest - Pediatric weight < 25 kg (3A)
Altered Mental Status - Pediatric weight < 25 kg (6B)
Seizure - Pediatric weight < 25 kg (6D)
Syncope - Pediatric weight < 25 kg (6E)
Dystonic Reaction - Pediatric weight < 25 kg (6F)
Behavioral Disorder - Pediatric weight < 25 kg (7A)
Dialysis -Related Issues - Pediatric weight < 25 kg (9E)
For hypoglycemia (blood glucose < 50 mg/dL)
Dextrose 25% (D25) 2 mL/kg IVP up to 50 mL
Dextrose 10% (D10) 25 grams in 250mL of NS IVPB wide open up to 125mL

Specific Cause of Cardiac Arrest - Adult & Pediatric weight ≥ 25 kg (4I)
Dextrose 50% (D50) 1 mL/kg IVP up to 50 mL

Specific Cause of Cardiac Arrest - Pediatric weight < 25 kg (4I)
Dextrose 25% (D25) 2 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)
Prefilled syringe of D50 – 25 grams dextrose in 50 mL of water added to 250 mL bag of normal saline (0.1 gram/mL)

Special Comments: D50 should be administered using an infusing IV, **NOT** a saline lock. The tissue caustic nature of D50 can be decreased by performing a slow and non-forceful IV push through the side port of an IV line that is flowing with normal saline into the patient's vein. Because of the risk of extravasation and the consequences of local tissue damage from extravasation, neither D50 nor D25 should be administered through an external jugular IV. High concentrations of dextrose can lead to cerebral edema in younger/smaller pediatric patients, requiring 1:1 dilution of D50 with normal saline to make D25 or using prefilled D25. A repeat determination of blood glucose level is to be performed post D50, D25, or D10 administration.

16J – DILTIAZEM (CARDIZEM®)

PARAMEDIC

Class: Calcium Channel Blocker

Actions/Pharmacodynamics: Diltiazem is a slow calcium channel blocker with pharmacologic actions similar to those of verapamil. It inhabits 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 (antidyshythmic effect) without affecting normal atrial action potential or intraventricular conduction.

Indications: Tachycardia - Stable (5F)
Sustained narrow-complex tachycardia > 150 bpm in adults with systolic BP ≥ 100 mmHg
****OLMC Order Only**

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.

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

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

Dosage: **Tachycardia - Stable - Adult (5F)**
Sustained narrow-complex tachycardia > 150 bpm in adults with systolic BP ≥ 100mmHg
****OLMC Order Only**
Usual adult dose is 0.25 mg/kg slow IVP over 2 minutes

How Supplied: 25 mg in 5 mL vial (5 mg/mL)
(Always check concentration and dose per container at time of patient medication administration)

PROTOCOL 16I: Diazepam (Valium®), cont.

Dosage, cont.:

Seizure - Pediatric (6D)
Head/Neck/Spine Injury - Pediatric (10A)
Heat Illness - Pediatric (11A)
0.1 mg/kg to max 5 mg IVP/IOP/IM for active seizure
May repeat once in 5 minutes if still seizing.

Dystonic Reactions - Adult (6F)
5 mg IVP

Dystonic Reactions - Pediatric (6F)
0.1 mg/kg to max 5 mg IVP/IM

Chemical Restraint - Adult (7C)
5 mg IVP/IOP or 10 mg IM

Chemical Restraint - Pediatric (7C)
0.1 mg/kg to max 5 mg IVP/IOP/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)
2.5 mg - 5 mg IVP

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)
****OLMC Order Only**

How Supplied: 10 mg/2 mL in vials, ampules, or pre-filled syringes.
(Always check concentration and dose per container at time of patient medication administration)

16J – DILTIAZEM (CARDIZEM®)

PARAMEDIC

Class: Calcium Channel Blocker

Actions/Pharmacodynamics: Diltiazem is a slow calcium channel blocker with pharmacologic actions similar to those of verapamil. It inhabits 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 (antidyshythmic effect) without affecting normal atrial action potential or intraventricular conduction.

Indications: Tachycardia - Stable (5F)
Sustained narrow-complex tachycardia > 150 bpm in adults with systolic BP ≥ 100 mmHg
****OLMC Order Only**

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.

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

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

Dosage: **Tachycardia - Stable - Adult (5F)**
Sustained narrow-complex tachycardia > 150 bpm in adults with systolic BP ≥ 100mmHg
****OLMC Order Only**
Usual adult dose is 0.25 mg/kg slow IVP over 2 minutes

How Supplied: 25 mg in 5 mL vial (5 mg/mL)
(Always check concentration and dose per container at time of patient medication administration)

16K – DIPHENHYDRAMINE (BENADRYL®)

PARAMEDIC

Class: Antihistamine, Anticholinergic

Actions/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: pruritis (itching), mucus secretion, and capillary leaking, which contributes to the formation of urticaria (hives), erythematous 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 (6F)
Acute Allergic Reactions (8D)
Bee/Wasp Stings (8F)

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.

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

Side Effects: Drowsiness, dizziness, disturbed coordination.

Dosage:

Dystonic Reactions - Adult (6F)
Acute Allergic Reactions- Adult (8D)
Bee/Wasp Stings - Adult (8F)
50 mg IM/IVP

Dystonic Reactions - Pediatric (6F)
Acute Allergic Reactions- Pediatric (8D)
Bee/Wasp Stings - Pediatric (8F)
1 mg/kg IM/IVP to maximum of 50 mg

How Supplied: 50 mg/1 mL in vial, ampule, or pre-filled syringe.
(Always check concentration and dose per container at time of patient medication administration)

16L – DOPAMINE (INTROPIN®)

PARAMEDIC

Class: Vasoconstrictor

Actions/Pharmacodynamics: Dose dependent. Higher doses (5+ mcg/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 mcg/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) (3E)
Post Cardiac Arrest Treatment (Cardiogenic Shock) (4J)
Acute Coronary Syndrome (Cardiogenic Shock) (5C)
Sepsis (Septic Shock) (9B)
Dialysis-Related Issues (9E)
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 (eg. pulmonary edema).

Contraindications: Hypertension

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

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

Dosage:

Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Adult (3E)
Post Cardiac Arrest Treatment (Cardiogenic Shock) - Adult (4J)
Acute Coronary Syndrome (Cardiogenic Shock) - Adult (5C)
Sepsis (Septic Shock) - Adult (9B)
Dialysis-Related Issues - Adult (9E)
For hypotension (shock) refractory to fluids or fluids contraindicated
5 – 20 mcg/kg/minute - see dosage chart - titrate to a sys B/P ≥ 100 mmHg.

Dyspnea - Congestive Heart Failure (Cardiogenic Shock) - Pediatric (3E)
Post Cardiac Arrest Treatment (Cardiogenic Shock) - Pediatric (4J)
Sepsis (Septic Shock) - Pediatric (9B)
Dialysis-Related Issues - Pediatric (9E)
For hypotension (shock) refractory to fluids or fluids contraindicated
****OLMC Order Only.**

PROTOCOL 16L: Dopamine (Intropin®), cont

Dopamine Infusion Adult Dosage Chart

Dopamine	Dose in mcg 5	10	15	20
Patient Weight in Kilograms				
40	8	15	23	30
50	9	19	28	38
60	11	23	34	45
70	13	26	39	53
80	15	30	45	60
90	17	34	51	68
100	19	38	56	75
110	21	41	62	83
120	23	45	68	90
130	24	49	73	98
140	26	53	79	105
150	28	56	84	113
160	30	60	90	120
170	32	64	96	128
180	34	68	101	135
190	36	71	107	143
200	38	75	113	150
210	39	79	118	158
220	41	83	124	165
230	43	86	129	173
240	45	90	135	180
250	47	94	141	188

mL/hr or drips/minute (for 1600 mcg concentration only)

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

Special Comments: Relative caution should be exercised prior to use in the setting of marked tachydysrhythmias, due to the potential for further increase in heart rates. In the setting of tachydysrhythmia-induced cardiogenic shock, treat per Protocol 5G - Tachycardia - Unstable. Ensure aggressive fluid resuscitation is accomplished (unless contraindicated) prior to dopamine use.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16M – DUODOTE® AUTOINJECTOR

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Parasympatholytic & Cholinesterase Reactivator

Actions/Pharmacodynamics:

Atropine 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, nerve agents), 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.

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: Nerve Agents (15E)

Contraindications: None

Pharmacokinetics: With IM autoinjector use in nerve agent poisoning, effects may not be observed for 3-5+ minutes. Beneficial effects can persist in excess of 1 hour.

Side Effects: Headache, dizziness, vision changes (blurry vision and photophobia) due to papillary dilation, loss of coordination, laryngospam, tachycardia, hypertension, palpitations, dry mouth.

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PROTOCOL 16M: DuoDote® Autoinjector, cont.

Dosage: **Nerve Agents - Adult & Pediatric > 12 years of age (15E)**
2.1 mg atropine/ 600 mg pralidoxime IM
May repeat every 5-15 minutes to cumulative maximum dose of 6.3 mg/1800 mg.
In the setting of serious symptoms (cardiopulmonary distress), repeat doses in rapid succession.

Nerve Agents - Pediatric ≤ 12 years of age (15E)
****OLMC Order Only**
Typical pediatric dose is 0.05 mg/kg atropine & 15 mg/kg pralidoxime IM per dose, max single dose of 2.1 mg atropine/600 mg pralidoxime

How Supplied: DuoDote® autoinjector
(Always check concentration and dose per container at time of patient medication administration)

Special Comments: Ideally, every public safety professional should have ready access to three DuoDote® autoinjectors for self/buddy use should emergent conditions warrant. In the setting of suspected/actual nerve agent exposure, administration of the DuoDote® autoinjector(s) must occur within minutes of exposure for clinically effective results.

16N – EPINEPHRINE 1mg/mL (1:1000) & 0.1mg/mL (1:10,000)

EMT	IM Administration 1mg/mL (1:1000) Only – 8D 8E 8F
EMT-INTERMEDIATE 85	IM Administration 1mg/mL (1:1000) Only – 8D 8E 8F
ADVANCED EMT	IM Administration 1mg/mL (1:1000) Only – 3C 8D 8E 8F
PARAMEDIC	

Class: Vasoconstrictor, Bronchodilator (Catecholamine)

Actions/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) (3C)
Asystole (4F)
Ventricular Fibrillation/Pulseless Ventricular Tachycardia (4G)
Pulseless Electrical Activity (4H)
Bradycardia (Pediatric) (5D)
Acute Allergic Reactions (Anaphylaxis) (8D)
Snakebites (Anaphylaxis) (8E)
Bee/Wasp Stings (Anaphylaxis) (8F)

Contraindications: None absolute in indications above.

Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks.

Pharmacokinetics: Onset of action within 2 minutes after IVP/IOP; within 5-10 minutes after IM. Duration of effect ranges from 3-5 minutes after IVP/IOP to upwards of 30 minutes after IM.

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

Dosage:

Dyspnea - Asthma (Severe & Refractory to Nebulization) - Adult (3C)
1mg/mL (1:1000) 0.3 mg IM

****OLMC Order Required if pt ≥ 50 years old, heart illness history, or blood pressure > 140/90 mmHg.**

Dyspnea - Asthma (Severe & Refractory to Nebulization) - Pediatric (3C)
1mg/mL (1:1000) 0.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) IM

****OLMC Order required if heart illness history or blood pressure > 140/90 mmHg.**

PROTOCOL 16N: Epinephrine 1mg/mL (1:1000) & 0.1mg/mL (1:10,000), cont

Dosage, cont:

Dyspnea – Croup – Pediatric (3M)
1mg/mL (1:1000) 3mg/3mL via nebulizer

Asystole - Adult (4F)
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)
Pulseless Electrical Activity - Adult (4H)
0.1mg/mL (1:10,000) 1 mg IVP/IOP
Repeat every 3 - 5 minutes while resuscitating cardiac arrest

Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Adult (4G)
0.1mg/mL (1:10,000) 1 mg IVP/IOP
Repeat every 3 - 5 minutes while resuscitating cardiac arrest, cumulative maximum 3mg

Asystole - Pediatric (4F)
Ventricular Fibrillation/Pulseless Ventricular Tachycardia - Pediatric (4G)
Pulseless Electrical Activity - Pediatric (4H)
0.1mg/mL (1:10,000) 0.01 mg/kg (0.1 mL/kg) IVP/IOP
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 (5D)
0.1mg/mL (1:10,000) 0.01 mg/kg (0.1 mL/kg) IVP/IOP
May repeat once.

Acute Allergic Reactions (Anaphylaxis) - Adult (8D)
Snakebites (Anaphylaxis) - Adult (8E)
Bee/Wasp Stings (Anaphylaxis) - Adult (8F)
1mg/mL (*1:1000)* 0.5 mg IM
If anaphylaxis refractory to above IM dose:
0.1mg/mL (1:10,000) 1 mg slow IVP/IOP over 3 minutes

Acute Allergic Reactions (Anaphylaxis) - Pediatric (8D)
Snakebites (Anaphylaxis) - Pediatric (8E)
Bee/Wasp Stings (Anaphylaxis) - Pediatric (8F)
1mg/mL (*1:1000)* 0.15 mg IM dose for EMT
1mg/mL (*1:1000)* 0.01 mg/kg (0.01 mL/kg) not to exceed 0.3 mg (0.3 mL) IM
If anaphylaxis refractory to above IM dose:
0.1mg/mL (1:10,000) 0.01 mg/kg slow IVP/IOP over 3 minutes

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

Epinephrine 0.1mg/mL (1:10,000) in 1 mg/10 mL prefilled syringes (Always check concentration and dose per container at time of patient medication administration)

Special Comments: Be sure to administer correct concentration. Pulsatile patients ages 35 years or greater, particularly those with known coronary artery disease, receiving epinephrine should have ECG monitoring initiated and continued as soon as an ECG monitor is available.

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16O – EPINEPHRINE AUTOINJECTOR (EPIPEN®, Auvi-Q®)

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Vasoconstrictor, Bronchodilator (Catecholamine)

Actions/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 Inhaler/Nebulization) (3C)
Acute Allergic Reactions (Anaphylaxis) (8D)
Snakebites (Anaphylaxis) (8E)
Bee/Wasp Stings (Anaphylaxis) (8F)

Contraindications: None in indications above.

Pharmacokinetics: Onset of action within 5-10 minutes after IM administration. Duration of effect may range upwards of 30 minutes intramuscularly.

Adverse/Side Effects: Restlessness, anxiety, generalized tremors, headache, dizziness, chest pain, palpitations, hypertension, premature ventricular contractions, tachycardia. Pulsatile patients ages 35 years or greater, particularly those with known coronary artery disease, receiving epinephrine should have ECG monitoring initiated and continued as soon as an ECG monitor is available. Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks and should not deter clinically necessary usage.

Dosage:
Dyspnea - Asthma (Severe - Refractory to Inhaler/Nebulization) - Adult (3C)
Acute Allergic Reactions (Anaphylaxis) - Adult (8D)
Snakebites (Anaphylaxis) - Adult (8E)
Bee/Wasp Stings (Anaphylaxis) - Adult (8F)
Adult Epinephrine Autoinjector (0.3 mg of Epinephrine 1mg/mL 1:1000) IM lateral thigh

****OLMC Order required if pt ≥ 50 years old, heart illness history, or blood pressure > 140/90 mmHg.**

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PROTOCOL 16O: Epinephrine Autoinjector (EpiPen®, Auvi-Q®)

Dosage, cont.:

Dyspnea- Asthma (Severe-Refractory to Inhaler/Nebulization)-Pediatric (3C)
Acute Allergic Reactions (Anaphylaxis) - Pediatric (8D)
Snakebites (Anaphylaxis) - Pediatric (8E)
Bee/Wasp Stings (Anaphylaxis) - Pediatric (8F)
Pediatric Epinephrine Autoinjector (0.15 mg of Epinephrine 1mg/mL 1:1000) IM lateral thigh

****OLMC Order required if heart illness history or blood pressure > 140/90 mmHg.**

How Supplied: 0.3 mg Adult Epinephrine Autoinjector

0.15 mg Pediatric Epinephrine Autoinjector

(Always check concentration and dose per container at time of patient medication administration)

Special Comment: For autoinjector medication administration, expose and wipe the mid-lateral thigh with ChloraPrep®, Betadine®, or an alcohol wipe. When handling the autoinjector for dosing, grasp the autoinjector with a fist, and remove the trigger safety cap. DO NOT place fingers or hand over the injection tip once the trigger safety cap is being removed.

Place the injection tip on the desired injection skin area and push the entire autoinjector into the thigh, using firm and continuous pressure, until a click is heard (patient will exhibit evidence of feeling spring-loaded needle activation) and hold in place for 10 seconds while medication is being delivered intramuscular.

Use caution when withdrawing the autoinjector to avoid needlestick injury. Dispose of whole autoinjector in a sharps container.

After autoinjector is complete, massage injection site for 15 to 30 seconds to improve epinephrine absorption.

16P – ETOMIDATE (AMIDATE®)

PARAMEDIC

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

Actions/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 (2G)

Contraindications: Known hypersensitivity to etomidate.

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.

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.

Dosage: **Medication Assisted Intubation - Adult (2G)**
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
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: Repeated doses of etomidate should be avoided to minimize its effect upon adrenal function. Repeated doses and continuous infusions of etomidate have been linked to adrenal suppression.

16Q – FENTANYL (SUBLIMAZE®)

PARAMEDIC

Class: Narcotic analgesic

Actions/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 mcg 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 (5A)
Acute Coronary Syndrome (5C)
Snakebites (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
Pain Management (Acute Onset &Chronic Type) (9D)
Eye Injury (10B)
Dental Injury/Pain (10C)
Chest/Abdomen/Pelvis Injury (10D)
Extremity/Amputation Injury (10G)
Compartment Syndrome (10J)
Crush Injury Syndrome (10K)
Burns (10L)
Lightning/Electrical Injury (11C)
Pelvic Pain (13E)
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.

PROTOCOL 16Q: Fentanyl (Sublimaze®), cont.

Dosage:

Chest Pain – Uncertain Etiology – Adult (5A)
Acute Coronary Syndrome – Adult (5C)
0.5 mcg/kg slow IVP/IM/IN, maximum single dose of 50 mcg
May repeat every 10 minutes to a maximum cumulative dose of 1.5 mcg/kg or 125 mcg, whichever is lesser

Snakebites – Adult (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)
Pain Management (Acute Onset &Chronic Type) – Adult (9D)
Eye Injury – Adult (10B)
Dental Injury/Pain – Adult (10C)
Chest/Abdomen/Pelvis Injury – Adult (10D)
Extremity/Amputation Injury – Adult (10G)
Compartment Syndrome – Adult (10J)
Crush Injury Syndrome – Adult (10K)
Burns – Adult (10L)
Lightning/Electrical Injury – Adult (11C)
Pelvic Pain – Adult (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.
1 mcg/kg slow IVP/IM/IN, maximum single dose of 100 mcg
May repeat every 10 minutes to a maximum cumulative dose of 3 mcg/kg or 250 mcg, whichever is lesser

Extremity/Amputation Injury – Pediatric (10G)
Burns – Pediatric (10L)
1mcg/kg up to 50 mcg per dose. Repeat dose(s) requires OLMC order.

Chest Pain – Uncertain Etiology – Pediatric (5A)
Snakebites – Pediatric (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)
Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)
Eye Injury – Pediatric (10B)
Dental Injury/Pain – Pediatric (10C)
Chest/Abdomen/Pelvis Injury – Pediatric (10D)
Compartment Syndrome – Pediatric (10J)
Crush Injury Syndrome – Pediatric (10K)
Lightning/Electrical Injury – Pediatric (11C)
Pelvic Pain – Pediatric (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient
****OLMC Order Only** – Typical dose is 1 mcg/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
(Always check concentration and dose per container at time of patient medication administration)

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16R – GLUCAGON

EMT-INTERMEDIATE 85	Intramuscular use only – 3A 4I 6B 6D 6E 6F 7A 8A 13D
ADVANCED EMT	Intramuscular use only – 3A 4I 6B 6D 6E 6F 7A 8A 13D
PARAMEDIC	

Class: Hormone

Actions/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/IO administration by paramedics for reversing cardiovascular collapse effects of suspected beta blocker toxicity.

Indications: Respiratory Arrest (3A)
Specific Causes of Cardiac Arrest (4I)
Altered Mental Status (6B)
Seizure (6D)
Syncope (6E)
Dystonic Reactions (6F)
Behavioral Disorder (7A)
Poisonings – General Management (8A)
Complications of Pregnancy (13D)

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-I85, AEMT, and Paramedic Scopes of Practice.

Additional indication for beta blocker toxicity with hypotension and bradycardia in Paramedic Scope of Practice.

Contraindications: None

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

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

PROTOCOL 16R: Glucagon, cont.

Dosage:

Respiratory Arrest – Adult & Pediatric weight ≥ 25 kg (3A)
Specific Causes of Cardiac Arrest - Adult& Pediatric weight ≥ 25 kg (4I)
Altered Mental Status – Adult & Pediatric weight ≥ 25 kg (6B)
Seizure – Adult & Pediatric weight ≥ 25 kg (6D)
Syncope – Adult & Pediatric weight ≥ 25 kg (6E)
Dystonic Reactions – Adult & Pediatric weight ≥ 25 kg (6F)
Behavioral Disorder – Adult & Pediatric weight ≥ 25 kg (7A)
Poisonings – General Management – Adult & Pediatric weight ≥ 25 kg (8A)
Complications of Pregnancy – Adult & Pediatric weight ≥ 25 kg(13D)
All indicatehypoglycemia without safe PO access and without IV access
1 mg IM

Respiratory Arrest - Pediatricweight < 25 kg (3A)
Specific Causes of Cardiac Arrest– Pediatricweight < 25 kg (4I)
Altered Mental Status – Pediatricweight < 25 kg (6B)
Seizure – Pediatricweight < 25 kg (6D)
Syncope – Pediatricweight < 25 kg (6E)
Dystonic Reactions – Pediatric weight < 25 kg (6F)
Behavioral Disorder – Pediatricweight < 25 kg (7A)
Poisonings – General Management – Pediatricweight < 25 kg (8A)
Complications of Pregnancy – Pediatricweight < 25 kg (13D)
All indicate hypoglycemia without safe PO access and without IV access
0.5 mg IM

Specific Causes of Cardiac Arrest - Adult (4I)
Poisonings – General Management - Adult(8A)
Suspected beta blocker toxicity with arrest or hypotension/bradycardia (Paramedic only)
1 mg IVP/IOP; May be given IM if no IV access obtainable

Specific Causes of Cardiac Arrest - Pediatric (4I)
Poisonings – General Management –Pediatric (8A)
Suspected beta blocker toxicity with arrest or hypotension/bradycardia (Paramedic only)
0.5 mg IVP/IOP; May be given IM if no IV access obtainable

How Supplied: 1 mg dry powder in vial with 1 mL of diluting solute for reconstitution (Always check concentration and dose per container at time of patient medication administration)

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16S – GLUCOSE (ORAL)

EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Carbohydrate

Actions/Pharmacodynamics: Increases blood sugar level.

Indications: Altered Mental Status (Hypoglycemia) (6B)
Syncope (Hypoglycemia) (6E)
Dystonic Reaction (Hypoglycemia) (6F)
Behavioral Disorder (Hypoglycemia) (7A)
Dialysis-Related Issues (Hypoglycemia) (9E)
Complications of Pregnancy (Hypoglycemia) (13D)

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.

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.

Side Effects: None

Dosage: **Altered Mental Status (Hypoglycemia) - Adult & Pediatric Weight ≥ 25 kg (6B)**
Syncope (Hypoglycemia) - Adult & Pediatric Weight ≥ 25 kg (6E)
Dystonic Reaction (Hypoglycemia) - Adult & Pediatric Weight ≥ 25 kg (6F)
Behavioral Disorder (Hypoglycemia) - Adult & Pediatric Weight ≥ 25 kg (7A)
Dialysis-Related Issues (Hypoglycemia) - Adult & Pediatric Weight ≥ 25 kg (9E)
Complications of Pregnancy (Hypoglycemia) - Adult (13D)
15 grams (1 tube) PO or SL for blood glucose < 50 mg/dL

PROTOCOL16S: Glucose (Oral), cont.

Dosage, cont.

Altered Mental Status (Hypoglycemia) - Pediatric Weight < 25 kg (6B)
Syncope (Hypoglycemia) - Pediatric Weight < 25 kg (6E)
Dystonic Reaction (Hypoglycemia) - Pediatric Weight < 25 kg (6F)
Behavioral Disorder (Hypoglycemia) - Pediatric Weight < 25 kg (7A)
Dialysis-Related Issues (Hypoglycemia) - Pediatric Weight < 25 kg (9E)
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)

Special Comment: Medical grade glucose should be utilized in place of sodas, candy, and other carbohydrate-heavy solid food. In many cases, the carbohydrate grams cannot be measured.

16T – HALOPERIDOL (HALDOL®)

PARAMEDIC

Class: Antipsychotic

Therapeutic 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 (7C)

Contraindications:
Known hypersensitivity
Behavioral disorder etiology easily reversed (eg. 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.

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

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

Dosage:

Chemical Restraint - Adult (7C)
5 mg IM (use deep IM injection in large muscle - lateral thigh if possible)

Chemical Restraint - Pediatric (7C)
**** OLMC Order Only**

How Supplied: 5 mg/1 mL vial.
(Always check concentration and dose per container at time of patient medication administration)

Special Comments: In emergency situations where the patient's behavior poses an immediate risk to rescuers and bystanders, the IM injection may be given through the patient's clothing to minimize risk of needlestick injuries to rescuers. Dystonic reactions are common with haloperidol; diphenhydramine should be readily available - see Protocol 6F - Dystonic Reactions.

16U – HYDRALAZINE (APRESOLINE®)

Protocol removed by the Medical Control Board

16V – HYDROMORPHONE (DILAUDID®)

PARAMEDIC

Class: Narcotic analgesic

Actions/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:
Snakebites (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
Pain Management (Acute Onset &Chronic Type) (9D)
Eye Injury (10B)
Dental Injury/Pain (10C)
Chest/Abdomen/Pelvis Injury (10D)
Extremity/Amputation Injury (10G)
Compartment Syndrome (10J)
Crush Injury Syndrome (10K)
Burns (10L)
Lightning/Electrical Injury (11C)
Pelvic Pain (13E)
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.

PROTOCOL 16V: Hydromorphone (Dilaudid®), cont.

Dosage:

Snakebites – Adult (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)
Pain Management (Acute Onset &Chronic Type) – Adult (9D)
Eye Injury – Adult (10B)
Dental Injury/Pain – Adult (10C)
Chest/Abdomen/Pelvis Injury – Adult (10D)
Extremity/Amputation Injury – Adult (10G)
Compartment Syndrome – Adult (10J)
Crush Injury Syndrome – Adult (10K)
Burns – Adult (10L)
Lightning/Electrical Injury – Adult (11C)
Pelvic Pain – Adult (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient.
0.5 – 1 mg slow IVP
May repeat every 10 minutes to a maximum cumulative dose of 2 mg

Snakebites – Pediatric (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)
Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)
Eye Injury – Pediatric (10B)
Dental Injury/Pain – Pediatric (10C)
Chest/Abdomen/Pelvis Injury – Pediatric (10D)
Extremity/Amputation Injury – Pediatric (10G)
Compartment Syndrome – Pediatric (10J)
Crush Injury Syndrome – Pediatric (10K)
Burns – Pediatric (10L)
Lightning/Electrical Injury – Pediatric (11C)
Pelvic Pain – Pediatric (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient
****OLMC Order Only** – 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
(Always check concentration and dose per container at time of patient medication administration)

16W – HYDROXOCOBALAMIN (CYANOKIT®)

ADVANCED EMT

PARAMEDIC

Class: Cyanide Antidote

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

Indications: Cyanide (12E)

Contraindications: None in the setting of suspected cyanide toxicity.

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.

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.

Dosage:

Cyanide - Adult (12E)
5 grams IVPB in 15 minutes

Cyanide - Pediatric (12E)
The pediatric dose is 70 mg/kg IVPB administered over 15 minutes. Safe use of CYANOKIT ® has not been well established in children. However, if clinically indicated the benefit likely out weights the risk.

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)

Special Comment: Multiple drug-drug incompatibilities exist with hydroxocobalamin. Use a separate IV line for the administration of hydroxocobalamin.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16X – IPRATROPIUM BROMIDE (ATROVENT®)

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Parasympatholytic Bronchodilator

Actions/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 (3C)
Dyspnea - Chronic Obstructive Pulmonary Disease (3D)
Acute Allergic Reactions (8D)
Bee/Wasp Stings (8F)

Contraindications and Precautions: 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.

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.

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

Dosage:
Dyspnea - Asthma - Adult & Pediatric weight ≥ 15 kg (3C)
Acute Allergic Reactions - Adult & Pediatric weight ≥ 15 kg (8D)
Bee/Wasp Stings - Adult & Pediatric weight ≥ 15 kg (8F)
0.5 mg nebulized (with albuterol 5 mg)

Dyspnea - Chronic Obstructive Pulmonary Disease - Adult (3D)
0.5 mg nebulized (with albuterol 5 mg), may repeat twice

PROTOCOL 16X: Ipratropium bromide (Atrovent®)

Dosage, cont.:

Dyspnea - Asthma - Pediatric weight < 15 kg (3C)
Acute Allergic Reactions - Pediatric weight < 15 kg (8D)
Bee/Wasp Stings - Pediatric weight < 15 kg (8F)
0.25 mg nebulized (with albuterol 2.5 mg)

How Supplied: 0.5 mg/2.5 mL nebulizer solution vials.
(Always check concentration and dose per container at time of patient medication administration)

16Y – LABETALOL (NORMODYNE®, TRANDATE®)

Protocol removed by the Medical Control Board

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16Z – LIDOCAINE 2% INTRAVASCULAR (XYLOCAINE®)

EMT-INTERMEDIATE 85	Intraosseous local anesthetic use only - 9I
ADVANCED EMT	Intraosseous local anesthetic use only - 9I
PARAMEDIC	

Class: Intraosseous Local Anesthetic & Antidysrhythmic

Therapeutic Actions/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 (5F)
Wide complex tachycardia, refractory to amiodarone
****OLMC Order Only**
Vascular Access - Intraosseous (9I)

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

Pharmacokinetics: Onset of action within 3 minutes IVP/IOP. Duration for 10-20 minutes.

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

Dosage:

Tachycardia - Stable - Wide Complex Tachycardia - Adult (5F) Refractory to Amiodarone
Up to 1 mg/kg, slow IVP/IOP at < 50 mg/minute
****OLMC Order Only**

Tachycardia - Stable - Pediatric (5F)
Consult with OLMCP for use and dosing.

Vascular Access - Intraosseous (Local Anesthetic) - Adult & Pediatric (9I)
1 mg/kg up to 40 mg IOP

How Supplied: 100 mg/5 mL (20 mg/mL of 2% lidocaine) prefilled syringe.
(Always check concentration and dose per container at time of patient medication administration)

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16AA – LIDOCAINE VISCOUS GEL (XYLOCAINE®)

EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Class: Topical Anesthetic

Actions/Pharmacodynamics: Lidocaine stabilizes the neuronal membrane by inhibiting the ionic fluxes required for the initiation and conduction of impulses, thereby effecting local anesthetic action. In gel formulation, additional lubricant effect is possible.

Indications: Nasotracheal Intubation (2H).

Contraindications: Known hypersensitivity to local anesthetics, amide type.

Pharmacokinetics: Onset of action within 3 - 5 minutes.

Side Effects: None expected unless amide anesthetic allergy. In this specific setting, adverse experiences are generally systemic in nature. Cardiovascular manifestations are usually depressant and are characterized by bradycardia, hypotension, and cardiovascular collapse.

Dosage: **Nasotracheal Intubation - Adult (2H)**
Apply gel to the external surface of the endotracheal tube, primarily the distal parts near the balloon cuff and the balloon cuff itself just prior to intubation.
Typical use is 1-2 mL of gel.

How Supplied: 2% Viscous Gel (20 mg/mL) - available in foil packs, tubes, pre-filled syringes for topical application, and bottles.
(Always check concentration and dose per container at time of patient medication administration)

Special Comments: Care should be taken to avoid partially occluding the lumen of the endotracheal tube with gel. Do not use the gel to lubricate the endotracheal stylette. Avoid large bottles of lidocaine viscous gel. Attempts to use over multiple patients can result in gel contamination.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16BB – LORAZEPAM (ATIVAN®)

PARAMEDIC

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

Actions/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 (2G)
- Post-intubation sedation - onset delay does not favor pre-intubation use

Seizure (6D)
- (Midazolam preferred benzodiazepine due to faster onset of action)

Dystonic Reactions (6F)

Chemical Restraint (7C)
- (Midazolam preferred benzodiazepine due to faster onset of action)

Poisonings - General Management (8A)
- Suspected stimulant toxicity = severe agitation, HTN, tachycardia, diaphoresis

Head/Neck/Spine Injury (10A)
- (Midazolam preferred benzodiazepine due to faster onset of action)

Heat Illness (11A)
- (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.

Pharmacokinetics: Onset is 5-10 minutes, IVP/IOP; up to 30 minutes IM; peak effects in 2-3 hours. Duration is 3-6+ hours IVP/IOP/IM; half – life can reach 20 – 50 hours.

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

Dosage: **Medication Assisted Intubation (Post Intubation Sedation) - Adult (2G)**
0.1 mg/kg to max 2 mg IVP/IOP, may repeat once if systolic BP > 100 mmHg

Seizure - Adult (6D)
Heat Illness - Adult (11A)
2 mg IVP/IOP/IM for active seizure
May repeat once in 10 minutes if still seizing.

PROTOCOL 16BB: Lorazepam (Ativan®), cont.

Dosage, cont.:

Seizure - Pediatric (6D)
Heat Illness - Pediatric (11A)
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 (6F)
2 mg IVP/IM

Dystonic Reactions - Pediatric (6F)
0.1 mg/kg to max 2 mg IVP/IM

Chemical Restraint - Adult (7C)
2 mg IVP/IOP/IM
May repeat once.

Chemical Restraint - Pediatric (7C)
0.1 mg/kg to max 2 mg IVP/IOP/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)
1 -2 mg IVP/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)
****OLMC Order Only**

Head/Neck/Spine Injury - Adult (10A)
1 mg IVP/IM/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Head/Neck/Spine Injury - Pediatric (10A)
0.1 mg/kg IVP/IM/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

How Supplied: 2 mg/1 mL or 4 mg/1 mL in vials, ampules, or pre-filled syringes. (Always check concentration and dose per container at time of patient medication administration)

Special Comment: Lorazepam must be kept refrigerated.

16CC – MAGNESIUM SULFATE

PARAMEDIC

Class: Electrolyte

Therapeutic Actions/Pharmacodynamics: As an antidysrhythmic, 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 (3C)
Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades) (4G)
Tachycardia - Stable (Torsades) (5F)
Childbirth - Complicated (Eclampsia) (13B)
Complications of Pregnancy (Eclampsia) (13D)

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

Pharmacokinetics: Onset of action typically within 1-2 minutes after IVP/IOP. Effects persist for up to 30 minutes.

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.

Dosage:

Dyspnea - Asthma - (Severe & Refractory to Nebulization) - Adult (3C)
1 gram very slow IVP over 10 minutes

Ventricular Fibrillation/Pulseless Ventricular Tachycardia (Torsades) - Adult (4G)
1 gram IVP/IOP

Tachycardia - Stable (Torsades) - Adult (5F)
1 gram slow IVP/IOP over 1 minute.
May repeat once.

Tachycardia - Stable (Torsades) - Pediatric (5F)
Consult with OLMCP for use and dosing.

Childbirth - Complicated (Eclampsia) (13B)
Complications of Pregnancy (Eclampsia) (13D)
1 gram IVP/IOP. May repeat every 2-3 mins until seizure abates. Maximum cumulative dose is 4 grams.

PROTOCOL 16CC: Magnesium Sulfate, cont.

How Supplied:

1 gram/2 mL (500 mg/mL in 50% solution) vials
5 grams/10 mL (500 mg/mL in a 50% solution) vials
5 grams/10 mL (50% mg/mL in a 50% solution) pre-filled syringes
(Always check concentration and dose per container at time of patient medication administration)

16FF – MORPHINE SULFATE

PARAMEDIC

Class: Narcotic analgesic

Actions/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:
Snakebites (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
Pain Management (Acute Onset &Chronic Type) (9D)
Eye Injury (10B)
Dental Injury/Pain (10C)
Chest/Abdomen/Pelvis Injury (10D)
Extremity/Amputation Injury (10G)
Compartment Syndrome (10J)
Crush Injury Syndrome (10K)
Burns (10L)
Lightning/Electrical Injury (11C)
Pelvic Pain (13E)
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.

PROTOCOL 16FF: Morphine Sulfate, cont.

Dosage:

Snakebites – Adult (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)
Pain Management (Acute Onset &Chronic Type) – Adult (9D)
Eye Injury – Adult (10B)
Dental Injury/Pain – Adult (10C)
Chest/Abdomen/Pelvis Injury – Adult (10D)
Extremity/Amputation Injury – Adult (10G)
Compartment Syndrome – Adult (10J)
Crush Injury Syndrome – Adult (10K)
Burns – Adult (10L)
Lightning/Electrical Injury – Adult (11C)
Pelvic Pain – Adult (13E)
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

Snakebites – Pediatric (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)
Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)
Eye Injury – Pediatric (10B)
Dental Injury/Pain – Pediatric (10C)
Chest/Abdomen/Pelvis Injury – Pediatric (10D)
Extremity/Amputation Injury – Pediatric (10G)
Compartment Syndrome – Pediatric (10J)
Crush Injury Syndrome – Pediatric (10K)
Burns – Pediatric (10L)
Lightning/Electrical Injury – Pediatric (11C)
Pelvic Pain – Pediatric (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient
****OLMC Order Only** – Typical dose is 0.1 mg/kg up to 2 mg per dose.

How Supplied:

2 mg/1 mL pre-filled syringe
4 mg/1 mL vial, ampule, or pre-filled syringe
8 mg/1 mL pre-filled syringe
10 mg/1 mL vial
10 mg/10 mL vial
(Always check concentration and dose per container at time of patient medication administration)

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 16EE: Midazolam (Versed®), cont.

Dosage, cont.:

Synchronized Cardioversion (Sedation) - Adult (5G)
0.1 mg/kg to max 5 mg IVP/IOP/INP

Seizure - Adult (6D)
Heat Illness - Adult (11A)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Seizure - Pediatric (6D)
Head/Neck/Spine Injury - Pediatric (10A)
Heat Illness - Pediatric (11A)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure
May repeat once in 5 minutes if still seizing.

Dystonic Reactions - Adult (6F)
2.5 mg IVP/IM/IN

Dystonic Reactions - Pediatric (6F)
0.1 mg/kg to max 2.5 mg IM/IVP/IN

Chemical Restraint - Adult (7C)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP.
May repeat once.

Chemical Restraint - Pediatric (7C)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP

Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)
0.1 mg/kg to max 5 mg IVP/IN/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)
****OLMC Order Only**

Head/Neck/Spine Injury - Adult (10A)
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.
(Always check concentration and dose per container at time of patient medication administration)

PROTOCOL 16EE: Midazolam (Versed®), cont.

Dosage, cont.:

Synchronized Cardioversion (Sedation) - Adult (5G)
0.1 mg/kg to max 5 mg IVP/IOP/INP

Seizure - Adult (6D)
Heat Illness - Adult (11A)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure.
May repeat once in 5 minutes if still seizing.

Seizure - Pediatric (6D)
Head/Neck/Spine Injury - Pediatric (10A)
Heat Illness - Pediatric (11A)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP for active seizure
May repeat once in 5 minutes if still seizing.

Dystonic Reactions - Adult (6F)
2.5 mg IVP/IM/IN

Dystonic Reactions - Pediatric (6F)
0.1 mg/kg to max 2.5 mg IM/IVP/IN

Chemical Restraint - Adult (7C)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP.
May repeat once.

Chemical Restraint - Pediatric (7C)
0.1 mg/kg to max 5 mg IM/IVP/IN/IOP

Poisoning - General Management (Suspected Stimulant Toxic) - Adult (8A)
0.1 mg/kg to max 5 mg IVP/IN/IM

Poisoning - General Management (Suspected Stimulant Toxic) - Pediatric (8A)
****OLMC Order Only**

Head/Neck/Spine Injury - Adult (10A)
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.
(Always check concentration and dose per container at time of patient medication administration)

16FF – MORPHINE SULFATE

PARAMEDIC

Class: Narcotic analgesic

Actions/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:
Snakebites (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
Pain Management (Acute Onset &Chronic Type) (9D)
Eye Injury (10B)
Dental Injury/Pain (10C)
Chest/Abdomen/Pelvis Injury (10D)
Extremity/Amputation Injury (10G)
Compartment Syndrome (10J)
Crush Injury Syndrome (10K)
Burns (10L)
Lightning/Electrical Injury (11C)
Pelvic Pain (13E)
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.

PROTOCOL 16FF: Morphine Sulfate, cont.

Dosage:

Snakebites – Adult (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Adult (9A)
Pain Management (Acute Onset &Chronic Type) – Adult (9D)
Eye Injury – Adult (10B)
Dental Injury/Pain – Adult (10C)
Chest/Abdomen/Pelvis Injury – Adult (10D)
Extremity/Amputation Injury – Adult (10G)
Compartment Syndrome – Adult (10J)
Crush Injury Syndrome – Adult (10K)
Burns – Adult (10L)
Lightning/Electrical Injury – Adult (11C)
Pelvic Pain – Adult (13E)
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

Snakebites – Pediatric (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea – Pediatric (9A)
Pain Management (Acute Onset &Chronic Type) – Pediatric (9D)
Eye Injury – Pediatric (10B)
Dental Injury/Pain – Pediatric (10C)
Chest/Abdomen/Pelvis Injury – Pediatric (10D)
Extremity/Amputation Injury – Pediatric (10G)
Compartment Syndrome – Pediatric (10J)
Crush Injury Syndrome – Pediatric (10K)
Burns – Pediatric (10L)
Lightning/Electrical Injury – Pediatric (11C)
Pelvic Pain – Pediatric (13E)
For all listed situations, indication is acute pain control in alert, hemodynamically stable patient
****OLMC Order Only** – Typical dose is 0.1 mg/kg up to 2 mg per dose.

How Supplied:

2 mg/1 mL pre-filled syringe
4 mg/1 mL vial, ampule, or pre-filled syringe
8 mg/1 mL pre-filled syringe
10 mg/1 mL vial
10 mg/10 mL vial
(Always check concentration and dose per container at time of patient medication administration)

16GG – NALOXONE (NARCAN®)

EMERGENCY MEDICAL DISPATCHER	IN Administration via MPDS Phone Directive - 3A, 4I, 6B, 6E, 8A
EMERGENCY MEDICAL RESPONDER	IN Administration Only – 3A, 4I, 6B, 6E, 8A
EMT	IN Administration Only – 3A, 4I, 6B, 6E, 8A
EMT-INTERMEDIATE 85	IN Administration Only – 3A, 4I, 6B, 6E, 8A
ADVANCED EMT	
PARAMEDIC	

Class: Narcotic antagonist

Actions/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 (3A)
Specific Causes of Cardiac Arrest (4I)
Altered Mental Status (6B)
Syncope (6E)
Poisonings – General Management (8A)

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.

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

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

PROTOCOL 16GG: Naloxone (Narcan®), cont.

Dosage:

Respiratory Arrest - Adult (3A)
Specific Causes of Cardiac Arrest - Adult (4I)
Altered Mental Status – Adult (6B)
Syncope – Adult (6E)
Poisonings – General Management – Adult (8A)
In Apnea/Agonal Breathing, 2 mg IVP/IOP/IN.
May repeat once to maximum cumulative dose of 4 mg.

In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 4 mg.

Respiratory Arrest - Pediatric (3A)
Specific Causes of Cardiac Arrest - Pediatric (4I)
Altered Mental Status – Pediatric (6B)
Syncope – Pediatric (6E)
Poisonings – General Management – Pediatric (8A)
In Apnea/Agonal Breathing, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 2 mg.

In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 2 mg.

How Supplied:

0.4 mg/1 mL vial
0.4 mg/1 mL prefilled syringe
2 mg/2 mL prefilled syringe
4 mg/10 mL vial
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: In non-respiratory arrest or non-cardiac arrest situations, always titrate administration slowly, using the lowest clinically effective amount of naloxone possible to avoid inadvertent acute narcotic withdrawal and/or other side effects.

PROTOCOL 16GG: Naloxone (Narcan®), cont.

Dosage:

Respiratory Arrest - Adult (3A)
Specific Causes of Cardiac Arrest - Adult (4I)
Altered Mental Status – Adult (6B)
Syncope – Adult (6E)
Poisonings – General Management – Adult (8A)
In Apnea/Agonal Breathing, 2 mg IVP/IOP/IN.
May repeat once to maximum cumulative dose of 4 mg.

In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 4 mg.

Respiratory Arrest - Pediatric (3A)
Specific Causes of Cardiac Arrest - Pediatric (4I)
Altered Mental Status – Pediatric (6B)
Syncope – Pediatric (6E)
Poisonings – General Management – Pediatric (8A)
In Apnea/Agonal Breathing, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 2 mg.

In Ineffective Breathing Activity, 0.5 mg IVP/IOP/IN.
May repeat to a maximum cumulative dose of 2 mg.

How Supplied:

0.4 mg/1 mL vial
0.4 mg/1 mL prefilled syringe
2 mg/2 mL prefilled syringe
4 mg/10 mL vial
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: In non-respiratory arrest or non-cardiac arrest situations, always titrate administration slowly, using the lowest clinically effective amount of naloxone possible to avoid inadvertent acute narcotic withdrawal and/or other side effects.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

16HH – NITROGLYCERIN (NITROLINGUAL®, NITROMIST®, NITROSTAT®, NITROQUICK®, TRIDIL (IV INFUSION), NITRO-BID® - DERMAL)

EMERGENCY MEDICAL DISPATCHER	Sublingual Dosing - Own Self-Administration Phone Directive - 3E 5A 5C
EMERGENCY MEDICAL RESPONDER	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
EMT	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
EMT-INTERMEDIATE 85	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
ADVANCED EMT	Sublingual Dosing - Assist Pt with Own Self-Administration - 3E 5A 5C
PARAMEDIC	

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

Actions/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 (3E)
- Chest Pain - Uncertain Etiology (5A)
- Acute Coronary Syndrome (5C)

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

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 transdermal dosing, with ongoing effect while continued transdermal absorption.

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 transdermal nitroglycerin ointment, avoiding contact with bare hands to avoid experiencing personal side effects, typically headache and dizziness.

PROTOCOL 16HH: Nitroglycerin (Nitrolingual®, NitroMist® NitroStat®, NitroQuick®, Tridil - Intravenous, Nitro-BID® - Transdermal), cont.

Dosage: **Dyspnea - Congestive Heart Failure - Adult (3E)**
Acute Coronary Syndrome - Adult (5C)
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 mcg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 mcg/min.

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

Chest Pain - Uncertain Etiology - Adult (5A)
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 mcg/min, titrate slowly to effect. Maximum infusion rate without OLMC consult is 50 mcg/min.

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

How Supplied: Metered dose spray 0.4 mg/spray.
Tablets for sublingual absorption 0.4 mg.
Intravenous infusion - Mix 50 mg into 250 mL D5W (200 mcg/mL)
- 10 mcg/min using microdrip infusion set is 3 mL/hour rate
- 20 mcg/min using microdrip infusion set is 6 mL/hour rate

Transdermal ointment in 2% nitroglycerin concentration
- 1½ inches = 22.5 mg of nitroglycerin

(Always check concentration and dose per container at time of patient medication administration)

16II – NOREPINEPHRINE (LEVOPHED®)

PARAMEDIC

Class: Vasoconstrictor

Actions/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) (3E)
Post Cardiac Arrest Treatment (Cardiogenic Shock) (4J)
Acute Coronary Syndrome (Cardiogenic Shock) (5C)
Sepsis (Septic Shock) (9B)
Dialysis-Related Issues (9E)
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 (eg. pulmonary edema).

Contraindications: Hypertension

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

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.

Dosage:
Dyspnea – Congestive Heart Failure (CHF) – Adult (3E)
Post Cardiac Arrest Treatment - Cardiogenic Shock - Adult (4J)
Acute Coronary Syndrome – Adult (5C)
Sepsis - Septic Shock - Adult (9B)
Dialysis-Related Issues - Adult (9E)
For hypotension (shock) refractory to fluids or fluids contraindicated
Start at 2-4 mcg/minute - see dosage chart - titrated to a systolic B/P ≥ 100 mmHg. Maximum infusion rate is 12 mcg/minute.

Norepinephrine Infusion Adult Dosage Chart
rates reflect using a microdrip (60 drops/mL) set:

mcg/min	2	3	4	5	6	7	8	9	10	11	12
drops/min	15	22	30	37	45	52	60	67	75	82	90

PROTOCOL 16II: Norepinephrine (Levophed®), cont.

Dosage, cont.:

Dyspnea – Congestive Heart Failure (CHF) - Pediatric (3E)
Post Cardiac Arrest Treatment - Cardiogenic Shock - Pediatric (4J)
Sepsis - Septic Shock - Pediatric (9B)
Dialysis-Related Issues - Pediatric (9E)
For hypotension (shock) refractory to fluids or fluids contraindicated
****OLMC Order Only**

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)

Special Comments:

In the setting of tachydysrhythmia-induced cardiogenic shock, treat per Protocol 5G – Tachycardia - Unstable. Ensure aggressive fluid resuscitation is accomplished (unless contraindicated) prior to norepinephrine use.

Norepinephrine should be given into a large, patent vein. The vein of choice for EMS use is the antecubital vein, as this will decrease the risk of overlying skin necrosis. Do not administer norepinephrine through an IV in the hand or leg. These veins are more likely to be affected by vaso-occlusive diseases and more prone to ischemic complications. Administration through IO in the proximal tibia or humeral head is permitted.

If local extravasation occurs, notify the receiving physician of the following FDA advisement of antidote to extravasation ischemia:

"To prevent sloughing/necrosis in peripheral ischemic areas promptly use syringe w/ fine hypodermic needle to liberally infiltrate area w/ 10-15 mL saline solution containing 5-10 mg phentolamine; sympathetic blockade causes immediate conspicuous local hyperemic changes if area infiltrated within 12 hours."

Safety in pregnancy not firmly established, though when clinically indicated the benefits outweigh risks. Safety in pediatrics not firmly established and OLMC is to be consulted prior to pediatric usage.

Avoid mixing in normal saline, as NS promotes loss of potency through oxidation of norepinephrine.

16JJ – ONDANSETRON (ZOFRAN®)

PARAMEDIC

Class: Antiemetic

Actions/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 (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea (9A)
Sepsis (9B)
Pelvic Pain (13E)
For all listed situations, indication is for 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 (eg. procainamide, amiodarone, tricyclic antidepressants, haloperidol)

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

Dosage:
Snakebites - Adult (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea - Adult (9A)
Sepsis - Adult (9B)
Pelvic Pain - Adult (13E)
For all listed situations, indication is for 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 (8E)
Abdominal Pain/Nausea/Vomiting/Diarrhea - Pediatric (9A)
Sepsis - Pediatric (9B)
Pelvic Pain - Pediatric (13E)
For all listed situations, indication is for 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/mL) vial.
4 mg rapid oral dissolving tablet (ODT)
(Always check concentration and dose per container at time of patient medication administration)

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16KK – PHENYLEPHRINE 2% (NEOSYNEPHRINE®)

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Active epistaxis only - 9C

Class: Topical Nasal Vasoconstrictor

Actions/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 (2H)
Epistaxis (9C)

Contraindications: None in the indicated settings.

Pharmacokinetics: Onset of action is within seconds.

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

Dosage:

Nasal Intubation - Adult (2H)
2 sprays in each nostril

Epistaxis - Adult & Pediatric (9C)
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.
(Always check concentration and dose per container at time of patient medication administration)

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16LL – PRALIDOXIME CHLORIDE (2PAM)

PARAMEDIC

Class: Cholinesterase Reactivator

Actions/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 (8A)

Contraindications: None

Pharmacokinetics: With IM autoinjector use, effects may not be observed for up to 15 minutes. Beneficial effects can persist in excess of 1 hour.

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

Dosage:

Poisonings – General Management - Adult & Pediatric > 12 years of age (8A)
600 mg IM
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 (8A)
****OLMC Order Only**
Typical pediatric dose is 15 mg/kg IM per dose, max single dose 600 mg

How Supplied:

600 mg/2 mL autoinjector
(Always check concentration and dose per container at time of patient medication administration)

16MM – SODIUM BICARBONATE

PARAMEDIC

Class: Alkalinizing agent

Actions/Pharmacodynamics: Raises the pH of blood by buffering excess hydrogen ions that are present in acidotic 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) (4I)
Poisonings – General Management (Tricyclic Antidepressant) (8A)
Dialysis-Related Issues (Hyperkalemia) (9E)
Crush Injury Syndrome (Hyperkalemia Prophylaxis) (10K)

Contraindications: Known metabolic alkalosis.

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

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.

Dosage:
Specific Causes of Cardiac Arrest – Hyperkalemia - Adult & Pediatric (4I)
Poisonings – General Management – Tricyclic Antidepressants - Adult & Pediatric (8A)
Dialysis-Related Issues – Hyperkalemia - Adult & Pediatric (9E)
Crush Injury Syndrome – Hyperkalemia Prophylaxis - Adult & Pediatric (10K)
1 mEq/kg IVP/IOP with maximum dose of 50mEq

How Supplied: 50 mEq/50 mL (1 mEq/mL) prefilled syringe.
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: Do not administer with calcium chloride. A precipitate will form and obstruct the vascular access being utilized.

16NN – CALCIUM GLUCONATE

EMERGENCY MEDICAL DISPATCHER	Administration Phone Directive - 8H
EMERGENCY MEDICAL RESPONDER	
EMT	
EMT-INTERMEDIATE 85	
ADVANCED EMT	
PARAMEDIC	

Class: Elemental metabolite – calcium is the active component

Actions/Pharmacodynamics: In the setting of hydrofluoric acid burns, calcium gluconate topically applied to affected skin will allow for calcium to bind up the free fluoride ions, reducing pain caused by such ions. Binding the free fluoride ions reduces their impacts, specifically those associated with causing hyperkalemia, hypocalcemia, and hypomagnesemia.

Indications: Hydrofluoric Acid (8H)

Contraindications: Known hypercalcemia; effectively none in setting of hydrofluoric acid burn

Pharmacokinetics: Absorption transdermally, with onset of action within several minutes and duration of action up to several hours.

Side Effects: Typically none from EMS dosing.

Dosage: **Hydrofluoric Acid – Adult & Pediatric (8H)**
Apply topically to exposed/affected burn on skin

How Supplied: 2.5% gel in 25 gram tube
(Always check concentration and dose per container at time of patient medication administration)

Special Comment: To monitor pain relief from calcium gluconate gel absorption, paramedics should avoid concurrent administration of opiate/narcotic medications. When hand(s) are involved, a best practice is to place a liberal amount of the calcium gluconate gel in exam glove(s), placing the gel in the spaces for any affected fingers too, and then pulling the glove(s) onto the affected hand(s). Weaker concentrations of hydrofluoric acid may result in time lag of several hours from exposure to onset of burn pain. High concentrations of hydrofluoric acid will cause immediate burn pain.

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PROTOCOL 17A: Destination Determination – Adult General Medical Patients

Adult General Medical Patients
Destination Determination
Four (4) Levels of General Medical Hospitals

Priority I and II

Assigned

Will time and distance to the hospital of choice be detrimental to the patient's condition?

- **No** → Transport to Level I, Level II or III General Medical Hospital of patient's choice
- **No** → At the discretion of the paramedic Level IV General Medical Hospitals may receive assigned Priority General Medical Patients
- **Yes** → Transport to closest appropriate Level 1 or Level II General Medical Hospital

Unassigned

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
  - ✓ Hillcrest Hospital South
    - ➢ (Transported to SFH or HHS if S. of 41st Street & SE of I-44, by hospital rotation)
  - ✓ St. John Medical Center
  - ✓ Hillcrest Medical Center
  - ✓ OSUMC
    - ➢ (Transported to SJMC, HMC or OSUMC if N. of 41st Street & NW of I-44, by hospital rotation)
- ❑ **Western Division**
  - ✓ Transport to closest appropriate Level I or Level II General Medical Hospital, (whichever is closer)

Priority III

Assigned

Transport to Level I, Level II, III, or IV General Medical Hospital of patient's choice

Unassigned

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
  - ✓ Saint Francis South
  - ✓ Hillcrest Hospital South
    - ➢ (Transported to SFH, SFS or HHS if S. of 41st Street & SE of I-44, by hospital rotation)
  - ✓ St. John Medical Center
  - ✓ Hillcrest Medical Center
  - ✓ OSUMC
    - ➢ (Transported to SJMC, HMC or OSUMC if N. of 41st Street & NW of I-44, by hospital rotation)
- ❑ **Western Division**
  - ✓ Transport to closest appropriate Level I or Level II General Medical Hospital, (whichever is closer)

General Medical Hospitals

- **Level I and II General Medical Hospitals**
  - ❑ Emergency Medical Services and Operative Procedures
  - ❑ Organized Emergency Department
  - ❑ Physician/Nursing Staff with specialties in emergency care on-site 24 hours a day
  - ❑ General Surgery/Anesthesiology Services on-site or on-call 24 hours a day
  - ❑ Additional clinical services/specialties promptly available
    - ✓ Nuclear diagnostic imaging
    - ✓ Endocrinology
    - ✓ Hematology
    - ✓ Oncology
- **Level III General Medical Hospitals**
  - ❑ Emergency Medical Services and Operative Procedures
  - ❑ Organized Emergency Department
  - ❑ Physician/Nursing Staff with specialties in emergency care on-site 24 hours a day
  - ❑ General Surgery/Anesthesiology Services on-site or on-call
- **Level IV General Medical Hospitals**
  - ❑ Emergency Medical Services twenty-four (24) hours a day with at least:
    - ✓ Mid-level practitioner
    - ✓ RN
    - ✓ LPN or
    - ✓ Paramedic or Intermediate Level EMT

Pre – Hospital Triage Criteria

- ❑ Priority I Adult General Medical Patient
  - ✓ Patient's condition requires immediate intervention by physician and nursing personnel upon arrival at the Emergency Department
    - ➢ Critical Medical Problems with unstable vitals signs
    - ➢ Patient with unstable vital signs and / or requiring critical procedures to save life
    - ➢ Patient with time sensitive conditions
- ❑ Priority II Adult General Medical Patient
  - ✓ Patient's condition requires emergent medical intervention by physician and nursing personnel upon arrival at the Emergency Department. Priority II patients have potential time sensitive problems, are currently stable but at risk for sudden deterioration
    - ➢ Acute Medical Problems with stable vital signs
- ❑ Priority III Adult General Medical Patient
  - ✓ Patient without acute medical problems i.e., no immediate life / organ threatening emergency

PROTOCOL 17A: Destination Determination – Adult Cardiology Patients

Adult Cardiology Patients
Destination Determination
ST – Elevation Myocardial Infarction Patients
Three (3) Levels of Cardiology Hospitals

- Priority 1 Assigned Patient with STEMI
  - Time and Distance to patient's hospital of choice detrimental to clinical condition?
    - No → Transport to Level I Cardiology Hospital of choice
    - Yes → Transport to closest Level 1 Cardiology Hospital
- Priority 1 Unassigned Patient with STEMI → Transport to closest Level 1 Cardiology Hospital
- Priority 2 Assigned Cardiology Patient → Transport to Level I, II, III Cardiology Hospital of choice
- Priority 2 Unassigned Cardiology Patient → Transport to closest Level I, II Cardiology Hospital

Cardiology Hospitals

Level I Cardiology Hospitals *(PCI-Capable Hospital)*

- ❑ Emergency Medical Services and Operative Procedures
- ❑ Physician/Nursing Staff trained in cardiac care 24 hours a day
- ❑ Capability of providing
  - ✓ Immediate diagnostic angiography
  - ✓ Reperfusion therapy by thrombolysis
  - ✓ Percutaneous coronary intervention
  - ✓ Coronary artery bypass graft
  - ✓ Capabilities of receiving 12 – lead prehospital ECG

Level II Cardiology Hospitals *(Non- PCI Hospital)*

- ❑ Emergency Medical Services with an organized Emergency Department
- ❑ Physician/Nursing Staff trained in cardiac care 24 hours a day
- ❑ Capability of providing
  - ✓ Reperfusion therapy by thrombolysis

Level III Cardiology Hospital *(Non-PCI Hospital)*

- ❑ Emergency Medical Services twenty-four (24) hours a day with at least:
  - ✓ Mid-level practitioner
  - ✓ RN
  - ✓ LPN or
  - ✓ Paramedic or Intermediate Level EMT
- ❑ Level III Cardiology Hospitals may ***ONLY*** receive:
  - ✓ Assigned Priority II cardiac patients

Definition of Adult Cardiology Patient

- Priority I Adult Cardiology Patient
  - ❑ Examples:
    - ✓ Unstable Angina
    - ✓ Acute myocardial infarction / STEMI
    - ✓ Any complex of signs and symptoms consistent with acute coronary syndrome and cardiac decompensation, i.e., pulmonary edema, symptomatic cardiac dysrhythmia
- Priority II Adult Cardiology Patient
  - ❑ Example:
    - ✓ Cardiac patients with pre-existing condition requiring evaluation only

PROTOCOL 17A: Destination Determination – Adult Stroke Patients

Adult Stroke Patients
Destination Determination
Three (3) Levels of Stroke Hospitals

Priority 1 Assigned Stroke Patient (Onset of Symptoms of Stroke within 3 Hours)
→ Time and Distance to patient's hospital of choice detrimental to clinical condition?
- No → Transport to Level I, II,III Stroke Hospital of patient's choice.
- Yes → Transport to closest Level I, II Stroke Hospital

Priority 1 Unassigned Stroke Patient (Onset of Symptoms of Stroke within 3 hours)
→ Transport to closest Level I, II Stroke Hospital

Priority 2 Assigned/ Unassigned Stroke Patients (Onset of Symptoms of Stroke > 3 / ≤ 6 hours)
→ Transport to Closest Level I Stroke Hospital

Priority 3 Assigned/ Unassigned Stroke Patients (Onset of Symptoms of Stroke > 6 hours or time indeterminate)
→ Transport to Level I, II,III Stroke Hospital of patient's choice if assigned or closest Level I, II, III, Stroke Hospital if patient unassigned

Definition of Adult Stroke Patient

- ❑ Priority I Adult Stroke Patient
  - ✓ Examples:
    - Patient with acute stroke symptoms (within two hours of onset) with abnormal Los Angeles Prehospital Stroke Screen
- ❑ Priority II Adult Stroke Patient
  - ✓ Examples:
    - Patient with acute stroke symptoms > three (3) hours of onset but ≤ 6 hours with abnormal Los Angeles Prehospital Stroke Screen
- ❑ Priority III Adult Stroke Patient
  - ✓ Examples:
    - Patient with acute stroke symptoms > 6 hours of onset or time indeterminate with abnormal Los Angeles Prehospital Stroke Screen

Stroke Hospitals

Level I Stroke Hospitals
- ❑ Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- ❑ Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- ❑ CT of the head with technician on – site 24 hours a day
- ❑ Clinical Laboratory Services
- ❑ 24 / 7 Stroke Call
  - ✓ Capabilities for IV / tPA therapy for eligible patients
- ❑ 24 / 7 Endovascular Call
  - ✓ Capabilities for endovascular therapy for eligible patients
- ❑ 24 / 7 Neurosurgery Call or availability within 2 hours
- ❑ Neuro-Intensive Care Unit
- ❑ Stroke Registry and Quality Improvement Process

Level II Stroke Hospitals
- ❑ Physician / Nursing Staff trained in neurologic care on-site 24 hours a day
- ❑ Organized Emergency Department with written pathway for rapid identification and management of acute stroke patient
- ❑ CT of the head with technician on – site 24 hours a day
- ❑ Clinical Laboratory Services
- ❑ 24 / 7 Stroke Call
  - ✓ Capabilities for IV / tPA therapy for eligible patients
- ❑ Stroke Registry and Quality Improvement Process

Level III Stroke Hospitals
- ❑ Emergency Department 24 hours a day
  - ✓ Physician or physician extender and nursing staff trained in neurological care on – site 24 hours a day
- ❑ CT of the head with technician on – site 24 hours a day
- ❑ Clinical Laboratory Services
- ❑ Telestroke Video – Conferencing Capabilities
  - ✓ Video-Conferencing: Patient evaluation over the internet/high-speed telephone line by stroke neurologist
- ❑ 24 / 7 Stroke Call
  - ✓ Capabilities for IV / tPA therapy for eligible patients
- ❑ Transfer agreement established in advance to ensure orderly transition from Level III Stroke Hospital to specialized stroke care facility

Level IV Non – Stroke Hospitals
- ❑ No organized treatment for acute stroke

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PROTOCOL 17A: Destination Determination – Adult Trauma Patients

Adult Trauma Patients
Destination Determination
Four (4) Levels of Trauma Centers

Priority I Trauma / Adult Patient

Eastern Division

P - I Trauma / Adult Patient

- ❑ **Saint Francis Hospital**
  - ✓ Patient located south of 41st Street and southeast of I-44
- ❑ **St. John Medical Center**
  - ✓ Patient located north of 41st Street and northwest of I-44

Western Division

OU Medical Center

OU Medical Center
Isolated P-1 neurologically-injured patients(unstable)

Priority II Trauma / Adult Patient

Eastern Division

P- II Trauma / Adult Patient

- ❑ IF patient located ***SOUTH*** of 41st Street and SE of I – 44 then transport assigned patient* to either:
  - ✓ *Saint Francis Hospital
  - ✓ Hillcrest Hospital South
- ❑ Unassigned P – II Trauma / Adult
  - ✓ Hospital Rotation within zone
  - ✓ Saint Francis Hospital

* P-II Hand injuries: transport to Saint Francis Hospital.

P- II Trauma / Adult Patient

- ❑ IF patient located ***NORTH*** of 41st Street and NW of I – 44 then transport assigned patient* to either:
  - ✓ *St. John Medical Center
  - ✓ Hillcrest Medical Center
  - ✓ *OSUMC
- ❑ Unassigned P – II Trauma / Adult
  - ✓ Hospital Rotation within zone

* P-II Hand injuries: transport to St. John Hospital or OSUMC

Western Division

P- II Trauma / Adult Patient*

- ❑ **Assigned** patients go to Level III Trauma Center of choice
- ❑ **Unassigned** patients go to closest Level III Trauma Center or
- ❑ Designated On-Call Hospital if Isolated Hand, Face, Neurosurgery and currently stable

*At the discretion of the paramedic **ASSIGNED** P – II Adult Trauma patients may be transported to their hospital of choice, regardless of their location, as long as the time and distance is NOT detrimental to the patient's clinical condition **AND** the patient has been fully educated to the trauma system design yet still makes an informed decision to be taken to their hospital of choice

Priority III Trauma / Adult Patient

Assigned Patient
Eastern Division
Western Division

Hospital of Patient's Choice

Unassigned Patient
Eastern Division
Western Division

- ❑ **Eastern Division**
  - ✓ Hospital Rotation within zone
- ❑ **Western Division**
  - ✓ Closest Hospital

Trauma and Emergency Operative Centers

- Level I / Level II Trauma Centers
  - ❑ Emergency Medical Services with organized trauma services
  - ❑ Physician/Nursing Staff with specialties in trauma care available 24 hours a day
  - ❑ All Priority I Trauma Patients should be transported to these facilities
- Level III Trauma Centers
  - ❑ Emergency Medical Services with organized trauma services
  - ❑ Physician/Nursing Staff with some specialties in trauma care available 24 hours a day
  - ❑ Level III Trauma Centers are intended to receive patients at risk for severe injury with normal, stable vital signs or patients with single system injuries
  - ❑ Level III Trauma Centers may receive Priority I Trauma Patients if the Level I or Level II Trauma Centers are on trauma services divert
- Level IV Trauma Centers
  - ❑ Emergency Medical Services twenty-four (24) hours a day with at least:
    - ✓ Mid-level practitioner
    - ✓ RN
    - ✓ LPN or
    - ✓ Paramedic or Intermediate Level EMT
    - ✓ Level IV Trauma Centers may receive adult/pediatric patients without physiologic instability, altered mentation, neurologic deficit or significant anatomical injuries and have also not been involved in a significant mechanism of injury incident

Pre – Hospital Triage Criteria

- ❑ Priority 1 Trauma Patient / Adult
  - ✓ Patients with high energy blunt or penetrating trauma with physiologic or anatomic abnormalities
- ❑ Priority 2 Trauma Patient / Adult
  - ✓ Patients who are involved in a high energy event with risk for severe injury despite stable or normal vital signs with no altered mentation or respiratory distress or patients with a single system injury
  - ✓ Select & Isolated hand injuries (Refer to I.1 Section 1)
- ❑ Priority 3 Trauma Patient / Adult
  - ✓ Patients without physiologic instability, altered mentation, neurological deficit, or significant anatomical or single system injuries and generally have been involved in low energy mechanism of injury incident.

PROTOCOL 17A: Destination Determination– Pediatric General Medical Patients

Pediatric General Medical Patients
Destination Determination
Four (4) Levels of Pediatric General Medical Hospitals

Priority I

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
- ❑ **Western Division**
  - ✓ The Children's Hospital or Integris Baptist Medical Center (whichever is closer)
- ❑ Patients that require immediate control of the airway where paramedic attempts have failed to maintain the airway with either ETT or BVM should be transported to closest Level I or II General Medical Hospital

Priority II

Assigned

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
  - ✓ St. John Medical Center
  - ✓ Hillcrest Medical Center
- ❑ **Western Division**
  - ✓ The Children's Hospital
  - ✓ Integris Baptist Medical Center

Unassigned

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
    - ➢ (Transported to SFH if South of 41st Street & SE of I-44)
  - ✓ St. John Medical Center
  - ✓ Hillcrest Medical Center
    - ➢ (Transported to SJMC or HMC if North of 41st Street & NW of I-44, as designated by rotation)
- ❑ **Western Division**
  - ✓ The Children's Hopsital
  - ✓ Integris Baptist Medical Center
    - ➢ (Whichever is closer)

Priority III

Assigned

- ❑ **Hospital or facility of patient's choice (may be non-categorized)**
  - ✓ If time and distance detrimental to patient's condition, transport to closest appropriate categorized pediatric or medical hospital

Unassigned

- ❑ **Eastern Division**
  - ✓ Hospital designated by Rotation
- ❑ **Western Division**
  - ✓ Closest categorized hospital

Pre – Hospital Triage Criteria

- ❑ Priority I General Medical Patient / Pediatric
  - ✓ Children (age ≤ 16 years)
  - ✓ Patient's condition requires immediate intervention by physician and nursing personnel upon arrival at the Emergency Department, i.e.:
    - ➢ Cardiac / Respiratory arrest
    - ➢ Signs / symptoms of shock
    - ➢ Status epilepticus
    - ➢ Poisoning / Overdose
- ❑ Priority II Pediatric General Medical Patient
  - ✓ Children (age ≤ 16 years)
  - ✓ Patient's condition requires emergent medical intervention by physician and nursing personnel upon arrival at the Emergency Department.
  - ✓ Priority II patients have potential time sensitive problems, are currently stable but at risk for sudden deterioration
- ❑ Priority III General Medical Patient / Pediatric
  - ✓ Children (age ≤ 16 years)
  - ✓ Patient without acute medical problems i.e., no immediate life / organ threatening emergency

Pediatric General Medical Hospitals

- **Level I Pediatric General Medical Hospitals**
  - ❑ Emergency Pediatric Medicine
  - ❑ Organized Emergency / Pediatric Department
  - ❑ Additional Services
    - ✓ Pediatric Critical Care Services with dedicated pediatric intensive care unit (PICU)
    - ✓ General Surgery/Anesthesiology Services on-site or on-call 24 hours a day
- **Level II Pediatric General Medical Hospitals**
  - ❑ Emergency Pediatric Medicine
  - ❑ Organized Emergency / Pediatric Department
  - ❑ Physician / Nursing Staff with special capability in pediatric emergency medicine shall be on-site or on call 24 hours a day
  - ❑ Additional Services
    - ✓ General Surgery/Anesthesiology Services on-site or on-call 24 hours a day
    - ✓ Pediatric neurosurgery
    - ✓ Pediatric orthopedics
- **Level III Pediatric General Medical Hospitals**
  - ❑ Emergency Pediatric Medicine
  - ❑ Organized Emergency Department
  - ❑ Physician / Nursing Staff with special capability in pediatric emergency medicine shall be on-site or on call 24 hours a day
  - ❑ Additional Services
    - ✓ General Surgery/Anesthesiology Services on-site or on-call 24 hours a day
    - ✓ Basic facilities for management of minor pediatric inpatient problems
- **Level IV Pediatric General Medical Hospitals**
  - ❑ Emergency Pediatric Medicine twenty-four (24) hours a day with at least:
    - ✓ Mid-level practitioner
    - ✓ RN
    - ✓ LPN or
    - ✓ Paramedic or Intermediate Level EMT

PROTOCOL 17A: Destination Determination – Pediatric Trauma Patients

Pediatric Trauma Patients
(≤ 16 years of age)
Destination Determination

Priority I Trauma / Pediatric Patient

- Eastern Division → Saint Francis Hospital
- Western Division → OU Medical Center

❑ If the patient requires immediate airway management and paramedic attempts have failed to maintain the airway with ETT or BVM, the patient should be transported to closest Level II or III Trauma Center

Priority II Trauma / Pediatric Patient

Eastern Division →

P- II Trauma / Pediatric Patient
❑ **Saint Francis Hospital**
 ✓ Whenever possible, transport injured adult and pediatric members of the same family to the same hospital.

Western Division →

P- II Trauma / Pediatric Patient
❑ **The Children's Hospital**

❑ **OU Medical Center**
 ✓ Whenever possible, transport injured adult and pediatric members of the same family to the same hospital.

Priority III Trauma / Pediatric Patient

Assigned Patient
Eastern Division
Western Division
→ Hospital of Patient's Choice

Unassigned Patient
Eastern Division
Western Division
→
❑ **Eastern Division**
 ✓ Hospital Rotation within zone
❑ **Western Division**
 ✓ Closest Hospital

PROTOCOL 17A: Destination Determination – Neonatal Medical Patients

Neonatal Patients
(≤ 30 days)
Destination Determination

Level I
(Unstable)

- ❑ **Eastern Division**
  - ✓ Saint Francis Hospital
  - ✓ St. John Medical Center
- ❑ **Western Division**
  - ✓ Integris Baptist Medical Center
  - ✓ The Children's Hospital
  - ✓ Mercy Hospital

Level II
(Stable)

- ❑ **Eastern Division**
  - ✓ Hillcrest Medical Center
  - ✓ Saint Francis
  - ✓ Saint Francis Hospital South
  - ✓ St. John Medical Center
  - ✓ St. John Owasso
- ❑ **Western Division**
  - ✓ Integris Baptist Medical Center
  - ✓ Integris Canadian Valley Hospital
  - ✓ Mercy Hospital
  - ✓ The Children's Hospital
  - ✓ St. Anthony's

Neonatal Priority Determination

- **Priority I - Unstable**
  - ❑ Cardiac or respiratory arrest
  - ❑ Less than 35 weeks gestation at time of birth(estimated)
  - ❑ APGAR ≤ 5 at 5 minutes
  - ❑ SpO2 less than 90% on oxygen
  - ❑ Diagnosed genetic disorders
- **Priority II - Stable**
  - ❑ 35 weeks or later gestation at time of birth (estimated)
  - ❑ APGAR > 5 at 5 minutes
  - ❑ No immediate life threat identified

EMS System for Metropolitan Oklahoma City and Tulsa
2019 Medical Control Board Treatment Protocols

PROTOCOL 17B, Table: Categorization of Hospitals

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

Categorized Hospitals—Tulsa (Levels of Emergency Services)

Hospital	General Medical	Adult Stroke	Trauma	Neonatal	Ped. Medical	Ped. Trauma	Cardiology	Burns	Heli. Pad	Hyperbaric Chamber	Level I Cardiac Arrest Center
Bailey Medical Center	IV	IV	IV	N/A	IV	IV	III		Yes		No
Hillcrest Medical Center	I	I	III	II	II	III	I	*	Yes		Yes
Hillcrest Hospital South	II	II	III	N/A	III	III	I		Yes		Yes
OSUMC	I	II	III	N/A	III	III	I		Yes	Yes	Yes
Saint Francis Hospital	I	I	II	I	I	II	I		Yes		Yes
Saint Francis South	III	III	III	II	III	III	III		Yes		No
Saint Francis Healthplex Glenpool	III	III	IV	N/A	IV	IV	III		No		No
St. John Medical Center	I	I	II	I	II	II	I		Yes		Yes
St. John Broken Arrow	IV	IV	IV	N/A	IV	IV	III		Yes		No
St. John Owasso	IV	IV	IV	II	IV	IV	III		Yes		No
St. John Sapulpa	IV	IV	IV	N/A	IV	IV	III		Yes		No

Categorized Hospitals--Oklahoma City (Levels of Emergency Services)

Hospital	General Medical	Adult Stroke	Trauma	Neonatal	Ped. Medical	Ped. Trauma	Cardiology	Burns	Heli. Pad	Hyperbaric Chamber	Level I Cardiac Arrest Center
AllianceHealth Deaconess Hospital	I	II	III	N/A	III	III	I		No		Yes
AllianceHealth Midwest City Hospital	II	III	III	N/A	III	III	II		Yes		Yes
The Children's Hospital	I	N/A	N/A	I	I	II	I	**	Yes		No
Community Hospital	IV	IV	IV	N/A	IV	IV	III		No		No
Integris Baptist Medical Center	I	I	III	I	I	III	I	*	Yes	Yes	Yes
Integris Canadian Valley Hospital	II	III	III	II	III	III	II		No		No
Integris Health Edmond	II	III	III	N/A	III	III	I		Yes		Yes
Integris Southwest Medical Center	I	II	III	N/A	III	III	I		Yes		Yes
Mercy Hospital – Oklahoma City	II	I	III	I	III	III	II		Yes		No
Norman Regional Hospital	II	II	III	N/A	III	III	I		Yes		No
Norman Regional HealthPlex	II	II	III	N/A	III	III	II		Yes		Yes
Norman Regional Moore	II	III	IV	N/A	III	III	III		No		No
OU Edmond	II	IV	III	N/A	III	III	II		Yes		No
OU Medical Center	I	I	I	N/A	III	I	I		Yes		Yes
St. Anthony Hospital	I	II	III	II	III	III	I		Yes		Yes
OK Heart Hospital North	NA	NA	NA	N/A	NA	NA	I		Yes		Yes
OK Heart Hospital South	NA	NA	NA	N/A	NA	NA	I		Yes		Yes
St. Anthony Healthplexes (Free Standing EDs)***	III	III	IV	N/A	IV	IV	III		No		No

17B.1 Table: Categorization of Hospitals

PROTOCOL 17B, Table: Categorization of Hospitals

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Specialty Hospitals, Healthcare Facilities, and Additional Service Capabilities

Veterans Administration Hospital OKC	**Predominately a medical and surgical facility for the veteran population. The Veterans Administration Hospital is capable of managing patients with complex medical illnesses and non-Priority 1 traumatic injuries.**
Bone and Joint Hospital OKC	**Predominately an orthopedic referral facility; Level IV Trauma Center**
Oklahoma Heart Hospital (North & South Campus) OKC	**Predominately a medical and surgical facility for Priority I and II assigned and unassigned patients with cardiac related symptoms.**
OU Medical Center, (Dean McGee Eye Institute) OKC	**OUMC is affiliated with Dean McGee Eye Institute. Patients with isolated ocular trauma with loss of vision, change in the appearance of the eye, or severe ocular pain should be transported to OUMC Presbyterian Tower for most expeditious access to ocular services.**
OU Medical Center, OKC	**Labor and Delivery Services should only receive pregnant women with an obstetrical complaint and a gestational period greater than 20 weeks.**
McBride Clinic Orthopedic Hospital OKC	**Predominately an orthopedic referral facility; Level IV Trauma Center**
Level I Cardiac Arrest Center	**Cardiac intervention capabilities including a Cardiac Cath Lab and an interventional cardiologist available 24 hours a day, seven days a week; a therapeutic hypothermia method to cool the patient for at least 12 hours after a cardiac arrest.**
Center for Orthopedic Reconstruction & Excellence (CORE), Jenks	**Predominately an orthopedic referral facility that should only receive surgical related patients with a chief complaint related to a scheduled surgery at CORE within the next 7 days or a surgery that was performed at CORE within the past 30 days. The patient's surgeon (or the call coverage surgeon) must be contacted and agree to accept the patient at CORE's "Emergency Department" prior to EMSA transport. The patient and/or patient representative (eg. family) has the responsibility to provide the treating EMS personnel the contact number for the surgeon/physician at CORE. The EMSA Communications Center will attempt to contact that surgeon/physician at CORE on a recorded line. If no answer from the surgeon/physician at CORE within 10 (TEN) minutes of attempted notification, an alternate destination shall be selected to promote efficient scene time.**
Oklahoma Surgical Hospital (OSH) Tulsa	**Predominately a surgical referral facility that should only receive surgical related patients with a chief complaint related to a scheduled surgery at OSH within the next 7 days or a surgery that was performed at OSH within the past 30 days. The patient's surgeon (or the call coverage specialist partner) must be contacted and agree to accept the patient at OSH's "Emergency Department" prior to EMSA transport. The patient and/or patient representative (eg. family) has the responsibility to provide the treating EMS personnel the contact number for the surgeon/physician at OSH. The EMSA Communications Center will attempt to contact that surgeon/physician at OSH on a recorded line. If no answer from the surgeon/physician at OSH within 10 (TEN) minutes of attempted notification, an alternate destination shall be selected to promote efficient scene time.**

PROTOCOL 17B, Table: Categorization of Hospitals

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Tulsa Spine & Specialty Hospital (TSSH)	Predominately an orthopedic & neurosurgical referral facility that should only receive surgical related patients with a chief complaint related to a scheduled surgery at Tulsa Spine & Select Specialty Hospital within the next 7 days or a surgery that was performed at Tulsa Spine & Select Specialty Hospital within the past 30 days. The patient's surgeon (or the call coverage surgeon) must be contacted and agree to accept the patient at Tulsa Spine & Select Specialty Hospital's "Emergency Department" prior to EMSA transport. The patient and/or patient representative (eg. family) has the responsibility to provide the treating EMS personnel the contact number for the surgeon/physician at TSSH. The EMSA Communications Center will attempt to contact that surgeon/physician at TSSH on a recorded line. If no answer from the surgeon/physician at TSSH within 10 (TEN) minutes of attempted notification, an alternate destination shall be selected to promote efficient scene time.
Norman Regional HealthPlex	Norman Regional HealthPlex has labor and delivery services for patients in labor.
Integris Lakeside Women's Hospital OKC	Predominately a labor and delivery hospital for assigned patients
St. Anthony Healthplex, Saint Francis Healthplex-Glenpool	Typical emergency department capabilities exist, though no post-emergency department care (surgery, cardiac cath, inpatient care) is available on-site. These facilities should be bypassed for a hospital-based emergency department when the patient's symptoms, exam, and/or diagnostics such as 12-lead ECG indicate the patient most likely requires very urgent or emergent intervention by a specialty physician that is hospital-based (eg. cardiac cath, surgery). Examples of typical transports allowed include: minor head trauma with no or brief LOC; MVC or falls with low suspicion for internal injury and normal vital signs; minor isolated/closed orthopedic injury; epistaxis; respiratory infections; dental injury/illness; fever in pediatrics and young adult (without hypotension/suspected sepsis); chest pain in patients less than 35 years of age, without ST elevation or depression on 12-lead ECG, and without coronary disease history; HTN illness; abdominal pain with normal vital signs and suspected non-surgical cause; genitourinary illness (infections, kidney stones, vaginal bleeding non-pregnant), neurological illness (headaches, seizure (non-status) with seizure history), psychiatric illness, allergic reactions, minor burns, dermal rashes, and MCI "green" patients.

Special Considerations

*	Burn Center. Burns associated with Priority I Trauma should be transported to Level I or II Trauma Centers
**	Pediatric Burn Center. Burns associated with Priority I Trauma should be transported to Level I or II Trauma Centers
***	See comments above for Freestanding EDs

PROTOCOL 17C: EMS Diversion from Hospitals

In the event that a hospital's capability to safely provide the standard of care becomes compromised, one **temporary** action may be the EMS system suspends transports to that hospital's emergency department for a limited amount of time. While EMS patient diversion may occur, the Medical Control Board believes hospitals must continually strive to minimize these occurrences in frequency and in duration. Specifically, hospitals should not expect patient divert continuously more than 2 hours and/or more than 6 hours in any 24 hour period. In return for this professional and civic commitment, hospitals directly contribute to efforts to ensure that all EMS patients receive efficient out-of-hospital emergency medical response and care, including efficient ambulance transport, and timely emergency department physician evaluation and stabilization.

Hospitals may request to be placed on divert status by contacting the EMSA Communications Center. Divert status may be granted depending on the entire system status at the time the request is made. Alternatively, an EMSA Field Operations Supervisor may designate a hospital on divert status due to operational impacts placed on the EMS system (eg. prolonged bed waits).

Hospitals on divert will utilize EMSystem.com to reflect their type and time on divert status, including timely updates of status. Specific types (and triggers) of hospital-initiated EMS patient diversion include:

1. Emergency Department Divert* – applies to all illness and injury conditions** ***.

   a) Overcrowding secondary to unpredicted, sudden influx of critical care patients

* ED divert is not granted to alleviate routine ED overcrowding and each hospital is expected to have a Divert Avoidance Policy when predictable levels of excess capacity need occur, including expeditious movement of admitted patients out of the ED, ancillary service optimization, and addressing crowding due to non-critical patients. The placement of a hospital on ED divert status is subject to the entire Regulated Service Area's system status at the time of hospital request.

** For OU Medical Center in Oklahoma City, emergency department divert may be specified as medical only, trauma only, or complete.

*** For pediatric priority one trauma, those patients must go to OU Medical Center if in Oklahoma City or St. Francis Hospital if in Tulsa regardless of divert status. For pediatric priority one medical, those patients must go to a hospital with pediatric ICU capabilities, which includes OU Medical Center Children's or Baptist Medical Center if in Oklahoma City or St. Francis Hospital if in Tulsa.

2. Priority One Trauma Divert* – applies to priority 1 trauma conditions only**.

   a) ICU or recovery bed shortage creating an overload of critical surgical patients in surgery or the emergency department
   b) Two or more active, unscheduled critical patients in surgery or emergency department
   c) Loss of critical ancillary service (CT scanning, basic laboratory)

PROTOCOL 17C: EMS Diversion from Hospitals, cont.

*Priority One Trauma divert is not granted to alleviate routine bed or nurse staffing shortages. Expedited patient transfers to free needed beds and/or nursing callbacks to achieve needed specialty unit staffing levels should be utilized.

In the event of multiple unscheduled critical patient resuscitations/surgeries, a time estimate of stabilization and return to normal receiving capacity is to be communicated to EMSA dispatch at the time of divert status request.

**For pediatric priority one trauma, those patients must go to OU Medical Center if in Oklahoma City or St. Francis Hospital if in Tulsa regardless of divert status.

3. CT Divert (Computerized Tomography Scanning Divert)

    a) Loss of CT scanning ability (affecting trauma and medical receiving capability)

*** CT divert is not routinely granted to accommodate scheduled maintenance. Immediate repairs are to be initiated and a time estimate of return to normal capacity is to be communicated to EMSA dispatch at the time of divert status request.

4. Cath Lab Divert (Cardiac Catheterization Lab Divert)

    a) Loss of Cath Lab operations (affecting STEMI receiving capability)

*** Cath Lab divert is not routinely granted to accommodate scheduled maintenance. Immediate repairs are to be initiated and a time estimate of return to normal capacity is to be communicated to EMSA dispatch at the time of divert status request.

Procedure:

1. Hospitals will request divert status by contacting the EMSA Communication Center.

2. Once divert conditions are met and approved, hospitals may enter their status in the EMSystem.com computer according to the following categories:

    a) Tulsa:
        1) ED Divert
        2) Priority One Trauma
        3) CT Divert
        4) Cath Lab Divert
    b) Oklahoma City:
        1) ED Divert
        2) Priority One Trauma
        3) CT Divert
        4) Cath Lab Divert

PROTOCOL 17C: EMS Diversion from Hospitals, cont.

3. The following information on hospital diverts shall be displayed on the EMSystem.com computer:

    a) Current hospital status
    b) Type of divert
    c) Time on divert or most recent update
    d) Special comments

In accordance with the American College of Emergency Physicians Policy Statement on Ambulance Diversion, if the Medical Director or Medical Director's designee determines the entire system to be overloaded, all hospitals will be opened to receive EMS patients in accordance with these protocols. If hospitals request divert to the point that a given geographic area is essentially without a receiving hospital, or overload is created for that area, then all facilities within that geographic region will be opened to receive EMS patients in accordance with these protocols. At the discretion of the Medical Director or Medical Director's designee, a temporary rotation of hospitals on divert may be utilized as conditions allow.

A hospital-initiated request for ED Divert shall automatically expire 1 hour after being initially granted unless extenuating circumstances continue and a diversion extension is granted for an additional 1 hour. A verbal report on divert avoidance action will be requested and forwarded to an EMSA Field Operations Supervisor for approval prior to any extension being granted. At EMSA, Medical Director, or Medical Director designee's discretion, an EMSA Field Supervisor may conduct an on-site consultation to determine if an extension of the divert status is justified, factoring concurrent system needs.

A hospital-initiated request for Priority One Trauma or CT Divert shall automatically expire 2 hours after being initially granted unless extenuating circumstances continue to prevail and a diversion extension is granted for an additionally defined period of hours.

When a hospital is on an MCB approved divert as defined above, all on-duty field personnel are to be notified in an expeditious manner and are expected to honor the diversion hospital's status (see exception next paragraph). Diversion status will be explained to the patient (or appropriate patient's representative) in order to allow for an informed alternative hospital destination decision. In the event of encode to a hospital in the midst of diversion request with EMSA Dispatch, the EMT or paramedic may continue to that hospital if an alternative hospital destination represents a detriment to the patient's clinical condition. Even after a hospital is on MCB approved divert status, an EMT or paramedic may override the hospital's divert status if transport to that hospital is required for life-saving, immediately needed patient stabilization.

When a hospital is on ED divert status only, all stable patients will be delivered to that hospital if there exists an established relationship with that hospital or a member of its medical staff. Established relationships include, but are not limited to, a previous admission to that hospital and/or a pre-existing doctor-patient relationship with a doctor on that hospital's medical staff.

PROTOCOL 17C: EMS Diversion from Hospitals, cont.

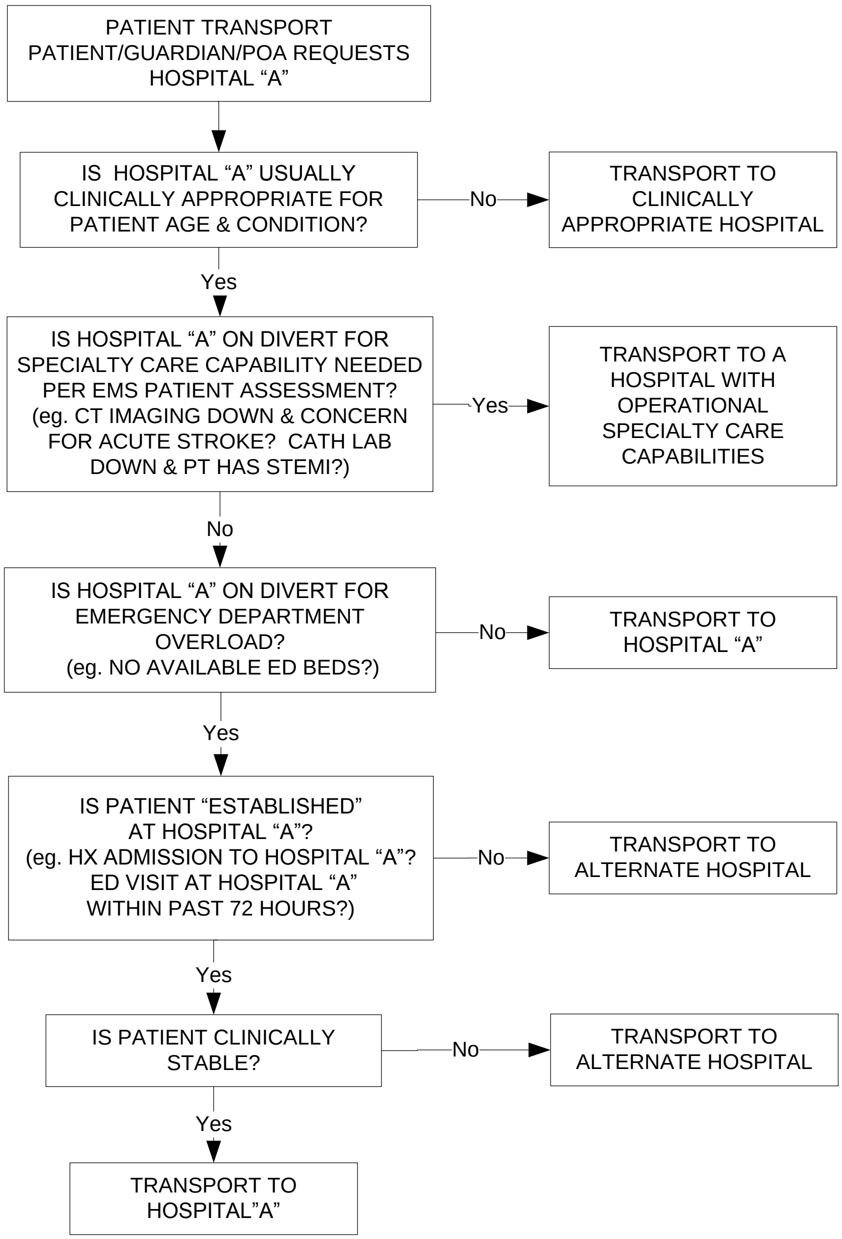
Questions that will assist Paramedics in determining an established patient include:

- Which hospital do you want to be transported to?
- Who is your primary physician?
- Which hospital has your physician told you to use for your care?
- Have you been an inpatient in a hospital and do you still go there for care?
- Have you recently been seen in a hospital emergency department for this problem?

In any instance that an EMSA ambulance transports an unscheduled patient for emergency medical care and arrives on hospital property, that hospital's Emergency Department must perform an emergency medical screening examination, even if on divert status. If further indicated treatment cannot be provided, it shall be the responsibility of that hospital to make arrangements for transfer of the patient to a more appropriate healthcare facility.

PROTOCOL 17C: EMS Diversion from Hospitals, cont.

The following algorithm is to be used in conjunction with the preceding text of this protocol and not independently of the preceding text of this protocol.



Medical References:

"Ambulance Diversion. A Position Paper for the Standards and Clinical Practices Committee of the National Association of EMS Physicians." 1997; 1:100-3.

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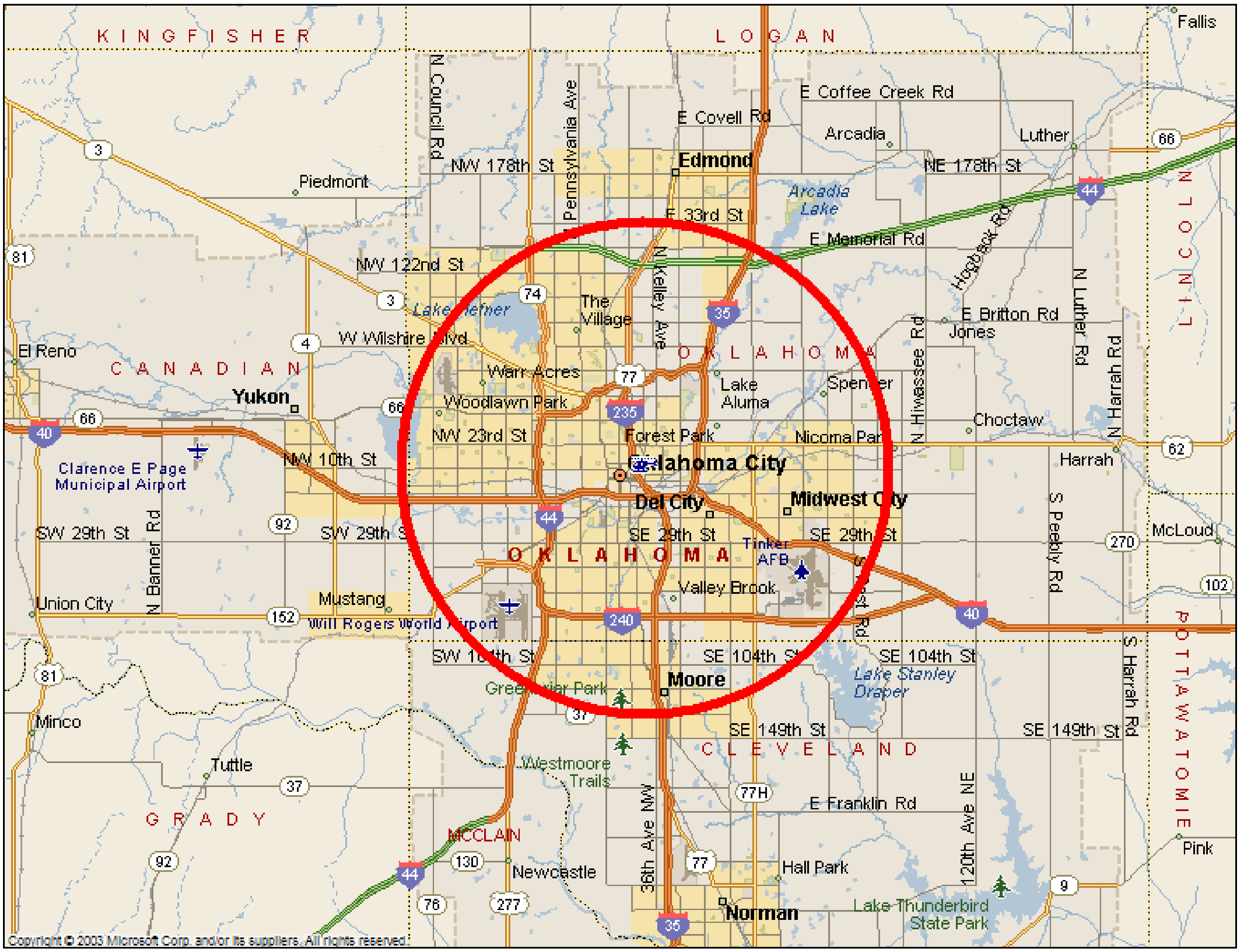
PROTOCOL 17D: "No Fly Zones"

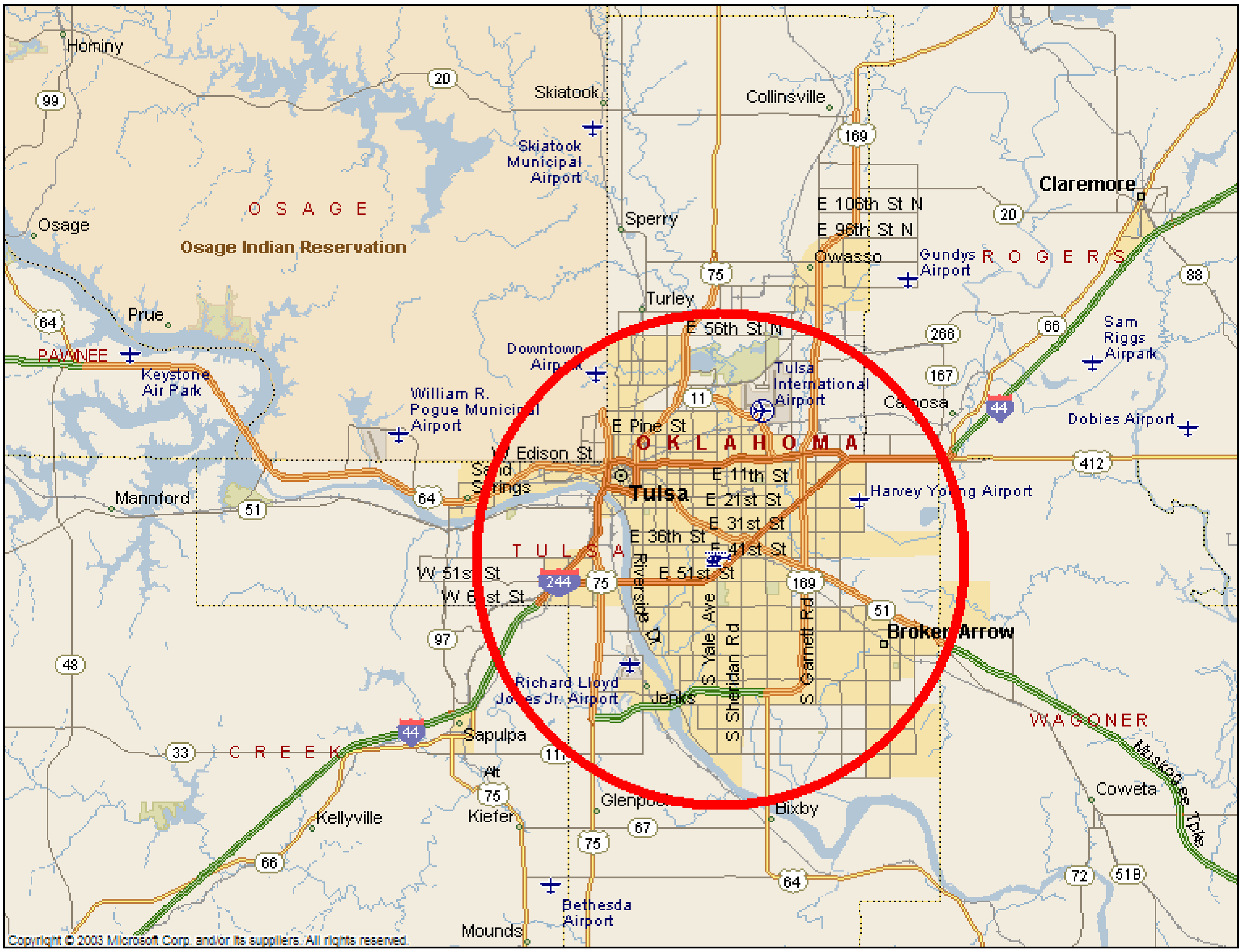
Western Division



- Service area within the boundaries of the red circle represents "No Fly" zone.

PROTOCOL 17D: "No Fly Zones," cont.

Eastern Division



- Service area within the boundaries of the red circle represents "No Fly" zone.

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PROTOCOL 17E: Advanced Airway Management: Pediatric Oral Intubation

EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Orotracheal intubation authorized for pediatric patients utilizing same protocols for adult patients.

Technique Comments:

1. Avoid hyperextension of neck during intubation attempts. This positioning compromises glottic visualization.

2. Endotracheal tube size can be determined using the formula 16 + age in years/4 or using a tube roughly the diameter of the patient's little finger, (5^{th} digit).

3. The Flex-Guide is **NOT** compatible with pediatric endotracheal tubes.

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17F - MEDICATION-ASSISTED INTUBATION PEDIATRIC

TREATMENT PRIORITIES

1, Oxygenation/Ventilation support

EMERGENCY MEDICAL DISPATCHER
EMERGENCY MEDICAL RESPONDER
EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

PARAMEDIC

MEDICATION-ASSISTED INTUBATION IF INDICATED
FOLLOW PROTOCOL 2G – ORAL INTUBATION FOR TECHNIQUE & CONFIRMATION OF INTUBATION

FOR FACILITATING ORAL INTUBATION:
PEDIATRIC: ETOMIDATE 0.3 mg/kg IVP/IOP SINGLE DOSE
OR
PEDIATRIC: MIDAZOLAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP

FOR POST-ORAL INTUBATION SEDATION TO PREVENT EXTUBATION (IF INDICATED):
PEDIATRIC: MIDAZOLAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP

OR
PEDIATRIC: DIAZEPAM 0.1 mg/kg TO MAX OF 5 mg IVP/IOP

OR
PEDIATRIC: LORAZEPAM 0.1 mg/kg TO MAX OF 2 mg IVP/IOP

CONTINUOUS ASSESSMENT & TREATMENT PER APPLICABLE PROTOCOL(S)

17G – CONFIRMATION OF ENDOTRACHEAL AIRWAY PLACEMENT PEDIATRIC

EMT-INTERMEDIATE 85

ADVANCED EMT

PARAMEDIC

The following sequence is to be used (and its use documented) to verify and maintain correct endotracheal artificial airway placement without fail:

1. **Visualization of endotracheal tube passage between vocal cords – oral intubation only.** (Figure 1)

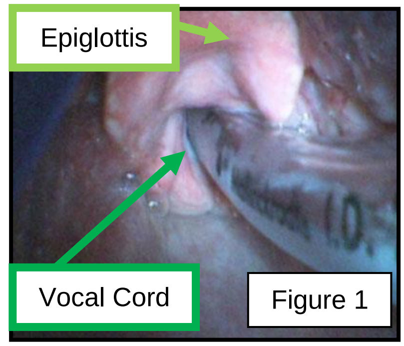


Figure 1

2. **Detection of End-tidal carbon dioxide.** End-tidal carbon dioxide ($EtCO_2$) detection shall be confirmed within 60 seconds of endotracheal tube placement. The capnography adaptor is to be placed at the bag-valve device-endotracheal tube interface for the first ventilation. The normal waveform indicating correct endotracheal placement reflects a rapid upstroke with the beginning of exhalation, the exhalation plateau ending at the point of $EtCO_2$ measurement, and a rapid downstroke with the beginning of inhalation. Any waveform that does not show rhythmic rise and fall correlating with assisted ventilations indicates incorrect tube placement and the tube must be withdrawn. **To be perfectly clear, the use of an endotracheal tube for ongoing oxygenation and ventilation is dependent upon continuously measurable capnography waveforms.** See Protocol 3H -Capnography for discussion of $EtCO_2$ values and waveforms. (Figure 2)

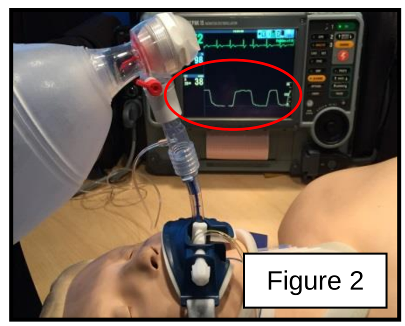


Figure 2

3. **Auscultation. Auscultate the epigastrium.** (Figure 3) If epigastric sounds are heard, intubation is to be reattempted. The endotracheal tube placed in the esophagus may be left in place, at the intubator's discretion, until another endotracheal tube is correctly placed and verified. If no epigastric sounds are heard, proceed to **auscultation of the thorax bilaterally**. Breath sounds are best auscultated in the anterior to mid-axillary lines. If breath sounds are present on the right and absent on the left, this suggests a right mainstem intubation. Withdraw the endotracheal tube 1 cm and repeat breath sound auscultation. If necessary, the tube may be withdrawn an additional 1-2 cm.

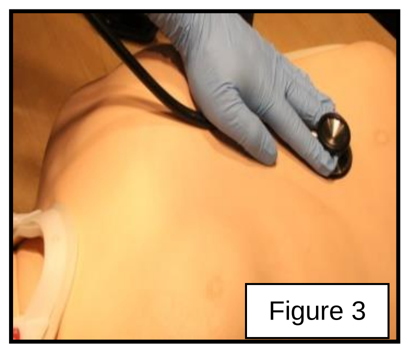


Figure 3

PROTOCOL 17G: Confirmation of Endotracheal Artificial Airway Placement – Pediatric

4. **Assessment of physiologic changes.** These include equal rise and fall of the chest, condensation in the endotracheal tube on exhalation, improvement in the patient's color, and improvement in the patient's respiratory distress/failure.

5. **Secure the endotracheal tube with a tube holder and place a cervical collar.** (Figure 4)

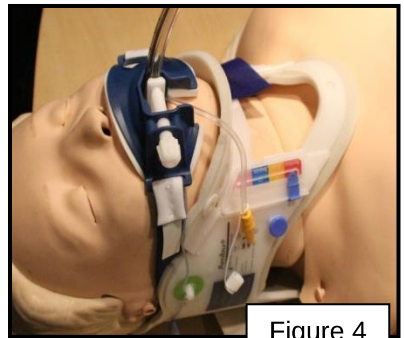


Figure 4

When intubated patients are moved during EMS care, waveform capnography must be rechecked for any change. If the waveform continues to show a normal pattern of rapid upstroke with exhalation, exhalation plateau, and rapid downstroke with inhalation, no further repeat confirmation is required. If at any time, the capnography waveform is abnormal, steps 2-5 must be rechecked and documented. If at any time during patient care there is doubt as to correct endotracheal placement of intubation, either re-verify by this sequence or reattempt correct endotracheal placement. While the intubator may delegate confirmation steps to his/her colleagues, he or she is ultimately responsible to ensure that a complete confirmation sequence is performed. If the intubator accompanies the patient to the hospital, he or she remains ultimately responsible for ongoing endotracheal tube placement confirmation. If the intubator does not accompany the patient to the hospital by ambulance or helicopter ambulance transport, the primary transporting/treating paramedic or RN assumes ultimate responsibility for ongoing endotracheal tube placement confirmation.

Upon delivery of the patient at treatment destination or at subsequent transport (eg. helicopter transport), a waveform capnograph will be obtained and documented after the patient has been physically transferred onto the destination's/subsequent transport's stretcher/bed/operating table to show confirmed, continued correct endotracheal tube placement at EMS transfer of patient care.

PROTOCOL 17H: Helmet Removal

EMT
EMT-INTERMEDIATE 85
ADVANCED EMT
PARAMEDIC

Motorcycle-style helmet comments:

While helmets offer protection for the head, they have not proven to reduce spine injuries. While their use is encouraged, helmets prevent airway access and complicate spinal immobilization. Because most full helmets do not hold the head firmly and also prevent cervical collar application, spinally immobilizing a helmeted patient does not result in effective cervical immobilization. Helmets must be removed prior to spinal immobilization on a long board to assure airway access and adequate spinal immobilization. In motocross events, look for neck braces and chest protectors that are attached by clasps and hinges that will also need to be removed.

MOTORCYCLE-STYLE HELMET REMOVAL PROCEDURE

Step 1: Apply manual stabilization by placing hands on each side of the helmet with fingers on the mandible.

Step 2: Second EMT unfastens any straps while stabilization is maintained.

Step 3: Second EMT stabilizes the mandible at the angles with one hand, thumb on one side, fingers on the other side.

Step 4: Second EMT stabilizes the occipital base with the other hand, manually stabilizing the head and neck.

Step 5: First EMT removes helmet, allowing second EMT to readjust hand position under the occipital base to prevent head tilt. During removal:

1. *If the helmet provides full facial coverage, glasses must be removed first.*
2. *Helmets are egg-shaped and must be expanded laterally to clear the ears.*
3. *If the helmet provides full facial coverage, to clear the nose the helmet must be tilted **BACKWARD**. After nose clearance, tilt the helmet slightly forward, sliding it off.*

PROTOCOL 17H: Helmet Removal, (cont.)

MOTORCYCLE-STYLE HELMET REMOVAL PROCEDURE (continued)

Step 6: After helmet removal, first EMT replaces hands on both sides of the head, resuming manual stabilization.

Step 7: Maintain manual stabilization until complete spinal immobilization is achieved.

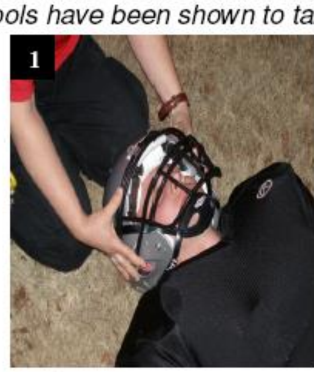
Football helmet and pad set comments:

When removing football helmets, shoulder pad sets must be also be removed to avoid immobilizing the neck in a hyperextended position. In some instances, the face mask alone may need to be removed first, either for immediate airway interventions or to facilitate helmet removal. In all cases, the coach or athletic trainer may prove a good source of information regarding the exact equipment needed for removal. For instance, many recently manufactured football helmets have air bladder systems designed so the helmet tightly fits the head; the coach or athletic trainer will be best able to release these air bladders.

FOOTBALL HELMET FACE MASK REMOVAL PROCEDURE

Several different tools can be used to remove a football helmet face mask – the FM extractor, Trainer's Angel, knives, pruning shears, and PVC cutters. There are typically four plastic clips attached to the face mask and screwed into the helmet. A screwdriver should be utilized only as a last resort. Unscrewing these face mask clips may cause excessive head movement if the screws have been place for some time and are rusted. Medic shears and seatbelt cutters are not recommended as these tools have been shown to take excessive time to work.

Step 1: Manually stabilize the head and spine. Remove the mouthpiece.



Step 2: Second EMT cuts all clips that secure the face mask.

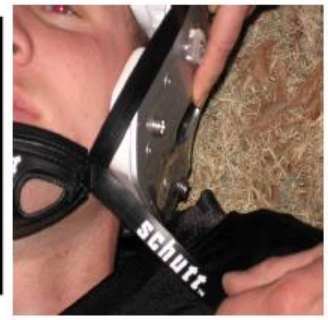
Step 3: Second EMT removes the face mask by lifting it straight off the helmet.

PROTOCOL 17H: Helmet Removal, (cont.)

FOOTBALL HELMET & PAD SET REMOVAL PROCEDURE

Step 1: Manually stabilize the head and spine. Remove the mouthpiece.

Step 2: Second EMT unfastens any straps while stabilization is maintained.



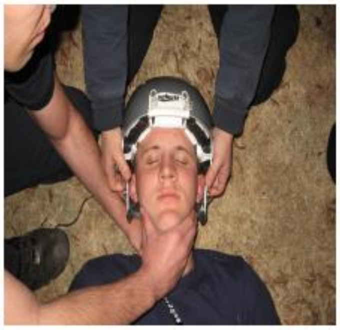
Step 3: Second EMT removes ear pads by unsnapping them from inside the shell.

Step 4: If fitted with air bladder system, deflate the liner through the valve as pictured by using the needle of the inflation system to release air pressure at inflation points.

PROTOCOL 17H: Helmet Removal, (cont.)

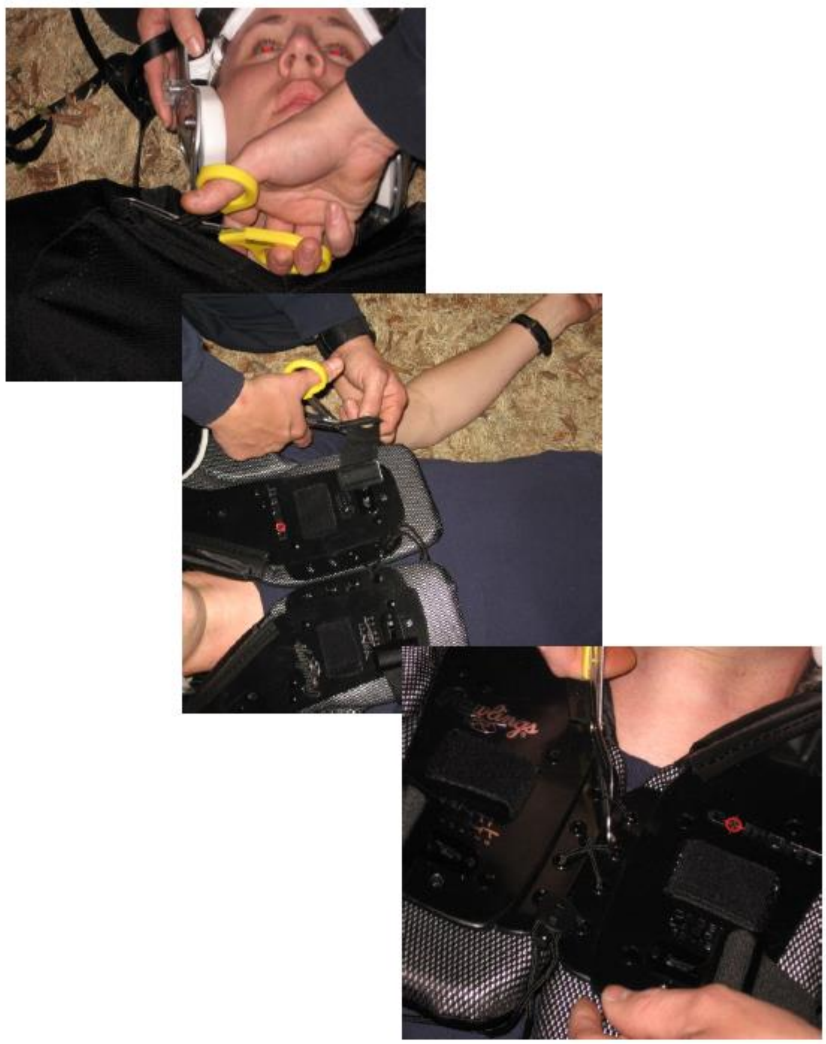
FOOTBALL HELMET & PAD SET REMOVAL PROCEDURE (continued)

Step 5: Remove helmet utilizing technique for motorcycle-style helmets.



Step 6: Maintain neutral alignment of the neck while the shoulder pads are removed.

Step 7: Cut jersey away. Unfasten or cut the shoulder pads straps and laces.



PROTOCOL 17H: Helmet Removal, (cont.)

FOOTBALL HELMET & PAD SET REMOVAL PROCEDURE (continued)

Step 8: Laterally unfold shoulder pads and slide out toward the first EMT. A third and even fourth EMT may be needed to support the back.

Step 9: Maintain manual stabilization until complete spinal immobilization

- *Techniques of Helmet Removal from Injured Patients, American College of Surgeons, Committee on Trauma, April 1997*
- *Training Medical Personnel in Techniques for Proper Motorcycle Helmet Removal, The Motorcycle Riders Foundation, September 2001*
- *Techniques and Equipment for Helmet Removal; Professional Sports Training, Green Bay Packers, EMSED.Com; November 2005*
- *Prehospital Emergency Care, 8th Edition, Copyright, July 2008*

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 17I: Controlled Substance Handling & Documentation - Field Paramedics

EMT-PARAMEDIC

Indication:

Federal, State of Oklahoma, and Medical Control Board/Office of the Medical Director laws, regulations, and requirements for appropriate control of controlled substances. These procedures apply to all scheduled controlled substances: Class II - Fentanyl (Sublimaze) and Morphine Sulfate; Class IV - Diazepam (Valium) and Midazolam (Versed).

Authorized Handling, Inventory, & Custody:

1. While in field use inventory, only system-certified paramedics may access and handle controlled substances.
2. At the start and end of every shift and at any time of resupply of controlled substance, direct inspection of each controlled substance container (e.g. vial, ampule, pre-filled syringe or cartridge) will be conducted for any signs of damage to the individually numbered and/or letter tamper-evident seals and overall container, recording of controlled substance containers present and/or missing, and such inspection shall be signed by the oncoming paramedic with an appropriate witness signature as well (e.g. off going paramedic if at shift change, authorized materials agent if at EMSA, supervising officer). Expiration dates are to be noted at these inspections. All such inspection/inventory shall be recorded in an apparatus specific controlled substance log book, itself having secured access.
3. At the start and end of every shift, if the apparatus is dispatched to an incident prior to the proper transfer of controlled substances to the oncoming paramedic, the paramedic with current documented custody must respond on the incident. At no time will transfer of controlled substances delay apparatus response or occur during an incident response.
4. In the event of tampered/damaged and/or unaccounted controlled substances at any inspection, all involved personnel will remain on-duty and the last authorized personnel will retain custody of the controlled substances until all discrepancies are immediately reported to the supervising EMS officer and an OMD director with sufficient resolution acceptable to both the EMS officer and OMD director.
5. In the event of expired controlled substances, the expired controlled substance will be removed from immediate patient use stock, reflected in the apparatus specific controlled substance log book and be secured, using a clear chain of custody per specific agency policy, until the expired controlled substance is in the secured custody of the agency's Controlled Substance Officer.
6. All completed pages in the apparatus specific controlled substance log book will be retained by the agency's Controlled Substance Officer in compiling an agency specific master log of controlled substance use and inventory.

Approved 9/12/18, Effective 1/15/19, replaces all prior versions

PROTOCOL 17I: Controlled Substance Handling & Documentation - Field Paramedics (cont.)

Storage for Immediate Patient Use:

1. All MCB-approved controlled substances will be maintained in locked, temperature-controlled locations on paramedic-staffed apparatus.
2. Securing of controlled substances will be primarily by mechanical lock.
3. Securing of controlled substances will be secondarily by consistent personal control of devices for accessing the controlled substance location on the apparatus. Paramedics are not to share individual access codes, keys, or other devices for access with anyone other than agency clinical leadership, Office of the Medical Director personnel, and/or law enforcement personnel conducting a formal inspection of controlled substances assigned to the individual paramedic/apparatus.
4. Securing of controlled substances will be by individually numbered and/or lettered tamper-evident seals (as approved and assigned by the Office of the Medical Director) that are uniquely assigned to each controlled substance container.
5. At any time the paramedic-staffed apparatus is taken out of service, the assigned paramedic at the time of such status change will maintain direct control of controlled substances until all assigned substances on that apparatus are secured within the station or central inventory as applicable based upon specific agency procedure.

Patient Administration

1. Paramedics may only administer a controlled substance in accordance with MCB treatment protocol(s) and/or a direct order from an on-line medical control physician.
2. When a controlled substance is administered in patient care, the patient care record will contain at a minimum in relation to the controlled substance: date, time, incident number, medical condition being treated, patient name, physician ordering (if applicable), and name, dose, and route of controlled substance administered.
3. When a controlled substance is administered in patient care, the apparatus specific controlled substance log book will contain at a minimum in relation to the controlled substance: date, time, incident number, medical condition being treated, patient initials, physician ordering (if applicable), and name and dose of controlled substance administered. Additionally, any unused ("wasted") amount of controlled substance will be recorded by patient care incident.
4. Any partially unused amount of opened controlled substance will require the log book entry to bear the signature of two persons each attesting to the fact that the drug was properly disposed. One of two persons should be a physician, nurse, or the paramedic’s partner (if unable to obtain nurse or physician’s signature).
5. Any wholly unused amount of an opened controlled substance (e.g. vial seal opened but not administered to patient) will be denoted in both the apparatus specific controlled substance log book and an incident report that details the specifics of why the controlled substance was accessed but not administered to the patient (e.g. seizure abated prior to medication administration). The involved container of controlled substance will be transferred, maintaining a clear chain of custody, to the agency's Controlled Substance Officer or his/her designee.

PROTOCOL 17J: Seasonal Influenza Vaccine Administration

EMT-PARAMEDIC

Indications:

1. Request from employee of EMS Agency and/or Fire Department administering the vaccine.
2. Request from employee of the city, county, and/or regional governmental authority providing oversight of the EMS Agency and/or Fire Department administering the vaccine.
3. Timing of request by indicated personnel in 1 or 2 above within the seasonal influenza vaccination time period as authorized by the Medical Director (timing authorized may change from year to year)

Contraindications:

1. Known hypersensitivity, including allergic reactions, to past seasonal influenza vaccine administration.
2. History of Guillain - Barré syndrome onset within 6 weeks of a past seasonal influenza vaccine administration.
3. Known hypersensitivity, including allergic reactions, to eggs.
4. Active infection.
5. Close contact with an immune - suppressed person requiring protective isolation.
6. Do not administer a live, attenuated seasonal influenza vaccination (e.g. inhaled formulation) to patients with any of the following characteristics:

    a. Age 50 years or greater
    b. COPD, including asthma
    c. Heart disease
    d. Vascular disease (excluding hypertension)
    e. Renal disease
    f. Hepatic disease
    g. Neurologic/Neuromuscular disease, including cognitive impairment
    h. Hematologic disease
    i. Metabolic/Endocrine disease, including diabetes
    j. Immune dysfunction, including that caused by HIV and related medications
    k. Pregnancy

PROTOCOL 17J: Seasonal Influenza Vaccine Administration (cont.)

Procedure Comments:

1. Review all seasonal influenza vaccine manufacturer's instructions supplied with the vaccine.
2. The seasonal influenza vaccine must be stored per manufacturer's instructions.
3. Utilize a standardized seasonal influenza vaccination informed consent form.
4. Utilize a standardized seasonal influenza vaccination pre-screening questionnaire form.
5. Ensure appropriate medical equipment is present at the seasonal influenza vaccination site for treatment per protocol of allergic reaction.
6. Administer seasonal influenza vaccine per manufacturer's instructions - proper dose, deltoid IM route (or inhaled route if using inhaled formulation), etc.
7. Briefly monitor the patient for any immediate allergic reaction.
8. Prior to patient leaving seasonal influenza vaccination site, ensure the following information is obtained and documented on a seasonal influenza vaccination form for each patient:

    a. Contact information: work mailing address, work email (if applicable), work phone
    b. This information is necessary if the seasonal influenza vaccination lot is found problematic (e.g. defective in immunity function) and patient notification is required.

9. Provide the patient with a standardized seasonal influenza vaccination post-vaccination information form.

10. A standard EMS Agency and/or Fire Department patient care record does NOT need to be generated, but the seasonal influenza vaccinating organization must maintain a log of all patient contacts associated with a seasonal influenza vaccination program. For each patient receiving a seasonal influenza vaccine administration, the following must be recorded:

    a. date of seasonal influenza vaccine administration
    b. the manufacturer and lot number of seasonal influenza vaccine administered
    c. vaccination site and route (e.g. left deltoid IM)
    d. name of paramedic administering the vaccination

11. Any and all adverse medical reactions to the administration of a seasonal influenza vaccine must be reported to the Medical Director or his/her designee within 24 hours. Upon the Medical Director's review, further reporting may be directed to the federal Vaccine Adverse Event Reporting System (VAERS) at www.vaers.hhs.gov or (800) 822-7967.

17K – TRANEXAMIC ACID (TXA, CYCLOKAPRON)

PARAMEDIC

Class: Anti-Fibrinolytic

Actions/Pharmacodynamics: Promotes clot formation in the setting of massive hemorrhage.

Indications: Hemostatic Agents (10I)

Traumatic hemorrhagic shock less than 3 hours from injury with suspected need for massive blood transfusion (clinical evidence of marked blood loss – internal or external, sustained tachycardia and hypotension, see Protocol 10I for exact VS parameters by age group)

Contraindications:

Non-hemorrhagic shock
Non-traumatic hemorrhagic shock
Hemorrhagic shock stabilized with other hemostatic agents/measures

Pharmacokinetics: Onset of action within 4 hours after IV administration, exact time of onset unclear and variable. Delayed effects up to 48 hours consistent with anti-inflammatory actions.

Side Effects: While a theoretical concern, TXA has not been shown to cause significant increase in deep venous thrombosis, pulmonary embolism, myocardial infarction, or stroke in published trials to date.

Dosage:

Hemostatic Agents – Adult (10I)
(Hemorrhagic shock as described above)
1 gram IVPB over 10 minutes.
Administer in 100 mL or 250 mL NS.

Hemostatic Agents – Pediatric Ages 10 and Above (10I)
(Hemorrhagic shock as described above)
15 mg/kg up to 1 gram IVPB over 10 minutes.
Administer in 100 mL or 250 mL NS.

How Supplied:

1 gram/10 mL vial or ampule (100 mg/mL)
(Always check concentration and dose per container at time of patient medication administration)

ABBREVIATIONS

A

ABCs	AIRWAY, BREATHING, AND CIRCULATION
Abd	ABDOMEN
AC	ASSIST CONTROL (Mechanical Ventilation mode)
ACS	ACUTE CORONARY SYNDROME
AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AEMT	ADVANCED EMERGENCY MEDICAL TECHNICIAN
AKA/BKA	ABOVE-BELOW-KNEE AMPUTATION
ALTE	APPARENT LIFE THREATENING EVENT
AMI	ACUTE MYOCARDIAL INFARCTION
AMS	ALTERED MENTAL STATUS
ASA	ASPIRIN
ASAP	AS SOON AS POSSIBLE
AV	ATRIOVENTRICULAR

B

BiPAP	Bi-LEVEL POSTIVE AIRWAY PRESSURE
BP	BLOOD PRESSURE
BSA	BODY SURFACE AREA
BVM	BAG VALVE MASK

C

C	CELSIUS
CABs	CIRCULATION, AIRWAY, AND BREATHING
CHF	CONGESTIVE HEART FAILURE
CM	CENTIMETER
CNS	CENTRAL NERVOUS SYSTEM
CO	CARBON MONOXIDE
CO2	CARBON DIOXIDE
COPD	CHRONIC OBSTRUCTIVE PULMONARY DISEASE
CPAP	CONTINUOUS POSITIVE AIRWAY PRESSURE
CPR	CARDIOPULMONARY RESUSCITATION

D

D10	DEXTROSE 10%
D25	DEXTROSE 25%
D50	DEXTROSE 50%
DC	DISCHARGE
DCAPP-BLS	DEFORMITIES, CONTUSIONS, ABRASIONS, , PENETRATIONS, PARADOXICAL MOVEMENTS, BURNS, LACERATIONS, SWELLING
DBP	DIASYSTOLIC BLOOD PRESSURE
dL	DECILITER
DNI	DO NOT INTUBATE
DNR	DO NOT RESUSCITATE
D.O.	DOCTOR OF OSTEOPATHY

E

ECG	ELECTROCARDIOGRAM
ED	EMERGENCY DEPARTMENT
EMD	EMERGENCY MEDICAL DISPATCHER
EMR	EMERGENCY MEDICAL RESPONDER
EMS	EMERGENCY MEDICAL SERVICES
EMT	EMERGENCY MEDICAL TECHNICIAN
EMT-I 85	EMERGENCY MEDICAL TECHNICIAN-INTERMEDIATE 1985
EOC	EMERGENCY OPERATIONS CENTER
ETA	ESTIMATED TIME OF ARRIVAL
EtCO2	END-TIDAL CARBON DIOXIDE
ETOH	ETHANOL
ETT	ENDOTRACHEAL TUBE

F

F	FAHRENHEIT
FiO2	FRACTION OF INSPIRED OXYGEN
FT	FEET (in measurement)

G

GCS	GLASGOW COMA SCALE

H

HBO	HYPERBARIC OXYGEN
HEMS	HELICOPTER EMERGENCY MEDICAL SERVICE
HIV	HUMAN IMMUNODEFICIENCY VIRUS
HR	HOUR

HTN	HYPERTENSION
HX	HISTORY

I

IABP	INTRA-AORTIC BALLON PUMP
ICD	IMPLANTABLE CARDIOVERTER DEFIBRILLATOR
ICS	INCIDENT COMMAND STRUCTURE
ID	IDENTIFICATION
I:E	INSPIRATORY TO EXPIRATORY RATIO
IM	INTRAMUSCULAR
IN	INTRANASAL
IO	INTRAOSSEOUS
IOP	INTRAOSSEOUS PUSH
IOPB	INTRAOSSEOUS PIGGYBACK
IV	INTRAVENOUS
IVP	INTRAVENOUS PUSH
IVPB	INTRAVENOUS PIGGYBACK

J

J	JOULES

K

KCL	POTASSIUM CHLORIDE
kg	KILOGRAM

L

L	LITER
LA	LEFT ARM

LAPSS	LOS ANGELES PREHOSPITAL STROKE SCALE
LL	LEFT LEG
LOC	LOSS OF CONSCIOUSNESS
lpm	LITERS PER MINUTE

M

mA	milliAmp
MAX	MAXIMUM
mcg	MICROGRAM
MCB	MEDICAL CONTROL BOARD
MCI	MASS CASUALTY INCIDENT
M.D.	MEDICAL DOCTOR
mEq	MILLIEQUIVALENT
MERC	MEDICAL EMERGENCY RESPONSE CENTER
mg	MILLIGRAM
MI	MYOCARDIAL INFARCTION
MIN	MINUTE

M

mL	MILLILITER
mm	MILLIMETER
mmHg	MILLIMETERS OF MERCURY
MOI	MECHANISM OF INJURY
mph	MILES PER HOUR

N

NC	NASAL CANULA

NIPPV	NON-INVASIVE POSITIVE PRESSURE VENTILATION
NPA	NASAL PHARYNGEAL AIRWAY
NPO	NOTHING BY MOUTH
NRB	NON REBREATHER MASK
NS	NORMAL SALINE
NTG	NITROGLYCERIN
NVD	NAUSEA, VOMITING, DIARRHEA

O

O2	OXYGEN
OD	OVERDOSE
ODT	ORAL DISOLVING TABLET
OLMC	ON-LINE MEDICAL CONTROL
OLMCP	ON-LINE MEDICAL CONTROL PHYSICIAN
OMD	OFFICE OF THE MEDICAL DIRECTOR
OPA	ORAL PHARYNGEAL AIRWAY
OSDH	OKLAHOMA STATE DEPARTMENT OF HEALTH
O2 SAT	OXYGEN SATURATION

P

PEA	PULSELESS ELECTRICAL ACTIVITY
PEEP	POSITIVE END-EXPIRATORY PRESSURE
PEP	POST-EXPOSURE PROPHYLAXIS
PICC	PERIPHERLLY INSERTED CENTRAL CATHETER
PO	BY MOUTH
PRN	AS NEEDED

Psi	POUNDS PER SQUARE INCH
PS	PRESSURE SUPPORT (Mechanical Ventilation mode)
PSVT	PAROXYSMAL SUPRAVENTRICULAR TACHYCARDIA
Pt	PATIENT
PVC	PREMATURE VENTRICULAR CONTRACTION
PERRLA	PUPILS EQUAL ROUND REACTIVE TO LIGHT ACCOMADATIONS

R

RA	RIGHT ARM
REMSS	REGIONAL EMERGENCY MEDICAL SERVICE SYSTEM
RESP	RESPIRATIONS
RL	RIGHT LEG
RN	REGISTERED NURSE
ROSC	RETURN OF SPONTANEOUS CIRCULATION

S

SA	SINOATRIAL
SBP	SYSTOLIC BLOOD PRESSURE
SL	SUBLINGUAL
SOB	SHORTNESS OF BREATH
SpCO	CARBON MONOXIDE SATURATION OF ARTERIAL BLOOD
SpO2	OXYGEN SATURATION OF ARTERIAL BLOOD
STEMI	ST SEGMENT ELEVATION MYOCARDIAL INFARCTION
SubQ	SUBCUTANEOUS
SYS BP	SYSTOLIC BLOOD PRESSURE
ST	SINUS TACHYCARDIA

T

TB	TUBERCULOSIS
TBSA	TOTAL BODY SURFACE AREA
TCA	TRICYCLIC ANTIDEPRESSANT
TEMP	TEMPERATURE
THA	TOTAL HIP ARTHROPLASTY
TKA	TOTAL KNEE ARTHROPLASTY
TKO	TO KEEP OPEN
TREC	TRAUMA REFERRAL CENTER
TXA	TRANEXAMIC ACID

V

VAD	VENTRICULAR ASSIST DEVICE
VF	VENTRICULAR FIBRILLATION
VS	VITAL SIGNS
VT	VENTRICULAR TACHYCARDIA

INSTRUCTIONS
Oklahoma State Department of Health
Communicable Disease Risk Exposure Report

This report form was developed to initiate a system of notification for risk exposures occurring outside of a health care facility to health care workers, emergency responders, and funeral workers as specified by the Oklahoma State Department of Health OAC 310:555. This report and all information entered on it are to be held in strictest confidence to conform with 63 O.S. Supp. 2001, Section 1-502.1 et. seq.

Note: For questions regarding the handling of ODH Form 207, call 405/271-4636.

PART I: Exposed Worker Section

Questions 1-13 are to be completed by the exposed worker, immediately following the injury.

11: Describe exposure in detail. Include information regarding type of exposure, body part affected, type of body fluid involved, duration of exposure, etc.

13: List the facility where the source patient was taken. This will be the facility that is responsible for testing the source patient.

Questions 14-19 are to be completed by Employer's Designee, immediately following the injury.

Questions 20-22 are to be completed by a Licensed Health Care Professional. (MD, DO, RN, PA,).

Routing:

A. If the Licensed Health Care Professional determines that the exposure does not have the potential for transmission of a communicable disease, the form should be returned to the Employer's Designee.

B. If the exposure does have the potential for transmission of a communicable disease, the ***Yellow*** copy should be mailed ***immediately*** to the OSDH HIV/STD Service (use gray, self addressed, metered envelope).

The ***Green*** copy, a gray metered envelope and instruction page are to be delivered ***immediately*** to the designated person (usually the Infection Control Practitioner) at the health care facility to which the source patient was transported; to the attending physician, if the source patient was being cared for outside of a health care facility; to the health care provider who last had responsibility for the deceased source patient; or to the medical examiner.

PART II: Source Patient Health Care Provider Section

Questions 23-38 are to be completed by the Health Care Provider who is responsible for testing the source patient.

32. Rapid HIV testing has become a valuable tool used to quickly determine the need for initiation and/or continuation of PEP meds for the exposed person. When a rapid HIV test is performed on the source patient, communication of these results should not be delayed. The results should be **immediately** communicated to the physician/provider who is providing post-exposure counseling and follow up and is listed on page 1, q. 17-19.

    Please note that as other source results become available, these should be released to the Provider listed on page 1, q. 17-19.

Routing:

A. The Health Care Provider should complete Part II and mail the completed green form to OSDH HIV/STD Service immediately using the gray, self-addressed, metered envelope.

PART II: Source Patient Health Care Provider Section ***(Please Print)***

23. Date and time Communicable Disease Risk Exposure Report received: (Mo./Day/Yr.) ______/______/______ Time: ________AM or PM (Circle One)

24. Person completing Part II: ____
(Last) (First) (Title)

25. Institution (name): ______________________________ Business Phone: (_____)______________

Source Patient Information

26. Birth date: (Mo./Day/Yr.) ______/______/______ 27. Sex: ▯ **Male;** ▯ **Female**

28. Primary Diagnoses: ____

29. Was the source patient found to have any potentially communicable disease(s), such as hepatitis B, hepatitis C, HIV, TB, meningococcal disease, or others? ▯ **Yes** ▯**No**

30. If yes, specify: ____

31. Does the source patient have clinical evidence of AIDS or symptoms of HIV infection or acute retroviral syndrome?▯**Yes;** ▯ **No;** ▯**Unknown**

Source Patient Test Results

32. Rapid HIV test: ▯**Positive;** ▯**Negative;** ▯ **Indeterminant** Test Date: (Mo./Day/Yr.) ______/______/______ ▯**Not Done**

Note: IMMEDIATELY report Rapid HIV results by phone or fax to the Provider listed on page 1, q. 17-19. As other test results become available, these are also to be released to the Provider listed on page 1, q. 17-19.

33. HBsAg: ▯**Positive;** ▯**Negative** Test Date: (Mo/Day/Yr.) ______/______/______ ▯ **Not Done**

34. anti-HCV: ▯**Positive;** ▯**Negative** Test Date: (Mo/Day/Yr.) ______/______/______ ▯ **Not Done**

35. HIV: ▯**Positive;** ▯**Negative;** ▯**Indeterminant** Test Date: (Mo/Day/Yr.) ______/______/______ ▯**Not Done**

36. Other: Name of Test:__________________ Test result: ________________ Test Date: (Mo./Day/Yr.) ______/______/______

Note: Source results may be released to the source patient; the exposed person; the exposed person's physician/provider or OSDH per OAC 310:555.

37. Date results released to Provider: (Mo/Day/Yr) _____/_____/_____ 38. Date mailed to OSDH: (Mo./Day/Yr.) ______/______/______

When Part II is completed, mail immediately to the OSDH HIV/STD Service using the gray, self-addressed, metered envelope.

Part III: OSDH Section ***(Please Print)***

Date Report Received: (Mo./Day/Yr.) ______/______/______ Person Completing Part III: ______________________________
(Last) (First)

OSDH Division:____

Follow-Up Action: ____

____

____

____

____

____

____

Communicable Disease Risk Exposure Report

The filing of this report initiates a system of notification for risk exposures occurring outside of a health care facility to health care workers, emergency responders, and funeral workers as specified by the Oklahoma State Department of Health OAC 310:555. This report and all information entered on it are to be held in strictest confidence in conformance with 63 O.S. Supp. 2001, Section 1-502.1 et. seq.

PART I: Exposed Worker Section ***(Please Print)***

1. Employee Name: ______________________________ (Last) (First) (MI) 2. Birth date: ____/____/____ Mo. Day Yr.

3. Home Telephone: (_____)______________ 4. Profession/Job Title:______________

5. Employer/Company Name:______________

6. Work Address/Telephone: ______________ (Street) (City) (Zip) (_____)__________ Telephone

7. Number of hepatitis B vaccinations previously received: ☐ **None;** ☐ **1;** ☐ **2;** ☐ **3**

8. Date of Exposure: (Mo./Day/Yr.) ____/____/____ 9. Time of Exposure: ______________AM or PM (Circle One)

10. Supervisor's Name/Telephone: ______________ (_____)__________ Telephone

11. Description of Exposure: ______________

12. Source Patient Name: ______________ (Last) (First) (M.I.)

13. Location of Source Patient (include name of facility, address and phone number): ______________

To Be Completed By Employer's Designee

I have reviewed the circumstances and management of this incident and verify that the appropriate follow-up (according to our agency Exposure Control Plan) is being attempted in order to identify or prevent the transmission of communicable diseases to which the employee may be at risk as a result of this exposure.

14.______________ Name & Title (Print) 15. ______________ Signature 16. ____/____/____ Mo. Day Yr.

Post-exposure counseling and follow-up will be provided to this employee by:

17. ______________ Provider's Name 18. (____)______________ Provider's Telephone Number 19. (____)______________ Provider's Fax Number

---

To Be Completed by A Licensed Health Care Professional (MD, DO, RN, PA,)

In my professional judgment, this ☐ **was** ☐ **was not** a mucosal, percutaneous or respiratory exposure that has the potential for transmission of a communicable disease, such as hepatitis B, hepatitis C, HIV, TB or meningococcus.

20. ______________ Name & Title (Print) 21. ______________ Signature 22. ____/____/____ Mo. Day Yr.

For consultation regarding exposures and PEP meds: PEP Hotline 1-888-448-4911

Note: If this exposure does not warrant medical follow-up, please return the form to the *Employer's Designee* and indicate to that individual why no follow-up is required.

If this is an exposure that warrants medical follow-up, the *employer* shall handle the report accordingly:

A. ***Yellow*** **copy to be mailed *Immediately* to the OSDH HIV/STD Service (use gray, self-addressed, metered envelope) at 1000 N.E. 10, OKC, Ok 73110**

B. ***Green*** copy, a gray metered envelope and instruction page to be delivered ***immediately*** to the designated person (usually the Infection Control Practitioner) at the location of the source patient.

ADULT PRE-HOSPITAL

TRIAGE AND TRANSPORT GUIDELINES

Oklahoma Model Trauma Triage Algorithm

- Inability To Secure Airway
- Traumatic Arrest

YES → Go Directly to Nearest Appropriate Facility

PRIORITY 1

Physiological Compromise Criteria

- Hemodynamic Compromise1-Systolic BP < 90mmHg
  Or signs that should be considered include:
  - Sustained tachycardia
  - Cool diaphoretic skin
- Respiratory Compromise2- RR < 10 or > 29 breaths/minute or < 20 in infant < 1 yr
- Altered Mentation of trauma etiology3- GCS < 14

YES → Initiate Trauma Treatment Protocol

NO ↓

Anatomical Injury

- Penetrating injury of head, neck, chest/abdomen, or extremities proximal to elbow or knee
- Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to regional Burn Center. Burns >10% with significant trauma transport to trauma center.
- Amputation above wrist or ankle
- Paralysis or suspected spinal fracture w/neurological deficit
- Flail chest
- Two or more obvious proximal long bone fractures [upper arm or thigh]
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected unstable pelvic fracture
- Tender and/or distended abdomen
- Crushed, degloved, or mangled extremity

YES →

Initiate Trauma Treatment Protocol
Activate Trauma System

RAPID transport to the designated Level I, II, or Regional Level III Trauma Center according to the Regional Trauma Plan but may be stabilized at a Level III or IV facility depending on location and time and distance to the higher level trauma center.

Air Rendezvous may be necessary considering time & distance constraints. If conditions do not permit air transport then consider ALS rendezvous. Stabilization may occur either in the field or at the nearest appropriate facility.

Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to regional Burn Center. Burns >10% with significant trauma transport to trauma center.

NO ↓

PRIORITY 2

Risk of Serious Injury - Single System Injury

Patients with potentially time sensitive injuries due to a high energy event (positive mechanism of injury) or with a less severe single system injury, but currently with no physiological abnormalities or significant anatomical injury

- Ejection of the patient from an enclosed vehicle
- Auto/pedestrian or auto/bike or motorcycle crash with significant impact (> 20 mph) with the patient thrown or run over by a vehicle
- Falls greater than 20 feet or distance 2-3 times height of patient
- Significant assault or altercations
- High risk auto crash5
- **Neurology:** Isolated head trauma with transient loss of consciousness or altered mental status but currently alert and oriented.
- **Orthopedic:** Single proximal and distal extremity fractures (including open) from high energy event, isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits, and unstable joint (ligament) injuries without neurovascular deficits.
- **Maxillofacial trauma:** Facial lacerations; such as those requiring surgical repair, isolated open facial fractures or isolated orbit trauma with or without entrapments, or avulsed teeth.

YES →

Initiate Trauma Treatment Protocol

PROMPT transport to the designated Level III Trauma Center or higher depending on location according to the Regional Trauma Plan

NO ↓

PRIORITY 3

- Consider[6]
  - Co-morbid factors
  - Gestalt-EMS clinical judgment

YES → Initiate Trauma Treatment Protocol (Priority 2)

NO →

TRANSPORT to either the closest Level IV Trauma Center or higher depending on location according to the Regional Trauma Plan or the facility of the patient's choice

PEDIATRIC (≤ 16 YEARS) PRE-HOSPITAL

TRIAGE AND TRANSPORT GUIDELINES

Oklahoma Model Trauma Triage Algorithm

- Inability To Secure Airway
- Traumatic Arrest

YES → Go Directly to Nearest Appropriate Facility

PRIORITY 1

Physiological Compromise Criteria

- Hemodynamic Compromise[1]-Systolic BP < 90mmHg or other signs such as:
  - Sustained tachycardia
  - Cool diaphoretic skin
- Respiratory Compromise[2]- RR < 10 or > 29 breaths/minute or < 20 in infant < 1 yr

Altered Mentation of trauma etiology[3]- GCS < 14

YES → **Initiate Trauma Treatment Protocol**
Activate Trauma System

RAPID transport to the designated Level I, II, or Regional Level III Trauma Center according to the Regional Trauma Plan but may be stabilized at a Level III or IV facility depending on location and time and distance to the higher level trauma center.

Air Rendezvous may be necessary considering time & distance constraints. If conditions do not permit air transport consider ALS rendezvous. Stabilization may occur either in the field or at the nearest appropriate facility.

Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to Hillcrest Burn Center or OUMC Children's Hospital. Burns >10% with significant trauma transport to trauma center.

NO ↓

Anatomical Injury

- Penetrating injury of head, neck, chest/abdomen or extremities proximal to elbow or knee
- Combination of burns > 10% or significant burns involving face, airway, hands, feet or genitalia without significant trauma transport to Hillcrest Burn Center or OUMC Children's Hospital. Burns >10% with significant trauma transport to trauma center.
- Amputation above wrist or ankle
- Paralysis or suspected spinal fracture w/neurological deficit
- Flail chest
- Two or more obvious proximal long bone fractures (upper arm or thigh).
- Open or suspected depressed skull fracture
- Unstable pelvis or suspected unstable pelvis fracture
- Tender and/or distended abdomen
- Crushed, degloved, or mangled extremity

Pediatric Trauma Score ≤5

YES → (Initiate Trauma Treatment Protocol, above)

NO ↓

PRIORITY 2

Risk of Serious Injury - Single System Injury

Patients with potentially time sensitive injuries due to a high energy event (positive mechanism of injury) or with a less severe single system injury, but currently with no physiological abnormalities or significant anatomical injury

- Ejection of the patient from an enclosed vehicle
- Auto/pedestrian or auto/bike or motorcycle crash with significant impact (> 20 mph) with the patient thrown or run over by a vehicle
- Falls greater than 10 feet or distance 2-3 times height of patient
- Significant assault or altercations
- High risk auto crash[5]
- **Neurology:** Isolated head trauma with transient loss of consciousness or altered mental status but currently alert and oriented.
- **Orthopedic:** Single proximal and distal extremity fractures (including open) from high energy event, isolated joint dislocations-knee, hip, elbow, shoulder without neurovascular deficits, and unstable joint (ligament) injuries without neurovascular deficits.
- **Maxillofacial trauma:** Facial lacerations; such as those requiring surgical repair, isolated open facial fractures or isolated orbit trauma with or without entrapments, or avulsed teeth.

Pediatric Trauma Score 6-8

YES → **Initiate Trauma Treatment Protocol**

PROMPT transport to the designated Level III Trauma Center or higher depending on location according to the Regional Trauma Plan

NO ↓

PRIORITY 3

- Consider[6]
  - Co-morbid factors and Gestalt-EMS clinical judgment

Pediatric Trauma Score 9-12

YES → (Initiate Trauma Treatment Protocol / PROMPT transport, above)

NO → **TRANSPORT** to either the closest Level IV Trauma Center or higher depending on location according to the Regional Trauma Plan or the facility of the patient's choice

100.3.17 Incident Scene Rehabilitation: (Rehab)

100.3.17.1 General:

No member will be permitted to continue emergency operations beyond safe levels of physical or mental endurance. The intent of rehab is to lessen the risk of injury that may result from extended field operations under adverse conditions. Rehab is implemented during hot or cold environmental temperature extremes, but may be used anytime at the direction of the IC.

100.3.17.2 Work-to-Rest Ratio:

The basic work-to-rest ratios are listed below. These ratios are considered minimum guidelines and can be adjusted for incident conditions.

Work: After:
- One 30-minute SCBA cylinder
- 20 minutes of intense work without SCBA

Rest: 10 minutes of self-rehabilitation (rest with hydration)

Work: After:
- Two 30-minute SCBA cylinders
- One 45/60-minute SCBA cylinder when encapsulating chemical protective clothing is worn
- 40 Minutes of intense work without SCBA

Rest: 20 minutes of rest (with hydration) in a rehabilitation area

100.3.17.3 Ongoing Hydration: (Water)

Minimum of 2-4 oz. of water for every:
- 20 minutes during any type of firefighting
- 20 minutes during major medical or mass casualty incidents
- 15-30 minutes during Hazmat/special operations

100.3.17.4 Long Term Incident Hydration: (Diluted Sports Drink)

When the on-scene time exceeds two hours, members will be provided with sports drink diluted to half strength with water in place of water at the intervals indicated above.

100.3.17.5 Rehab Levels and Functions:

100.3.17.5.1 Self-Rehabilitation (Company/Crew Level Rehabilitation):

Self-rehabilitation occurs after short duration incidents and/or between trips to the Rehab Area. Company officers should ensure that fluids are available on their apparatus so that members can replace fluids (while changing SCBA cylinders, taking short breaks, etc.).

100.3.17.5.2 Formal Rehab (Rehab Group):

The Rehab group will be used to evaluate and assist personnel who could be suffering from the effects of sustained physical or mental exertion during emergency operations.

The rehab group provides a specific area where personnel will assemble to receive:

- A physical assessment
- Rest, hydration, and refreshments
- Medical evaluation and treatment of minor injuries
- Continual monitoring of physical condition
- Transportation for those requiring treatment at medical facilities
- Initial stress support assessment
- Reassignment

100.3.17.5.2.1 Rehab Group Resources and Capabilities:

When the IC implements the Rehab Group, the group supervisor should utilize any of the following resources that he/she deems appropriate:

- EMSA
- TFD Apparatus with Rehab Equipment
  - "? Air & Light Units
  - "? Hazmat
  - "? TFD Bus
- TFD Training Staff: The TFD Training Center maintains a cache of towels, buckets, and sports drink for Rehab. Additionally, the staff can bring the TFD Bus.
- TFD EMS Staff
- TFD ALS Capabilities
- TFD Fitness Staff
- MTTA Bus
- Any other resource necessary

The IC has the discretion to assign an appropriate person to the position of Rehab Group Supervisor. When assigning this position, the IC should consider the following personnel:

- TFD EMS Officer
- TFD Training Officer
- TFD Exercise Physiologist
- TFD Chief Officer or Company Officer
- EMSA Supervisor

100.3.17.5.2.2 Check-In Point:

This is the initial entry point. Rehab staff will take a pulse rate on all crew members.

- Any member who has a pulse rate greater than 120 will report directly to medical rehab. These members will be treated by advanced life support personnel in accordance with EMS protocols.
- All other members will report to the hydration and replenishment area.

100.3.17.5.2.3 Hydration and Replenishment Area:

During warm weather conditions, all personnel will remove coats, helmets, gloves, and protective hoods. Turnout pants should be removed or at least rolled down over the boots. Fluid and electrolyte replacement will be provided.

The following requirements pertain to the physical area used for Rehab:

- A key concept to abide by when establishing a Rehab Area is to set it up as close as safely possible to where firefighters are working.
- During hot temperature extremes, avoid placing personnel directly in an air conditioned environment. Provide a shaded area with air movement. Air and Light Units and Hazmat have canopies, fans and misters for this purpose. Hazmat also has tent capabilities. Rehab supervisors may also be able to secure areas that are close to the incident.

The following other requirements pertain to personnel assigned to the hydration and replenishment area:

- All personnel should spend a minimum of 20 minutes resting in this area.
- Personnel should consume a minimum of 10 ounces of water or other approved beverages while in this area.
- Personnel should place their arms into cool (not cold) water as they are resting (See Rehab Group Resources).
- Smoking is not permitted in this area.

100.3.17.5.2.4 Medical Rehab and Transport Area:

This Section is staffed by an ALS crew and at least one EMS transport vehicle. Personnel reporting here will receive evaluation and treatment per EMS protocols. The ALS crew in this area will pay close attention to the following:

- Pulse
- Pulse-ox
- Respiratory rate
- Blood pressure
- Body temperature
- Obvious injuries or illness

Any firefighters who receive IV fluids are considered to be in medical rehab and fall under EMS protocols. Additionally, those receiving IV fluids will be taken to the appropriate medical facility to obtain laboratory blood testing to ensure appropriate levels of hydration, electrolytes, and renal function.

100.3.17.5.2.5 Reassignment Area:

After the prescribed rehabilitation (minimum of 20 minutes for an initial cool down and evaluation period) members will be re-evaluated. Upon evaluation, the members will be triaged into one of the following groups:

- Return to duty - adequately rehabbed and medically sound.
- Remove from duty - evidence of an illness or injury; including any person with a pulse rate greater than 100.
- Transported to an appropriate medical facility for further evaluation and treatment of illness or injury; including any member who has a temperature greater than 101 °F (38 °C) or a blood pressure less than 100 (systolic).

Members who are transported to a medical facility should be accompanied by a department representative.

Crews authorized to return to duty will be released as intact crews and report to the Reassignment Area.

The rehab group supervisor will update the IC throughout the operation with pertinent information including the identities of companies in Rehab, the companies available for reassignment, and the status of injured personnel.

Company officers must keep crews intact and report to the proper sections in Rehab. The rehab group supervisor will direct the crew to the proper areas; however, it is the company officer's responsibility to make sure crew members receive refreshments, rest, and a medical clearance.

REHABILITATION

ARM & HAND IMMERSION IN TAP WATER

A simple, safe and controlled method to reduce heat stress is hand and arm immersion into containers of standard tap water. Buckets for this procedure will be stored on Engines and specialized apparatus or staff positions.

STEP 1

Remove the helmet, bunker coat, hood, pants and boots when checked into Rehabilitation. The helmet, coat and hood tend to be naturally removed. Direction usually needs to be given to remove the pants and boots. The removal of all gear is essential to obtain the desired cooling.

Fill two buckets with tap water obtained from a garden hose, hose line from fire apparatus or connection to a fire hydrant. NOTE: If water is acquired through a fire pump, make certain that it has not been heated from the churn action of the fire pump.

D0 NOT ADD ICE TO THE BUCKETS.

STEP 2

Seat the person onto a bench type surface such as the tailboard of the apparatus or curb of the street. Position the buckets on either side of the person at the same elevation at the object used as a seat. Instruct the person to place both hands and arms into the water with the hands touching the bottom of the bucket. Ideally, the person should spread his/her fingers apart to maximize the exchange of heat.

STEP 3

The immersion process should be conducted for ten to twenty minutes. A similar process may be conducted with the feet for additional control of severe cases.

Continuously monitor the medical condition of the person and frequently record vital signs. Provide medical care as needed.

Also provide cool water or partial strength sports drinks. Do not provide hot or cold beverages and avoid all fluids that contain caffeine.

OPS/006 *INCIDENT REHABILITATION*

1. PURPOSE:

The policy of the Oklahoma City Fire Department is that no employee will operate at an emergency or non-emergency scene beyond a safe level of physical and mental endurance. The Rehabilitation Group will be utilized to evaluate and assist personnel to avoid sustained physical exertion that can result in acute health detriments as well as to evaluate and assist personnel who may already be suffering from the effects of sustained physical exertion during emergency operations. The Rehab Group will provide a specific area where personnel will assemble to receive:

- a physical assessment
- revitalization - rest, refreshments, etc.
- treatment for physical and/or mental stress as well as physically-induced injuries and/or illnesses
- close monitoring of physical condition
- transportation for those requiring treatment at medical facilities

2. SCOPE:

These guidelines apply to all appropriate emergency incidents and training exercises where physical activity or exposure to extreme environmental conditions exist.

3. RESPONSIBILITIES:

a) ***Incident Commander***

The Incident Commander will consider the circumstances of each incident and make necessary arrangements early in the incident for the rest and rehabilitation of all personnel operating at the scene.

b) ***Supervisors***

All supervisors will maintain an awareness of the condition of each company member operating within their span of control. The command structure will be utilized to request relief of fatigued crews.

c) ***Personnel***

It is the responsibility of each company member to advise their supervisor when they believe that their level of fatigue or exposure to heat or cold is approaching a level that could affect themselves or their company in the operation in which they are involved.

4. ESTABLISHMENT OF REHAB:

a) ***Responsibility***

The Incident Commander will establish a Rehab Group as per OCFD Incident Management System when conditions indicate it will be needed at an incident or training evolution scene. A member will be placed in charge of the Group and will be known as the Rehab Officer. The Rehab Officer will typically report to the Logistics Officer (if filled) in the framework of the Incident Management System.

b) ***Location***

The location for the Rehab area will normally be designated by the Incident Commander. If a specific location has not been designated, the Rehab Officer will select an appropriate location.

c) Site characteristics

(1) The entry/exit will be marked with two traffic cones to indicate where all personnel will enter and exit the Rehab area.

(2) Rehab area should be far enough away from the scene that members may safely remove their turnout gear and SCBA.

(3) The site should enable members to be free of exhaust fumes from apparatus, vehicles, or equipment

(4) It should provide protection from the prevailing environmental conditions.

(5) Misting and cooling equipment should be made available if heat illness could result from the incident operations and/or prevailing environmental conditions.

(6) It should be large enough to accommodate multiple crews.

(7) It should be easily accessible to EMS and other support units.

(8) It should allow easy reentry into the emergency operation.

(9) Rehab should be divided into three areas, one for immediate rehab, one for staged and ready firefighters, and another area for medical. The staffing of the Rehab area will be determined by the Incident Commander taking into consideration the size and duration of the incident/evolution.

d) Staffing

(1) Residential/Commercial Response Rehab areas will be staffed using the initial responding companies unless in the judgment of the Incident Commander more resources are needed to adequately staff it.

(2) Multiple Alarm Rehab areas will be staffed by initial responding resources until such time as the greater alarm support personnel arrive on the scene. The greater alarm, support personnel will report to the IC and could be assigned Medical / Rehab duties if necessary for existing personnel to be relieved.

OPS/006 *INCIDENT REHABILITATION* -

5. GUIDELINES:

a) *Rehabilitation Group Establishment*
Rehabilitation should be considered by the incident commander during the size-up phase of an incident. Climatic and environmental conditions for the incident scene should not be the sole justification for establishing a Rehabilitation Area. Any training or incident activity that is large in size, long in duration, and/or labor intensive will rapidly deplete the energy and strength of personnel and therefore merits consideration for establishing a Rehabilitation Group.

b) *Accountability*
All crew members reporting to Rehab will check in with the Rehab Officer at the entry/exit point. Personnel leaving the Rehab Area must check out through the Rehab Officer. When a rehabilitation area is established, no member should be reassigned to return to duty before being medically evaluated, hydrated for at least 10 minutes, and cleared by Rehab Officer.

The Rehab Officer will update the Logistics Officer (or Incident Commander) throughout the operation with pertinent information including the identity of companies in Rehab, the companies available for reassignment, plus the status of any injured or ill personnel.

c) ***Resources***

The Rehab Officer will secure all necessary resources to adequately staff and supply the Rehabilitation Area. The supplies should include the following items, but should be adjusted as necessary for the incident.

(1) Fluids - water, activity beverage and ice

(2) Food - Red Cross can be used as a resource for soup, broth, or other types of food.

(3) Medical - need at least one trauma kit, oxygen administration equipment, defibrillator, RAD -57 or defibrillator with CO monitoring capabilities, and other equipment as needed.

(4) Other - as deemed by the incident fans, tarps, heaters, floodlights, blankets, and traffic cones (to mark the entry/exit of the Rehabilitation Area)

d) ***Hydration***

A critical factor in the prevention of heat injury is the maintenance of water and electrolytes. Water must be replaced during exercise periods and at emergency incidents. Employees will rehydrate (at least eight ounces) while SCBA cylinders are being refilled. During heat stress, each employee should consume at least one quart (32 oz.) of water per hour. The rehydration fluid should be an activity beverage administered cool. Rehydration is important even during cold weather operations where heat stress may occur during firefighting or other strenuous activity when protective equipment is worn. Caffeinated drinks should be avoided before and during emergency operations, because both interfere with the body’s water conservation mechanisms. Carbonated drinks should also be avoided.

e) ***Nourishment***

Food and nourishing drinks may be provided by the American Red Cross (or suitable alternative) at the scene of extended incidents when units are engaged for three or more hours.

f) **Rest**

Rest normally should not be less than ten minutes and may exceed an hour as determined by the Rehab Officer. Fresh crews, or crews released from the Rehab rest area, will move to the Ready area of Rehab to ensure that fatigued employees are not required to return to duty before they are rested, evaluated, and released by the Rehab officer.

***The company officer or crew leader should additionally ensure that all members in the company or crew seem fit to return to duty.**

Work-to-Rest Ratio

Up to one 30 minute SCBA cylinder	**At least 10 minutes of self-rehabilitation (rest with hydration) as a company or crew**
20 min of intense work without SCBA	**At least 10 minutes of self-rehabilitation (rest with hydration) as a company or crew**

(When encapsulating chemical protective clothing is worn)

Up to two 30-minute SCBA cylinders	**At least 20 minutes of rest (with hydration) in rehabilitation area**
One 45-minute SCBA cylinder	**At least 20 minutes of rest (with hydration) in rehabilitation area**
One 60-minute SCBA cylinder	**At least 20 minutes of rest (with hydration) in rehabilitation area**
40 minutes of of work without SCBA	**At least 20 minutes of rest (with hydration) in rehabilitation area**

Medical Surveillance Form Instructions

See Attachment A - COMPANY CHECK IN / CHECK OUT SHEET

g) Medical Evaluation

When employees are assigned to the Rehabilitation unit, the Rehab Officer (or his/her designated rehab personnel) will observe all members in each crew for employees that have signs of heat stress, hypothermia, extreme fatigue, and/or need of medical aid. If employee does not recover in allotted time, they should be moved to the medical evaluation area.

REHAB OFFICER

1. Enter your name and time in as Rehab Officer.
2. All companies must enter and exit the Rehab area as a crew at the entry/exit point.
3. Enter the company, number of persons in company, and time in and out of Rehab.
4. Each arriving emergency worker must be questioned regarding any medical symptoms, be asked about any injury or illness resulting from incident work, and have assessment of appropriate vital signs. If employee is in need of aid or does not recover in allotted time, they should be moved to the medical surveillance area.
5. If any personnel need to go to the medical surveillance or medical treatment area, enter names.
6. Enter number of times company has been in Rehab.
7. After company has had sufficient rest and rehabilitation and all SCBA have been refilled, move company to the Ready area of Rehab and enter time.
8. The Rehab Officer will update the Logistics Officer (or Incident Commander) throughout the operation with pertinent information including the identity of companies in Rehab, the companies available for reassignment, plus the status of any injured personnel
9. Release companies from the Ready area as needed and enter time in the Time out column.

MEDICAL SURVEILLANCE

Enter name of person entering the medical evaluation area for heat/cold/fatigue or for medical treatment of injury or illness.

Once in the medical surveillance area, heart rate should be measured for 30 seconds as early as possible in the rest period along with full vital signs including pulse ox and CO readings.

Vitals will be taken every 5-10 minutes.

- If any of the following signs and/or symptoms, or any complaint or reason for concern in the opinion of rehab officer or employee, they should be moved from the medical monitoring area to medical treatment area.

Heat Stress Symptoms		Cold Stress Symptoms	
nausea	shortness of breath	headache	low or absent blood pressure
flushed skin	weakness	mental confusion	slow pupil response
cramping	exhaustion	numbness	muscle rigidity or stiff posture
headache	seizures	waxy/pale skin	blistered skin
mental confusion	sunburn	dehydration	
rapid heartbeat	absence of sweating		

- If an employee's heart rate exceeds 110 beats per minute, an oral temperature should be taken.
  If an employee's temperature exceeds 100.6°F, employee should be moved to medical treatment area and, rehabilitation time should be increased.

- Measure the SpO2%. If an employee's oxygen saturation below 94 percent (while breathing atmospheric or room air) employee should be moved to medical treatment area.

- Measure the SpCO% with RAD-57 or LifePak 15

- If SpCO% > 3% with any of below signs or symptoms, treat per MCB protocol III.44 Monitoring of CO Poisoning.

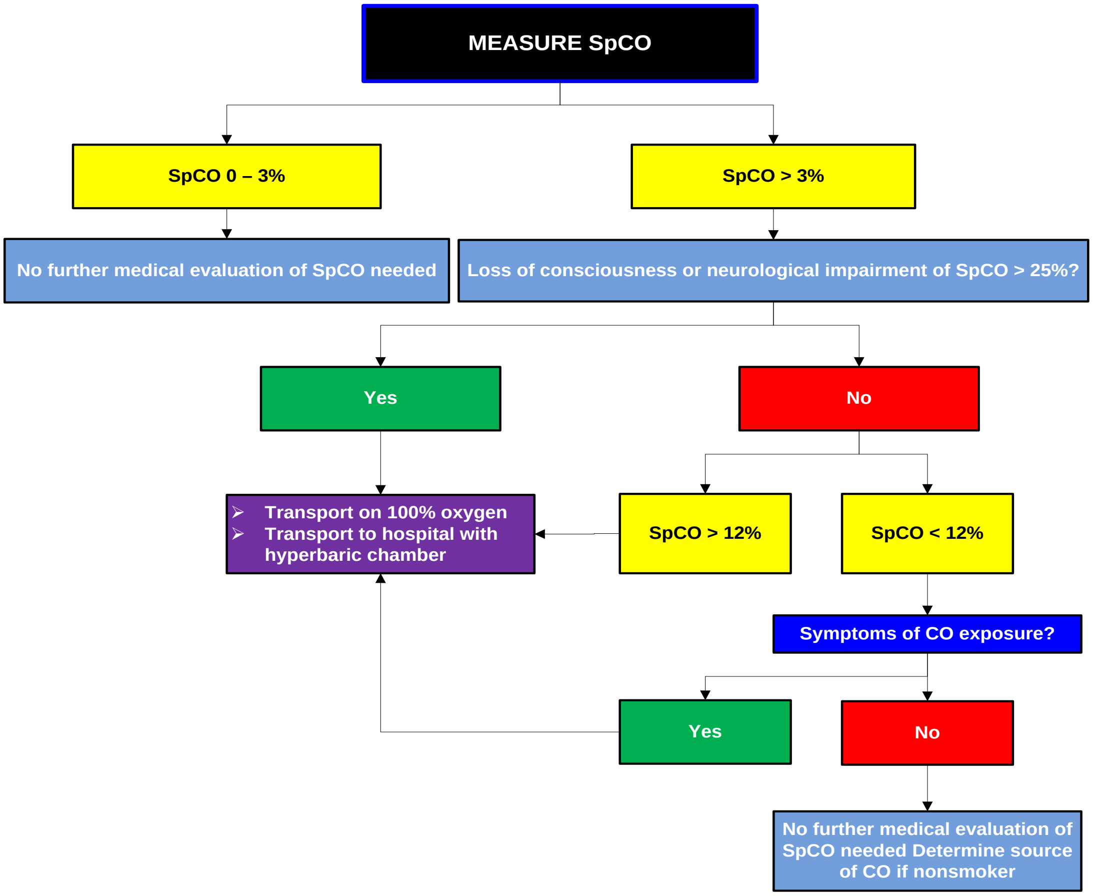
CO Poisoning Symptoms

Flu-like symptoms	Abdominal pain
Fatigue	Headache
Dyspnea	Drowsiness
Chest pain	Dizziness
Palpitations	Weakness
Lethargy	Confusion
Confusion	Visual disturbances
Depression	Syncope
Impulsiveness	Seizures
Distractibility	Fecal incontinence
Hallucination	Urinary incontinence
Confabulation	Memory disturbances
Agitation	Gait disturbances
Nausea	Bizarre neurologic symptoms
Vomiting	Coma
Diarrhea	

Firefighter Headaches

While CO should always be considered a possible cause of headaches in working firefighters, there are more common causes which includes:

- Tight helmet ratchet
- Too heavy a helmet (especially leather)
- Dehydration



MEDICAL TREATMENT AREA
All treatment should follow MCB approved protocols. There is clear delineation between medical monitoring and emergency medical treatment in rehab. Documentation is to be kept separately. Although the same providers may do both, it makes logistical and operational sense to separate them into functional areas if possible.

<u>If an employee has abnormal vital signs or if employee does not recover in a reasonable amount of time, contact the Medical Officer for possible transport to the hospital.</u>

Attachment A - COMPANY CHECK IN / CHECK OUT SHEET (FRONT SIDE)

Oklahoma City Fire Department
Incident Medical Surveillance Form

***Instructions for this form are on reverse of this page

Name and Company	# Times in Rehab	Time in / Time Out	# SCBA Bottles Used	Time Vitals Taken	BP	Heart Rate	Resp.	Pulse Ox	CO Level	Temp	Cooling/ Heating Y/N	Medical Complaints	Transport Y/N	Transport Destination

Incident Address: ______________________________ Incident Number: ______________

Date: ____________________ Rehab Medic: ________________________ Page ________ of ________

Transport Destination

Attachment A - COMPANY CHECK IN / CHECK OUT SHEET (BACK SIDE)

- Enter name of medic in rehab at bottom of form
- Enter the name and company of each person entering rehab
- Each time personnel enter rehab, re-enter them on the form. Be sure to record the number of times the person is rehabilatated
- Once in the medical evaluation area, heart rate should be measured for 30 seconds as early as possible in the rest period
- If employee’s heart rate exceeds 110 beats per minute, an oral temperature should be taken
- If temperature exceeds 100.6°, no PPE should be worn
- If temperature is below 100.6° and heart rate remains above 110 beats per minute, rehab time should be increased
- Vitals should be taken every 5-10 minutes
- If employees SpCO level is >3% with any of the below signs or symptoms, treat per MCB protocol III.44 Monitoring of CO Poisoning

Signs of CO Poisioning			**Heat Stress Symptoms**		**Cold Stress Symptoms**	
Flu like symptoms	Fatigue	Dyspnea	nausea	shortness of breath	headache	low or absent blood pressure
Chest Pain	Palpitations	Lethargy	flushed skin	weakness	mental confusion	slow pupil response
Confusion	Depression	Impulsiveness	cramping	exhaustion	numbness	muscle rigidity or stiff posture
Abd pain	Headache	Drowsiness	headache	seizures	waxy/pale skin	blistered skin
Weakness	Confusion	Visual Disturbances	mental confusion	sunburn	dehydration	
Syncope	Seizures	Hallucination	rapid heartbeat	absence of sweating		
Agitation	Nausea	Vomiting				
Diarrhea	Incontinence	Memory disturbances				
Gait disturbances	Neurologic symptoms	Coma				

Work-to-Rest Ratio

Up to one 30 minute SCBA cylinder	**At least 10 minutes of self-rehabilitation (rest with hydration) as a company or crew**
20 min of intense work without SCBA	**At least 10 minutes of self-rehabilitation (rest with hydration) as a company or crew**

(When encapsulating chemical protective clothing is worn)

Up to two 30-minute SCBA cylinders	**At least 20 minutes of rest (with hydration) in rehabilitation area**
One 45-minute SCBA cylinder	**At least 20 minutes of rest (with hydration) in rehabilitation area**
One 60-minute SCBA cylinder	**At least 20 minutes of rest (with hydration) in rehabilitation area**
40 minutes of of work without SCBA	**At least 20 minutes of rest (with hydration) in rehabilitation area**

If an employee has abnormal vital signs or if employee does not recover in a reasonable amount of time, contact the Medical Officer for possible transport to the hospital