

# **METRO REGIONAL EMS CONSORTIUM**

**Clackamas County and Washington County, Oregon  
Emergency Medical Services**

# **PATIENT TREATMENT PROTOCOLS**

# **2012**

## Introduction to Protocols

These patient care protocols will go into effect January 9th, 2012 for EMT's and paramedics of American Medical Response Clackamas, Banks Fire District #13, Boring Fire District #59, Clackamas Fire District #1, Cornelius Fire Department, Estacada Fire District #69, Forest Grove Fire & Rescue, Gaston Rural Fire District, Hillsboro Fire & Rescue, Hoodland Fire District #74, Lake Oswego Fire Department, Metro West Ambulance, Sandy Fire District #72, Tualatin Police, Tualatin Valley Fire & Rescue, Washington County Fire District #2 and Washington County Sheriffs Office.

These protocols, we believe, are the best of their type. Where evidence has been available, the Tri-County Protocol Development Committee has diligently evaluated the material and drafted protocols that will assist us in providing excellent patient care. Where evidence is lacking, we have relied on best practices, expert advice and consensus to guide the development of the protocol or procedure. These protocols are reviewed on a regular basis and updated when necessary to reflect advances in the art and science pertaining to the care of the acutely ill and injured.

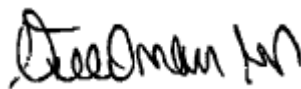
Remember that these protocols are guidelines. EMS is performed in a stressful environment with time-critical decisions and no specific patient care matrix can be developed that will cover every type of injury, illness, and complicating circumstance that EMT's will encounter while providing on-scene care. It is our expectation that providers will use these protocols in conjunction with their training and experience to do what is best for each patient. From time to time, it is expected that circumstances will arise that are not covered within these protocols. In such instances, providers should function within their scope of practice and use all available resources (including On-Line Medical Consultation) to provide the best possible patient care.

Thanks to everyone who has provided assistance in protocol development and review. Anything that is complex and includes detail is prone to errors. Please review these protocols carefully and route any potential errors, unclear directions, or suggestions for improvement to your agencies EMS Office.

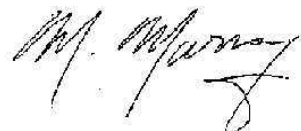
Finally, we thank every one of you for your dedication and commitment every day to providing the best possible prehospital medical care to the citizens of our respective communities.



Mohamud Daya MD  
Forest Grove Fire & Rescue  
Tualatin Valley Fire & Rescue



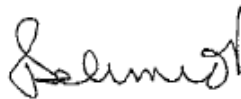
Skip Freedman, MD  
Washington County EMS



Michael Murray, MD  
East Clackamas County EMS



Ritu Sahni, MD  
Lake Oswego Fire Dept



Terri Schmidt, MD  
Clackamas County EMS



Michael Shertz, MD  
Hillsboro Fire & Rescue



Craig Warden, MD  
Clackamas County Fire Dist #1

# Table of Contents

<b>Scope of Practice</b> .....	00.010
<b>Medical Control of Medications and Procedures</b> .....	00.040
<b>Treatment – 10.000</b>	
Abdominal Pain.....	10.010
Altered Mental Status.....	10.020
Anaphylaxis.....	10.030
Burns.....	10.040
Cardiac Arrest – <i>AED / CPR</i> .....	10.050
Cardiac Arrest – <i>Asystole</i> .....	10.050
Cardiac Arrest – <i>PEA</i> .....	10.050
Cardiac Arrest – <i>VFib / Pulseless VT</i> .....	10.050
Cardiac Dysrhythmias – <i>Bradycardia</i> .....	10.060
Cardiac Dysrhythmias – <i>PVC’S</i> .....	10.060
Cardiac Dysrhythmias – <i>Tachycardia</i> .....	10.060
Chest Pain / Acute Coronary Syndrome.....	10.070
Crush Injury.....	10.075
Eye Emergencies.....	10.077
Hyperkalemia.....	10.078
Hyperthermia.....	10.080
Hypothermia.....	10.090
Musculoskeletal Injuries – <i>Extremity Trauma</i> .....	10.100
Musculoskeletal Injuries – <i>Spinal Injury</i> .....	10.100
Nausea & Vomiting.....	10.110
Neonatal Resuscitation.....	10.120
OB/GYN Emergencies & Childbirth.....	10.130
Pain Management.....	10.135
Poisoning & Overdose.....	10.140
Respiratory Distress.....	10.160
Seizures.....	10.170
Shock.....	10.180
Stroke / CVA.....	10.190
Submerged Patient.....	10.200
Universal Patient Care / General Illness.....	10.900

## Medications – 20.000

Activated Charcoal .....	20.010
Adenosine (Adenocard®).....	20.020
Albuterol (Ventolin®).....	20.030
Amiodarone (Cordarone®).....	20.040
Aspirin .....	20.050
Atropine Sulfate.....	20.060
Calcium Gluconate.....	20.070
Dexamethasone (Decadron®) .....	20.075
Dextrose 50%.....	20.080
Diphenhydramine (Benedryl®).....	20.090
Dopamine (Intropin®).....	20.100
Droperidol (Inapsine®).....	20.102
Epinephrine.....	20.110
Etomidate .....	20.115
Fentanyl .....	20.117
Furosemide .....	20.120
Glucagon.....	20.130
Glucose – Oral .....	20.140
Hydroxocobalamin (Cyanokit®) .....	20.145
Ipratropium Bromide (Atrovent®) .....	20.150
Lidocaine.....	20.160
Magnesium Sulfate .....	20.170
Midazolam (Versed®) .....	20.190
Morphine Sulfate .....	20.200
Naloxone (Narcan®) .....	20.210
Nitroglycerin .....	20.220
Ondansetron (Zofran®).....	20.230
Oxygen.....	20.240
Pralidoxime (Protopam® / 2-PAM®) .....	20.250
Proparacaine (Alcaine®).....	20.255
Sodium Bicarbonate.....	20.260
Sodium Thiosulfate 25% .....	20.265

## Medications – 20.000 (Continued)

Succinylcholine (Anectine®) .....	20.270
Vasopressin .....	20.280
Vecuronium .....	20.290

## Procedures – 30.000

Airway Management General Approach .....	30.010
AICD Deactivation .....	30.020
Combitube® Placement .....	30.030
Continuous Positive Airway Pressure (CPAP) .....	30.032
Endotracheal Intubation .....	30.040
Endotracheal Intubation with Paralytics .....	30.050
Emergency Cricothyrotomy .....	30.060
End Tidal CO <sub>2</sub> Monitoring .....	30.070
Impact Uni-vent® Ventilator .....	30.075
Intranasal Medication Administration .....	30.078
Intraosseous Access & Infusion .....	30.080
Intravenous Access & Infusion .....	30.090
Induced Hypothermia .....	30.102
King Airway® Placement.....	30.105
Left Ventricular Assist Devices.....	30.107
Patient Restraint.....	30.120
Pelvic Immobilization.....	30.132
PICC Line Access .....	30.140
Sports Equipment Removal .....	30.160
Suctioning .....	30.161
TASER® Barb Removal .....	30.162
Tension Pneumothorax Decompression .....	30.170
Transcutaneous Pacing .....	30.180

# Table of Contents

## Operations – 50.000

Advance Directives, DNR and POLST Guidelines.....	50.005
Ambulance Diversion Guidelines .....	50.015
Crime Scene Response .....	50.020
Death in the Field.....	50.025
Documentation .....	50.040
Grieving People Guidelines.....	50.050
Hazardous Materials .....	50.060
Multiple Toxic Exposure .....	50.070
Medical Control of Scene .....	50.110
On-Line Medical Control .....	50.115
Refusal and Informed Consent .....	50.117
Rehabilitation .....	50.119
Transport by Fire Medic Unit.....	50.130

## Trauma System – 60.000

Trauma System Guidelines ATAB-1 .....	60.000
---------------------------------------	--------

## Multi-Casualty Incidents – 65.000

MCI General Guidelines .....	65.100
Medical Task Card .....	65.200
Treatment Task Card .....	65.300
Triage Task Card.....	65.400
Transportation Task Card.....	65.500
Destination Task Card.....	65.550
MPS Log.....	65.600

## Hazardous Materials – 70.000

Decontamination .....	70.010
Hydrogen Cyanide .....	70.020
Hydrogen Fluoride.....	70.030
Organophosphates.....	70.040

## Special Studies – 90.000

Cardiac Arrest - <i>VFib / Pulseless VT (ROC ALPS Study)</i> .....	90.010
--	--------

## FIRST RESPONDER SCOPE OF PRACTICE

A First Responder may perform the following emergency care procedures without having signed standing orders from a supervising physician:

- A. Conduct primary and secondary patient examinations;
- B. Take and record vital signs;
- C. Utilize noninvasive diagnostic devices in accordance with manufacturer's recommendation;
- D. Open and maintain an airway by positioning the patient's head;
- E. Provide external cardiopulmonary resuscitation and obstructed airway care for infants, children, and adults;
- F. Provide care for soft tissue injuries;
- G. Provide care for suspected fractures;
- H. Assist with prehospital childbirth; and
- I. Complete a clear and accurate prehospital emergency care report form on all patient contacts and provide a copy of that report to the senior EMT with the transporting ambulance.

A First Responder may perform the following additional procedures only when the First Responder is part of an agency which has a Board-approved supervising physician who has issued written standing orders to that First Responder authorizing the following:

- A. Administration of medical oxygen;
- B. Maintain an open airway through the use of:
  - 1. a nasopharyngeal airway device;
  - 2. a non-cuffed oropharyngeal device;
  - 3. a pharyngeal suctioning device
- C. Operate a bag mask ventilation device with reservoir;
- D. Provision of care for suspected medical emergencies, including administering liquid oral glucose for hypoglycemia; and
- E. Administer epinephrine by automatic injection device for anaphylaxis;
- F. Perform cardiac defibrillation with an automatic or semi-automatic defibrillator, only when the First Responder:
  - 1. Has successfully completed a Section- approved course of instruction in the use of the automatic or semi-automatic defibrillator; and
  - 2. Complies with the periodic requalification requirements for automatic or semi-automatic defibrillator as established by the Section.

## EMT-BASIC SCOPE OF PRACTICE

An Oregon-certified EMT-Basic may perform emergency and nonemergency procedures:

- A. Perform all procedures that an Oregon-certified First Responder can perform;
- B. Ventilate with a non-invasive positive pressure delivery device;
- C. Insert a cuffed pharyngeal airway device in the practice of airway maintenance. A cuffed pharyngeal airway device is:
  - 1. A single lumen airway device designed for blind insertion into the esophagus providing airway protection where the cuffed tube prevents gastric contents from entering the pharyngeal space; or
  - 2. A multi-lumen airway device designed to function either as the single lumen device when placed in the esophagus, or by insertion into the trachea where the distal cuff creates an endotracheal seal around the ventilatory tube preventing aspiration of gastric contents.
- D. Perform tracheobronchial tube suctioning on the endotracheal intubated patient.
- E. Provide external cardiopulmonary resuscitation and obstructed airway care for infants, children, and adults;
- F. Provide care for suspected shock, including the use of the pneumatic anti-shock garment;
- G. Provide care for suspected medical emergencies, including:
  - 1. Obtaining a capillary blood specimen for blood glucose monitoring;
  - 2. Administer epinephrine by subcutaneous injection or automatic injection device for anaphylaxis;
  - 3. Administer activated charcoal for poisonings; and
  - 4. Administer aspirin for suspected myocardial infarction.
- H. Perform cardiac defibrillation with an automatic or semi-automatic defibrillator;
- I. Transport stable patients with saline locks, heparin locks, foley catheters, or indwelling vascular devices;
- J. Perform other emergency tasks as requested if under the direct visual supervision of a physician and then only under the order of that physician;
- K. Complete a clear and accurate prehospital emergency care report form on all patient contacts;
- L. Assist a patient with administration of sublingual nitroglycerine tablets or spray and with metered dose inhalers that have been previously prescribed by that patient's personal physician and that are in the possession of the patient at the time the EMT-Basic is summoned to assist that patient.

### EMT-BASIC SCOPE OF PRACTICE (Continued)

- M. In the event of a release of military chemical warfare agents from the Umatilla Army Depot, the EMT-Basic who is a member or employee of an EMS agency serving the DOD-designated Immediate Response Zone who has completed a Section-approved training program may administer atropine sulfate and pralidoxime chloride from a Section-approved pre-loaded auto-injector device, and perform endotracheal intubation, using protocols promulgated by the Section and adopted by the supervising physician. 100% of EMT-Basic actions taken pursuant to this section shall be reported to the Section via a copy of the prehospital emergency care report and shall be reviewed for appropriateness by Section staff and the Subcommittee on EMT Certification, Education and Discipline.
- N. In the event of a release of organophosphate agents the EMT-Basic, who has completed Section-approved training, may administer atropine sulfate and pralidoxime chloride by autoinjector, using protocols approved by the Section and adopted by the supervising physician.
- O. In the event of a declared Mass Casualty Incident (MCI) as defined in the local Mass Casualty Incident plan, the EMT-Basic may monitor patients who have isotonic intravenous fluids flowing.

## ADVANCED EMT (AEMT) SCOPE OF PRACTICE

An Oregon-certified Advanced EMT may perform the following procedures:

- A. Perform all procedures that an Oregon-certified EMT-Basic can perform;
- B. Initiate and maintain peripheral intravenous (I.V.) lines;
- C. Initiate saline or similar locks;
- D. Draw peripheral blood specimens;
- E. Initiate and maintain an intraosseous in the pediatric patient;
- F. Tracheobronchial suctioning of an already intubated patient;
- G. Administer the following medications under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician:
  - 1. Physiologic isotonic crystalloid solution.
  - 2. Epinephrine - anaphylaxis
  - 3. Naloxone hydrochloride
  - 4. Hypertonic glucose
  - 5. Glucagon
  - 6. Nitroglycerine
  - 7. Albuterol
  - 8. Ipratropium bromide
  - 9. Nitrous oxide.

## EMT-INTERMEDIATE SCOPE OF PRACTICE

An Oregon-certified EMT-Intermediate may perform the following procedures:

- A. Perform all procedures that an Oregon-certified Advanced EMT can perform;
- B. Initiate and maintain an intraosseous infusion;
- C. Administer the following medications under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician:
  - 1. Epinephrine
  - 2. Vasopressin
  - 3. Atropine sulfate
  - 4. Lidocaine
  - 5. Amiodarone
  - 6. Morphine
  - 7. Nalbuphine Hydrochloride
  - 8. Ketorolac tromethamine
  - 9. Fentanyl
  - 10. Diphenhydramine
  - 11. Furosemide
  - 12. Intraosseous infusion anesthetic lidocaine
  - 13. Ondansetron
- D. Administer immunizations in the event of an outbreak or epidemic as declared by the Governor of the state of Oregon, the State Public Health Officer or a county health officer, as part of an emergency immunization program, under the agency's supervising physician's standing order;
- E. Administer immunizations for seasonal and pandemic influenza vaccinations according to the CDC Advisory Committee on Immunization Practices (ACIP), and/or the Oregon State Public Health Officer's recommended immunization guidelines as directed by the agency's supervising physician's standing order.
- F. Distribute medications at the direction of the Oregon State Public Health Officer as a component of a mass distribution effort.
- G. Administer routine or emergency immunizations, as part of an EMS Agency's occupational health program, to the EMT's EMS agency personnel, under the supervising physician's standing order.
- H. Insert an orogastric tube;
- I. Maintain during transport any intravenous medication infusions or other procedures which were initiated in a medical facility, and if clear and understandable written and verbal instructions for such maintenance have been provided by the physician, nurse practitioner or physician assistant at the sending medical facility;
- J. Electrocardiographic rhythm interpretation;
- K. Perform cardiac defibrillation with a manual defibrillator.

## EMT-PARAMEDIC SCOPE OF PRACTICE

An Oregon-certified EMT-Paramedic may perform the following procedures:

- A. Perform all procedures that an Oregon-certified EMT-Intermediate can perform;
- B. Initiate the following airway management techniques:
  - 1. Endotracheal intubation
  - 2. Cricothyrotomy; and
  - 3. Transtracheal jet insufflation which may be used when no other mechanism is available for establishing an airway.
- C. Initiate a nasogastric tube;
- D. Provide advanced life support in the resuscitation of patients in cardiac arrest;
- E. Perform emergency cardioversion in the compromised patient;
- F. Attempt external transcutaneous pacing of bradycardia that is causing hemodynamic compromise;
- G. Electrocardiographic interpretation.
- H. Initiate needle thoracentesis for tension pneumothorax in a prehospital setting;
- I. Access indwelling catheters and implanted central IV ports for fluid and medication administration.
- J. Initiate placement of a femoral intravenous line when a peripheral line cannot be placed;
- K. Initiate placement of a urinary catheter for trauma patients in a prehospital setting who have received diuretics and where the transport time is greater than thirty minutes; and
- L. Initiate or administer any medications or blood products under specific written protocols authorized by the supervising physician, or direct orders from a licensed physician.

## Medical Control for Drugs & Procedures – 00.040

The following drugs and procedures are considered **CATEGORY A**, and will be used at the EMT's discretion in accordance with these EMS Treatment Protocols.

### Drugs – Category A:

- Activated Charcoal (aspirin or acetaminophen < 2 hrs post ingestion)
- Adenosine
- Albuterol
- Amiodarone
- Ammonia Inhalant
- Aspirin
- Atropine Sulfate
- Calcium Gluconate (cardiac arrest & hyperkalemia)
- Dexamethasone
- Dextrose 50%, IV
- Diphenhydramine
- Dopamine
- Droperidol
- Epinephrine
- Etomidate
- Glucagon
- Glucose, Oral
- Fentanyl
- Furosemide
- Hydrocobalamin (Cyanokit®)
- IV solutions
- Ipratropium
- Lidocaine
- Magnesium Sulfate (cardiac arrest)
- Midazolam
- Morphine
- Naloxone
- Nitroglycerin
- Ondansetron
- Oxygen
- Pralidoxime
- Proparacaine
- Sodium Bicarbonate
- Sodium Thiosulfate
- Succinylcholine
- Vasopressin
- Vecuronium

## Procedures – Category A

- Combitube
- Chemical Patient Restraint
- Continuous Positive Airway Pressure (CPAP)
- End-Tidal CO<sub>2</sub> Monitoring
- Endotracheal Intubation
- Endotracheal intubation with paralytics
- Impact Univent ventilator
- Induced Hypothermia
- Intraosseous access & infusion
- Intravenous access & infusion
- King LT-D/LTS-D Airway Device
- Left Ventricular Assist Device
- Emergency cricothyrotomy
  - Needle cricothyrotomy
  - Per-Trach
  - Quick-Trach<sup>®</sup> (type device)
  - Surgical cricothyrotomy
- Physical Patient Restraint
- PICC line access
- Pelvic immobilization with sling/wrap
- Sports equipment removal
- Suctioning
- Synchronous cardioversion
- Unstable V-Tachycardia, OR
- SVT, unstable patient with BP less than 90 mm/Hg
- Taser Barb Removal
- Tension Pneumothorax Decompression
- Transcutaneous Pacing

The following drugs and procedures are considered **CATEGORY B**, and require On-line Medical Control authorization. Confirmation of dosage or procedure will be obtained directly from a Physician on duty at OLMC.

## Drugs – Category B:

- Activated Charcoal (aspirin or acetaminophen > 2 hours post ingestion and all other poisons)
- Calcium Gluconate (calcium channel blocker overdose)
- Epinephrine (asthma and COPD pts > 40 yrs)
- Glucagon (beta blocker OD)
- Magnesium Sulfate (OB/GYN and asthma)

## Procedures – Category B:

- Automatic Implantable Cardio-Defibrillator (AICD) deactivation

# Treatment

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs frequently including ECG.
- C. Place patient in a position of comfort.
- D. Establish venous access.
- E. If systolic blood pressure is < 90 mmHg systolic follow Shock Protocol and initiate rapid transport. If traumatic injury is suspected, enter patient into Trauma System. If patient has a suspected abdominal aortic aneurysm, titrate IV to maintain systolic blood pressure of 90 mmHg.
- F. Avoid having the patient eat or drink.
- G. Treat pain per Pain Management Protocol

### PEDIATRIC PATIENTS:

- A. Consider non-accidental trauma.
- B. Closely monitor vital signs, blood pressure may drop quickly.

### NOTES & PRECAUTIONS:

- A. Abdominal pain may be the first sign of catastrophic internal bleeding (ruptured aneurysm, liver, spleen, ectopic pregnancy, perforated viscous, etc).
- B. Since the bleeding is not apparent you must think of volume depletion and monitor the patient closely for signs of shock.

### KEY CONSIDERATIONS:

Inferior MI, ectopic pregnancy, abdominal aortic aneurysm, recent trauma, perforated viscous, emesis type and amount, last meal, bowel movements, urinary output, ruptured spleen or liver, GI bleed, abnormal vaginal bleeding

## Altered Mental Status & Coma – 10.020

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs and oxygen saturation.
  - **Hypoglycemia**
    1. Determine capillary blood glucose level. If < 60 mg%, **or** <100 mg% in a symptomatic patient:
      - a. If patient can protect their own airway give oral glucose.
      - b. If patient is unable to protect their own airway, establish venous access and give 25 grams (50 ml) of dextrose 50% slow IV.
    2. Repeat blood glucose level after 10 minutes and repeat treatment if it remains low.
    3. If no IV can be established give glucagon 1 mg IM.
  - **Opiate Overdose**
    1. If opiate intoxication is suspected, administer naloxone 0.5 mg IV. Dose may be repeated every two minutes up to 2 mg titrating to respiratory rate. If no improvement and opiate intoxication is still suspected, repeat Naloxone 2 mg every 3-5 minutes up to a maximum of 8 mg total.
    2. If no IV, give naloxone 2 mg IM/IN every 5 minutes up to 8 mg.
- C. Attach cardiac monitor. Treat dysrhythmias per appropriate protocol.
- D. If other specific cause of altered mental status is known (i.e. seizure, stroke, poisoning) follow appropriate protocol.
- E. If patient is combative consider sedation with Inapsine per Restraint of Patient protocol.

### PEDIATRIC PATIENTS:

- A. Consider etiology and treat per appropriate protocol (Shock, Toxic Exposure, Seizure, Poisoning and Overdose, etc).
- B. If suspected hypoglycemia, determine capillary blood glucose level.
  - Patients less than 10 kg (birth to 1 year) with CBG < 40 mg%:
    1. Give oral glucose if patient can protect their own airway.
    2. If patient is unable to protect their own airway, establish venous access and give 0.5 grams/kg (2 ml/kg) of **Dextrose 25%**. May repeat once.
  - Patients 10 kg – 35kg (1 year to adolescence) with CBG < 60 mg%:
    1. Give oral glucose if patient can protect their own airway.
    2. If patient is unable to protect their own airway, establish venous access and give 0.5 grams/kg (1 ml/kg) of Dextrose 50%. May repeat once.
- C. If no IV access and patient is unable to protect their own airway, administer Glucagon 0.02 mg/kg IM to a maximum of 1 mg.
- D. If suspected opiate overdose, administer Naloxone 0.1 mg/kg IV/IO/IM/ IN to a maximum of 2 mg. If no improvement and opiate intoxication is still suspected, may repeat q 3-5 minutes up to 2 mg / dose to a maximum of 8 mg.

### NOTES & PRECAUTIONS:

- A. If patient is disoriented, think of medical causes.
- B. If patient is suicidal do not leave alone.
- C. All patients in restraints must be monitored closely including pulse oximeter.

## Anaphylaxis & Allergic Reactions – 10.030

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access.
- D. If signs of mild respiratory distress are present administer 1:1,000 Epinephrine 0.3 mg SQ or IM. May repeat once.
- E. If patient exhibits signs of progressive anaphylaxis and/or significant respiratory distress:
  1. With systolic blood pressure > 90 mmHg, administer 1:1,000 Epinephrine 0.3 mg (0.3 cc) SQ or IM.
  2. With systolic blood pressure < 90 mmHg administer:
    - a) 1:1,000 Epinephrine 0.3 mg (0.3 cc) SQ or IM **OR**
    - b) 1:10,000 Epinephrine 0.3 mg (3 cc) IV **OR**
    - c) 1:10,000 Epinephrine 0.6 mg (6 cc) ET (if no venous access)
    - d) Treat with fluid challenge per Shock Protocol.
  3. If no improvement noted repeat epinephrine every 5 minutes.
- F. If patient continues to exhibit signs of respiratory distress, administer dexamethasone 10 mg IV /IO/IM/PO.
- G. Consider Diphenhydramine 1 mg/kg to a maximum of 50 mg IV/IM.
- H. Consider Albuterol 2.5 mg via nebulizer.
- I. If unable to secure a protected airway or unable to ventilate with BVM after epinephrine has been administered cricothyrotomy may be required.

### PEDIATRIC PATIENTS:

- A. If signs of mild respiratory distress are present administer 1:1,000 epinephrine 0.01 mg/kg SQ to a maximum dose of 0.3 mg (0.3 cc). May repeat once in 20 minutes.
- B. If patient exhibits signs of progressive anaphylaxis and/or significant respiratory distress:
  1. With normal perfusion, administer 1:1,000 Epinephrine 0.01 mg/kg SQ to a maximum dose of 0.3 mg (0.3 cc) SQ.
  2. With diminished perfusion administer:
    - a) 1:1,000 Epinephrine 0.01 mg/kg SQ to a maximum of 0.3 mg (0.3 cc) **OR**
    - b) 1:10,000 Epinephrine 0.01mg/kg IV to a maximum of 0.1 mg (1.0 cc) **OR**
    - c) 1:1,000 Epinephrine 0.02mg/kg diluted in 4 cc of normal saline via ET (if no venous access).
    - d) Treat with fluid challenge per Shock Protocol.
  3. If no improvement noted repeat Epinephrine q 5 minutes.
- C. If patient continues to exhibit signs of respiratory distress, administer dexamethasone 0.3 mg/kg IV/IO/IM/PO. Do not exceed adult dose.
- D. Consider Diphenhydramine 1 mg/kg IV/IM to a maximum of 50 mg.
- E. Consider Albuterol 2.5 mg via nebulizer.
- F. If unable to secure patients airway or unable to ventilate with BVM after epinephrine has been administered cricothyrotomy may be required.

## Anaphylaxis & Allergic Reactions – 10.030

### **NOTES & PRECAUTIONS:**

- A. Allergic reactions, even systemic in nature, are not necessarily anaphylaxis. Treatment may not be indicated if only hives and itching are present.
- B. Epinephrine increases cardiac work load and may cause angina or AMI in some individuals.
- C. Common side effects of Epinephrine include anxiety, tremor, palpitations, tachycardia and headache particularly with IV administration.
- D. Epinephrine should not be given unless signs of cardiovascular collapse or respiratory distress are present.

### **KEY CONSIDERATIONS:**

Toxic exposure, insect bites, recent exposure to allergen, dyspnea or hives, abdominal cramps, known allergens, chest or throat tightness, swelling, numbness

**TREATMENT:**

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access. If systolic BP < 90 mmHg follow Shock Protocol.
- D. Remove jewelry and clothing that is smoldering or which is non-adherent to the patient.
- E. Cool burned areas (less than 10 minutes for large burns) then cover with sterile dressing. Discontinue cooling if patient begins to shiver. Attempt to leave unbroken blisters intact.
- F. Apply Carbon Monoxide (e.g. Rad-57) monitor if available.
- G. Treat pain per Pain Management protocol.
- H. If the patient has the following, transport to the Burn Center:
  - 1. Total burn that is 15% or more of body surface area.
  - 2. Full thickness burn greater than 5% of body surface area.
  - 3. Burns with inhalation injuries.
  - 4. Electrical burns
  - 5. Facial burns or burns to hands, feet, genitalia or circumferential burns.
  - 6. Burns in high risk patients (pediatrics, elderly, significant cardiac or respiratory problems)
  - 7. Trauma system patients with burns meeting the above criteria.
- I. If chemical burn:
  - 1. Consider Haz-Mat response.
  - 2. Protect yourself from contamination. (See Decontamination protocol)
  - 3. Flush contaminated areas with copious amounts of water.
  - 4. If chemical is dry, carefully brush off prior to flushing.
- J. If electrical burn:
  - 1. Apply sterile dressings to entry and exit wounds
  - 2. Treat any dysrhythmias per appropriate Cardiac Dysrhythmia protocol.
- K. If Cyanide Toxicity is suspected based on findings (soot in mouth, nose or oropharynx) and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:
  - 1. Administer Hydroxocobalamin (Cyanokit®) 5 g IV/IO as an infusion over 15 minutes and monitor for clinical response. Contact OLMC for advice regarding a second 5 g dose.
  - 2. If Hydroxocobalamin (Cyanokit®) is not available, then administer Sodium Thiosulfate 50 ml of 25% solution over 10-20 minutes. Do NOT administer Hydroxocobalamin (Cyanokit®) and Sodium Thiosulfate to the same patient.
  - 3. Treat other presenting symptoms per appropriate protocol.
  - 4. Initiate emergent transport to appropriate facility.

**PEDIATRIC PATIENTS:**

- A. Treat pain per Pain Management protocol.
- B. Consider possibility of non-accidental cause in children.
- C. Hydroxocobalamin dose for pediatric patients is 70 mg/kg IV/IO over 15 minutes. Do not exceed adult dosing. Contact OLMC for advice regarding second dose.

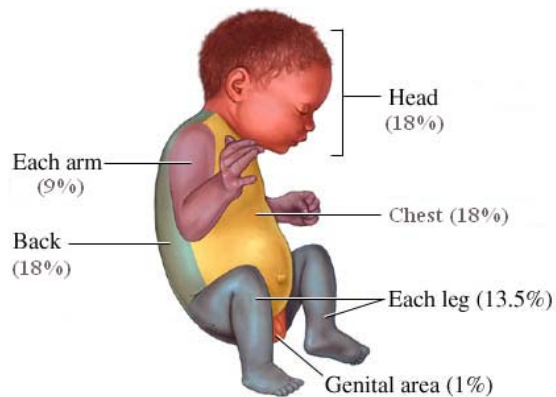
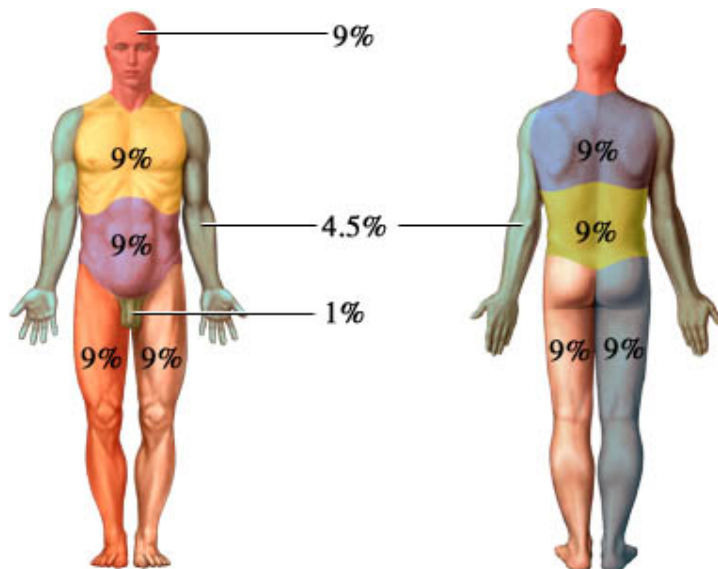
**NOTES & PRECAUTIONS:**

- A. Remove rings or other constricting items immediately.
- B. Be prepared to use RSI early to control airway if necessary.
- C. For firefighters, consider the potential for other traumatic injury or MI.

**KEY CONSIDERATIONS:**

Enclosed space, lung sounds, possibility of inhaled toxins, past medical history, CO/Cyanide poisoning, evidence of respiratory burns, extent of burns, explosion or trauma injuries

**RULE OF NINES:**



## Cardiac Arrest (AED/CPR) – 10.050

### CPR GUIDELINES

Maneuver	Adult Adolescent and older	Child 1 yr to adolescent	Infant Under 1 year of age
Airway	Head tilt-chin lift. Jaw thrust if suspected cervical trauma.		
Breathing: Without CPR	10 to 12 breaths/min (Approximate)	12 to 20 breaths/min (Approximate)	
Breathing: CPR with advanced airway	One breath every 6 – 8 seconds (8 to 10 breaths/min) asynchronous with chest compressions. About 1 sec/breath. Visible chest rise.		
Foreign Body – Conscious pt	<i>Abdominal thrusts (use chest thrusts in pregnant and obese patients or if abdominal thrusts are not effective)</i>	Back blows and chest thrusts	
Compression landmarks	Lower half of sternum between nipples		Just below nipple line (lower half of sternum)
Compression method	Heel of one hand, other hand on top	Heel of one hand, as for adults	2-3 fingers or 2 thumb- encircling hands
Compression depth	At least 2 inches	Approximately one-third anterior/posterior depth of chest. (Approx 2" in child and 1 ½" in infant)	
Compression rate	At least 100 per minute		
Compression- ventilation ratio w/o advanced airway	30:2 (one or two rescuers)	30:2 (single rescuer) 15:2 (two rescuers)	

### AED GUIDELINES

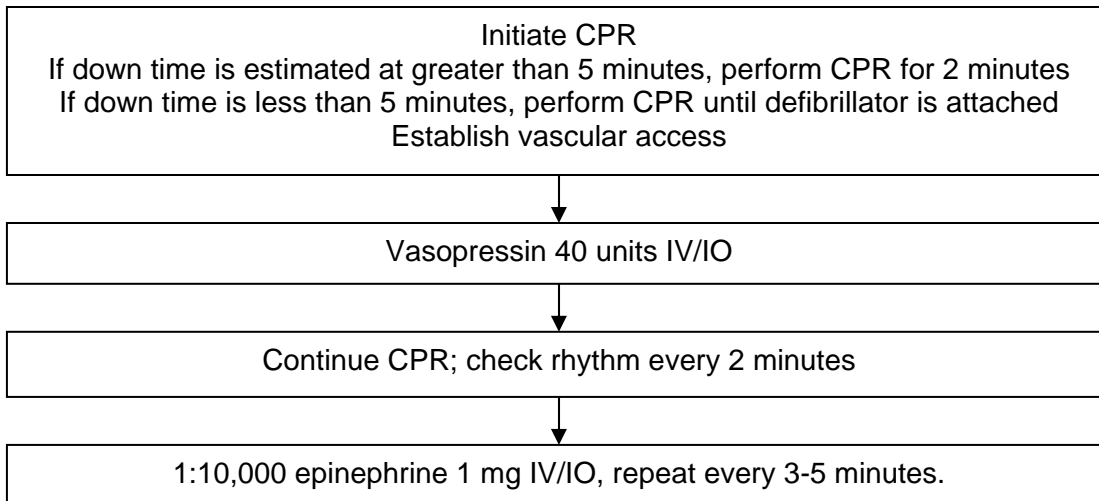
AED Defibrillation	Use adult pads, do not use child pads	Use pediatric dose-attenuator system for children and infants if available.
-----------------------	--	--

### NEONATAL GUIDELINES

Assisted ventilation should be delivered at a rate of 40-60 breaths/minute to achieve or maintain a heart rate > 100 bpm.  
The ratio of compressions to ventilations should be 3:1, with 90 compressions and 30 breaths to achieve approximately 120 events per minute.

## Cardiac Arrest (Asystole) – 10.050

### TREATMENT:



### PEDIATRIC PATIENTS:

- Begin CPR and airway management.
- Establish vascular access.
- Administer 1:10,000 epinephrine 0.01 mg/kg IV/IO, repeat every 3-5 minutes. If no IV access, give 1:1,000 epinephrine 0.1 mg/kg in 4 cc normal saline via ET (ET epinephrine should be considered a last resort after attempts at IV/IO have failed).
- Consider and treat other possible causes.

### NOTES & PRECAUTIONS:

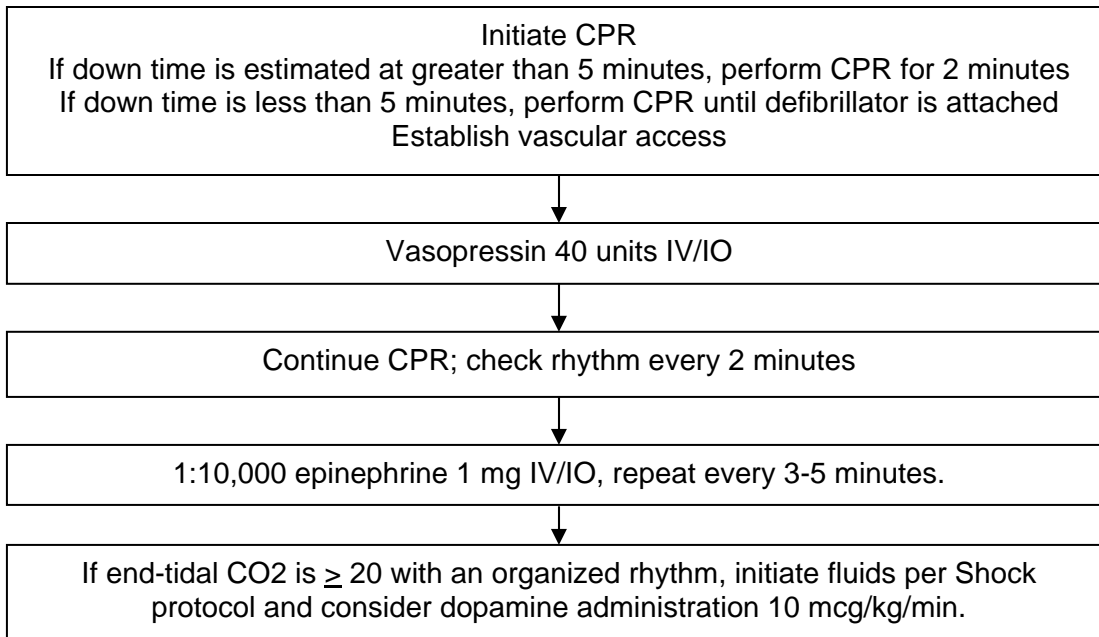
- If unwitnessed arrest, unknown downtime, and no obvious signs of death, proceed with resuscitation and get further information from family/bystanders.
- Contact OLMC for advice on continuing resuscitation.
- If history of traumatic event, consider Death in the Field protocol.
- Minimize interruptions to CPR when securing patient's airway.
- If patient has return of spontaneous circulation, start cooling per Induced Hypothermia protocol.

### KEY CONSIDERATIONS:

Consider and treat other possible causes:

- Acidosis - Sodium bicarbonate 1 mEq/kg IV.
- Cardiac tamponade – Initiate rapid transport.
- Hyperkalemia – Treat per Hyperkalemia protocol.
- Hypothermia – Treat per Hypothermia protocol
- Hypovolemia – Treat with fluids per Shock protocol.
- Hypoxia – Oxygenate and ventilate
- Pulmonary embolus – Initiate rapid transport.
- Tension pneumothorax – Needle decompression.
- Tri-cyclic antidepressant overdose – Sodium bicarbonate 1 mEq/kg IV

## TREATMENT:



## PEDIATRIC PATIENTS:

- A. Begin CPR and airway management.
- B. Establish vascular access.
- C. Administer 1:10,000 epinephrine 0.01 mg/kg IV/IO, repeat every 3-5 minutes. If no IV access, give 1:1,000 epinephrine 0.1 mg/kg in 4 cc normal saline via ET (ET epinephrine should be considered a last resort after attempts at IV/IO have failed).
- D. Consider and treat other possible causes.

## NOTES & PRECAUTIONS:

- A. Minimize interruptions to CPR when securing patients airway.
- B. If patient has return of spontaneous circulation, start cooling per Induced Hypothermia protocol.

## KEY CONSIDERATIONS:

Consider and treat other possible causes:

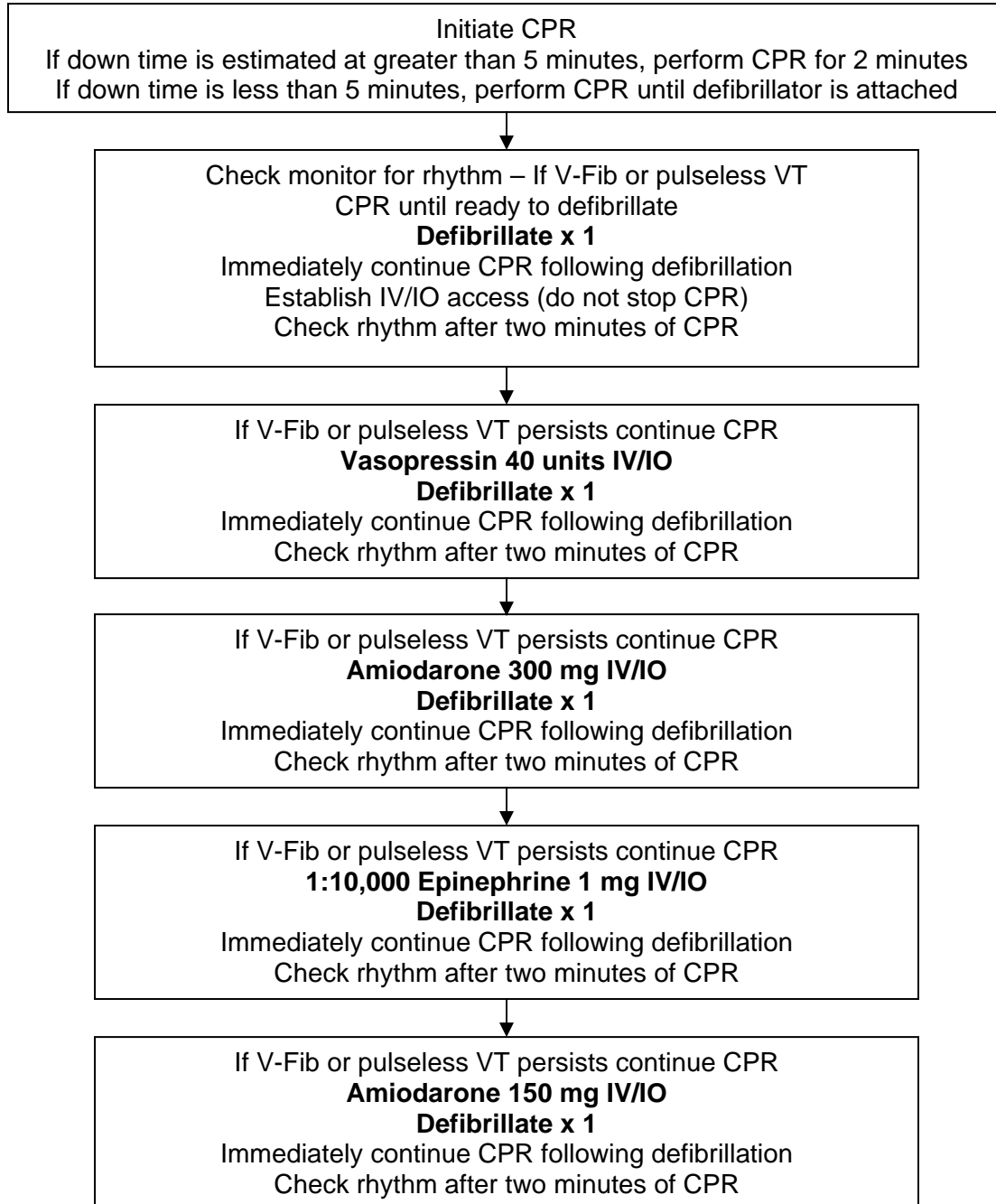
- Acidosis - Sodium bicarbonate 1 mEq/kg IV.
- Cardiac tamponade – Initiate rapid transport.
- Hyperkalemia – Treat per Hyperkalemia protocol.
- Hypothermia – Treat per Hypothermia protocol
- Hypovolemia – Treat with fluids per Shock protocol.
- Hypoxia – Oxygenate and ventilate
- Pulmonary embolus – Initiate rapid transport.
- Tension pneumothorax – Needle decompression.
- Tri-cyclic antidepressant overdose – Sodium bicarbonate 1 mEq/kg IV

## Cardiac Arrest (V-Fib / Pulseless VT) – 10.050

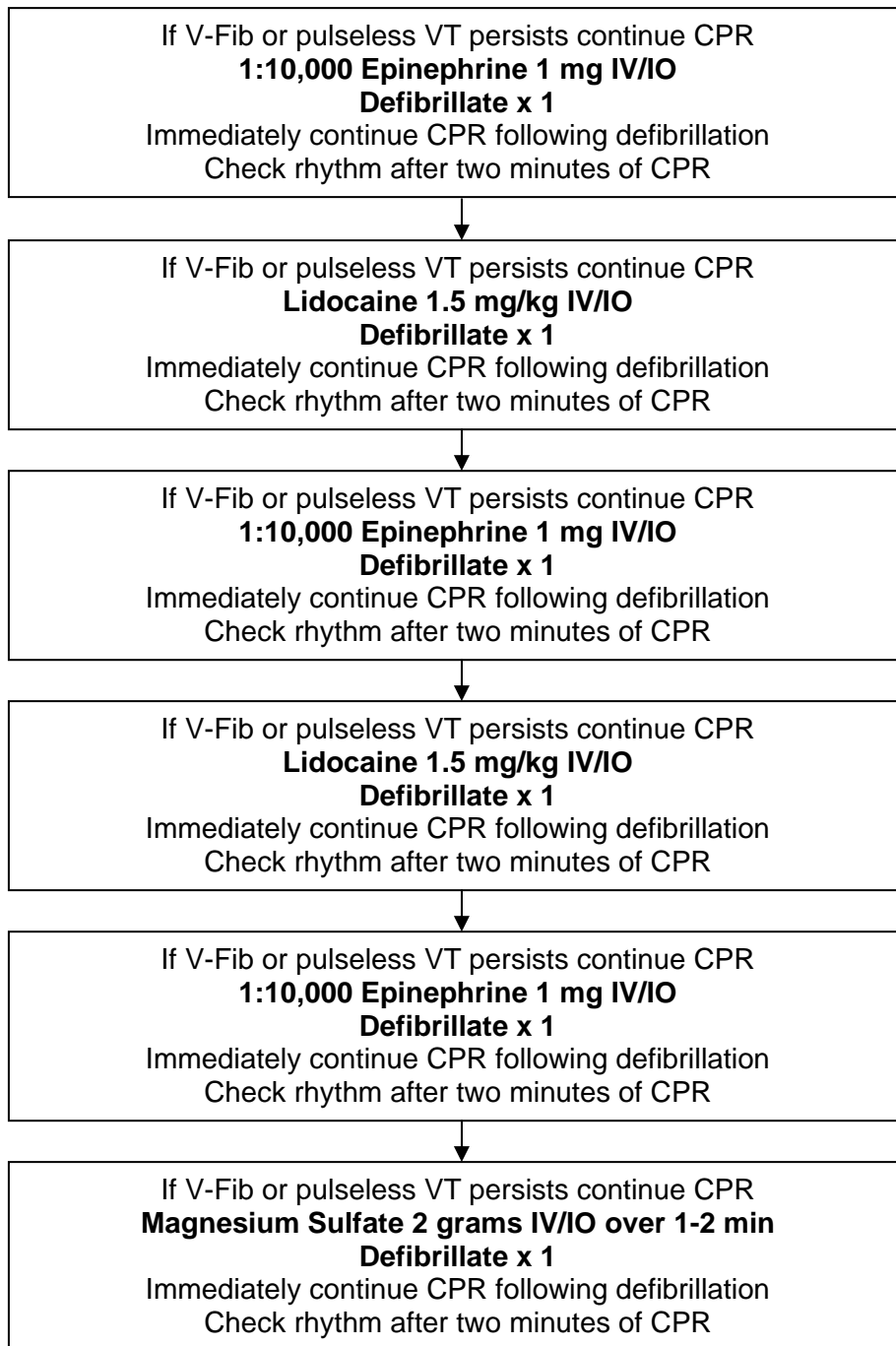
### TREATMENT:

Flow of algorithm presumes that the initial rhythm is continuing. If the rhythm changes, begin the appropriate algorithm. Interruptions to CPR should be avoided. When necessary they should be less than 10 seconds. Follow manufacturer's recommendations for defibrillation settings:

- **Medtronic Lifepak® – 200j, 300j, 360j and then repeat at 360j as needed.**
- **Philips MRX® – 150j all shocks.**
- **Zoll E-Series® – 120j, 150j, 200j, and then repeat at 200j as needed.**



## Cardiac Arrest (V-Fib / Pulseless VT) – 10.050



## Cardiac Arrest (V-Fib / Pulseless VT) – 10.050

### PEDIATRIC PATIENTS:

Follow adult algorithm flow. Use the following dosing:

- Defibrillation:
  1. First shock 2j/kg.
  2. Subsequent shocks, 4j/kg as needed.
- Drugs:
  1. Epinephrine
    - a) 1:10,000 – 0.01 mg/kg IV/IO
    - b) 1:1,000 – 0.1 mg/kg ET in 4 cc Normal Saline. (ET epinephrine in pediatric patients should be considered a last resort after attempts at IV/IO have failed)
  2. Amiodarone – 5 mg/kg IV/IO. May repeat once with 2.5 mg/kg IV/IO.
  3. Lidocaine – Follow adult dosing.
  4. Sodium Bicarbonate - Follow adult dosing. For children less than 10 kg (1 yr), dilute by one-half with Normal Saline prior to administration.
  5. Magnesium Sulfate – 25 mg/kg IV/IO

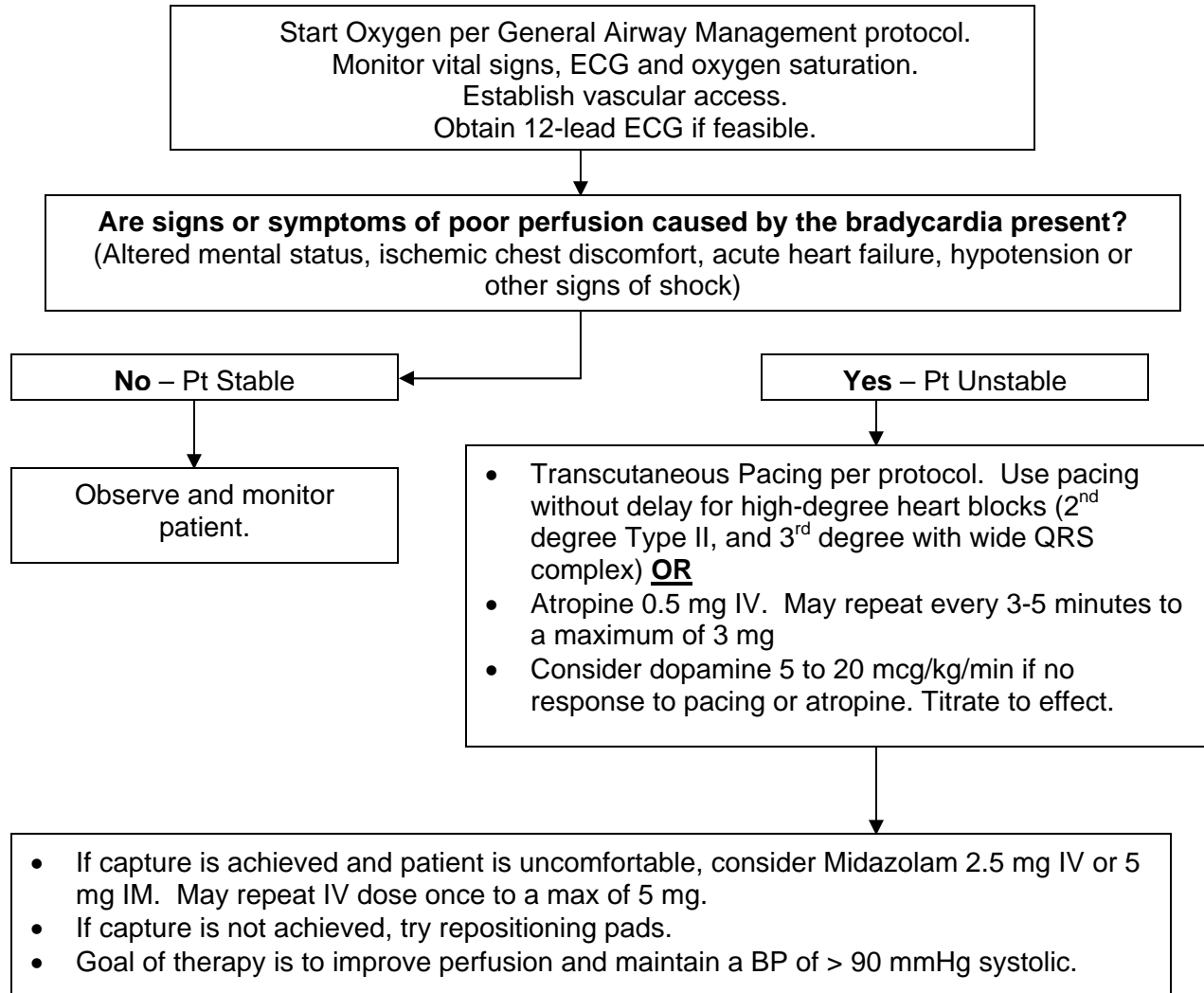
NOTE: Vasopressin not used in Pediatric algorithm

### NOTES & PRECAUTIONS:

- A. Airway should be addressed with minimal interruption to CPR. Ventilation rate should be 8-10 breaths per minute.
- B. If the initial rhythm is Torsades de Pointes, give Magnesium Sulfate 2 grams IV/IO.
- C. After successful resuscitation:
  1. With no antidysrhythmic – Give Lidocaine bolus 1.5 mg/kg and re-bolus with Lidocaine 0.75 mg/kg every ten minutes.
  2. If Amiodarone was the last antidysrhythmic given – Re-dose after 30 minutes with Amiodarone 150 mg over 10 minutes.
  3. If Lidocaine or Magnesium was the last antidysrhythmic given – Give Lidocaine 0.75 mg/kg every 10 minutes.
- D. Be cautious with the administration of Lidocaine or Amiodarone if any of the following:
  1. Systolic BP is less than 90 mmHg
  2. Heart rate is less than 50 beats per minute
  3. Periods of sinus arrest are present
  4. Any AV block is present
- E. Sodium Bicarbonate is not recommended for the routine cardiac arrest sequence, but should be used early in cardiac arrest of known cyclic antidepressant overdose or in patients with hyperkalemia. It may also be considered after prolonged arrest. If used, administer 1 mEq/kg IV/IO. It can be repeated at 0.5 mEq/kg every 10 minutes.
- F. If patient has return of spontaneous circulation, start cooling per Induced Hypothermia protocol.

# Cardiac Dysrhythmias (Bradycardia) – 10.060

## HEART RATE < 50 BPM AND INADEQUATE FOR CLINICAL CONDITION



### NOTES & PRECAUTIONS:

- Bradycardia may be protective in the setting of cardiac ischemia and should only be treated if associated with serious signs and symptoms of hypoperfusion.
- Most pediatric bradycardia is due to hypoxia.
- Hyperkalemia may cause bradycardia. If the patient has a wide complex bradycardia with a history of renal failure, muscular dystrophy, paraplegia, crush injury or serious burn > 48 hours prior, consider treatment per Hyperkalemia protocol.
- Immediate transcutaneous pacing can be considered in unstable patients when vascular access is not available.
- Transcutaneous pacing is not useful in asystole.

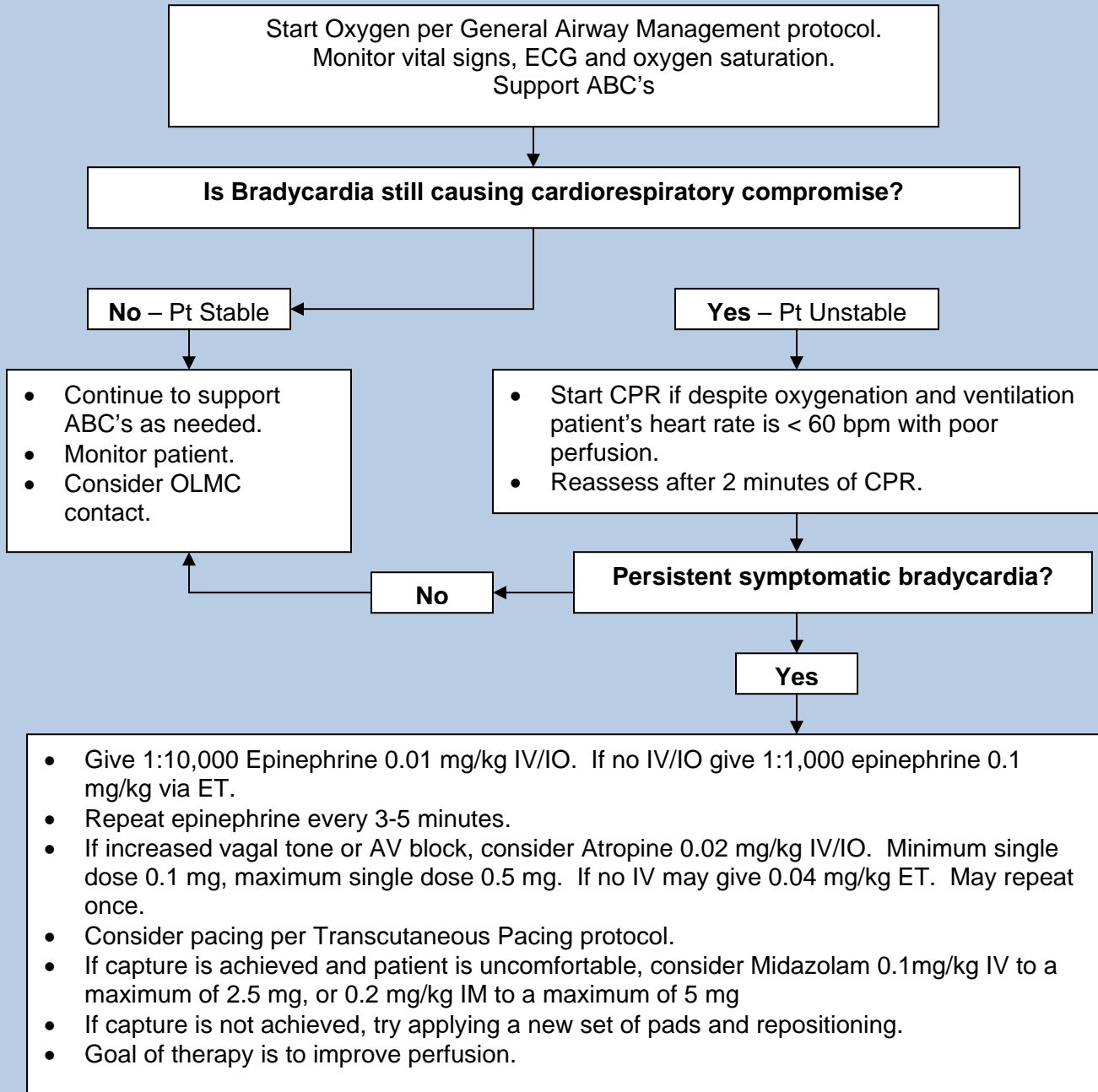
### KEY CONSIDERATIONS:

Pain evaluation (PQRST), nausea and vomiting, drug overdose, speed of onset, previous MI, angina, fever or recent illness, medical history, medications.

# Cardiac Dysrhythmias (Bradycardia) – 10.060

## PEDIATRIC PATIENTS:

### BRADYCARDIA WITH A PULSE CAUSING CARDIORESPIRATORY COMPROMISE



## Cardiac Dysrhythmias (PVCs) – 10.060

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access.
- D. Administer Lidocaine:
  1. 1.5 mg/kg IV over 1-2 minutes.
  2. If no change, give 0.75 mg/kg every 10 minutes up to a maximum of 3 mg/kg.
  3. When PVC's are suppressed, continue with Lidocaine 0.75 mg/kg every 10 minutes.
  4. All doses after the initial bolus, must be reduced to one-quarter (0.375 mg/kg) of the initial bolus in patients with congestive heart failure, shock, hepatic disease, or in patients > 70 years of age.

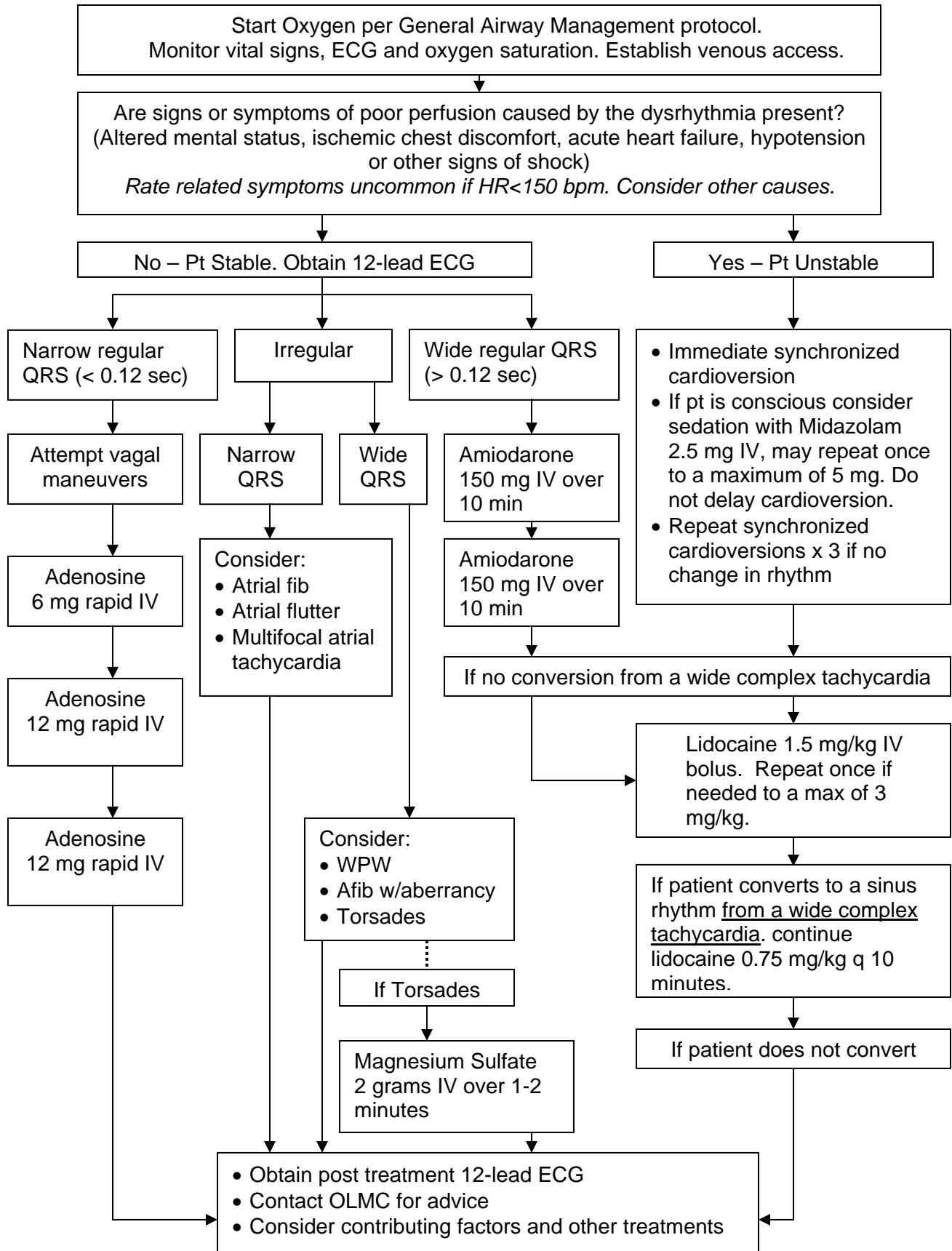
### NOTES & PRECAUTIONS:

- A. PVC's should be treated only in the setting of an acute ischemic event (i.e. chest pain, couplets, R on T, runs of VT)
- B. Lidocaine should not be used without OLMC direction if the following are present:
  1. Systolic BP is less than 90 mmHg.
  2. Heart rate is less than 50 beats per minute.
  3. Periods of sinus arrest are present.
  4. Second or Third degree heart block is present.

### KEY CONSIDERATIONS:

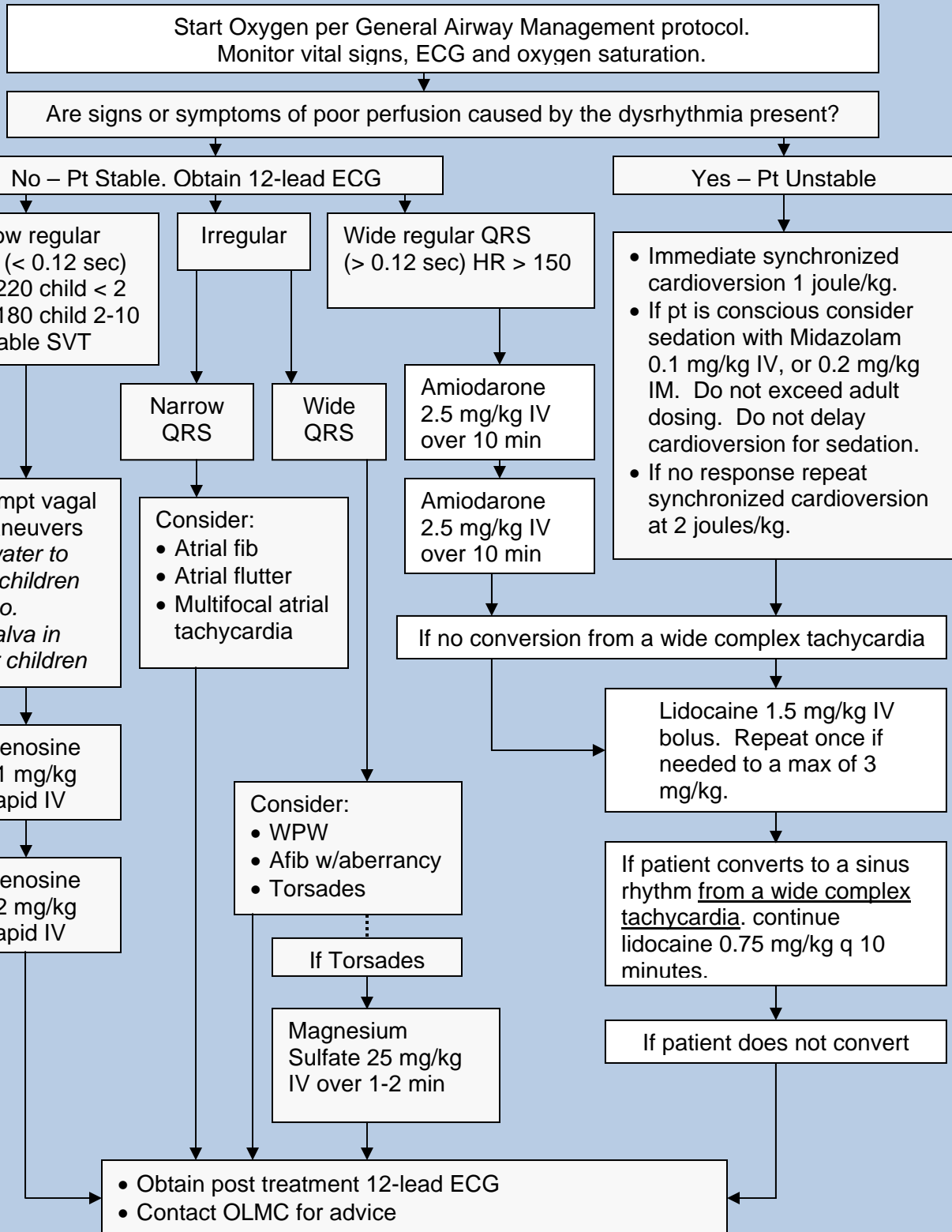
Medical history, medications, shortness of breath, angina, palpitations, does pulse match ECG?

# Cardiac Dysrhythmias (Tachycardia) – 10.060



# Cardiac Dysrhythmias (Tachycardia) – 10.060

## PEDIATRIC PATIENTS:



If patient is not symptomatic with a narrow regular QRS (< 0.12 sec) and has a HR < 220 (child less than 2) or HR < 180 (child 2-10) consider Sinus Tachycardia and treat possible causes (see Notes & Precautions below).

## Cardiac Dysrhythmias (Tachycardia) – 10.060

### NOTES & PRECAUTIONS:

- A. In stable wide complex tachycardia which is monomorphic, consider adenosine if SVT with aberrancy is suspected.
- B. If the patient is asymptomatic, tachycardia may not require treatment in the field. Continue to monitor the patient for changes during transport. The acceptable upper limit for heart rate for sinus tachycardia is 220 minus the patient's age.
- C. Other possible causes of tachycardia include:
  1. Acidosis
  2. Hypovolemia
  3. Hyperthermia/fever
  4. Hypoxia
  5. Hypo/Hyperkalemia
  6. Hypoglycemia
  7. Infection
  8. Pulmonary embolus
  9. Tamponade
  10. Toxic exposure
  11. Tension pneumothorax
- D. All lidocaine doses after the initial bolus must be reduced to one-quarter (0.375 mg/kg) of the initial dose in patients with CHF, shock, hepatic disease, or in patients greater than 70 years old.
- E. If pulseless arrest develops, follow Cardiac Arrest protocol.
- F. All doses of adenosine should be reduced to one-half (50%) in the following clinical settings:
  1. History of cardiac transplantation.
  2. Patients who are on carbamazepine (Tegretol) and dipyridamole (Persantine, Aggrenox).
  3. Administration through any central line.
- G. Adenosine should not be given to patients with asthma.

### KEY CONSIDERATIONS:

Medical history, medications, shortness of breath, angina or chest pain, palpitations, speed of onset

### HEART MONITOR ADULT SYNCHRONOUS CARDIOVERSION SETTINGS

- Medtronic Lifepak<sup>®</sup> – 100j, 200j, 300j, 360j
- Philips MRX<sup>®</sup> – 100j, 120J, 150J, 150J
- Zoll E-Series<sup>®</sup> – 70j, 120j, 150j, 200j

## Chest Pain/Acute Coronary Syndrome – 10.070

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. If an acute ischemic event is suspected, obtain 12-lead ECG if available. This may be done concurrently with other treatment and should not delay treatment or transport.
- D. Establish vascular access. This should be done prior to nitroglycerine administration in patients who have not taken nitroglycerine previously or who have a potential for hemodynamic instability.
- E. Administer aspirin 324 mg orally unless contraindicated.
- F. If blood pressure is > 100 mmHg systolic, administer nitroglycerine 0.4 mg sublingual. Repeat every 5 minutes until chest pain is relieved as long as systolic BP remains > 100 mmHg.
- G. For pain unrelieved after three doses of nitroglycerine, consider analgesia per Pain Management protocol. Nitroglycerin may be continued for strong suspicion of acute coronary syndrome.
- H. Treat any dysrhythmias per appropriate Cardiac Dysrhythmia protocol.

### PEDIATRIC PATIENTS:

- A. Consider pleuritic causes or trauma.
- B. Contact OLMC for advice.

### NOTES & PRECAUTIONS:

- A. DO NOT DELAY ADMINISTRATION OF ASPIRIN TO OBTAIN 12-LEAD ECG.
- B. Nitroglycerine administration to patients with an acute inferior myocardial infarction should be performed with close monitoring of vital signs and rhythm. Nitroglycerine in these patients may result in symptomatic hypotension and/or shock which should be treated with fluids and positioning.
- C. Do not administer nitroglycerin without OLMC if patient has taken Viagra or other similar drugs in the last 24 hours, or Cialis within the last 48 hours.
- D. Do not administer aspirin in patients who have an allergy or sensitivity to aspirin, who have a history of an active bleeding disorder, GI bleed or ulcer, or who have a suspected aortic dissection.

### FIELD IDENTIFIED ST-ELEVATION MI (STEMI)

**Indication:** 12-lead ECG with:

- Automatic ECG interpretation of “Acute MI Suspected”
- Paramedic interpretation of probable STEMI

**Action:**

- Rapid transport to destination hospital ED with interventional capability
- Early notification of destination and advise receiving hospital of “STEMI patient”.
- If available, transmit 12-lead ECG to destination hospital.
- Non diagnostic ECG’s with potential “imitators” of ACS or ECG’s that are clinically concerning should also be transmitted **without** STEMI activation. If transmission is unavailable, describe ECG to receiving hospital or contact OLMC. These may include:  
Left or right bundle branch block, left ventricular hypertrophy, SVT with aberrancy, paced rhythms, pericarditis, benign early repolarization, and digitalis effects.

## Crush Injury / Entrapment – 10.075

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access.
- D. Protect patient from environment (rain, snow, direct sun...). If applicable, begin warming methods to prevent hypothermia. (warm blankets, heated air with blower, warm IV fluids)
- E. Plan extrication activities to allow for periodic patient assessment. Plan for occasional extrication equipment “shut down” to assess vital signs.
- F. Carefully track vitals, IV fluids, and medications during extrication.
- G. Evaluate degree of entrapment and viability of extremities. (absent pulse, blanched skin, capillary refill, diminished sensation, extremely cold to the touch)  
If one or more extremities are trapped and circulation is compromised or absent consider the placement of constricting bands to inhibit rapid venous return to the central circulatory system of potassium, lactic acid, and myoglobin upon extrication. Contact Trauma Physician through OLMC for direction.
- H. If extrication of a limb will be prolonged, direct mechanical crush injuries are present (tissue is crushed), and patient’s condition is deteriorating, strongly consider calling OLMC to arrange on-scene amputation.
- I. Carefully assess collateral injuries that may have occurred during event.
- J. If patient is trapped in a heavy dust environment, consider methods to provide filtered oxygen to the patient. If patient is in respiratory distress, consider dust impaction injuries and prepare to administer nebulized Albuterol per OLMC direction.
- K. During extrication of a severely trapped patient who is at risk for crush syndrome, administer 1000 - 2000 cc NS via IV bolus, then maintain at 500 cc/hr.
- L. Consider the administration of Sodium Bicarbonate prior to release to buffer acid release from anaerobic metabolism. Contact Trauma Physician through OLMC for advice.

### NOTES & PRECAUTIONS:

- A. Do not allow any personnel into extrication area (inner circle) without proper protective equipment and thorough briefing to include evacuation signal.
- B. Notify the receiving Trauma Center through OLMC early in the extrication process to facilitate receiving advanced medical resources if needed.
- C. Technical Rescue Team Leader should coordinate all extrication activities, especially the release of patient, with Medical Branch Director.
- D. Keep patient well-hydrated and warm during extrication efforts.
- E. Constantly evaluate the risks associated with your position, and the possibility of complicating factors (HazMat, wind, rain or runoff, gas leaks, etc...).

### KEY CONSIDERATIONS:

Previous medical history, current medications, length and degree of entrapment, use of technical rescue, length of extrication, alternate treatment plans

### TREATMENT:

- A. In order to decrease intraocular pressure, patients should be transported in a sitting position of at least 30 degrees unless contraindicated.
- B. Monitor vital signs.
- C. Treat specific injuries as follows:
  1. Chemical Burns
    - a. Administer proparacaine.
    - b. Irrigate from the center of the eye towards the eyelid with lactated ringers (preferred), isotonic saline, or tap water for at least 30 minutes.
    - c. Do not attempt to neutralize acids or bases.
  2. Direct Trauma to Eye (Suspected Rupture/Penetration of Globe)
    - a. Protect the affected eye and its contents with a hard shield or similar device and cover the other eye.
    - b. Follow Pain Management Protocol as indicated and consider ondansetron per Nausea and Vomiting protocol.
  3. Foreign body on outer eye
    - a. Do not wipe eye.
    - b. Administer proparacaine.
    - c. Consider irrigation.

### PROPARACAINE ADMINISTRATION:

Instill one drop in the affected eye. If there is no effect within one minute, three additional drops may be instilled at one-minute intervals. For transports longer than 15 minutes, if eye pain returns, 1-4 additional drops may be instilled to continue anesthetic effect.

### NOTES & PRECAUTIONS:

- A. Document new onset of blurring, double vision, perceived flashes of light or other visual changes.
- B. Contact lenses should be removed, if possible.

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access.
- D. If hyperkalemia is suspected based on history and physical findings:
  1. Administer 10% calcium gluconate 10 ml slow IV/IO over 5 – 10 minutes in a proximal port.
  2. If no change in rhythm following Calcium administration and transport time is prolonged consider alternate therapy per OLMC contact:
    - a) Glucose and regular insulin if available
    - b) High dose albuterol (10 mg by nebulizer)
    - c) Sodium bicarbonate 50 mEq IV.

### NOTES & PRECAUTIONS:

- A. Treatment is going to be based on patient history. Renal failure may elevate blood potassium levels (hyperkalemia) causing bradycardia, hypotension, weakness, weak pulse and shallow respirations. Other patients who are predisposed to hyperkalemia are those who have muscular dystrophy, paraplegia/quadriplegia, crush injury, or patients who have sustained serious burns > 48 hours. A 12-lead ECG may be helpful.
- B. ECG changes that may be present with hyperkalemia include
  1. Peaked T waves.
  2. Lowered P wave amplitude or no P waves.
  3. Prolonged P-R interval (> 0.20 seconds).
  4. Second degree AV blocks.
  5. Widened QRS complex.
- C. DO NOT mix Sodium bicarbonate solutions with calcium preparations. Slowly flush remaining calcium gluconate from the catheter prior to administering sodium bicarbonate.

### KEY CONSIDERATIONS:

Previous medical history, medications and allergies, trauma

### PEDIATRIC PATIENTS:

Calcium gluconate dosing is 0.5 ml/kg slow IV/IO over 5 – 10 minutes. Max dose 10 ml.

### **TREATMENT:**

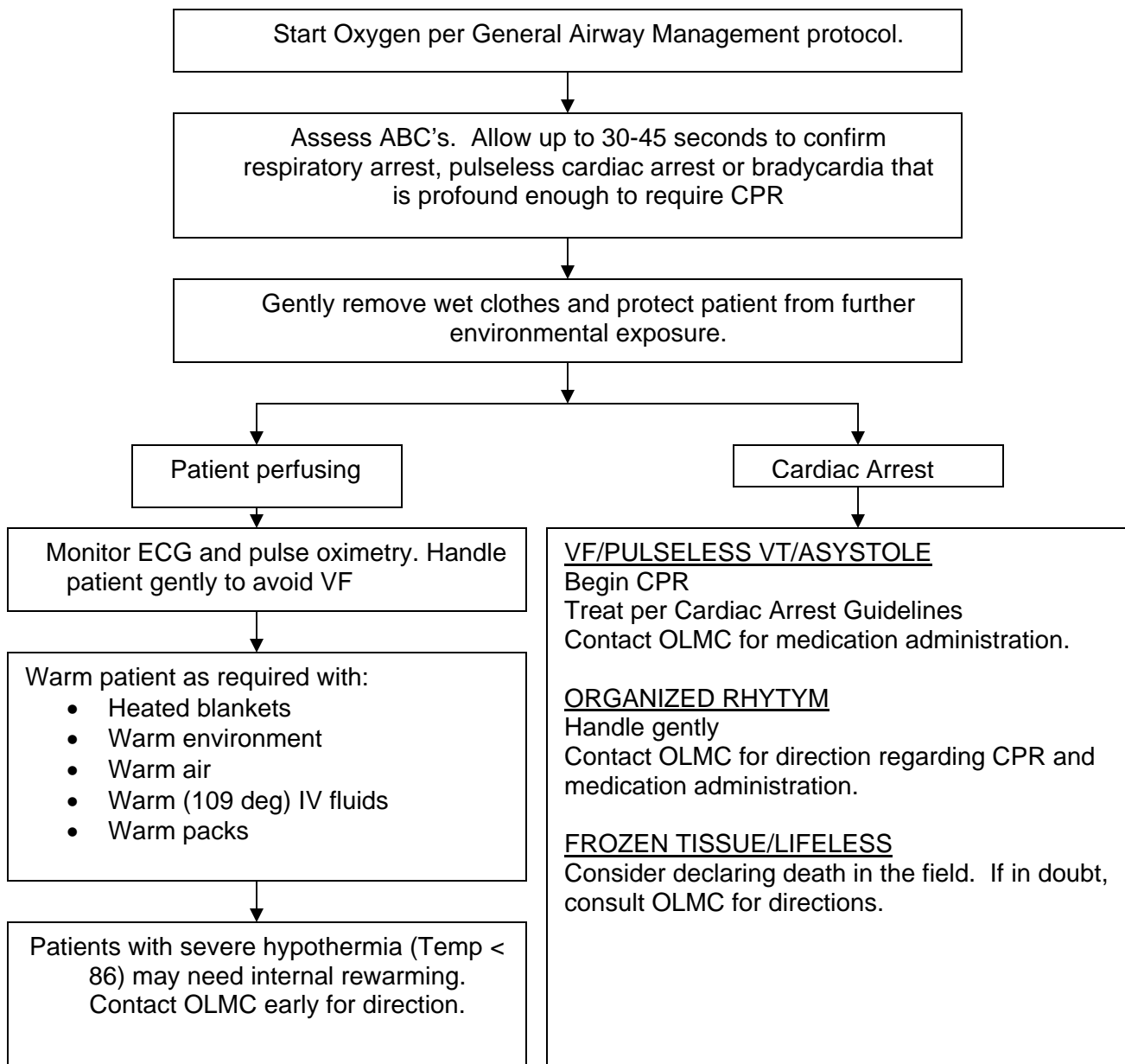
- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access as needed.
- D. Remove clothing and begin cooling measures that maximize evaporation. (Spray bottle with tepid water, cool wipes, fans)
- E. If blood pressure is less than 90 mmHg systolic, treat per Shock Protocol.

### **NOTES & PRECAUTIONS:**

- A. Heat stroke is a medical emergency. Differentiate from heat cramps or heat exhaustion. Be aware that heat exhaustion can progress to heat stroke.
- B. Wet sheets over a patient without good airflow will increase temperature and should be avoided.
- C. Do not let cooling measures in the field delay transport.
- D. Suspect hyperthermia in patients with altered mental status or seizures on a hot, humid day.
- E. Consider sepsis and/or contagious disease. Examine patient for rashes or blotches on the skin or nuchal rigidity.

### **KEY CONSIDERATIONS:**

History of onset, sweating, patient's temperature, recent infection/illness, medical history, medications and allergies



## NOTES & PRECAUTIONS:

- At-risks groups for hypothermia include trauma victims, alcohol and drug abuse patients, homeless persons, elderly, low income families, infants and small children, and entrapped patients.
- Hypothermia may be preceded by other disorders (alcohol, trauma, OD) look for and treat any underlying conditions while treating the hypothermia.
- The hypothermic heart may be unresponsive to cardiovascular drugs, pacer stimulation or defibrillation.

## KEY CONSIDERATIONS:

Submersion, cool rainy weather, wind chill, prolonged exposure

## Musculoskeletal Extremity Trauma – 10.100

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access if indicated.
- D. Control external bleeding with direct pressure, elevation, hemostatic dressings, and/or tourniquet.
  - **Fracture, Sprain or Dislocation**
    1. Check for pulses, sensation and movement distal to the injury site before and after immobilization.
    2. Splint fractures/dislocations in the position found. If PMS is compromised distal to fracture consider applying axial traction to bring extremity into normal anatomical position. If patient complains of increase in pain or resistance is felt, stop and immobilize. If PMS is compromised distal to dislocation, contact OLMC.
    3. If fracture/dislocation is open, place a moist sterile dressing over wound and cover with a dry dressing.
    4. Elevate and/or place cold packs over fracture site if time/injuries allow.
    5. Apply traction splint to femur shaft fractures.
    6. For pelvic fractures, utilize pelvic sling and secure patient to a backboard to minimize movement and blood loss.
  - **Amputation**
    1. Cover stump or partial amputation with moist sterile dressing.
    2. Splint partial amputations in anatomical position to avoid torsion and angulation.
    3. Wrap amputated part in a sterile dressing, and place in a plastic bag to keep dry. Place bag in ice water if available.
    4. If transport time is prolonged (extended extrication, etc.) consider sending the amputated part ahead to be prepared for reimplantation.
- E. Treat pain per Pain Management protocol.

### PEDIATRIC PATIENTS:

- A. Treat pain per Pain Management protocol.
- B. Consider non-accidental trauma as a cause of injury.

### KEY CONSIDERATIONS:

Mechanism of injury, previous medical history, medications and allergies, time of injury, quality of distal pulses, capillary refill

## Musculoskeletal Spinal Injury – 10.100

### TREATMENT:

- A. Provide initial cervical spine immobilization using manual in-line stabilization.
- B. Immobilize using a long spine board if the patient has a mechanism with the potential for causing spinal injury and meets ANY of the following clinical criteria:
  1. Altered mental status
  2. Evidence of intoxication
  3. Distracting pain/injury (extremity fracture, drowning, etc.)
  4. Neurological deficit (numbness, tingling, paralysis).
  5. Spinal pain or tenderness.
  6. Distracting situation (communication barrier, emotional distress, etc.)
- C. Complete a secondary exam to include serial neurological status after immobilization.
- D. Treat pain per Pain Management protocol.

### PEDIATRIC PATIENTS:

If using an adult backboard:

- a. Children may require extra padding under the upper torso to maintain neutral cervical alignment.
- b. Consider using a short-spine device (OSS, KED) to immobilize the patient prior to placing on the backboard.

### NOTES & PRECAUTIONS:

- A. If any immobilization techniques cause an increase in pain or neurological deficits, immobilize patient in the position found or position of greatest comfort.
- B. Carefully assess the patient's respiratory status during transport. Loosen straps as needed to avoid respiratory compromise.
- C. Comorbid age factors (< 12 or > 60 yrs) may impact the EMT's ability to assess the patient's perception and communication of pain. A conservative approach to immobilizing these patients is strongly recommended.
- D. Patients in the third trimester of pregnancy should have the right side of the backboard elevated six inches.
- E. Pad backboards for all inter-facility transports. If feasible, especially in prolonged scene transports, pad backboards.
- F. If sports injury, immobilize patient per Sports Equipment Removal protocol.

### KEY CONSIDERATIONS:

Mechanism of injury, loss of consciousness, medications and allergies, medical history, neurological deficits, PMS before and after immobilization, pain or tenderness

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Start IV if needed; if shock syndrome is present follow **Shock** protocol.
- D. Consider fluid challenge in patients exhibiting signs of dehydration.
- E. Consider offering patient an isopropyl alcohol swab and allowing the patient to self-administer the swab by inhalation. Emphasize slow deep inhalation. May be repeated up to 2 times (total of 3 administrations) but should not delay the administration of ondansetron.
- F. Give 8 mg ondansetron orally dissolving tablets (Zofran® ODT) or 4 mg ondansetron slow IV push over 2 minutes, or 4mg IM.
  1. If nausea and/or vomiting are inadequately controlled after 10 minutes, may repeat ondansetron once.
  2. If vomiting persists administer droperidol 0.625mg IV (0.25 ml)
- G. If patient continues to vomit administer fluid challenge and consider other causes.

### PEDIATRIC PATIENTS:

- A. Ondansetron use in patients under 2 years of age requires OLMC consultation except for children in spinal immobilization or children receiving chemotherapy.
- B. For children 2-12 years of age, administer one (1) 4mg ondansetron orally dissolving tablet (Zofran® ODT) or administer ondansetron 0.1mg/kg via slow IV push over 2 minutes up to a total maximum IV dose of 4mg. Consider IM at same dose if unable to start IV and ODT tablet is contraindicated.

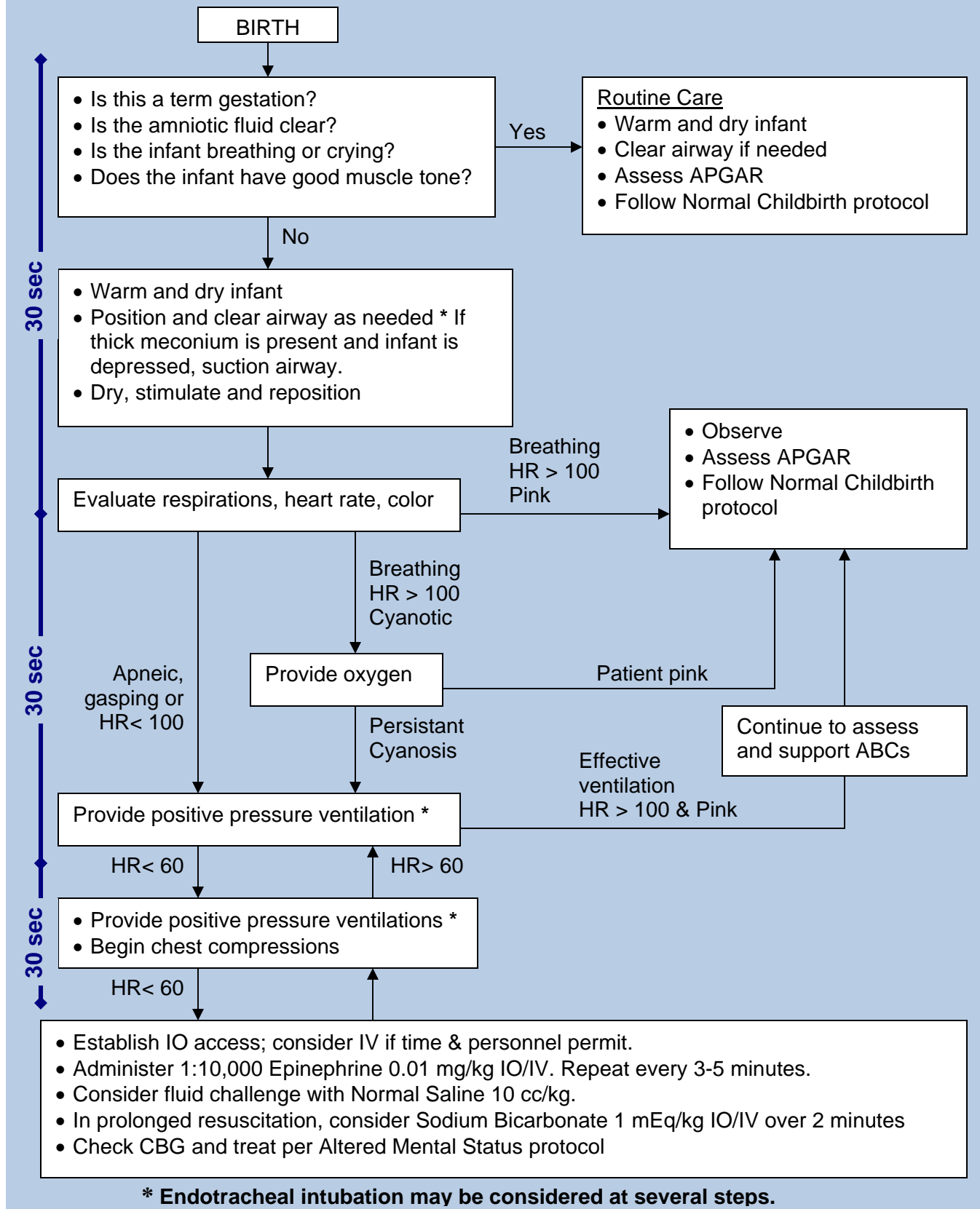
### NOTES & PRECAUTIONS:

- A. Do not administer ondansetron (Zofran®) to patients with a hypersensitivity to the drug or other 5-HT<sub>3</sub> type serotonin receptor agonists (e.g., dolasetron [Anzemet®] and granisetron [Kytril])
- B. Do not administer alkaline medications or preparations in the same IV as ondansetron as it may cause precipitation.

### KEY CONSIDERATIONS:

Vomiting blood or bile, complaint of nausea, medications and allergies, pregnancy, abdominal pain or trauma, diarrhea, head trauma, orthostatic vital signs.

# Neonatal Resuscitation – 10.120



## NOTES & PRECAUTIONS:

- A. Do not use Atropine in neonatal resuscitation.
- B. If meconium is lightly stained and infant is vigorous (strong respiratory effort, good muscle tone, heart rate > 100 bpm) endotracheal suctioning should not be performed.
- C. An infant may need resuscitation if intrapartum risk factors for asphyxia are present (prolapsed cord, painful bleeding, prolonged rupture of membranes, maternal fever, multiple births, abnormal presentation, maternal hypotension or seizure)

## KEY CONSIDERATIONS:

Fetal presentation, recent trauma, Maternal health/risk factors, Maternal medications, previous birth difficulties, APGAR

APGAR SCORE:	0	1	2
Appearance	Blue/Pale	Body pink, blue extremities	Completely pink
Pulse	Absent	Slow (< 100 bpm)	≥ 100 bpm
Grimace	No response	Grimace	Cough or sneeze
Activity	Limp	Some flexion	Active motion
Respirations	Absent	Slow, irregular	Good, crying

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access as time allows.
- D. Normal Childbirth
  1. Guide/control but do not hurry or retard delivery.
  2. Check for cord around neck and remove if present.
  3. Suction mouth, then nose with bulb syringe after head delivers.
  4. Clamp and cut cord and dry infant. Keep infant level with mother's heart until cord is cut.
  5. If child does not need treatment, place on mother's chest and cover to maintain warmth.
  6. Assess APGAR at one and five minutes after birth.
  7. If infant needs resuscitation, follow Neonatal Resuscitation protocol.
  8. Massage uterus to encourage contraction and prevent bleeding. Do not delay transport to deliver the placenta.
- E. Arm or Leg Presentation
  1. Place mother in knee-chest position and transport immediately to nearest hospital.
  2. Call OLMC early.
- F. Breech Presentation (Buttocks first)
  1. If delivery is imminent, prepare the mother as usual and allow the buttocks and trunk to deliver spontaneously.
  2. Support the body while the head delivers.
  3. If the head does not deliver within three minutes suffocation can occur. Place a gloved hand into the vagina to keep the vaginal wall away from the baby's face. Inserting a finger into the infant's mouth and gently tilting the head toward the chest can sometimes ease delivery.
  4. If child does not deliver, transport mother in knee-chest position.
- G. Prolapsed Cord
  1. Place mother in knee-chest position or with hips elevated on pillows.
  2. With a gloved hand gently attempt to push the baby back up the vagina several inches. Do not attempt to push the cord up.
  3. Transport immediately to the nearest hospital.
- H. Toxemia of Pregnancy (Eclampsia)
  1. Treat seizures per Seizure protocol.
  2. Contact OLMC for use of Magnesium Sulfate (normal dose is 4 grams IV infused over 10 minutes).
- I. Abtupto Placenta/Placenta Previa
  1. Treat per Shock Protocol if necessary.
  2. Transport immediately to the nearest hospital.
  3. Contact OLMC early.

## OB/GYN & Childbirth Emergencies – 10.130

### NOTES & PRECAUTIONS:

- A. If thick meconium is present, follow Suctioning procedure. Contact OLMC early for advice.
- B. Always consider the possibility of ectopic pregnancy in a woman of child bearing age (13 – 55) with abdominal pain or vaginal bleeding.
- C. Patients > 20 weeks may still be transported to a hospital who is on divert if the hospital's Labor & Delivery department will take the patient directly. Contact the destination hospital.

### KEY CONSIDERATIONS:

Due date/prenatal care, last menstrual period, previous childbirth history, single or multiple birth, fetal heart tones, ruptured membranes, vaginal bleeding, contractions, cramping, edema or hypertension, abdominal pain, seizures

<b>APGAR SCORE:</b>	<b>0</b>	<b>1</b>	<b>2</b>
Appearance	Blue/Pale	Body pink, blue extremities	Completely pink
Pulse	Absent	Slow (< 100 bpm)	≥ 100 bpm
Grimace	No response	Grimace	Cough or sneeze
Activity	Limp	Some flexion	Active motion
Respirations	Absent	Slow, irregular	Good, crying

## TREATMENT:

- A. For acute pain and uncontrolled chronic pain:
- B. Consider oxygen per General Airway Management protocol.
- C. Monitor vital signs and level of consciousness, consider ECG monitor.
- D. Establish venous access if indicated. Determine location of pain and severity using numeric scale (1-10) or Faces scale.
- E. Consider and treat underlying cause of pain.
- F. Use non-pharmacological pain management (i.e., position of comfort, hot/cold pack, elevation, splinting, padding, wound care, therapeutic calming and communication).
- G. Administer pain medication:
  1. Fentanyl 50 micrograms IV/IM/IN. Repeat with 25-50 micrograms every 3-5 minutes as needed to a maximum of 200 micrograms **OR**
  2. Morphine 2-5 mg IV or IM every 3-5 minutes to a maximum of 20 mg.
  3. Contact OLMC if maximum dose of either medication is reached without adequate pain management.

**Do not administer pain medications if any of the following are present:**

- **Respiratory distress or O2 saturation of < 90%**
  - **Known allergy to pain medications**
  - **Altered mental status**
  - **Systolic blood pressure of < 100 mm/Hg**
- H. Obtain a full set of vital signs and pain scale rating prior to and after each administration of pain medication.

## PEDIATRIC PATIENTS:

- A. Fentanyl dose for children is 1 microgram/kg IV/IM/IN. May repeat with 0.5 -1 microgram/kg every 3-5 minutes as needed to a maximum of 4 micrograms/kg. Do not exceed adult dosing.
- B. For children < 20 kg morphine dose is 0.1 mg/kg IV or IM. May repeat every 3-5 min. Do not exceed adult dosing.
- C. Contact OLMC if maximum dose of either medication is reached without adequate pain management.



USE PROPER PRECAUTIONS. DECONTAMINATE PT PRIOR TO TREATMENT/TRANSPORT

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish venous access. If systolic BP < 90 mmHg follow Shock Protocol.
- D. If unknown poison or overdose and patient has a decreased level of consciousness treat per Altered Mental Status protocol. Contact OLMC for advice.
- E. Treat specific poisons/overdoses as outlined below:
  - **Aspirin or Acetaminophen:**
    1. If it is less than two hours since ingestion, administer 1 gram/kg of activated charcoal PO/NG.
    2. If ingestion involves more than just aspirin and/or acetaminophen contact OLMC for use of activated charcoal.
  - **Beta blockers:**

Contact OLMC for consideration of glucagon.
  - **Calcium channel blocker:**

Contact OLMC for consideration of calcium gluconate, 10cc of 10% over 5-10 min.
  - **Carbon Monoxide:**
    1. High flow O<sub>2</sub>.
    2. All symptomatic patients (e.g. headache, dizziness, nausea) should be transported.
    3. Transport patients with severe symptoms (e.g. cardiac ischemia, coma, syncope, seizures, loss of consciousness) to the nearest facility with a hyperbaric chamber.
    4. If CO monitor is available and CO reading is  $\geq 15$ , transport to nearest facility with a hyperbaric chamber (unless patient meets burn or trauma center criteria).
    5. If cyanide poisoning is also suspected, consider obtaining SpCO, if possible, before administration of Cyanokit<sup>®</sup> since the latter will interfere with the carboxyhemoglobin monitor.
  - **Tricyclic antidepressant:**
    1. If patient exhibits arrhythmias or a widening QRS complex administer sodium bicarbonate 1 mEq/kg IV/IO.
    2. Treat hypotension per Shock protocol.
  - **Organophosphates:**
    1. Prepare to handle copious secretions.
    2. Administer atropine 1 – 2 mg IV/IO until symptoms improve. Contact OLMC for frequency of dosing. See Haz-Mat Protocol for more specifics of treatment.
- F. Contact Poison Control as needed.
- G. Contact OLMC for advice on activated charcoal for other ingested poisons.

## Poisoning & Overdose – 10.140

### PEDIATRIC PATIENTS:

- A. Consider possibility of neglect or abuse.
- B. Contact OLMC for atropine dosing. May be very high in children who have orally ingested organophosphate poisons.
- C. Activated charcoal dose is 1 gram/kg.
- D. For children < 1 yr dilute sodium bicarbonate by one-half with normal saline prior to administration.

### NOTES & PRECAUTIONS:

- A. SpCO levels may be elevated in smokers. Levels can range from 3-20% depending on the number of packs smoked.
- B. Pulse oximeter may provide a false reading in patients with elevated SpCO levels.
- C. If the patient exhibits extrapyramidal symptoms/dystonias with a history of phenothiazine use, consider diphenhydramine.
- D. For large organophosphate poisonings, refer to Haz Mat protocol.
- E. Do not neutralize acids or alkalis.
- F. Consider Haz Mat Team activation.

### KEY CONSIDERATIONS:

Route of poisoning, amount of ingestion, antidote given, suicidal intent, multiple patients, psychiatric history

CO Clinical Presentation Transport Matrix				
Carbon Monoxide	Yes	Yes	Yes	Yes
Burns	No	Yes	No	Yes
Trauma	No	No	Yes	Yes
Destination	Hyperbaric Center	Burn Center	Trauma Center	Trauma Center

Carbon Monoxide =  $\geq 15$ , Burns = Burn Center Criteria, Trauma = Trauma Center Criteria

## Poisoning & Overdose – 10.140

TOXIDROME TABLE			
Toxidrome	Examples	Clinical Features	Antidotes
Sympathomimetic	Cocaine Methamphetamine	Agitation Diaphoresis Hypertension Hyperthermia Dilated pupils Tachycardia	Midazolam (OLMC)
Opioid	Heroin Hydromorphone Methadone Oxycodone	Depressed mental status Hypoventilation Constricted pupils	Naloxone
Cholinergic (Anti-cholinesterase)	Pesticides • Carbamates • Organophosphates Nerve agents	Muscarinic* Nicotinic** Central***	Atropine Pralidoximine (2-Pam) (Hazmat, OLMC)
Sedative-Hypnotic	Barbituates Benzodiazepines GHB	Depressed mental status Hypotension Hypothermia	Supportive treatment
Cardiotoxic drugs	Beta-blockers Calcium channel blockers	Bradycardia Conduction issues Hypotension	Glucagon (OLMC) Calcium (OLMC)
Anticholinergic	Atropine Jimson Weed Scopolamine Diphenhydramine	Delirium Hyperthermia Tachycardia Warm, dry skin	Supportive treatment Physostigmine (ED)
Sodium channel blockade	Tricyclic antidepressants Antiarrhythmics • Type 1A – quinidine, procainamide • Type 1C – flecanide, propafenone	Altered mental status Hypotension Seizures Wide complex tachycardia	Sodium Bicarbonate (OLMC)
<b>*Muscarinic</b>		<b>**Nicotinic</b>	<b>***Central</b>
Diarrhea, Urination, Miosis, Bradycardia, Bronchospasm, Bronchorrhea, Emesis, Lacrimation, Salivation, Sweating		Mydriasis, Tachycardia, Weakness, Hypertension, Hyperglycemia, Fasciculations	Confusion, Convulsions, Coma



### TREATMENT:

- A. Start oxygen; obtain vital signs, SpO<sub>2</sub>, ETCO<sub>2</sub> and ECG.
- B. Assess lung sounds.
- C. Start IV if needed.
- D. Follow appropriate Airway Management or Cardiac Dysrhythmia protocol if indicated.
- E. Treat patients clinical impression as follows:
  - **Upper Airway**
    1. Croup & Epiglottitis – Transport in position of comfort, monitor airway
    2. Anaphylaxis – Treat per Anaphylaxis and Allergic Reaction protocol.
    3. Foreign Body – Obstructed airway procedures. Remove object using direct laryngoscopy if complete obstruction.
    4. Complete Obstruction – If you cannot effectively BVM ventilate the patient and the patient is deteriorating, consider cricothyrotomy.
  - **Pulmonary Edema**
    1. Sit patient upright
    2. If BP < 100 mmHg systolic, treat possible cardiogenic shock drip per Shock protocol.
    3. If BP > 100 mmHg systolic:
      - a. Nitroglycerine 0.4 mg SL, repeat every 3-5 minutes. (Do not administer nitroglycerine without OLMC approval if pt has taken Viagra®, Levitra® or other similar drugs in the last 24 hours, or Cialis® within the last 48 hours).
      - b. If the patient remains in severe respiratory distress (e.g. unable to speak more than 1-2 words, low O<sub>2</sub> saturation (<90%), respiratory rate > 40) start CPAP if available.
      - c. Consider albuterol 2.5 mg by nebulizer. May repeat as needed.
      - d. Furosemide (If systolic BP > 100 and fluid overload state (JVD, rales, peripheral edema, hypertension):
        - i. If patient is not currently taking furosemide, give 20 mg IV.
        - ii. If the patient is taking furosemide, give 40 mg IV.
  - **COPD**
    1. Albuterol, 2.5 mg by nebulizer. Repeat as needed.
    2. If a second or third dose of albuterol is needed, add one unit dose of Ipratropium 0.5 mg to the nebulizer with the albuterol treatment.
    3. If patient has moderate to severe respiratory distress based on Severity Assessment Guide, give Dexamethasone 10mg IV/IO or IM. May also be given orally.
    4. Administer CPAP if available.
    5. If continuous nebulizer treatment is needed contact OLMC for advice.

- **Asthma**
  1. Albuterol, 2.5 mg by nebulizer. Repeat as needed.
  2. If a second or third dose of Albuterol is needed, add one unit dose of Ipratropium 0.5 mg to the nebulizer with the Albuterol treatment.
  3. If patient has Moderate to Severe asthma based on Severity Assessment Guide, give dexamethasone 10mg IV/IO/IM/PO.
  4. If patient is deteriorating and < 40 years old, give epinephrine 0.3 mg IM or SQ. Contact OLMC for additional doses or patients 40 years or older.
  5. If transport time is long and asthma is severe, contact OLMC for consideration of Magnesium Sulfate (usual dose is 2 grams over 20 minutes).
  6. If continuous nebulizer treatment is needed during transport (which may be necessary in some pediatric patients) contact OLMC for advice.

### **PEDIATRIC PATIENTS:**

#### **A. Upper Airway**

1. In patients 6 months to 6 years of age with audible stridor at rest, give 5 ml epinephrine 1:1,000 via nebulizer. Contact OLMC for additional dosing.
2. Treat anaphylaxis and foreign body obstruction per adult guidelines.
3. The usual cause of respiratory arrest in children with croup, epiglottitis or laryngeal edema is exhaustion, not complete obstruction. If the child with suspected upper airway compromise deteriorates, you may still be able to ventilate with a BVM. Only attempt intubation if you cannot effectively ventilate with BVM.
4. If complete obstruction is present and you cannot effectively BVM ventilate the patient and the patient is deteriorating, consider needle cricothyrotomy.

#### **B. Asthma**

1. Give albuterol and ipratropium per adult guidelines.
2. If patient is deteriorating give 1:1,000 epinephrine 0.01 mg/kg IM or SQ (max dose 0.3 mg). Contact OLMC for additional doses.
3. If patient has Moderate to Severe asthma based on Severity Assessment Guide and is not improving with treatment, consider dexamethasone 0.3 mg/kg IV/IO/IM/PO up to 10 mg.

### **NOTES & PRECAUTIONS:**

- A. In addition to specific interventions for respiratory distress, aggressive airway management, including early intubation, is appropriate for the patient who does not respond to treatment or is rapidly deteriorating.
- B. The best indicator for the cause of respiratory distress is past history. If a person has had COPD or CHF in the past, it is likely the person has the same condition again.
- C. In cases of tachypnea it is essential to consider all causes such as pulmonary embolus, hypoxia, cardiac causes, infection and trauma. Hyperventilation may be a response to an underlying medical problem and should only be considered after these other causes have been excluded. Do not treat hyperventilation by rebreathing CO<sub>2</sub>. Reassurance and oxygen via mask are appropriate.

## Respiratory Distress – 10.160

### KEY CONSIDERATIONS:

Speed of onset, recent illness/infection, fever, chills or productive cough, medications and allergies, distended neck veins, peripheral edema, lung sounds, medical history (including asthma, CHF, COPD, pneumonia)

ASTHMA SEVERITY ASSESSMENT GUIDE			
	MILD	MODERATE	SEVERE
<b>Short of breath</b>	Walking	Talking	At rest
<b>Able to speak</b>	In sentences	In phrases	In words
<b>Heart rate</b>	< 100	100 - 120	> 120
<b>Respiratory rate</b>	Elevated	Elevated	> 30
<b>Lung sounds</b>	End expiratory wheezes	Full expiratory wheezes	Wheezes both phases or absent
<b>Accessory muscle use</b>	Not usually	Common	Usually
<b>Alertness</b>	Possibly agitated	Usually agitated	Usually agitated
<b>ETCO<sub>2</sub></b>	20 - 30	30 - 40	>50

**TREATMENT:**

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish IV access as required.
- D. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness):
  1. Administer midazolam 2.5 mg IV/IO. May repeat to a maximum dose of 5 mg for seizures lasting longer than five minutes.
  2. If no IV access, administer midazolam 5 mg IM. May repeat to a maximum dose of 10 mg for seizures lasting longer than five minutes.
  3. Contact OLMC if further doses are needed.
  4. Monitor patient's respiratory status closely after midazolam administration.
- E. Check blood glucose and treat per Altered Mental Status protocol.
- F. Place patient on their left side for transport.
- G. Transport may be unnecessary if patient becomes fully oriented, is taking their anti-seizure medication as prescribed, has a physician, and is experiencing their usual frequency of seizure activity. If patient is not transported have the patient (or guardian) sign a Patient Information Form and document the patient's mental status.
- H. All first time seizure patients require medical evaluation by a physician. Contact OLMC if patient refuses transport.

**PEDIATRIC PATIENTS:**

- A. If patient is in status seizure (continuous seizure or repetitive seizures without regaining consciousness):
  1. Administer midazolam 0.1 mg/kg IV/IO to a maximum initial dose of 2.5 mg. May repeat to a maximum dose of 5 mg for seizures lasting longer than five minutes.
  2. If no IV access, administer midazolam 0.2 mg/kg IM/IN to a maximum initial dose of 5 mg. May repeat to a maximum dose of 10 mg for seizures lasting longer than five minutes.
  3. Contact OLMC if further doses are needed.
  4. Monitor patient's respiratory status closely after midazolam administration.
- B. Febrile seizures are generally found between the ages of 1- 6 and are usually short in duration.
- C. First time seizures in children should be considered sepsis or meningitis until proven otherwise.

**NOTES & PRECAUTIONS:**

- A. Seizures in patients > 50 years of age are frequently caused by arrhythmias. Treat per appropriate protocol.
- B. New onset of seizures in a pregnant patient, especially in the third trimester, may indicate toxemia of pregnancy. Contact OLMC for consideration of magnesium sulfate. Normal dose is 4 grams slow IV over 1-2 minutes.
- C. Remember to check a pulse once a seizure stops. Seizure activity may be the sign of hypoxia or dysrhythmias.

**TREATMENT:**

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish vascular access.
- D. Prepare for rapid transport.
- E. Determine type of shock and treat as follows:
  - **Hypovolemic Shock:**
    1. Give 500cc fluid bolus, repeat if needed if no signs of pulmonary edema.
    2. For penetrating trauma or AAA, do not fluid overload. Goal is a systolic BP of 90 mmHg.
  - **Cardiogenic Shock:**
    1. Follow appropriate cardiac dysrhythmia protocol.
    2. Consider fluid challenge.
    3. Dopamine infusion. Start at 5 mcg/kg/min and increase in 5 mcg/kg/min increments every five minutes to a maximum of 20 mcg/kg/min, or until systolic BP is at least 90 mmHg and signs of shock are alleviated.
  - **Distributive Shock (anaphylaxis, sepsis, neurogenic):**
    1. Give 500cc fluid bolus, repeat if needed if no signs of pulmonary edema. May repeat to a total of 1,000cc. If shock persists consider dopamine as above.
    2. If possible, treat underlying cause.
  - **Obstructive Shock (cardiac tamponade, tension pneumo, aneurysm, PE):**
    1. If tension pneumothorax is suspected, decompress following Needle Decompression procedure.
    2. Consider 500cc fluid challenge.
    3. Contact OLMC for advice on other care including Dopamine infusion.

**PEDIATRIC PATIENTS:**

Treat as outlined above with the exception of the following Fluid Administration guidelines:

1. Infants – 10 cc/kg.
2. Children – 20 cc/kg.
3. Maximum fluid amount in Cardiac and Obstructive shock is 20 cc/kg.
4. Maximum fluid amount Distributive Shock is 500 cc.
5. Contact OLMC early for advice.

**NOTES & PRECAUTIONS:**

- A. Closely monitor patient's respiratory status and vital signs. Avoid fluid overload.
- B. Other signs and symptoms of shock include confusion, restlessness, altered mental status, moist skin, apathy and tachycardia.

**KEY CONSIDERATIONS:**

Mechanism of injury, medications, recent illness, medical history

**TREATMENT:**

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs and oxygen saturation.
- C. Check CBG and treat per Altered Mental Status guidelines.
- D. Complete **Modified Los Angeles Prehospital Stroke Screen**.
- E. Establish IV access (16 – 18 g in proximal site if possible).
- F. Transport patient in supine position with < 15 degree of head elevation if tolerated.
- G. Expedite transport to nearest appropriate stroke hospital.
- H. Document serial neurologic examinations.

**NOTES & PRECAUTIONS:**

- A. Do not treat hypertension or give aspirin.
- B. Acute interventions, if indicated, generally must begin within 4.5 hours of symptom onset. All potential stroke patients should go to an appropriate stroke center.

**KEY CONSIDERATIONS:**

Time last seen normal, pertinent medical history including history of GI bleeding, trauma or surgery in last 3 months, history of prior CVA/TIA, CBG, neurological exam (including pupils), currently taking Coumadin, clopidogrel (Plavix®) or heparin

**If questions 1 – 5 are all answered “Yes” or “Unknown” and at least 1 of the 3 neurological examination findings are abnormal and unilateral, notify the nearest appropriate stroke hospital with a “Acute Stroke.”**

MODIFIED LOS ANGELES PREHOSPITAL STROKE SCREEN			
1. Age over 45 years	Yes	No	Unknown
2. No prior history of seizure disorder	Yes	No	Unknown
3. New onset of neurologic symptoms in last 24 hours	Yes	No	Unknown
4. Patient was ambulatory at baseline (prior to event)	Yes	No	Unknown
5. CBG between 60 & 400	Yes	No	
<b>Neurological examination</b>	<b>Normal</b>	<b>Abnormal</b>	
Facial smile/grimace (ask patient to smile/show teeth) Normal: both sides of face move equally well Abnormal: one side of face does not move as well as the other	Yes	Right	Left
Arm drift (patient closes eyes and hold both arms out palms up) Normal: both arms move the same or do not move at all Abnormal: One arm does not move or drifts down compared to other	Yes	Right	Left
Hand grip (have patient squeeze both hands simultaneously) Normal: equal grip strength Abnormal: unequal grip strength	Yes	Right	Left

### TREATMENT:

- A. Start Oxygen per General Airway Management protocol.
- B. Monitor vital signs, ECG and oxygen saturation.
- C. Establish IV access as required.
- D. If there is any doubt as to mechanism of injury or any possibility of cervical injury, immobilize patient and consider Trauma System entry.
- E. If indicated, treat per Hypothermia protocol.
- F. If patient is in cardiac arrest, do not attempt resuscitation if patient has been submerged for more than 30 minutes, with the following exceptions:  
Resuscitation may be initiated if the patient is recovered within 60 minutes if:
  1. Children < 6 years of age and water temperature at recovery depth of < 40 deg F.
  2. Patients who may have been trapped in an underwater air pocket.
  3. Water temperature at recovery depth is < 40 deg F and information suggests that patient may have been swimming on the surface for at least 15 minutes prior to becoming submerged.
  4. Paramedic discretion (contact OLMC)

### NOTES & PRECAUTIONS:

- A. If patient is still in the water rescue should be performed by properly trained and equipped personnel only.
- B. Be prepared to manage vomiting.
- C. Even if patient initially appears fine, delayed pulmonary edema is likely to occur.

### KEY CONSIDERATIONS:

Medical history, length of submersion, water temperature at recovery depth, medications and allergies, events prior to submersion

### **TREATMENT:**

- A. Assess scene safety and use appropriate PPE.
- B. Begin initial patient assessment and determine chief complaint.
- C. Secure airway and start Oxygen as needed per General Airway Management protocol.
- D. Monitor vital signs and SpO<sub>2</sub>.
- E. Monitor ECG, ETCO<sub>2</sub> and obtain CBG readings as appropriate.
- F. Establish IV access as required.
- G. Obtain pain severity scale if applicable.
- H. Follow appropriate Patient Care Treatment Protocol if patient's chief complaint or assessment findings change.

### **KEY CONSIDERATIONS:**

If patient is unable to provide medical history, check for medical bracelets and necklaces which can provide critical medical information and treatment.

# Medications

## Activated Charcoal – 20.010

### **OLMC REQUIRED:**

- A. Aspirin and Acetaminophen with time of ingestion > two hours.
- B. All other poisons or ingestions regardless of time from ingestion.

**SUPPLIED:** 25 grams / 120 ml bottle.

### **PHARMACOLOGY AND ACTIONS:**

Activated charcoal adsorbs toxic substances ingested and inhibits GI adsorption by forming an effective barrier between the particulate material and the gastrointestinal mucosa. The effect is greatest if used within one hour of ingestion.

### **INDICATIONS:**

Management of poisoning or overdose of many substances.

### **CONTRAINDICATIONS:**

- A. Patients with altered mental status or the inability to maintain their own airway.
- B. Patients who have aspirated or with a potential for aspiration.

### **PRECAUTIONS:**

- A. Activated charcoal may be ineffective in some ingestions.
- B. Milk, ice cream and other dairy products will decrease the adsorption capacity substantially.

### **SIDE EFFECTS AND NOTES:**

May cause nausea, vomiting, and constipation.

### **ADULT DOSING:**

- Poisoning & overdose -**  
1 gram / kg PO or NG.

### **PEDIATRIC DOSING:**

- Same as adult.

**OLMC REQUIRED:** No

**SUPPLIED:** 6 mg / 2 ml and 12 mg / 4 ml pre-filled syringes

**PHARMACOLOGY AND ACTIONS:**

Adenosine is a naturally occurring nucleoside that has the ability to slow conduction through the AV node. Since most cases of PSVT involve AV nodal re-entry, adenosine is capable of interrupting the AV nodal circuit and stopping the tachycardia, restoring normal sinus rhythm. It is eliminated from the circulation rapidly and has a half-life in the blood of less than ten seconds.

**INDICATIONS:**

To convert PSVT to a normal sinus rhythm, including PSVT that is associated with accessory bypass tracts (e.g. Wolff-Parkinson-White Syndrome).

**CONTRAINDICATIONS:**

- A. Second or third degree heart block.
- B. Sick Sinus Syndrome
- C. Known hypersensitivity
- D. Atrial fibrillation

**PRECAUTIONS:**

- A. When doses larger than 12 mg are given by injection there may be a decrease in blood pressure secondary to a decrease in vascular resistance.
- B. The effects of Adenosine are antagonized by methylxanthines such as Theophylline and caffeine. Larger doses of Adenosine may be required.
- C. Adenosine effects are potentiated by dipyridamole (Persantine) resulting in prolonged asystole.
- D. In the presence of carbamazepine (Tegretol), high degree heart block may occur.
- E. Adenosine is not effective in converting atrial fibrillation, atrial flutter or ventricular tachycardia.
- F. All doses of adenosine should be reduced to one-half (50%) in the following clinical settings:
  - a. History of cardiac transplantation.
  - b. Patients who are on carbamazepine (Tegretol) and dipyridamole (Persantine).
  - c. Administration through any central line.

**SIDE EFFECTS AND NOTES:**

May cause facial flushing, shortness of breath, chest pressure, nausea, headache and lightheadedness.

**ADULT DOSING:**

**PSVT -**

6 mg rapid IV. May repeat with 12 mg IV x 2 if patient fails to convert after 6 mg dose. Use a large proximal IV site with fluid bolus flush.

**PEDIATRIC DOSING:**

**PSVT -**

0.1 mg/kg rapid IV. May repeat with 0.2 mg/kg once if patient fails to convert after first dose. Use a large proximal IV site with fluid bolus flush.

**OLMC REQUIRED:**

For use in hyperkalemia patients including crush injury.

**SUPPLIED:** 2.5 mg / 3 ml vial.

**PHARMACOLOGY AND ACTIONS:**

Albuterol is a potent, relatively selective Beta-2 adrenergic bronchodilator and is associated with relaxation of bronchial smooth muscle and inhibition of release of mediators of immediate sensitivity from cells, especially MAST cells. The onset of improvement in pulmonary function is within 2 – 15 minutes after the initiation of treatment and the duration of action is from 4 – 6 hours. Albuterol has occasional Beta-1 overlap with clinically significant cardiac effects.

**INDICATIONS:**

- A. To treat bronchial asthma and reversible bronchial spasm that occurs with chronic obstructive pulmonary disease.
- B. To treat hyperkalemia.

**CONTRAINDICATIONS:**

None in the prehospital setting.

**PRECAUTIONS:**

- A. The patient's rhythm should be observed for arrhythmias. Stop treatment if frequent PVC's develop or any tachyarrhythmias other than sinus tachycardia appear or if heart rate increases by more than 20 beats/minute.
- B. Paradoxical bronchospasm may occur with excessive administration.

**SIDE EFFECTS AND NOTES:**

Clinically significant arrhythmias may occur, especially in patients with underlying cardiovascular disorders such as coronary insufficiency and hypertension.

**ADULT DOSING:****Respiratory distress -**

2.5 mg via nebulizer. Repeat as needed.

**Hyperkalemia -**

10 mg via nebulizer. OLMC contact required.

**Hyperkalemia secondary to crush injury -**

OLMC contact required.

**PEDIATRIC DOSING:**

Same as adult

## Amiodarone (Cordarone®) – 20.040

**OLMC REQUIRED:** No

**SUPPLIED:** 150 mg / 3 ml pre-filled syringe or vial.

### **PHARMACOLOGY AND ACTIONS:**

Amiodarone depresses automaticity of the SA node. It slows conduction and increases refractoriness of the AV node. Amiodarone increases atrial and ventricular refractory period and prolongs the QT interval. When given IV it is rapidly distributed. No dosage adjustments are needed for patients with renal, liver or heart failure, or advanced age.

### **INDICATIONS:**

- A. Ventricular fibrillation.
- B. Ventricular tachycardia with pulses.

**CONTRAINDICATIONS:**  
None in cardiac arrest.

### **PRECAUTIONS:**

- A. In high concentrations (> 3 mg / ml ) Amiodarone can cause phlebitis. Infusion concentrations should not exceed 2 mg / ml.
- B. Amiodarone will precipitate if administered in the same IV line as sodium bicarbonate or heparin.

### **SIDE EFFECTS AND NOTES:**

- A. In perfusing patients, Amiodarone may cause hypotension, prolonged QT interval, proarrhythmic effects (Torsades and ventricular fibrillation), severe bradycardia and atrioventricular block.
- B. Non-cardiac toxicities are usually related to chronic administration and include pulmonary infiltrates, hepatic and/or thyroid dysfunction and perhiperal neuropathy.

### **ADULT DOSING:**

#### **V Fib, pulseless V Tach -**

300 mg IV/IO. May repeat once with 150 mg.

#### **V Tach with a pulse -**

150 mg IV/IO. Mix with 100 ml of NS in Buretrol and infuse over 10 minutes.

### **PEDIATRIC DOSING:**

#### **V Fib, pulseless V Tach -**

5 mg/kg IV/IO. May repeat once with 2.5 mg/kg.

#### **V Tach with a pulse -**

2.5 mg/kg IV/IO. Mix with 2 ml/kg of NS in Buretrol and infuse over 10 minutes.

**OLMC REQUIRED:** No

**SUPPLIED:** 81 mg chewable tablets (Children's aspirin)

**PHARMACOLOGY AND ACTIONS:**

Aspirin inhibits prostaglandins and disrupts platelet function for the life of the platelet. It is also a mild analgesic and anti-inflammatory agent.

**INDICATIONS:**

In unstable angina and acute myocardial infarction, aspirin has been shown to lower mortality and is indicated in patients with suspected ischemic chest pain.

**CONTRAINDICATIONS:**

- A. Allergy to aspirin or aspirin induced asthma.
- B. History of bleeding disorder (i.e. hemophilia)
- C. Current ulcer or GI bleeding.
- D. Suspected aortic dissection.

**SIDE EFFECTS AND NOTES:**

- A. High doses of aspirin can cause ringing in the ears.
- B. May cause heartburn, nausea and vomiting.

**ADULT DOSING:**

Chest pain (acute myocardial infarction)  
324 mg PO.

**PEDIATRIC DOSING:**

Not indicated for pediatric patients

**OLMC REQUIRED:** No

**SUPPLIED:** 1 mg / 10 ml pre-filled syringe, 2 mg / 0.7 ml autoinjector, 8 mg / 20 ml vial.

## PHARMACOLOGY AND ACTIONS:

Atropine is a muscarinic-cholinergic blocking agent. As such, it has the following effects:

- A. Increases heart rate (by blocking vagal influences).
- B. Increases conduction through the AV node.
- C. Reduces motility and tone of the GI tract.
- D. Reduces action and tone of the urinary bladder (may cause urinary retention).
- E. Dilates pupils.

## INDICATIONS:

- A. To increase the heart rate in bradycardia or pacemaker failure.
- B. To improve conduction in second and third degree heart block.
- C. As an antidote for some insecticide exposures (e.g. anti-cholinesterases, organophosphates) and nerve gases.
- D. To counteract excessive vagal influences causing some bradysystolic and asystolic arrests.
- E. For bradycardia not due to hypoxia when using Succinylcholine.

## CONTRAINDICATIONS:

- A. Atrial fibrillation and atrial flutter because increased conduction may speed ventricular rate excessively.
- B. Not used in neonatal resuscitation.

## PRECAUTIONS:

Bradycardia in the setting of an acute myocardial infarction is common and probably beneficial. Do not treat unless there are signs of poor perfusion (low blood pressure, mental confusion).

## SIDE EFFECTS AND NOTES:

- A. Atropine blocks cholinergic (vagal) influences already present. If there is little cholinergic stimulation present, effects will be minimal.
- B. Remember in cardiac arrest situations, atropine dilates pupils.

## ADULT DOSING:

### Bradycardia (cardiac) -

0.5 mg IV/IO. May repeat every 3-5 minutes to max of 3 mg.

### Bradycardia secondary to RSI -

0.5 mg IV/IO.

### Organophosphate poisoning -

1-2 mg IV/IO until symptoms improve. Contact OLMC for frequency of dosing.

## PEDIATRIC DOSING:

### Bradycardia (cardiac) -

0.02 mg/kg IV/IO. Minimum single dose 0.1 mg, max single dose 0.5 mg. May repeat once.

### Bradycardia secondary to RSI -

0.02 mg/kg IV/IO. Minimum dose 0.1 mg. Do not exceed adult dose.

### Organophosphate poisoning -

0.02 mg/kg IV/IO. Contact OLMC for frequency of dosing.

**OLMC REQUIRED:**

Suspected calcium channel blocker overdose except in cardiac arrest.

**SUPPLIED:** 98 mg (4.65 mEq) of 10% solution / 10 ml vial.

**PHARMACOLOGY AND ACTIONS:**

Calcium is the most common cation in the human body. The majority of the body stores of calcium are located in bone. It plays an important role in many physiologic functions and is essential for proper nerve and muscle function.

**INDICATIONS:**

- A. Suspected calcium channel Blocker overdose.
- B. Hyperkalemia.

**CONTRAINDICATIONS:**

- A. **Hypercalcemia and hypercalciuria (hyperthyroidism, Vitamin D overdose, bone metastases).**
- B. **Patients on Digoxin.**

**PRECAUTIONS:**

- A. Extravasation of Calcium salts will cause necrosis of tissue. The IV should be secured and free blood return into the syringe should be checked 2-3 times during administration. If extravasation does occur, immediately stop administration.
- B. Administer slowly (no faster than 2ml/min) and stop if patient complains of distress. Inject using a small needle in a large vein.
- C. Calcium Gluconate will precipitate if mixed with Sodium Bicarbonate. Flush catheter completely before administering one medication after another.

**SIDE EFFECTS AND NOTES:**

- A. Rapid injection of Calcium Gluconate may cause vasodilatation, decreased blood pressure, bradycardia, cardiac arrhythmias, syncope and cardiac arrest.
- B. One vial of 10 ml Calcium Gluconate 10% contains 1 gram of calcium gluconate salt (= 93 mg elemental calcium or 4.6 mEq calcium or 2.3 mmol calcium)

**ADULT DOSING:**

**Hyperkalemia, calcium channel blocker overdose -**  
10 ml slow IV/IO over 5 – 10 minutes. Use a proximal port.

**PEDIATRIC DOSING:**

**Hyperkalemia, calcium channel blocker overdose -**  
0.5 ml/kg slow IV/IO over 5 – 10 minutes. Use a proximal port. Max dose 10 ml.

## Dexamethasone (Decadron®) – 20.075

**OLMC REQUIRED:** No

**SUPPLIED:** 10 mg / 1 ml vial

**PHARMACOLOGY AND ACTIONS:**

Dexamethasone is a synthetic steroid that has suppresses acute and chronic inflammation. In addition, it potentiates vascular smooth muscle relaxation by beta-adrenergic agonists and may alter airway hyperactivity.

**INDICATIONS:**

- A. Moderate to severe asthma/COPD
- B. Severe allergic reaction.
- C. Croup

**CONTRAINDICATIONS:**

**Do not use in patients with known hypersensitivity to corticosteroids.**

**PRECAUTIONS:**

May cause hypertension and hyperglycemia.

**SIDE EFFECTS AND NOTES:**

May cause nausea, vomiting, headache, or dizziness.

**ADULT DOSING:**

**Respiratory distress, severe allergic reaction, anaphylaxis -**  
10 mg IV/IO/IM/PO. Flavoring may be used if available if for oral dosing.

**PEDIATRIC DOSING:**

**Respiratory distress, severe allergic reaction, anaphylaxis, croup -**  
0.3 mg/kg IV/IO/IM/PO. Flavoring may be used if available if for oral dosing.

**OLMC REQUIRED:** No.

**SUPPLIED:** 25 g / 50 ml pre-filled syringe.

**PHARMACOLOGY AND ACTIONS:**

Glucose is the body's basic fuel. It produces most of the body's quick energy. Its use is regulated by insulin which stimulates storage of excess glucose outside the bloodstream, and glucagon, which mobilizes stored glucose into the bloodstream.

**INDICATIONS:**

- A. Hypoglycemia
- B. Unconscious patient when history is unobtainable.

**CONTRAINDICATIONS:**

None

**PRECAUTIONS:**

- A. Extravasation of Dextrose 50% is likely to cause necrosis of tissue. IV should be secured and free blood return of blood into the syringe or tubing should be checked 2-3 times during administration. If extravasation does occur, immediately stop administration.
- B. Report any extravasation to receiving hospital personnel and document on the Prehospital Care Report.

**SIDE EFFECTS AND NOTES:**

Hyperglycemia may complicate or worsen a number of medical conditions (e.g. myocardial infarction and stroke). D50 should be given whenever hypoglycemia is documented by blood glucose meters. If these findings are not available, the EMT should use judgement based on signs and history.

**ADULT DOSING:**

**Hypoglycemia/Altered mental status -**  
25 grams (50 ml) slow IV/IO.

**PEDIATRIC DOSING – Patients less than 10 kg (birth to one year):**

**Hypoglycemia/Altered mental status -**  
2 ml /kg of D25% slow IV/IO. May repeat once.

**PEDIATRIC DOSING – Patients greater than 10 kg:**

**Hypoglycemia/Altered mental status -**  
1 ml /kg of D50% to a max of 50 ml slow IV/IO. May repeat once.

## Diphenhydramine (Benedryl®) – 20.090

**OLMC REQUIRED:** No

**SUPPLIED:** 50 mg / ml vial

### **PHARMACOLOGY AND ACTIONS:**

Diphenhydramine is an antihistamine which blocks the action of histamines released from cells during an allergic reaction. It has direct CNS effects, which may be stimulant, or more commonly depressant, depending on individual variation. Diphenhydramine also has an anticholinergic and antiparkinsonian effect which is used to treat acute dystonic reactions to antipsychotic drugs (e.g. Haldol®, Thorazine®, Compazine®, Inapsine®). These reactions include oculogyric crisis, acute torticollis, and facial grimacing.

### **INDICATIONS:**

- A. The second-line drug in anaphylaxis and severe allergic reactions (after epinephrine).
- B. To counteract acute dystonic and dysphoric reactions to anti-psychotic drugs.

### **CONTRAINDICATIONS:**

None

### **PRECAUTIONS:**

- A. May have an additive effect with alcohol or other CNS depressants.
- B. Although useful in acute dystonic reactions it is not an antidote for anti-psychotic toxicity or overdose.
- C. May cause hypotension when given IV.

### **SIDE EFFECTS AND NOTES:**

Diphenhydramine is rarely necessary in the field. It is not the first-line drug for allergic reactions, but may be useful for long transports.

### **ADULT DOSING:**

**Anaphylaxis, extrapyramidal symptoms -**  
1 mg/kg IV/IM to a max of 50 mg.

### **PEDIATRIC DOSING:**

**Anaphylaxis, extrapyramidal symptoms -**  
1 mg/kg IV/IM to a max of 50 mg.

**OLMC REQUIRED:** No.

**SUPPLIED:** 800 mg / 10 ml vial or 400 mg / 10 ml vial

## **PHARMACOLOGY AND ACTIONS:**

Dopamine is the chemical precursor of norepinephrine which occurs naturally in humans and which has both alpha and beta receptor stimulating actions. Its actions differ with the dosage given:

- 1 – 2 mcg/kg/min – dilates renal and mesenteric blood vessels. No effect on heart rate or blood pressure.
- 2 – 10 mcg/kg/min – beta effects on the heart which usually increase cardiac output without increasing heart rate or blood pressure.
- 10 – 20 mcg/kg/min – alpha peripheral effects cause peripheral vasoconstriction and increased blood pressure.
- 20 – 40 mcg/kg/min – alpha effects reverse dilatation of renal and mesenteric vessels with resultant decreased flow.

## **INDICATIONS:**

- A. Primary indication is cardiogenic shock.
- B. May be useful in other forms of shock, except hypovolemic.

## **CONTRAINDICATIONS:** **Hypovolemic shock**

## **PRECAUTIONS:**

- A. May induce tachyarrhythmias, in which case infusion should be decreased or stopped.
- B. High doses may cause extreme peripheral vasoconstriction. Conversely, low doses may cause a decreased blood pressure due to peripheral dilatation.
- C. Should not be added to Sodium Bicarbonate or other alkaline solutions since Dopamine will be inactivated in alkaline solutions.

## **SIDE EFFECTS AND NOTES:**

- A. The most common side effects include ectopic beats, nausea, and vomiting.
- B. Angina has been reported following treatment.
- C. Tachycardia and arrhythmias are less likely than with other catecholamines.
- D. Can precipitate hypertensive crisis in susceptible individuals (i.e. patients on MAO inhibitors such as Parnate, Nardil or Marplan).
- E. Consider hypovolemia and treat this with appropriate fluids before administration of Dopamine.
- F. Dopamine is best administered by infusion pump if available. Monitor closely.

## **ADULT DOSING:**

### **Cardiogenic shock -**

5 mcg/kg/min IV drip. Increase by 5 mcg/kg/min every 5 minutes to max of 20 mcg/kg/min or until systolic BP is at least 90 mmHg and signs of shock have been alleviated.

## **PEDIATRIC DOSING:** **Same as adult.**

**OLMC REQUIRED:** Patients < 14 years old

**SUPPLIED:** 5 mg / 2 ml vial and ampule

**PHARMACOLOGY AND ACTIONS:**

Droperidol is a potent tranquilizing agent. It produces marked sedation and allays apprehension. It also provides a state of mental detachment and indifference while maintaining a state of reflex alertness. Droperidol potentiates the effects of other CNS depressants. It also produces mild alpha-adrenergic blockade, peripheral vasodilatation and a reduction of the pressor effect of epinephrine and can produce hypotension. It also has an anti-emetic effect. Onset of action is from 3-10 minutes following administration and peak effect may not be apparent for up to 30 minutes. Duration is generally 2-4 hours.

**INDICATIONS:**

- A. Sedation of combative patients to facilitate restraint.
- B. Nausea and vomiting not responsive to ondansetron.

**CONTRAINDICATIONS:**

Unless directed by OLMC, do not administer Droperidol in the following situations:

- A. Systolic BP < 90.
- B. Known allergy or prior reaction to Droperidol.
- C. Pregnancy.
- D. Patients < 14 years old

**PRECAUTIONS:**

- A. Use caution when administering droperidol to patients who have taken other CNS depressant drugs (barbiturates, tranquilizers, alcohol)
- B. Droperidol may induce Torsades De Pointes. Monitor the patients ECG Q-T interval following use.
- C. Use in caution in patients with a seizure disorder or a condition that causes seizures; other similar neuroleptics are known to lower the seizure threshold. Consider use of midazolam instead.

**SIDE EFFECTS AND NOTES:**

- A. The most common side effects are hypotension and tachycardia which usually respond to a fluid bolus.
- B. Dysphoric (restlessness) and dystonic reactions have been reported following administration. These symptoms can be treated with the administration of Diphenhydramine.

**ADULT DOSING:**

**Nausea & vomiting unresponsive to ondansetron -**

0.625 mg IV. (0.625 mg = 0.25 ml based on a 5 mg/ 2 ml package)

**Patient restraint -**

2.5 mg IV or 5 mg IM. May repeat once in 10 minutes.

**PEDIATRIC DOSING:**

Contact OLMC for patients < 14 years old

**OLMC REQUIRED:**

Asthma – Patients > 40 y/o or for additional doses.

**SUPPLIED:** 1:10,000 – 1 mg / 10 ml pre-filled syringe 1:1,000 – 30 mg / 30 ml vial or 1 mg/ml amps

**PHARMACOLOGY AND ACTIONS:**

Epinephrine is a catecholamine with both alpha and beta effects. In general the following cardiovascular responses can be expected: increased heart rate, increased myocardial contractile force, increased systemic vascular resistance, increased arterial blood pressure, increased myocardial oxygen consumption, increased automaticity.

Epinephrine is also a potent bronchodilator.

**INDICATIONS:**

Epinephrine is indicated in the following situations: ventricular fibrillation, asystole, pulseless electrical activity, systemic allergic reactions, asthma in patients < 40, children 6 months to 6 years with audible stridor at rest.

**CONTRAINDICATIONS:**

None

**PRECAUTIONS:**

- A. Epinephrine increases cardiac work load and can precipitate angina, MI, or major dysrhythmias in individuals with ischemic heart disease.
- B. Wheezing in an elderly person is pulmonary edema or pulmonary embolus until proved otherwise

**SIDE EFFECTS AND NOTES:**

- A. May cause anxiety, tremor and headache.
- B. Cardiac side effects include tachycardia, PVC's, angina and hypertension.

**ADULT DOSING:****V Fib, asystole, PEA -**

1 mg 1:10,000 IV/IO every 3-5 minutes.

**Anaphylaxis, asthma -**

0.3 mg 1:1000 SQ / IM or 0.3 mg 1:10,000 IV/IO. OLMC contact required for patients > 40 years old.

**PEDIATRIC DOSING:****V Fib, asystole, PEA -**

0.01 mg/kg 1:10,000 IV/IO or 0.1mg/kg 1:1000 in 4 ml NS ET (last resort).

**Anaphylaxis, asthma -**

0.01 mg 1:1000 SQ / IM to a max single dose of 0.3 mg. Contact OLMC for additional doses.

**Respiratory distress with audible stridor at rest (pts 6 mths to 6 years old) -**

5 ml of 1:1,000 via nebulizer. Contact OLMC for additional doses.

## Etomidate (Amidate<sup>®</sup>) – 20.115

### **OLMC REQUIRED:**

None

**SUPPLIED:** 40 mg / 20 ml pre-filled syringe or 2 mg/ml in 40 mg vial

### **PHARMACOLOGY AND ACTIONS:**

Etomidate is a hypnotic drug without any analgesic activity. Intravenous injection of Etomidate produces hypnosis characterized by rapid onset of action; usually within one minute. Duration of hypnosis is dose dependent but relatively brief, usually 3-5 minutes.

### **INDICATIONS:**

As an induction agent for use in rapid sequence intubation.

### **CONTRAINDICATIONS:**

**Etomidate is contraindicated in patients who have a known hypersensitivity to the drug.**

### **PRECAUTIONS:**

Excessively rapid injection may cause a fall in blood pressure.

### **SIDE EFFECTS AND NOTES:**

- A. The most frequent adverse reactions are transient venous pain on injection and transient skeletal muscle movements.
- B. Etomidate may also cause nausea and/or vomiting.

### **ADULT DOSING:**

**Induction agent for rapid sequence intubation -**  
0.3 mg / kg IV/IO injected over 10 seconds

### **PEDIATRIC DOSING:**

**Same as adult**

**OLMC REQUIRED:** No

**SUPPLIED:** 100 micrograms / 2 ml vial

**PHARMACOLOGY AND ACTIONS:**

Fentanyl is a potent synthetic opioid analgesic that produces analgesia and sedation. It is about 50-100 times more potent than morphine on a weight basis. Onset of action when given is 2-3 minutes. Peak effect occurs at 3-5 minutes and lasts 15-45 minutes.

**INDICATIONS:**

- A. Pain due to musculoskeletal injury or burn.
- B. Suspected ischemic chest pain unresponsive to nitroglycerin.

**CONTRAINDICATIONS:**

- A. Respiratory distress or O<sub>2</sub> saturation of < 90%
- B. Known allergy to fentanyl
- C. Altered mental status
- D. Systolic blood pressure of < 100 mm/Hg

**PRECAUTIONS:**

- A. Fentanyl can cause respiratory depression that is reversible with naloxone. Respiratory depression can also be exacerbated by underlying lung disease and the use of other respiratory depressant drugs (benzodiazepines, alcohol, cyclic antidepressants). Have naloxone and respiratory support available when administering fentanyl.
- B. If administered rapidly and in very large doses, fentanyl can cause muscle spasm and chest wall rigidity. The only reliable treatment for this is neuromuscular blockade.
- C. The action of fentanyl is prolonged and its elimination is slower in the elderly. Smaller maintenance doses are advisable.
- D. Fentanyl must be used cautiously in patients who have already received morphine for prehospital analgesia.

**SIDE EFFECTS AND NOTES:**

- A. If hypotension develops, it is usually responsive to naloxone administration and Trendelenburg position. If hypotension continues, follow Shock protocol.
- B. Check and document vital signs and patient response after each dose.
- C. The goal of fentanyl administration is patient comfort, not the total elimination of pain but the reduction in the perception of pain by the patient.

**ADULT DOSING:**

**Pain - Musculoskeletal Injuries, Burns, Chest Pain**  
50 mcg IV/IM/IN, repeat 25-50 mcg q 3-5 minutes as needed to a maximum of 200 mcg.

**PEDIATRIC DOSING:**

**Pain - Musculoskeletal Injuries, Burns, Chest Pain**  
1 mcg/kg IV/IM/IN, repeat 0.5-1 mcg/kg q 3-5 minutes as needed to a maximum of 4 mcg/kg. Do not exceed adult dosing.

**OLMC REQUIRED:**

Respiratory Distress – Second dose.  
Patients ≤ 18 years of age.

**SUPPLIED:** 40 mg / 4 ml pre-filled syringe or 40 mg / 4 ml vial

**PHARMACOLOGY AND ACTIONS:**

Furosemide is a potent diuretic with a rapid onset of action and short duration of effect. It acts primarily by inhibiting sodium reabsorption in the kidney. Increase in potassium excretion occurs along with the sodium excretion. As an IV bolus, causes immediate (3-4 minute) increase in venous capacitance. This decreases venous pre-load and probably accounts for its immediate effect in pulmonary edema. Peak effect is one-half to one hour after IV administration with a duration of about two hours. (Duration if taken orally is 6-8 hours with peak effect in 1-2 hours)

**INDICATIONS:**

In acute pulmonary edema to decrease the extracellular volume and reduce pressure on the lungs in cardiac failure.

**CONTRAINDICATIONS:**

- A. Hypovolemia or hypotension.
- B. Pregnancy

**PRECAUTIONS:**

- A. May lead to profound diuresis with resultant shock and electrolyte depletion. Monitor patient closely after administration.
- B. Hypovolemia, hypotension, hyponatremia and hypokalemia are the main toxic effects. Other toxic effects are usually not related to single-dose use.
- C. Patients who are on digitalis and are having arrhythmias consistent with digitalis toxicity (atrial tachycardia with conduction block, nonparoxysmal junction tachycardia, sinus arrest, etc.) may need lower doses of Furosemide. Contact OLMC.
- D. Because of the potency and need for close monitoring, Furosemide should only be given with specific indications.

**ADULT DOSING:**

**Respiratory distress with pulmonary edema and systolic BP > 100 mmHg -**  
If patient is not currently taking furosemide, give 20 mg IV. If the patient is taking furosemide, give 40 mg IV.

**PEDIATRIC DOSING:**

**Not indicated for pediatric patients**

**OLMC REQUIRED:**

Beta blocker overdose

**SUPPLIED:** 1 mg vial of powder / 1 ml vial of diluent

**PHARMACOLOGY AND ACTIONS:**

Glucagon is a hormone that causes glucose mobilization in the body. It works opposite to insulin, which causes glucose storage. It is released at times of insult or injury when glucose is needed and mobilizes glucose from body glycogen stores. Return to consciousness should be within 20 minutes of an IM dose if patient is hypoglycemic.

**INDICATIONS:**

- A. Known hypoglycemia (preferably demonstrated by blood glucose determination) when patient is confused or comatose and dextrose is not available or an IV cannot be started.
- B. Possible Beta blocker overdose per OLMC.

**CONTRAINDICATIONS:**

None

**PRECAUTIONS:**

IV Dextrose is the treatment of choice for hypoglycemia in the patient who cannot tolerate oral glucose. The use of Glucagon is restricted to patients who are seizing, comatose, combative, or with collapsed veins and in whom an IV cannot be started.

**SIDE EFFECTS AND NOTES:**

- A. Nausea and vomiting may occur with administration.
- B. Persons with no liver glycogen stores (malnutrition, alcoholism) may not be able to mobilize any glucose in response to Glucagon.

**ADULT DOSING:**

**Hypoglycemia -**

1 mg IM

**Beta blocker overdose –**

Contact OLMC for dosing

**PEDIATRIC DOSING:**

**Hypoglycemia -**

0.02 mg/kg IM to a maximum of 1 mg

**Beta blocker overdose –**

Contact OLMC for dosing

**OLMC REQUIRED:** No

**SUPPLIED:** 15 - 24 grams glucose in gel tubes

**PHARMACOLOGY AND ACTIONS:**

Glucose is the body's basic fuel and it produces most of the body's quick energy. Its use is regulated by insulin that stimulates storage of excess glucose from the bloodstream and glucagon that mobilizes stored glucose into the bloodstream.

**INDICATIONS:**

Oral glucose is indicated in the conscious patient where a suspicion of hypoglycemia exists or a blood glucose measurement indicates a low blood glucose level.

**CONTRAINDICATIONS:**

**Do not give to patients who cannot adequately protect their own airway.**

**PRECAUTIONS:**

To give solutions orally, a patient must be continually assessed for the ability to protect his or her own airway.

**SIDE EFFECTS AND NOTES:**

- A. Research suggests that hyperglycemia may complicate, or worsen, a number of medical conditions (i.e. myocardial infarction, stroke). Oral glucose should be given to a conscious patient whenever hypoglycemia is documented by blood glucose meter. If these objective findings are not available, the EMT should use judgment based on signs and history.
- B. Effects will be delayed in the elderly and people with poor circulation.
- C. May be more tolerable if administered with liquid between dosages.
- D. Patient's condition may require more than one dose of oral glucose.

**ADULT DOSING:**

**Hypoglycemia -**

One tube or equivalent. Repeat as needed.

**PEDIATRIC DOSING:**

Same as adult

## Hydrocobalamin (Cyano-Kit®) – 20.145

### **OLMC REQUIRED:**

Second 5 gram dose.

**SUPPLIED:** 2.5 grams powder in vial for reconstitution with 100 ml NS. Kit has two vials.

### **PHARMACOLOGY AND ACTIONS:**

Hydroxocobalamin (vitamin B12a) is an effective antidote in the treatment of cyanide poisoning based on its ability to bind cyanide ions. Each Hydroxocobalamin molecule can bind one cyanide ion to form cyanocobalamin (vitamin B12), which is then excreted in the urine. Cyanide is an extremely potent toxic poison. In the absence of rapid and adequate treatment exposure to a high dose of cyanide can result in death within minutes due to inhibition of cytochrome oxidase resulting in arrest of cellular respiration.

### **INDICATIONS:**

Cyanide poisoning or smoke inhalation with suspected cyanide poisoning due to the presence of coma, persistent hypotension or cardiorespiratory arrest.

### **CONTRAINDICATIONS:**

**Do not administer Hydroxocobalamin and Sodium Thiosulfate to the same patient.**

### **PRECAUTIONS:**

Hydroxocobalamin has physical (particulate) and chemical incompatibilities with many medications and it is best to administer other drugs or products (e.g. blood) through a separate intravenous line.

### **SIDE EFFECTS AND NOTES:**

- A. The most frequently occurring side effects are chromaturia (red colored urine) and erythema (skin redness) which occur in nearly all patients.
- B. Other reported serious side effects include allergic reactions, temporary increases in blood pressure, nausea, headache and infusion site reactions.
- C. Because of its deep red color, Hydroxocobalamin has also been found to interfere with certain laboratory tests based on light absorption including co-oximetric measurements or carboxyhemoglobin, methemoglobin and oxyhemoglobin.

### **ADULT DOSING:**

**Cyanide poisoning or smoke inhalation with suspected cyanide poisoning -** 5 grams IV or IO over 15 minutes. Each 2.5 gram vial should be reconstituted with 100 ml of normal saline. Contact OLMC regarding second dose. Monitor for clinical response.

### **PEDIATRIC DOSING:**

**Cyanide poisoning or smoke inhalation with suspected cyanide poisoning -** 70 mg / kg IV or IO over 15 minutes. Each 2.5 gram vial should be reconstituted with 100 ml of normal saline. Contact OLMC regarding second dose. Monitor for clinical response.

## Ipratropium Bromide – 20.150

**OLMC REQUIRED:** No

**SUPPLIED:** 0.5 mg / 2.5 ml vial

**PHARMACOLOGY AND ACTIONS:**

Ipratropium is an atropine derivative used for inhalation therapy. For severe asthma, Ipratropium taken in addition to a short acting beta agonist (such as Albuterol) can provide greater bronchodilation and clinical benefit than the beta agonist alone. It has no anti-inflammatory effects and does not decrease bronchial hyper-responsiveness.

**INDICATIONS:**

As a supplement to Albuterol in patients with asthma and COPD.

**CONTRAINDICATIONS:**

**Do not use in patients with severe glaucoma.**

**PRECAUTIONS:**

Ipratropium in the meter dose inhaler and auto-inhaler formulations should not be administered to individuals allergic to soy lecithin or related food products (e.g. soy beans, peanuts). The nebulized formulation may be administered to these patients.

**SIDE EFFECTS AND NOTES:**

- A. Dry mouth.
- B. Pharyngeal irritation.
- C. Increased intra-ocular pressure in glaucoma patients.

**ADULT DOSING:**

**Asthma/ COPD -**

0.5 mg via nebulizer. Combine with second and third dose of albuterol.

**PEDIATRIC DOSING:**

**Same as adult dosing**

**OLMC REQUIRED:** See Contraindications.

**SUPPLIED:** 100 mg / 5 ml of 2% solution in pre-filled syringe

**PHARMACOLOGY AND ACTIONS:**

Lidocaine depresses the automaticity of Purkinje fibers, raising stimulation threshold in the ventricular muscle fibers which makes the ventricles less likely to fibrillate. It has little antiarrhythmic effect on the atrial muscle in normal doses. The effect of a single bolus on the heart disappears in 10-20 minutes due to redistribution in the body. The metabolic half-life of lidocaine is about 2 hours.

**INDICATIONS:**

- A. Recurrent ventricular fibrillation
- B. Stable ventricular tachycardia or recurrent ventricular tachycardia if clinical condition is not rapidly deteriorating.
- C. Following successful defibrillation or cardioversion from ventricular fibrillation or ventricular tachycardia.
- D. PVC's in a suspected ischemic event.

**CONTRAINDICATIONS:**

**Lidocaine is contraindicated in perfusing pts in the following situations without OLMC approval:**

- A. **Systolic BP is less than 90 mmHg.**
- B. **Heart rate is less than 50 beats per minute.**
- C. **Periods of sinus arrest are present.**
- D. **Second or Third degree heart block are present.**

**PRECAUTIONS:**

- A. Lidocaine is not recommended in the treatment of supra-ventricular arrhythmias.
- B. If administering maintenance dosing and the patient begins seizing, stop the Lidocaine dosing and treat per Seizure protocol.

**SIDE EFFECTS AND NOTES:**

- A. CNS side effects include sleepiness, dizziness, disorientation, confusion, and convulsions.
- B. Hypotension
- C. Lidocaine is metabolized in the liver and, therefore, patients with hepatic disease, shock or congestive heart failure will have decreased metabolism. All doses after the initial dose must be decreased to one-quarter of the initial dose.
- D. Toxicity is more likely in elderly patients.

**ADULT DOSING:**

**VFib/Pulseless VT, VT with pulse, PVC's -**

Bolus dose - 1.5 mg/kg IV/IO. Repeat to a max of 3 mg/kg if needed.  
Maintenance dose - 0.75 mg/kg IV/IO every 10 minutes.

**PEDIATRIC DOSING:**

**Same as adult.**

**OLMC REQUIRED:**

Asthma and seizures in pre-eclampsia/eclampsia.

**SUPPLIED:** 1 gram (50%) / 2 ml vial

**PHARMACOLOGY AND ACTIONS:**

Magnesium is a cation that is present in human cells and intercellular fluids. It acts as an antiarrhythmic agent and may convert ventricular fibrillation and ventricular tachycardia.

**INDICATIONS:**

- A. In cardiac arrest after defibrillation, Epinephrine, Lidocaine and Amiodarone in the treatment of ventricular fibrillation and pulseless ventricular tachycardia.
- B. For the treatment of seizures in women with pre-eclampsia/eclampsia with OLMC approval.
- C. In severe asthma as a smooth muscle relaxant and inhibitor of histamine with OLMC approval.

**CONTRAINDICATIONS:**

**None in the emergency setting.**

**PRECAUTIONS:**

In the non-arrest patient, Magnesium Sulfate may cause hypotension, bradycardia, decreased reflexes and respiratory depression.

**ADULT DOSING:****V Fib / V Tach -**

2 grams IV/IO over 1-2 minutes.

**Eclampsia -**

Contact OLMC for dosing in this situation.

**Asthma -**

Contact OLMC for dosing in this situation. Usual dose is 2 grams over 20 minutes.

**PEDIATRIC DOSING:****V Fib / V Tach -**

25 mg/kg IV/IO over 1-2 minutes.

**Asthma -**

Contact OLMC for dosing in this situation.

**DILUTING FOR IV ADMINISTRATION**

**Dilute each gram (2 ml) of Magnesium Sulfate in 8 ml of Normal Saline.  
(Example: Mix 1 gram (2 cc) in 8 cc's of NS; mix 2 grams (4 cc) in 16'cc of NS)**

**OLMC REQUIRED:** No

**SUPPLIED:** 10 mg / 2 ml vial

**PHARMACOLOGY AND ACTIONS:**

Midazolam is a benzodiazepine with potent sedative, anti-anxiety, and anticonvulsant properties. It also causes significant antegrade amnesia when administered IV.

**INDICATIONS:**

- A. Status seizure (any seizure that has lasted longer than 2 minutes or two consecutive seizures without regaining consciousness)
- B. To relieve anxiety, and produce amnesia during cardioversion, pacing or paralytic intubation.

**CONTRAINDICATIONS:**

**In seizures, do not give unless patient is actively seizing.**

**PRECAUTIONS:**

Midazolam causes respiratory depression and/or hypotension especially if administered rapidly. Monitor patient closely.

**SIDE EFFECTS AND NOTES:**

- A. Common side effects include drowsiness, hypotension, respiratory depression and apnea. These are like more likely to occur in the very young and the elderly. Rarely, patients may experience paradoxical agitation.
- B. Respiratory depression is more likely in patients who have taken other CNS depressant drugs such as opioids alcohol and barbiturates, or when given rapidly.
- C. Midazolam is metabolized in the liver and excreted by the kidney. Doses should be adjusted accordingly in patients with underlying hepatic or renal diseases and low flow states such as congestive heart failure.

**ADULT DOSING:**

**Seizures/Pacing -**

2.5 mg IV/IO or 5 mg IM. May repeat once. Call OLMC for additional doses.

**Chemical restraint -**

2.5 – 5 mg IV or 5 mg IM. May repeat once. Call OLMC for additional doses.

**Sedation after intubation without paralytics -**

0.1 mg/kg IV to a max of 2.5 mg.

**Sedation after intubation with paralytics -**

2.5 - 5 mg IV/IO if systolic BP is  $\geq$  100 mmHg. Repeat as necessary to maintain sedation.

**Sedation for induced hypothermia -**

5 mg IV/IO. May repeat to a maximum of 10 mg as long as systolic BP is  $\geq$  100 mmHg.

**PEDIATRIC DOSING:**

**Seizures -**

0.1 mg / kg IV to a max of 2.5 mg or 0.2 mg / kg IM/IN to a max of 5 mg. May repeat once after five minutes. Contact OLMC for additional doses.

**Sedation after intubation with or without paralytics -**

0.1 mg/kg IV to a max of 2.5 mg.

**OLMC REQUIRED:** No

**SUPPLIED:** Varies

**PHARMACOLOGY AND ACTIONS:**

Morphine is a narcotic analgesic that induces drowsiness, mental clouding and mood changes. It also increases venous capacitance, decreases venous blood return (preload) and reduces systemic vascular resistance at the arteriolar level (afterload). This may lead to decreases in myocardial oxygen demand. Onset of action when given IV is 2-3 minutes and peak effect occurs at 7-10 minutes. Duration is 3-5 hours.

**INDICATIONS:**

- A. Suspected ischemic chest pain unresponsive to nitroglycerin.
- B. Pain due to burns or musculoskeletal injury.

**CONTRAINDICATIONS:**

- A. Known allergy to morphine or sulfates (Sulfa drugs are not sulfates)
- B. Blood pressure less than 100 mmHg systolic.
- C. Trauma or pain of the head or abdomen.
- D. Respiratory rate less than 14 breaths per minute or oxygen saturation less than 90%. For pediatric patients, vital signs should be maintained within the normal age-appropriate range.

**PRECAUTIONS:**

- A. Morphine causes respiratory depression that is reversible with Naloxone. This respiratory depression is exacerbated by underlying lung disease (COPD, etc.) and other depressant drugs (Valium, alcohol, cyclic anti-depressants). Naloxone and respiratory support must be available when using Morphine.
- B. If hypotension develops it is usually responsive to Naloxone administration and Trendelenburg position. If hypotension persists, follow Shock protocol.

**SIDE EFFECTS AND NOTES:**

- A. The goal of Morphine administration is patient comfort (not the total elimination of pain but reduction in perception of pain by the patient).
- B. Morphine is a Schedule II controlled substance. Follow your agencies Controlled Substance policy or procedure for control and monitoring of use.

**ADULT DOSING:**

**Pain - Musculoskeletal injuries, burns, chest pain -**  
2-5 mg IV/IM. Repeat every 3-5 to max of 20 mg.

**PEDIATRIC DOSING (< 20kg):**

**Pain - Musculoskeletal injuries, burns, chest pain -**  
0.1 mg / kg IV/IM. Do not exceed adult dosing.

**OLMC REQUIRED:** No

**SUPPLIED:** 2 mg / 2 ml pre-filled syringe

**PHARMACOLOGY AND ACTIONS:**

Naloxone is an opioid antagonist which competitively binds to opioid receptor sites but which exhibits almost no pharmacologic activity of its own. Duration of effect is 1-4 hours.

**INDICATIONS:**

- A. Reversal of opioid effects, particularly respiratory depression, due to opioid drugs either ingested or injected or administered in the course of treatment. Opioid drugs include Fentanyl, Morphine, Demerol, Dilaudid, Percodan, Codeine.
- B. Diagnostically in coma of unknown etiology to rule out or reverse opioid depression.

**CONTRAINDICATIONS:**

**Do not use in neonates.**

**PRECAUTIONS:**

- A. In patients physically dependent on opioids, violent withdrawal symptoms may occur. Be prepared to restrain the patient.
- B. Some opioid intoxications may require up to 8 mg of Naloxone to reverse symptoms (e.g. Methadone, designer drugs).

**SIDE EFFECTS AND NOTES:**

- A. The duration of some opioids is longer than Naloxone, repeat doses may be necessary. Monitor the patient closely. Patients who have received Naloxone must be transported to the hospital because coma may reoccur when Naloxone wears off.
- B. Side effects are rare. Do not hesitate to use if indicated.
- C. If no effect is seen from Naloxone administration, consider other causes of coma.

**ADULT DOSING:**

**Reversal of opioid effects, coma of unknown etiology –**

0.5 mg IV, repeat q 2 minutes up to 2 mg titrating to respirations. If no IV, give 2 mg IM/IN. If no response to initial dose, may repeat at 2 mg q 5 min (IV/ IM/IN) up to a maximum of 8 mg.

**PEDIATRIC DOSING:**

**Reversal of opioid effects, coma of unknown etiology –**

0.1 mg / kg IV/IM/IN up to 2 mg. May repeat q 3-5 minutes up to 2 mg / dose. Max total dose 8 mg. Do not use in neonates.

**OLMC REQUIRED:** See Contraindications (B)

**SUPPLIED:** 0.4 mg metered dose spray, 0.4 mg tablets.

**PHARMACOLOGY AND ACTIONS:**

Nitroglycerin is an organic nitrate and is a vasodilating agent. Its cardiovascular effects include: reduced venous tone (causing pooling of blood in the peripheral veins and decreased return of blood to the heart), decreased peripheral resistance, and dilation of coronary arteries. It also is a general smooth muscle relaxant.

**INDICATIONS:**

- A. Chest pain thought to be related to cardiac ischemia.
- B. Pulmonary edema.

**CONTRAINDICATIONS:**

- A. Blood pressure less than 100 mmHg systolic.
- B. Patients who have taken Viagra® (sildenafil citrate) or Levitra® (vardenafil HCl) within 24 hours, or who have taken Cilais® (tadalafil) within 48 hours. Contact OLMC for direction.

**PRECAUTIONS:**

- A. Generalized vasodilatation may cause profound hypotension and reflex tachycardia.
- B. IV should be established prior to administration in patients who have not taken Nitroglycerin previously, or who have a potential for hemodynamic instability.
- C. Use with caution in patients with borderline blood pressure or with inferior/right side MI.

**SIDE EFFECTS AND NOTES:**

- A. Common side effects are headache, flushing or dizziness.
- B. Because nitroglycerin causes generalized smooth muscle relaxation, it may be effective in relieving chest pain caused by esophageal spasm.

**ADULT DOSING:**

**Chest pain, pulmonary edema -**

0.4 mg SL every 5 minutes until pain is relieved as long as systolic BP is greater than 100 mmHg.

**PEDIATRIC DOSING:**

Contact OLMC for dosing.

**OLMC REQUIRED:**

Patients < 2 years except for children in spinal immobilization or children receiving chemotherapy.

**PHARMACOLOGY AND ACTIONS:**

Ondansetron is a potent, highly selective serotonin (5-HT<sub>3</sub>) receptor agonist. Its precise mode of action in the control of nausea is not known. Pharmacologic agents and other triggers may cause release of 5-HT<sub>3</sub> receptors. Ondansetron blocks the initiation of this reflex. Ondansetron is commonly used in the treatment of nausea in patients who are receiving chemotherapy or as a postoperative nausea treatment. Peak plasma concentrations of the drug occur 10 minutes after IV administration, and 40 minutes after IM injection. Both routes have the same elimination half-life of 4 hours.

**INDICATIONS:**

Prevention and control of uncomplicated nausea and vomiting.

**CONTRAINDICATIONS:**

**Known hypersensitivity to Zofran or similar medications.**

**PRECAUTIONS:**

- A. Hypersensitivity reactions have been reported in patients who have exhibited hypersensitivity to other 5-HT<sub>3</sub> medications (Anzemet®, Kytril®)
- B. Patients with bowel obstruction should be monitored closely following administration.
- C. Ondansetron may precipitate if mixed with alkaline solutions.

**SIDE EFFECTS AND NOTES:**

- A. The most common side effects include headache, dizziness, drowsiness and shivers.
- B. Body aches, agitation, dysuria, hypotension and rash have also been reported in a very small number of patients.

**ADULT DOSING:****Nausea & vomiting -**

8 mg oral tablet or 4 mg IV/IM. Give slowly over two minutes if giving IV. If nausea and/or vomiting are inadequately controlled after 10 minutes, may repeat dose once.

**PEDIATRIC DOSING:****Nausea & vomiting (children 2-12 yrs)**

4 mg oral tablet or 0.1 mg/kg IV/IM. Give slowly over two minutes if giving IV. Do not exceed 4 mg.

**OLMC REQUIRED:** None

**SUPPLIED:** Various. D cylinder contains 415 liters at 2,000 psi.

**PHARMACOLOGY AND ACTIONS:**

Oxygen added to the inspired air raises the amount of oxygen in the blood and the amount delivered to the tissues. Breathing in most persons is regulated by small changes in acid/base balance and CO<sub>2</sub> levels and it takes a large drop in oxygen concentration to stimulate respiration.

**INDICATIONS:**

- A. Suspected hypoxemia or respiratory distress from any cause.
- B. Acute chest pain in which cardiac ischemia or myocardial infarction is suspected.
- C. Shock from any cause.
- D. Major trauma.
- E. Carbon monoxide poisoning.

**CONTRAINDICATIONS:** None

**PRECAUTIONS:**

- A. If the patient is not breathing adequately on their own, the treatment of choice is ventilation with oxygen, not just supplemental oxygen.
- B. In a small percentage of patients with chronic lung disease, administration of oxygen will decrease respiratory drive. Do not withhold oxygen because of this possibility. Be prepared to assist ventilation if needed.

**SIDE EFFECTS AND NOTES:**

- A. Non humidified oxygen is drying and irritating to mucous membranes.
- B. Restless may be an important sign of hypoxia.
- C. Oxygen toxicity is not a risk in acute administration.
- D. Nasal cannula prongs work equally well on nose and mouth breathers.

**DELIVERY:**

<b>Nasal cannula -</b>	
2-8 lpm	24 – 40% inspired O <sub>2</sub>
<b>Simple face mask -</b>	
6 lpm	50 – 60% inspired O <sub>2</sub>
<b>Rebreather mask -</b>	
10-12 lpm	90% inspired O <sub>2</sub>
<b>Bag valve mask -</b>	
Room air	21% inspired O <sub>2</sub>
12 lpm	40% inspired O <sub>2</sub>
With reservoir	+ 90% inspired O <sub>2</sub>

## **Pralidoxime (2-Pam<sup>®</sup>) – 20.250**

**OLMC REQUIRED:** For IV use.

**SUPPLIED:** 600 mg / 2 ml auto-injector, 1 gm powder vial – reconstitute with 20 ml NS

### **PHARMACOLOGY AND ACTIONS:**

The principal action of Pralidoxime is to reactivate cholinesterase which has been inactivated by an organophosphate pesticide or related compound. The drug's most critical effect is in relieving paralysis of respiratory muscles. Atropine is always required concurrently to block the effect of acetylcholine.

### **INDICATIONS:**

- A. As an antidote in the treatment of poisoning due to organophosphate pesticides and chemicals.
- B. Control of overdose by anticholinesterase drugs (e.g. treatment of myasthenia gravis).

### **CONTRAINDICATIONS:**

None in the emergency setting.

### **PRECAUTIONS:**

- A. Rapid IV injection may cause tachycardia, laryngospasm, muscle rigidity and transient neuromuscular blockade. Administration should be done slowly and preferably by infusion.
- B. Pralidoxime is a relatively short acting drug, repeat dosing may be necessary.

### **SIDE EFFECTS AND NOTES:**

Dizziness, blurred vision, diplopia, headache, drowsiness, nausea, tachycardia and muscle weakness have been reported following administration.

### **ADULT DOSING:**

Refer to Haz-Mat Protocol – Organophosphate Poisoning for dosing.

### **PEDIATRIC DOSING:**

Refer to Haz-Mat Protocol – Organophosphate Poisoning for dosing.

**OLMC REQUIRED:** No

**SUPPLIED:** 0.5% solution in 15 ml bottle

**PHARMACOLOGY AND ACTIONS:**

Proparacaine hydrochloride is a short-acting local anesthetic of the ester type with an onset of action within 30 seconds. Duration is up to 15 minutes.

**INDICATIONS:**

Superficial foreign bodies or chemical burns to the eye.

**CONTRAINDICATIONS:**

**Known hypersensitivity to any component of the solution.**

**PRECAUTIONS:**

Systemic effects are rare with topical use.

**SIDE EFFECTS AND NOTES:**

Instillation of Proparacaine in the recommended concentration and dosage produces little or no initial irritation, stinging or burning, these effects may occur several hours after use.

**ADULT DOSING:**

**Chemical burns or foreign body to outer eye -**

Instill one drop in the affected eye. If there is no effect within one minute, three additional drops may be instilled at one-minute intervals. For transports longer than 15 minutes, if eye pain returns, 1-4 additional drops may be instilled to continue anesthetic effect.

**PEDIATRIC DOSING:**

**Same as adult**

**OLMC REQUIRED:**

Crush injury, Hyperkalemia.

**SUPPLIED:** 50 mEq / 50 ml pre-filled syringe.

**PHARMACOLOGY AND ACTIONS:**

Sodium Bicarbonate is an alkalotic solution which neutralizes acids found in the blood. Acids are increased in the blood when body tissues become hypoxic due to cardiac or respiratory arrest. Acidosis depresses cardiac contractility and cardiac response to catecholamines, and makes the heart more likely to fibrillate and less likely to defibrillate. In the non-perfusing patient Sodium Bicarbonate has been shown to increase the intracellular acidosis and worsen acid/base balance, thus it is not recommended in the routine cardiac arrest sequence.

**INDICATIONS:**

- A. To control arrhythmias or asystole in cyclic antidepressant overdose or hyperkalemia.
- B. Acidosis caused by prolonged cardiac arrest.

**CONTRAINDICATIONS: None****PRECAUTIONS:**

- A. Addition of too much bicarbonate may result in alkalosis that is difficult to reverse and may cause as many problems in resuscitation as acidosis.
- B. May increase cerebral acidosis, especially in diabetics who are ketotic.
- C. Do not mix Sodium Bicarbonate with calcium preparations. Slowly flush one drug from the catheter before administering the other.

**SIDE EFFECTS AND NOTES:**

Each amp of Sodium Bicarbonate contains 50 mEq of sodium. This may increase intravascular volume and hyperosmolarity resulting in cerebral impairment.

**ADULT DOSING:****Tri-cyclic antidepressant overdose -**

1 mEq / kg IV or IO

**V Fib, pulseless V Tach, asystole -**

1 mEq / kg IV or IO. May repeat q 10 minutes at 0.5 mEq / kg.

**Hyperkalemia -**

50 mEq IV or IO. OLMC required.

**Crush injury -**

Contact trauma physician through OLMC for advice.

**PEDIATRIC DOSING:**

- A. Use same dosing as for adult with exception of hyperkalemia, call OLMC for dosing in that situation.
- B. For children less than 10 kg (1 yr), dilute by one-half with Normal Saline prior to administration.

**OLMC REQUIRED:** All situations.

**SUPPLIED:** 12.5 grams / 50 ml vial

**PHARMACOLOGY AND ACTIONS:**

Sodium Thiosulfate is used as an antidote for cyanide poisoning. The primary mechanism of cyanide detoxification involves the conversion of cyanide to the thiocyanate ion, which is relatively non-toxic. This reaction involves the enzyme rhodanese which is found in many body tissues but with the major activity in the liver. The body has the capability to detoxify cyanide, however, the rhodanese enzyme system is slow to respond to large amounts of cyanide. The rhodanese enzyme reaction can be accelerated by supplying an exogenous source of sulfur. This is commonly accomplished by administering Sodium Thiosulfate.

**INDICATIONS:**

Cyanide poisoning.

**CONTRAINDICATIONS:**

**Do not administer to a patient who has been given hydroxocobalamin (Cyano-Kit).**

**PRECAUTIONS:**

- A. Sodium Thiosulfate is essentially non-toxic. However, some animal studies showed that a constant infusion of Sodium Thiosulfate led to hypovolemia which was considered due to an osmotic effect.
- B. It is not known whether Sodium Thiosulfate can cause fetal harm when administered to a pregnant woman and should only be administered in this setting if clearly needed.

**SIDE EFFECTS AND NOTES:**

- A. Sodium Thiosulfate is administered as a slow push over 10 minutes. Consider using a Burette or similar device.

**ADULT DOSING:**

**Cyanide poisoning -**  
50 ml slow IV over 10-20 minutes.

**PEDIATRIC DOSING:**

**Cyanide poisoning -**  
1.65 ml / kg slow IV over 10-20 minutes.

**OLMC REQUIRED:** None

**SUPPLIED:** 200 mg / 10 ml vial

**PHARMACOLOGY AND ACTIONS:**

Succinylcholine is a short acting motor nerve depolarizing skeletal muscle relaxant. It competes with acetylcholine to combine with cholinergic receptors in the motor end plate causing depolarization inhibiting neuromuscular transmission. After intravenous injection paralysis is obtained within 1-2 minutes and persists for approximately 4-6 minutes. Effects then start to fade and return to normal. It has no effect on consciousness. Muscle relaxation begins in the eyelids and jaw, then progresses to the limbs, abdomen, diaphragm and finally intercostal muscles. Succinylcholine is hydrolyzed by plasma pseudocholinesterase and is excreted by the kidneys.

**INDICATIONS:**

To achieve temporary paralysis where endotracheal intubation is indicated.

**CONTRAINDICATIONS:**

- A. Hypersensitivity to the drug.
- B. Major burns and crush injuries between 48 hours and 6 months old.
- C. Stroke or spinal cord injuries with profound residual deficits between 48 hours and 6 months old.
- D. Suspected hyperkalemia

**PRECAUTIONS:**

- A. Succinylcholine shall not be administered unless personnel trained and authorized in this procedure are present and ready to perform the procedure.
- B. Oxygen, ventilation equipment and resuscitation drugs should be readily available.
- C. Succinylcholine produces paralysis, but does not alter a person's level of consciousness. Paralysis in the conscious patient is very frightening, therefore, sedation should be provided to the patient during the procedure. Verbal explanations should be provided to the patient during the procedure, even if you do not think they can hear you.

**SIDE EFFECTS AND NOTES:**

In rare individuals, because of pseudocholinesterase deficiency, paralysis may persist for a prolonged period of time. Be prepared to continue to assist ventilations as needed.

**ADULT DOSING:**

- Rapid sequence intubation -**  
1.5 mg/kg IV/IO for patients  $\geq$  6 years old.

**PEDIATRIC DOSING:**

- Rapid sequence intubation -**  
2 mg/ kg IV/IO for patients < 6 years old.

**OLMC REQUIRED:** No

**SUPPLIED:** 20 units / 1 ml vial

**PHARMACOLOGY AND ACTIONS:**

Vasopressin is a non-peptide hormone made in the posterior pituitary. Its primary role is water regulation with a secondary role as vasoconstriction. It increases gastrointestinal and uterine motility and platelet aggregation. Vasopressin also results in the secretion of ACTH, aldosterone, and factor VIII.

**INDICATIONS:**

As the first line pressor agent in cardiac arrest.

**CONTRAINDICATIONS:**

**Hypersensitivity to the medication.**

**PRECAUTIONS:**

None in cardiac arrest.

**SIDE EFFECTS AND NOTES:**

None in cardiac arrest.

**ADULT DOSING:**

**VFib/Pulseless VT, Asystole, PEA -**  
40 units IV/IO.

**PEDIATRIC DOSING:**

**Not indicated in pediatrics.**

## Vecuronium (Norcuron<sup>®</sup>) – 20.290

**OLMC REQUIRED:** No

**SUPPLIED:** 10 mg vial of powder and 10 ml vial of diluent solution

### **PHARMACOLOGY AND ACTIONS:**

Vecuronium is a non-depolarizing neuromuscular blocking agent causing skeletal muscle relaxation. It reversibly binds the acetylcholine receptor, blocking the action of acetylcholine. Neuromuscular blockade occurs within 2-3 minutes. Time to recovery is 30-45 minutes. Vecuronium metabolism is 5-35% renal with the remainder done in the liver.

### **INDICATIONS:**

- A. For sustained neuromuscular blockade in the intubated patient.
- B. As the first line agent for Rapid Sequence Induction in the patient where Succinylcholine is contraindicated.

### **CONTRAINDICATIONS:**

None

### **PRECAUTIONS:**

- A. Patients with renal or hepatic failure may experience prolonged paralysis.
- B. Vecuronium has no effect on consciousness and must be used with a sedative or induction agent.

### **SIDE EFFECTS AND NOTES:**

- A. Vecuronium exhibits minimal side effects and does not substantially affect heart rate or rhythm, systolic or diastolic blood pressure, mean arterial pressure, cardiac output, or systemic vascular resistance.
- B. Vecuronium can be used to maintain paralysis even if intubation was performed without Succinylcholine.

### **ADULT DOSING:**

**Rapid Sequence Induction -**  
0.1 mg/kg IV/IO.

### **PEDIATRIC DOSING:**

Same as adults.

# Procedures

### **INDICATIONS:**

Proper airway management is the first priority of the EMT/Paramedic. There are several adjuncts used for airway control and protection and the adequate oxygenation and ventilation of patients.

### **DELIVERY SYSTEMS**

- A. Nasal Cannula  
Used when small amounts of oxygen are desired. Flow rates are generally 4-6 liters/minute. It provides between 24-40% inspired oxygen.
- B. Partial Re-breather Mask (PRB)  
Used when higher concentrations of oxygen are needed. It provides approx 90% inspired oxygen.
- C. "Blow-By" Oxygen  
Typically used in infants or toddlers or those who cannot tolerate a cannula or mask.

### **MAINTENANCE DEVICES**

- A. Nasopharyngeal Airway (NPA)  
Used in patients who are unconscious or have an altered LOC and are unable to maintain their own airway and who will not accept an OPA.
- B. Oropharyngeal Airway (OPA)  
Used in patients who are unconscious or have an altered LOC and are unable to maintain their own airway.
- C. Bag Valve Mask (BVM)  
Used when respiratory drive is compromised and patient needs ventilatory assistance. Proper facial seal and head positioning are required to deliver maximum inspired oxygen and effectively ventilate the patient. Capnography and chest rise and fall should be monitored to ensure proper ventilation.

### **NOTES & PRECAUTIONS:**

In trauma patients, airway maintenance with cervical spine control is the primary concern. If unable to establish or maintain an airway, transport the patient to the closest hospital. This includes patients entered into the Trauma System.

### DEFINITION:

An AICD is an implanted defibrillator device that consists of: a lead system that senses cardiac activity, logic circuitry to analyze sensed signals, a power supply for device function and generating high voltage, and a capacitor that stores and delivers shocks. This device activates when brady and/or tachyarrhythmias are detected within programmed parameters.

### INDICATIONS:

For verified frequent and recurrent inappropriate AICD discharges, a doughnut magnet may be utilized to deactivate “runaway” devices. Inhibition of AICD devices should be considered when continuous ECG monitoring verifies malfunction and ACLS is readily available.

### PROCEDURE:

- A. Contact OLMC.
- B. Monitor ECG and verify sinus rhythm AND inappropriate defibrillator discharge.
- C. Locate the position of the AICD device.
- D. Place doughnut magnet directly over the device.
- E. After proper positioning and AICD deactivation, tape magnet securely in place and transport.

### NOTES & PRECAUTIONS:

- A. It is very important to make the correct diagnosis before utilizing this protocol. Be sure that the ECG is showing a normal sinus rhythm without ectopy AND indications of recurrent AICD discharges.
- B. Some AICD devices will emit varying beeping or continuous tones when magnets are applied, other will not. Disregard these tones.
- C. If the magnet placement is successful in overriding the pulse generation of the AICD, **DO NOT REMOVE THE MAGNET**. Some units will return to normal operation after removal from the magnetic field.
- D. Magnets should be stored so as not to come into contact with magnetic sensitive materials, i.e., monitor screens, tapes, credit cards, magnetic door entry cards, and other electronic equipment.
- E. A small percentage of AICDs are impervious to magnetic fields (AICD recipients who normally work around magnetic fields have these special units). This will not be deactivated with the doughnut magnet. In such cases, advise OLMC and transport.
- F. Consider use of the AICD magnet in deactivating cardiac pacemaker malfunctions. Call OLMC.
- G. Identification information of the AICD type, date implanted, and location of implantation should accompany the patient to the hospital. This information is typically found on a wallet card that the patient has.

## **DEFINITION:**

The Combitube<sup>®</sup> is a two-tube system similar to the PTL, EOA or EGTA airways. However, the Combitube<sup>®</sup> has combined the lumens of an endotracheal and esophageal tubes. The device is inserted blindly, entering the esophagus (approx. 90% of the time) or the trachea (approx. 10% of the time). Depending on which structure it enters it will function as an esophageal or endotracheal ventilation device. The Combitube<sup>®</sup> may be used by EMT-Paramedics and EMT-Intermediates who have received the appropriate training.

## **INDICATIONS:**

- A. Immediate intubation is not available or cannot be performed.
- B. Access to the patient's head is inhibited due to entrapment.
- C. Direct visualization of the larynx is inhibited.

## **CONTRAINDICATIONS:**

- A. Patient less than 16 years of age.
- B. Patient under five (5) feet tall.
- C. Patient who has an intact gag reflex.
- D. Patient with known esophageal disease (i.e. varices, cancer.)
- E. Patient who has ingested a caustic substance.

## **PROCEDURE:**

- A. Pre-oxygenate.
- B. Place head in neutral position.
- C. Insert device using a jaw-lift maneuver to the depth indicated by the marking on the tube. The black rings on the tube should be positioned between the patient's teeth (or gums if patient has no teeth).
- D. Inflate the pharyngeal (large) cuff with 100cc of air.
- E. Inflate the distal (small) cuff with 15cc of air.
- F. Ventilate through longer blue connector (number 1) tube.
- G. Listen for sounds in both lungs and stomach.
  - a. If you hear breath sounds instead of gastric sounds, continue ventilation through tube number 1.
  - b. If you hear gastric sounds and no lung sounds, begin ventilation through shorter (number 2) clear tube.
- H. Confirm lung sounds with 5-point auscultation.
- I. Ventilate with 100% oxygen.
- J. Secure using ETT securing device.
- K. Apply ETCO<sub>2</sub> detection device.

## Continuous Positive Airway Pressure – 30.032

### DEFINITION:

Continuous Positive Airway Pressure (CPAP) has been shown to rapidly improve vital signs, gas exchange, and to decrease the work of breathing, the sense of dyspnea, and the need for endotracheal intubation in patients who suffer from shortness of breath secondary to CHF/Pulmonary edema or COPD. In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

### INDICATIONS:

**Medical patients** complaining of moderate to severe respiratory distress meeting **ALL** the following criteria:

- A. Is awake, oriented and has the ability to maintain an open airway.
- B. Has signs and symptoms consistent with either CHF/pulmonary edema or COPD.
- C. Has a systolic blood pressure above 100 mmHg.
- D. Is over 12 years old and is able to fit the CPAP mask.

### CONTRAINDICATIONS:

- A. Respiratory arrest.
- B. Non-cooperative patient.
- C. Suspected pneumothorax.
- D. Hemodynamically unstable.
- E. Inability to maintain mask seal.
- F. Active vomiting.

### PROCEDURE:

- A. EXPLAIN and COACH THE PATIENT ON THE PROCEDURE.
- B. Ensure adequate oxygen supply to ventilation device.
- C. Place the patient on continuous pulse oximetry and end-tidal CO<sub>2</sub>.
- D. Turn on device:
  1. For the Boussignac<sup>®</sup> and Flow-Safe<sup>®</sup> CPAP devices start with oxygen flow @ 15 lpm (3-5cm H<sub>2</sub>O) and adjust as needed up to 25 lpm.
  2. For the Emergent PortO<sub>2</sub> CPAPos, begin at 0-2 cm H<sub>2</sub>O, titrate pressure to a maximum of 10 cm H<sub>2</sub>O on exhalation.
- E. Place the CPAP over the patient's mouth and nose (consider having the patient hold the mask against their face initially to reduce anxiety).
- F. Secure the mask with the provided straps.
- G. Check for air leaks.
- H. Monitor and document the patient's respiratory response to the treatment.
- I. Continue to coach patient to keep mask in place and readjust as needed.
- J. IF RESPIRATORY STATUS DETERIORATES, REMOVE THE DEVICE AND CONSIDER BAG VALVE MASK VENTILATION AND/OR ENDOTRACHEAL INTUBATION.

### REMOVAL PROCEDURE:

CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask or experiences continued or worsening respiratory failure.

## Continuous Positive Airway Pressure – 30.032

### SPECIAL NOTES:

- A. Contact the receiving hospital as soon as possible that a patient with CPAP is enroute to their hospital so they can be prepared for patient.
- B. Reassessment of the patient's status is critical and documentation should be performed every 5-10 minutes until patient is stable.
- C. CPAP mask may be removed temporarily to administer nitroglycerin.
- D. Suctioning of secretions may be required on some patients.
- E. Watch for gastric distention and/or nausea.
- F. Estimated CPAP pressure delivered by the **Boussignac** CPAP:
  - 5 cm H<sub>2</sub>O @ 15 lpm,
  - 7.5 cm H<sub>2</sub>O @ 20 lpm,
  - 10 cm H<sub>2</sub>O @ 25 lpm
- G. Estimated CPAP pressure delivered by the **Flow-Safe** CPAP:
  - 3-4 cm H<sub>2</sub>O @ 15 lpm,
  - 6-7 cm H<sub>2</sub>O @ 20 lpm,
  - 8.5-10 cm H<sub>2</sub>O @ 25 lpm

### INDICATIONS:

- A. Respiratory insufficiency or arrest.
- B. Airway obstruction.
- C. Brain injury (GCS  $\leq$  8).
- D. Unconsciousness or altered mental status with airway compromise.
- E. Situations that require positive pressure ventilation.

### PROCEDURE:

- A. Open airway and pre-oxygenate with cricoid pressure.
- B. Assemble and check all equipment, including cardiac monitor, suction, and pulse oximeter.
- C. Intubate in a controlled, but timely manner.
- D. Verify placement with ETCO<sub>2</sub> detection device and a careful five-point check. Watch for chest expansion; use continual ETCO<sub>2</sub> monitoring and pulse oximetry to confirm patient status.
- E. Secure the tube utilizing ETT securing device. Record ET Tube depth at the teeth or gum line.
- F. Ventilate and monitor patient's vital signs including SpO<sub>2</sub>.
- G. Administer midazolam 0.1 mg/kg IV up to a maximum of 2.5 mg as needed for agitation.
- H. If patient continues to be agitated, administer vecuronium 0.1 mg/kg IV.

### DOCUMENTATION:

The following items should be documented in the PCR:

- A. Visualization of the cords (if applicable).
- B. Number of attempts.
- C. 5-point check and equal chest expansion.
- D. Any other devices/ techniques used.
- E. ETCO<sub>2</sub> device used/reading.
- F. Any changes during patient contact.
- G. Reconfirmation of placement after patient movement.

### NOTES & PRECAUTIONS:

- A. Recheck tube placement with every major movement of the patient, movement of equipment, or if a significant change in vital signs occurs.
- B. **DO NOT** rely solely on monitoring equipment to determine the efficacy of intubation. Auscultate for lung sounds and/or re-visualize with laryngoscope.

## Endotracheal Intubation with paralytics – 30.050

### INDICATIONS:

Patient meets criteria described previously under "Intubation," **and** patient has any of the following:

- A. Clenched jaw.
- B. Active gag reflex.
- C. Uncontrollable combative behavior.
- D. Clinical condition requiring airway protection.

### PROCEDURE:

- A. Open airway and pre-oxygenate while maintaining cricoid pressure.
- B. Assemble airway equipment including suction and alternative airway devices and attach required monitoring equipment (ECG, pulse oximeter). Initiate IV/IO.
- C. Premedicate with Etomidate 0.3 mg/kg IV/IO over 10 seconds. (Pediatric dose is the same)
- D. Continue cricoid pressure and maintain until ET tube is in place, verified and secured.
- E. Administer Succinylcholine 1.5 mg/kg IV for patients  $\geq 6$  years and 2 mg/kg for patients  $< 6$  years.
- F. If inadequate paralysis exists after 1 minute, check patency of IV/IO line. Repeat succinylcholine with same dose.
- G. If Succinylcholine is contraindicated, substitute Vecuronium 0.1 mg/kg IV push as the paralytic.
- H. Treat bradycardia with ventilation first. If bradycardia persists, administer Atropine 0.5 mg in an adult patient. 0.02 mg/kg IV for children  $< 2$  years old. Minimum dose is 0.1 mg. Do not exceed adult dose.
- I. Intubate in a controlled but timely manner when patient becomes relaxed.
- J. Verify placement with ETCO<sub>2</sub> detection device and a careful five-point check. Watch for chest expansion; use continual ETCO<sub>2</sub> monitoring and pulse oximetry to confirm patient status.
- K. Secure the tube using ETT securing device. Record ET tube depth at the teeth.
- L. Ventilate and monitor patient's vital signs including ETCO<sub>2</sub> and SpO<sub>2</sub>.
- M. If intubations attempts fail, ventilate with BVM. Consider pharyngeal airway (King®, Combitube®) or cricothyrotomy to secure airway if needed.
- N. After successful advanced airway placement, administer midazolam® 2.5 - 5 mg IV/IO if systolic BP is  $>100$  mmHg and repeat as necessary to maintain sedation. (Pediatric dose is 0.1 mg/kg up to 2.5 mg).
- O. If additional paralysis is needed in the event of long scene time or transport, administer Vecuronium 0.1 mg/kg IV/IO. Dose may be repeated once if needed.
- P. Contact OLMC if additional sedation or paralysis is needed.

## Endotracheal Intubation with paralytics – 30.050

### NOTES & PRECAUTIONS:

- A. **Recheck tube placement with every major movement of the patient, movement of equipment, or if a significant change in vital signs occurs.**
- B. Check IV/IO patency if the first dose of Succinylcholine does not appear to be effective in paralyzing the patient.
- C. In most situations, the number of intubation attempts per paramedic should be limited to 2 (with a maximum of 4 attempts prior to transport).
- D. **DO NOT** rely solely on monitoring equipment to determine the efficacy of intubation. Auscultate for lung sounds.
- E. Succinylcholine does not affect the level of consciousness.
- F. Succinylcholine is contraindicated in the following situations:
  - 1. Hypersensitivity to the drug.
  - 2. Major burns and crush injuries between 48 hours and 6 months old.
  - 3. Stroke or spinal cord injuries with profound residual deficits between 48 hours and 6 months old.
  - 4. Suspected hyperkalemia.

### **INDICATIONS:**

This technique is to be used only when other attempts to establish an airway have been unsuccessful (i.e., you are unable to intubate or ventilate using BVM) and respiratory obstruction exists. Such conditions are most likely to be found with foreign-body obstruction; facial and laryngeal trauma; inhalation, thermal, or caustic injury to the upper airway; angioneurotic edema; upper airway bleeding; epiglottitis; and severe croup.

### **PROCEDURE:**

Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck. Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage. This is the position of the cricothyroid membrane.

### **PerTrach**

- A. Locate the cricothyroid membrane.
- B. Palpate the cricothyroid membrane with gloved hand.
- C. Pinch the skin, and make a 1-2 cm vertical incision, cutting away from the patient.
- D. Firmly grasp the trachea and insert the needle.
- E. Aspirate for air with a syringe.
- F. Remove syringe, and thread dilator through needle.
- G. Squeeze wings of needle and open out to split needle. Carefully remove needle.
- H. Insert dilator into airway, place tube in functional position, (faceplate against skin.)
- I. Remove dilator.
- J. Inflate cuff with 1-8 ccs of air.
- K. Secure the device to the neck and ventilate.
- L. Consider sedation with Versed® as with RSI if not already given.

### **QuickTrach**

- A. Place the patient in a supine position. Assure stable positioning of the neck region and hyperextend the neck.
- B. Locate the cricothyroid membrane (in the midline between the thyroid cartilage and the cricoid cartilage).
- C. Pinch the skin and make a vertical incision in a downward motion with a scalpel over the cricothyroid membrane large enough to introduce the device.
- D. Secure the larynx laterally between the thumb and middle finger and reconfirm the location of the cricoid membrane.
- E. Firmly hold the device and puncture the cricothyroid membrane at a 90 degree angle.
- F. After puncturing the cricothyroid membrane, check entry of the needle into the trachea by aspirating air through the syringe. If air is aspirated the needle is in the trachea.
- G. Change the angle of the needle to 60 degrees and advance the device forward into the trachea to the level of the stopper.
- H. Remove the stopper being careful not to advance the device further into the trachea with the needle still attached.
- I. Hold the needle and syringe firmly and slide only the plastic cannula along the needle into the trachea until the flange rests on the neck. Carefully remove the needle and syringe.
- J. Secure the device to the neck.
- K. Apply the connecting tube to the device and ventilate.
- L. Consider sedation with Versed® as with RSI if not already given.

## **Surgical Cricothyrotomy (Patients > 40 kg)**

- A. Cleanse the site with antiseptic.
- B. Using your non-dominant hand (thumb and middle finger), stabilize the trachea. Your index finger is available to maintain location of the cricothyroid membrane throughout the procedure.
- C. Locate the cricothyroid membrane
- D. May make a vertical incision through the skin. **NOTE:** There may be significant bleeding.
- E. Make a horizontal incision through the cricothyroid membrane large enough to pass the tube.
- F. Insert the tracheal hook or dilator through the cricoid membrane, if using the hook secure the superior edge of the cricothyroid cartilage and apply caudal displacement.
- G. Insert a 6.5 or smaller tube (rotate at 90° if necessary).
- H. Remove tracheal hook.
- I. Inflate the cuff.
- J. Secure device.
- K. Attach end-tidal CO2 adapter and BVM.
- L. Consider sedation if necessary.

## **Needle Cricothyrotomy – (pediatric patients 12 years and younger)**

- A. Assemble equipment. 14 ga or 16 ga angiocath, 3cc syringe, 3.0 ETT adapter, oxygen, BVM.
- B. Place the patient in a supine position with support under the shoulders and mild hyperextension of the neck unless C-Spine injury is suspected.
- C. Palpate the neck in the midline and locate the slight depression just below the notch of the thyroid cartilage. This is the position of the cricothyroid membrane.
- D. Prepare the area with antiseptic solution.
- E. Stabilize the airway between thumb and forefingers.
- F. Insert the needle with catheter into the cricothyroid membrane at a 30 degree angle caudally (toward the pts feet).
- G. When the needle is through the membrane. Stop and aspirate for air to ensure tracheal entry.
- H. Advance the catheter over the needle and then remove the needle.
- I. Attach the 3.0 ETT adapter to the hub of the catheter and begin ventilations with the BVM.
- J. Secure the cannula with tape after confirming correct placement by auscultation for breath sounds (5 point check). Observe for kinking of cannula.
- K. Consider sedation with Versed® as with RSI if not already given.

## Emergency Cricothyrotomy – 30.060

### NOTES & PRECAUTIONS:

- A. Hazards in performing this procedure are primarily those of damage to nearby structures - major vessels to either side of the midline, to the vocal cords if the puncture is made too high, or a through and through injury of the trachea if the puncture is made too deeply. The latter is more commonly seen in infants and children whose tracheas may be deceptively narrow.
- B. Palpation of the cricothyroid membrane is very difficult in the infant and young child. The key to success is immobilization of the trachea throughout the procedure.
- C. Needle cricothyrotomy is only a temporizing measure providing oxygenation not adequate ventilation.

## End-Tidal CO<sub>2</sub> Monitoring – 30.070

### INDICATIONS:

For use to measure effectiveness of ventilation by measuring the amount of carbon dioxide in exhaled air.

### PROCEDURE:

1. Manage airway according to appropriate Airway Management Procedure.
2. Apply ET<sub>CO<sub>2</sub></sub> monitor, if available. Maintain ET<sub>CO<sub>2</sub></sub> output between 35-40 mmHg.

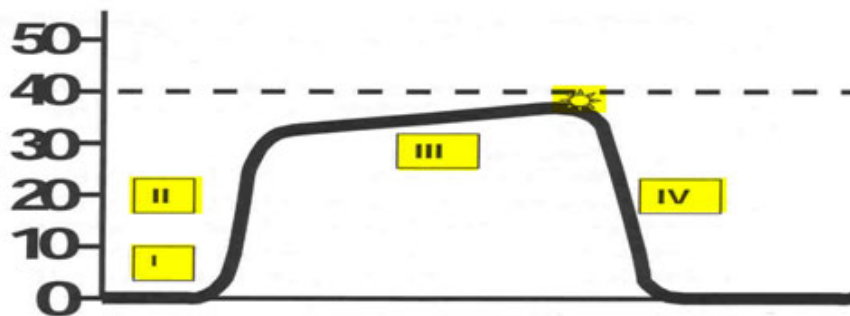
*The following approximates the degree of ventilation:*


- > 40 mmHg = Hypoventilation
- 35 – 40 mmHg = Normal ventilation
- 30 – 35 mmHg = Hyperventilation
- < 30 mmHg = Aggressive hyperventilation should be avoided in all patients !

3. Patients who are posturing, or who have other clinical presentations indicative of head trauma (blown pupil, focal motor findings) should be ventilated to maintain an ET<sub>CO<sub>2</sub></sub> level between 30-35 mmHg.

### NOTES & PRECAUTIONS:

- A. **Remember, pulse oximetry does not equate ventilation.** You can have a poorly ventilated patient displaying an oxygen saturation of 100%. Excessively high PaCO<sub>2</sub> levels can be detrimental to your patient's outcome.
- B. A sudden drop in CO<sub>2</sub> output from normal (35-40 mmHg) to 15-20 mmHg and an obvious change in waveform is indicative of tube displacement, most likely into the hypopharynx. Re-assess tube placement immediately and take corrective action.
- C. **DO NOT** rely on pulse oximetry or ET<sub>CO<sub>2</sub></sub> monitoring solely to determine the efficacy of intubation.



- **PHASE I:** Respiratory Baseline, CO<sub>2</sub> free dead space air, normally 0.
- **PHASE II:** Expiratory Upstroke, rapid rise due to mixing of dead space air and alveolar air, should be steep.
- **PHASE III:** Expiratory Plateau, exhalation of mostly alveolar air
- : Peak Et CO<sub>2</sub> Level, end of exhaled air, peak end tidal CO<sub>2</sub> level, normally 35-45mmHg
- **PHASE IV:** Inspiratory Downstroke, inhalation of CO<sub>2</sub> free gas, quickly returns to the baseline.

**INDICATION:**

Need for prolonged ventilation.

**PROCEDURE:**

1. O<sub>2</sub> operation:
  - a. Secure O<sub>2</sub> hose to 55 PSI source and model 73x fitting marked "Oxygen In".
  - b. If O<sub>2</sub> cylinder is used, slowly open the cylinder valve. Follow steps 3-8
2. Internal compressor operation: follow steps 3-8
3. Connect the 3 ventilator circuit tubing (Gas Output, Transducer, and Exhalation Valve) to mating fittings on ventilator. Do not attach ventilator to patient until control settings are made and proper operation is verified.
4. Select Operating Mode by rotating Power/Mode Switch (1) to appropriate setting
  - a. Control - used during transport when considerable motion artifact is present and patient is not spontaneously breathing.
  - b. Assist/Control - for use with patients requiring mechanical support.
5. Select :
  - a. Breath Rate (2) between 8-12 breaths per minute.
  - b. Tidal Volume (VT) set points (3) between 6-10 ml/kg ideal body weight , (stay within the Tidal Volume color range), and
  - c. Airway Pressure Limit / Alarm (4) set points (Default 35 cm H<sub>2</sub>O for adults, 20-30 cm H<sub>2</sub>O for children)
6. Attach ventilator circuit to patient.
7. Check hose connection for leaks.
8. Verify chest rise during ventilation. Increase Tidal Volume (VT) set point as required.
9. If High Pressure Alarm activates, verify correct Tidal Volume setting (3). Also look for airway or ventilator circuit occlusion. If no occlusion, increase High Pressure Relief Alarm (4) Set point until relief mechanism "chatter during inspiration stops.
10. Adjust settings to maintain PaO<sub>2</sub> > 90%, ETCO<sub>2</sub> between 35-40 mm Hg.

**NOTES & PRECAUTIONS:**

1. Contraindications include Active CPR, suspected pneumothorax, inability to maintain adequate oxygenation (PaO<sub>2</sub> > 90%), pediatric patient under 30 kg (66 lbs).
2. Initial settings should be 100% oxygen, ventilatory rate between 8-12 breaths per minute, and tidal volume 6-10 mL/kg ideal body weight. Attempt to decrease tidal volume to 6 mL/kg to minimize barotrauma.
3. If patient becomes unstable or saturations < 80% disconnect from ventilator and bag patient with 100% FiO<sub>2</sub>.

# Impact Uni-vent<sup>®</sup> 73x Ventilator – 30.075

## Uni-Vent<sup>®</sup>

Series Portable Ventilator - Model 73X

### IMPACT<sup>®</sup>

**POWER/MODE**

(OXYGEN) Assist/Control Control  
OFF  
(COMPRESSOR) Assist/Control Control

**BREATH RATE (BPM)**

10, 12, 14, 16, 18, 20

**TIDAL VOLUME (V<sub>T</sub>) (ml)**

300, 400, 500, 600, 700, 800, 900, 1000

**AIRWAY PRESSURE LIMIT/ALARM (cm H<sub>2</sub>O)**

25, 35, 50, 65, 80

**ALARM CENTER**

- SYSTEM FAILURE
- EXT POWER LOW/FAIL
- LOW BATTERY (Less than 30 minutes of operating time remains)
- LOW OXYGEN (Oxygen input pressure to ventilator is less than 41 PSI)
- V<sub>T</sub> SETTING (Tidal Volume setting is too high or too low based on breathing rate. Increase/decrease Tidal Volume setting as required)
- PATIENT DISCONNECT (Low airway pressure detected. Check patient circuit for disconnect, leakage at airway, loose or disconnected hose/fitting)
- HIGH AIRWAY PRESSURE (Airway Pressure Limit/Alarm setpoint exceeded on 4 consecutive breaths. Check airway, check patient. Check alarm setpoint)

**BATTERY CHARGE**

● ——— Charged  
● - - - - Charging

**ALARM MUTE/CANCEL (30 Seconds)**  
- or - **TEST (Rechargeable Battery Only)**

**CONDENSED OPERATING INSTRUCTIONS**

- O<sub>2</sub> operation: secure O<sub>2</sub> hose to 55 PSI source and Model 73X fitting marked "OXYGEN IN". If O<sub>2</sub> cylinder is used, slowly open the cylinder valve. Follow steps 3 through 8.
- Internal compressor operation: follow steps 3 through 8.
- Connect ventilator circuit tubing to mating fittings on ventilator. **DO NOT** attach ventilator to patient until control settings are made and proper operation is verified.
- Select Operating Mode by rotating Mode Switch (1) to appropriate setting:  
Control - use during transport when considerable motion artifact is present and patient is not spontaneously breathing.  
Assist/Control - for use with patients requiring mechanical support.
- Select: Breathing Rate (2), Tidal Volume setpoints (3) (stay within Tidal Volume color range), and Airway Pressure Limit/Alarm setpoints (4) (default 35 cm H<sub>2</sub>O for adults, 20 to 30 cm H<sub>2</sub>O for children).
- Attach ventilator circuit to patient. Check hose connections for leaks.
- Verify "chest rise" during ventilation - increase Tidal Volume setpoint (3) as required.
- If High Pressure Alarm activates, verify correct Tidal Volume setting (3). Also look for airway or ventilator circuit occlusion. If no occlusion, increase High Pressure Relief/Alarm setpoint (4) until relief mechanism "chatter" during inspiration stops.

**DO NOT BLOCK**

## Intranasal Medication Administration – 30.078

### DEFINITION:

In the absence of an established IV, intranasal is a rapid route offering high level of bioavailability of the medication being administered. The intranasal route can reduce the risk of needle sticks while delivering effective medication levels. The rich vasculature of the nasal cavity provides a direct route into the bloodstream for medications that easily cross the mucous membranes.

### INDICATIONS:

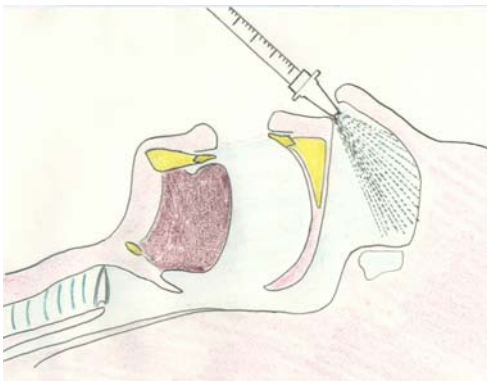
- A. Patient without IV access requiring urgent medication administration (e.g., active seizure, respiratory arrest secondary to opiate overdose)
- B. Alternate administration route for fentanyl administration for pain management.

### CONTRAINDICATIONS:

- A. Epistaxis
- B. Nasal Trauma
- C. Nasal septal abnormalities
- D. Nasal congestion or discharge

### PROCEDURE:

- A. Patient should be in a supine or recumbent position. If the patient is sitting then compress the nares after administration.
- B. Draw up medication into a syringe using appropriate transfer device.
- C. Remove air from syringe
- D. Remove transfer device and place atomizer onto syringe and confirm it is secure.
- E. Administer medication by briskly compressing the plunger to expel and atomize the medication administering a maximum of 1cc of solution per nare.
- F. Evaluate medication effectiveness and continue with treatment protocol



## Intraosseous Access & Infusion - 30.080

### DEFINITION:

Intraosseous cannulation is an alternative technique for establishing IV access in critical adult and pediatric patients when peripheral IV access is difficult or time-sensitive.

### INDICATIONS:

- A. Intraosseous infusion is indicated in emergency situations when life-saving fluids or drugs should be administered and IV cannulation is difficult, impossible or too time-consuming to perform.
- B. If a peripheral IV cannot be established after two attempts or within 60–90 seconds of elapsed time *and* in:
- C. Adult and pediatric patients, within the proper weight range, who present with one or more of the following clinical conditions:
  1. Cardiac arrest.
  2. Hemodynamic instability (BP <90 mmHg and clinical signs of shock).
  3. Imminent respiratory failure
  4. Status epilepticus with prolonged seizure activity greater than 10 minutes, and refractory to IM anticonvulsants. Hemodynamic instability (BP <90 mmHg and clinical signs of shock).
  5. Toxic conditions requiring immediate IV access for antidote.
- D. IO placement may be considered prior to peripheral IV attempts in cases of cardiopulmonary or traumatic arrest, in which it may be obvious that attempts at placing an IV would likely be unsuccessful and or too time consuming, resulting in a delay of life-saving fluids or drugs.

### EZ-IO™ PROCEDURE:

- A. Determine patient's weight.
- B. Assemble all necessary equipment
  1. The Standard EZ-IO AD® needle should be utilized on patients who weigh  $\geq$  40 kg (approximately 88 lbs. or greater).
  2. The EZ-IO PD® needle should be used on patients who weigh between 3–39 kg (approximately 6–87 lbs.).
- C. Site Selection (patient's weighing  $\geq$  40 kg).
  1. Tibial
    - a) Palpate the landmarks at the proximal tibia (patella and tibial tuberosity).
    - b) Insertion site should be approximately one finger width to the medial side of the tibial tuberosity.
    - c) An alternate site may be used at the distal tibia, two finger widths proximal to the medial malleolus along the midline of the tibia.
  2. Proximal Humerus
    - a) Insertion site is located directly on the most prominent aspect of the greater tubercle. Slide thumb up the anterior shaft of the humerus until you feel the greater tubercle, this is the surgical neck. Approximately 1 cm (depending on patient anatomy) above the surgical neck is the insertion site.
    - b) Ensure that the patient's hand is resting on the abdomen and that the elbow is adducted (close to the body).

### D. Needle Insertion

1. Prep the surface with Betadine® and wipe dry with a sterile gauze pad.
2. Stabilize patient's leg and begin insertion from a 90-degree angle to the plane of the tibial plateau. Gently advance the needle set into position—do not force. Stop when you feel the “pop” on smaller patients.
3. When needle is in proper position, remove stylet (if insertion fails, leave the needle in place and clamp the EZ-Connect; do not attempt second insertion on same leg).
4. Connect extension tubing or EZ-Connect, primed with saline, to IO hub.
5. Confirm the catheter position (catheter is stable at a 90-degree angle to the bone, able to aspirate blood, and fluids flow without evidence of extravasation).
6. Rapid bolus or “power” flush with approximately 10 ml normal saline when using the EZ-IO AD® needle, and 5 ml normal saline when using the EZ-IO PD® needle.
7. Connect IV tubing and bag to extension tubing or EZ-Connect.
8. Consider additional bolus of saline if flow rates slower than expected.
9. Utilize a blood pressure cuff or pressure bag to help infuse fluids.
10. Dress site, secure tubing, and apply wristband.

### E. Pain Management

1. If the procedure is performed on a conscious patient, immediately following placement of the IO needle, administer 0.5 mg/kg 2% lidocaine (not to exceed 50 mg) *slowly* through the IO site. Wait approximately 30–60 seconds before flushing with normal saline.
2. In the event a patient regains consciousness and complains of severe pain secondary to the IO insertion, temporarily stop infusing the fluids, and administer lidocaine as in E.1 above. Wait approximately 30–60 seconds before continuing fluid administration.
3. If fluids do not flow freely, flush IO site with an additional 10 cc normal saline.

### **PEDIATRIC EZ-IO™ PROCEDURE (patients weighing 3-39 kg)**

- A. Assemble all equipment. The EZ-IO PD® should be used on patients who weigh between 3-39 kg (approximately 6-87 lbs.)
- B. Site Selection (Patients weighing 3-39 kg)
  1. Palpate the landmarks at the proximal tibia (patella and tibial tuberosity).
  2. Insertion site should be one finger width below the tibial tuberosity, then medial along the flat aspect of the tibia.
  3. If the tibial tuberosity cannot be identified on the child, then the insertion site may be two finger widths below the patella, then medial along the flat aspect of the tibia.

### C. Needle Insertion

1. Prep the surface with Betadine and wipe dry with a sterile gauze pad.
2. Stabilize patient's leg and begin insertion from a 90-degree angle to the insertion site. Gently advance the needle set into position—do not force. Stop when you feel the “pop.”
3. When needle is in proper position, remove stylet (if insertion fails, leave the needle in place and clamp the EZ-Connect; do not attempt second insertion on same leg).
4. Connect extension tubing or EZ-Connect, primed with saline, to IO hub.
5. Confirm the catheter position (catheter is stable at a 90-degree angle to the bone, able to aspirate blood, and fluids flow without evidence of extravasation).
6. Rapid bolus or “power” flush with approximately 5 ml normal saline when using the EZ-IO PD<sup>®</sup> needle.
7. Connect IV tubing and bag to extension tubing or EZ-Connect.
8. Consider additional bolus of saline if flow rates slower than expected.
9. Utilize a blood pressure cuff or pressure bag to help infuse fluids.
10. Dress site and secure tubing.

### **PEDIATRIC PROCEDURE WITH MANUAL IO DEVICE:**

#### A. Assemble equipment

1. Approved bone marrow needles, 15 or 18 gauge size
2. Betadine<sup>®</sup> swabs
3. Two small syringes (3-5cc)
4. One large Luer-lock<sup>®</sup> syringe (35-50cc)
5. Flush solution
6. Sterile gauze pads and tape

#### B. Site Selection – Proximal tibia. Palpate the landmarks and note the entry point that is the anteriomedial flat surface 1-3 cm below the tibial tuberosity.

#### C. Prep the surface with Betadine<sup>®</sup> and wipe dry with a sterile gauze pad.

#### D. Needle Insertion

1. Insert the needle at the proximal tibial site, directing the needle caudally. The needle should penetrate the skin and subcutaneous tissue and be pushed through the cortex of the bone using rotation (avoid rocking the needle) until a “pop” or loss of resistance is felt.
2. Confirm placement of the needle by:
  - a. Firm fixation of the needle and free aspiration of marrow/blood.
  - b. Infusion of 2-3 cc of NS, palpating for extravasation or noting significant resistance. If extravasation occurs, further attempts at the site should be avoided.
  - c. It is not always possible to aspirate blood/marrow but the line may be patent.

#### E. Tape and secure IO needle firmly in place.

#### F. Start Infusion

1. Although gravity drainage may suffice, pressurized infusions may be needed during resuscitation.
2. When infusing medications via an IO route, pressure must be applied to the fluid bag in order to maintain flow rates. The EMT must continually monitor the rate of infusion.

## Intraosseous Access & Infusion - 30.080

### **CONTRAINDICATIONS:**

- A. Fracture of the bone selected for IO insertion.
- B. Previous significant orthopedic procedures (IO within 24 hours, prosthesis)
- C. Infection at the site of insertion.
- D. Excessive tissue at insertion site with the absence of landmarks.

### **NOTES & PRECAUTIONS:**

- A. Osteomyelitis, growth plate injury (in pediatric patients), and extravasation of fluid with compression of popliteal vessels or the tibial nerve may occur.
- B. Airway and breathing should be established first in accordance with other protocols.
- C. Do not perform more than one attempt in each tibia.
- D. Any ALS medication may be administered IO.
- E. Do not give Hypertonic Saline through an IO line.

## Intravenous Access & Infusion – 30.090

### INDICATIONS:

- A. Normal Saline is indicated for replacement of fluid volume losses such as in trauma, burns, dehydration, or shock.
- B. An IV lock may be substituted for an IV line in all situations, except where IV fluid is the therapy of choice for volume replacement.

### PROCEDURE for IV Access:

- A. IV access:
  - 1. Establish IV access and prepare NS.
  - 2. Connect an extension set between the IV hub and the solution bag and tubing.
  - 3. All IVs will be started using regular drip sets (15 gtt/cc), unless otherwise indicated.
- B. IV access with an IV lock:
  - 1. Establish IV access.
  - 2. Connect male adapter plug (with pre-flushed short extension tubing) to IV hub.
  - 3. After placement, the line should be flushed with normal saline.
  - 4. If the IV lock system is used for the administration of medication, the line must be flushed after each administration.

### PROCEDURE for IV Medication Infusions:

- A. Using a Buretrol® or Soluset® type device:
  - 1. Establish IV access and prepare solution.
  - 2. Connect the Buretrol® between the solution bag and the IV tubing.
  - 3. Place one hour's solution into the Buretrol® and close the connection between the Buretrol® and the solution bag. Note: The number of microdrops/minute=the number of ccs/hour.
  - 4. Begin infusing solution at the appropriate rate.
  - 5. If desired, additional solution may be placed in the Buretrol®. The Buretrol® should never contain more than one hour of solution.
- B. Using an infusion pump:
  - 1. Establish IV access and prepare solution.
  - 2. Connect IV tubing to infusion pump according to manufacturer's directions.
  - 3. Begin infusing solution at the appropriate rate.

### NOTES & PRECAUTIONS:

Normal Saline should be used with caution in patients with renal impairment (hyperkalemia), cardiac and respiratory disorders (fluid overload), or extremes of age.

## Induced Hypothermia – 30.102

### **PURPOSE:**

To define the procedures for inducing hypothermia following post-resuscitation from sudden cardiac arrest, with the aim to reduce the patient's body temperature to 32 – 34 degrees C.

### **INDICATIONS (Must meet all indications):**

- A. Patients with a sustained return of spontaneous circulation (ROSC) > 5 minutes post cardiac arrest.
- B. Unconscious and without purposeful response to pain or verbal stimuli.
- C. Systolic BP  $\geq$  100 mmHg (may use pressors to maintain pressure)

### **CONTRAINDICATIONS:**

- A. Age < 15 years old.
- B. Traumatic cardiac arrest or suspected significant hemorrhage.
- C. Hypothermia already present.
- D. Pulmonary edema.
- E. Known pregnancy.
- F. Refractory or recurrent VF/VT, 2<sup>nd</sup> or 3<sup>rd</sup> degree heart blocks.

### **COOLING METHODS:**

- A. Exposure combined with ice packs, and/or
- B. Chilled normal saline (NS); stored at a temperature of approximately 4 degrees C (39 F)

### **PROCEDURE:**

- A. Remove patient's clothing (undergarments may remain in place)
- B. Obtain 12-lead ECG if feasible. If STEMI is identified, follow STEMI protocol.
- C. Begin the cooling process with ice packs applied to the groin and axilla (wet towels may be used along with ice packs).
- D. If feasible, establish a large-bore IV. Using a high-pressure bag or other method, rapidly infuse up to 2 liters of chilled normal saline. Do not administer medications at the same time through the same IV line as the chilled saline.
- E. If patient begins to shiver, move, or have an increased level of consciousness administer 5 mg of midazolam IV or IO. May repeat to a maximum of 10 mg as long as systolic BP is  $\geq$  100 mmHg.

**DEFINITION:**

The KING LT-D is a disposable supraglottic airway created as an alternative to tracheal intubation or mask ventilation. The KING LT-D is designed for positive pressure ventilation as well as for spontaneously breathing patients.

**INDICATIONS:**

Use of the King LTD airway is indicated if endotracheal intubation cannot be performed and the patient needs a secure airway.

**CONTRAINDICATIONS:**

- A. Intact gag reflex
- B. Airway obstruction.
- C. Patients under 4 feet in height (until pediatric sizes are available)
- D. Known or suspected caustic ingestion.
- E. Known esophageal disease.

**PROCEDURE:**

- A. Attach pulse oximeter and monitor oxygen saturation.
- B. If vomitus, blood or other foreign material is present in the hypopharynx, rapid and aggressive suctioning and/or manual removal must be done prior to placement of the King Airway.
- C. Ventilate with BVM to optimize oxygen saturation prior to King LTD intubation especially if several endotracheal intubations were attempted.
- D. Estimate patient's height (for sizing of King LTD airway) and select proper tube size.
  - a. 4 – 5 feet tall → Size 3 (Yellow)
  - b. 5 – 6 feet tall → Size 4 (Red)
  - c. 6 – 7 feet tall → Size 5 (Purple)
- E. Lubricate the posterior distal end of the King Airway with a water-soluble gel.
- F. Place patients head into a “sniffing” position. If suspected or potential cervical spine injury keep patients head in neutral position during insertion.
- G. Using a midline approach, introduce tip into mouth and advance behind base of tongue. The blue orientation line on the tube should face the chin of the patient.
- H. Without using excessive force, advance tube until the base of the connector is aligned with the teeth and/or gums. Never force the tube into position.
- I. Inflate the cuffs using the appropriate volume of air.

King Airway Inflation Volumes		
Size	LTS-D	LT-D
#2	-	25-35 ml
#2.5	-	30-40 ml
#3	40-55 ml	45-60 ml
#4	50-70 ml	60-80 ml
#5	60-80 ml	70-90 ml

- J. Attach bag valve device to the tube with supplemental oxygen. While gently bagging the patient to assess ventilation, simultaneously withdraw the King Airway until ventilation is easy and free-flowing (large tidal volume with minimal airway pressure).

- K. Listen for lung sounds in both lung fields and over epigastrium.
- L. As soon as feasible, secure the King Airway with an endotracheal tube holder.
- M. Monitor oxygen saturation, chest rise, and attach continuous ETCO<sub>2</sub> monitor.
- N. After successful placement, continue to monitor for adequate ventilations and possible displacement or cuff failure.

### **SUCTIONING THROUGH THE KING LTS-D:**

- A. Use of the gastric access lumen for suctioning and removal of stomach contents will be at the discretion of the user.
- B. Attach a maximum size 18 Fr suction catheter to a portable suction unit
- C. If necessary, lubricate the catheter with a water-soluble gel.
- D. Insert the suction catheter into the opening of the gastric access lumen, and advance to the maximum depth.
- E. Turn on suction unit and maintain continuous suction until there is no further return of stomach contents.
- F. After detaching suction unit, the catheter may be left in place to prevent any additional stomach contents from being expelled from the gastric access lumen.
- G. If active suctioning is not performed, a suction catheter may be placed in the gastric access lumen to act as a passive vent, and to prevent stomach contents from being expelled from the lumen.

### **NOTES & PRECAUTIONS:**

- A. It is important that the tip of the device be maintained in the patient's midline. Keeping the tip at midline assures that the distal tip is properly placed in the hypopharynx and upper esophagus.
- B. Depth of insertion is key to providing a patent airway. A shallow initial insertion will require deflation of the cuffs to advance the tube deeper.
- C. It is extremely important to open the airway and ensure that the tip of the King Airway advances past the base of the tongue.
- D. Unlike the Combitube, the King LTD device is not designed to ventilate the patient if placed in the trachea. If unable to ventilate the patient after placement deflate balloons and adjust depth of tube to optimize ventilation

## Indications

Evaluation of patient with implanted Left Ventricular Assist Device.

## HeartMate II®

The current LVAD deployed is the HeartMate II. This device provides “pump” assistance to the left ventricular in patients with heart failure. It is implanted in the chest of the patient with connections from the apex of the left ventricle to the ascending aorta. The pump itself is implanted in the chest with the controller external to the chest with a conduit connecting the two.

## Troubleshooting

- Two potential treatable device complications may present with an LVAD patient:
  - Battery Failure
  - Controller failure.
- This may present as a catastrophic failure to the pump with the resulting “cardiac arrest in the patient” or a “low flow state”

## When the pump has stopped

1. Check the connections between the controller and the pump and the power source
2. Fix any loose connections (2) to restart the pump
3. If the pump does not restart and the patient is connected to batteries, replace the current batteries with a new fully-charged pair of batteries
4. If pump does not start, then change the controller.

## Changing batteries

**Warning: At least one power lead must be connected to the power source AT ALL TIMES. DO NOT remove both batteries at the same time or the pump will stop.**

1. Obtain two (2) charged batteries from the patient’s accessory bag. Charged batteries should be marked with a white fuzzy tab at the end of the battery.
2. Remove only one battery from the clip by pressing the black tab on the battery clip to unlock the battery.
3. Controller will start beeping and flashing green light signals when you remove the battery. This is normal.
4. Replace the new battery by lining up arrows on the battery and clip
5. Slide a new, fully charged battery into the empty battery clip by aligning the black arrows. The battery will click into the clip. Gently tug at battery to assure connection. IF battery is properly secured, the beeping and green flashing lights will stop.
6. Repeat the previous steps with the second battery.

### Changing Controllers

1. Place the replacement controller within easy reach, along with the battery and battery clips or PBU/Power Module cable. The spare controller is usually found in the patient's travel case.
2. Make sure patient is sitting or lying down since pump will momentarily stop during this procedure.
3. Rotate the PERC lock on the replacement controller in the direction of the "unlocked icon" until the PERC locks clicks into the fully unlocked position.
4. Repeat this same step for the original controller until the PERC Lock clicks into the unlocked position.
5. Attach the power leads on the new, replacement Controller to the battery clips or PBU/Power Module cable.
6. If using battery power, place fully-charged batteries into the battery clips after attaching the power leads.
7. Press the silence alarm button (upside down bell with circle) on the new replacement Controller until the alarm is silenced to silence its Red Heart Alarm for 2 minutes.
8. Disconnect the PERC Lead / Driveline from the original controller by pressing the metal release tab on the connector socket. The pump will stop and an alarm will sound. The alarm will continue until power is removed from the original controller. **Getting the new replacement controller connected and the pump restarted is the first priority.**
9. Connect the new replacement Controller.
  - a. Line up the mark on the PERC Lead connector with the mark on the metal tab of the new Controller
  - b. Fully insert the connector into the socket of the new Controller. The pump should restart /alarms should stop.
  - c. Gently tug on the metal end of the lead to make sure the PERC lead is fully inserted into the socket. DO NOT pull the lead.
10. If the pump restarts, skip to Step 12  
Or continue with next step

### Changing Controllers - continued

11. If the pump does not restart and the RED Heart Alarm continues:
  - a. Firmly press the Silence Alarm or Test Select Button to restart the pump
    - i. If the pump speed is set below 8,000 rpm, the pump will NOT automatically restart when power is restored. Pressing the Silence Alarm or Test Select button is required to restart the pump if the pump speed is set below 8,000 rpm.
  - b. Check the power source. Make sure that power is going to the Controller.
  - c. Gently tug on the metal end of the lead to make sure the PERC lead is fully inserted into the socket. DO NOT pull the lead.
  - d. If the pump still does not restart, then try to restart the pump using the System Controller backup system:
    - i. Press and hold both the Test Select and Silence Alarm Buttons at the same time. The RED Heart Alarm will stop and you will hear a repeating cycle of 1 beep per second for 2 seconds, followed by 2 seconds of silence to indicate that the System Controller is operating on the backup system.
12. After the pump restarts, rotate the PERC lock on the new replacement controller in the direction of the “locked” icon until the PERC Lock clicks into the fully locked position. If unable to engage PERC lock to the locked position, gently push the driveline into the controller to assure a proper connection. Retry to engage PERC Lock.
13. Disconnect power from the original controller. The original controller will stop alarming once power is removed.

## Left Ventricular Assist Devices – 30.107

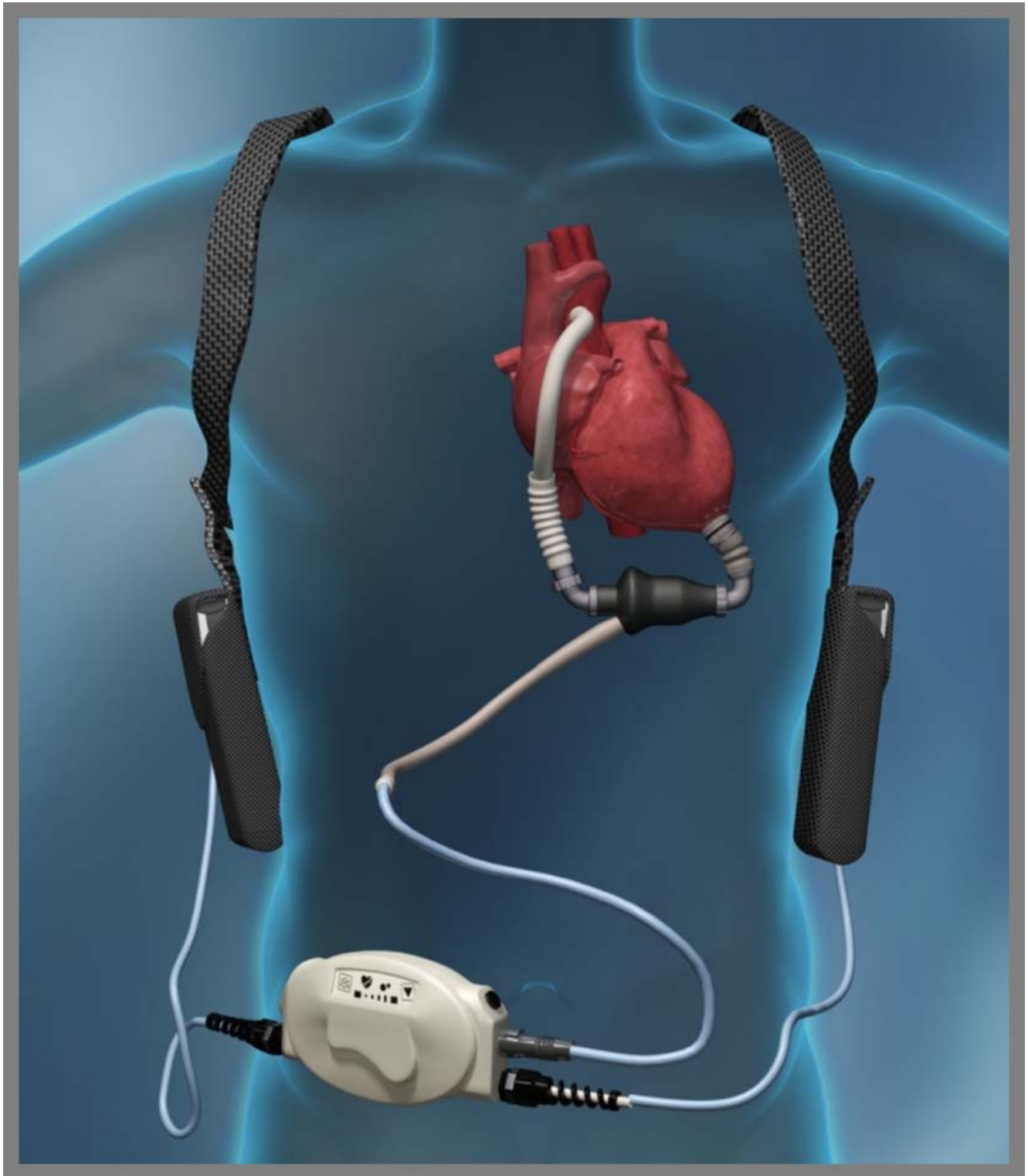
### NOTES & PRECAUTIONS:

1. Blood pressure may be difficult to obtain on these patients. Most patients have a mean arterial blood pressure of 70-90 with a narrow pulse pressure.
2. Palpable pulse may be weak or absent
3. The conduit from the chest to the controller is the electrical line from the pump which connects to the controller which runs the pump.
4. Common presenting non pump related complications include bleeding and infection.
5. If device slows down, LOW FLOW STATE alarm will go off.
6. Do NOT perform CPR, no hand pump is available
7. All ACLS drugs may be administered.
8. Pump does not affect the patient's ECG.
9. The patient can be defibrillated while connected to the device without any disconnection required
10. The patient can be paced in per our normal standard operating procedures.
11. Set of batteries last approximately 3 hours
12. Any emergency mode of transportation is OK. These patients are permitted to fly.
13. Be sure to bring ALL the patients' equipment with them.

### ALARMS:

1. Yellow or Red Battery Alarm
  - a. Need to change batteries
2. Red Heart Flashing Alarm
  - a. This may indicate a Low Flow Hazard. Check patient-the flow may be too low. This alarm will consist of red heart alarm indicator light and steady audio alarm if the flow rate is less than 2.5 liters per minute.
  - b. If the patient is hypovolemic, treat per protocol
  - c. If patient is in right heart failure-treat per protocol
  - d. If pump has stopped, check connections, batteries, and controllers as instructed in the section above.

## Left Ventricular Assist Devices – 30.107



**PURPOSE:**

Physical and chemical restraint is used to protect the safety of patients and responders. Patient restraints should be utilized only when necessary and in those situations where the patient is exhibiting behavior that presents a danger to themselves and/or others.

**PROCEDURE:****A. Physical Restraint Guidelines:**

1. Use the minimum level of physical restraints required to accomplish patient care and ensure safe transportation (Soft restraints may be sufficient). If law enforcement or additional manpower is needed, call for it prior to attempting restraint procedures. Do not endanger yourself or your crew.
2. Avoid placing restraints in such a way as to preclude evaluation of the patient's medical status.

**• Physical Restraint Procedure:**

1. Place patient face up on long backboard, NOT PRONE. Closely monitor the patient's respiratory status.
2. Secure ALL extremities to backboard. Try to restrain lower extremities first using flexcuffs around both ankles. Next, restrain the patient's arms at his/her sides.
3. If necessary, utilize cervical spine precautions (tape, foam bags, etc.) to control violent head or body movements.
4. Secure the backboard onto gurney for transport using additional straps if necessary. Remember to secure additional straps to the upper part of the gurney to avoid restricting the wheeled carriage.
5. Evaluate the patient's respiratory and cardiac status continually to ensure that no respiratory compromise exists. Monitor SpO<sub>2</sub> if possible.
6. DO NOT tighten chest straps to the point that they restrict breathing.

**B. Chemical Restraint Guidelines:**

Sedative agents may be needed to restrain the violently combative patient. These patients may include alcohol and/or drug-intoxicated patients and restless, combative, head-injury patients.

**• Chemical Restraint Procedure:**

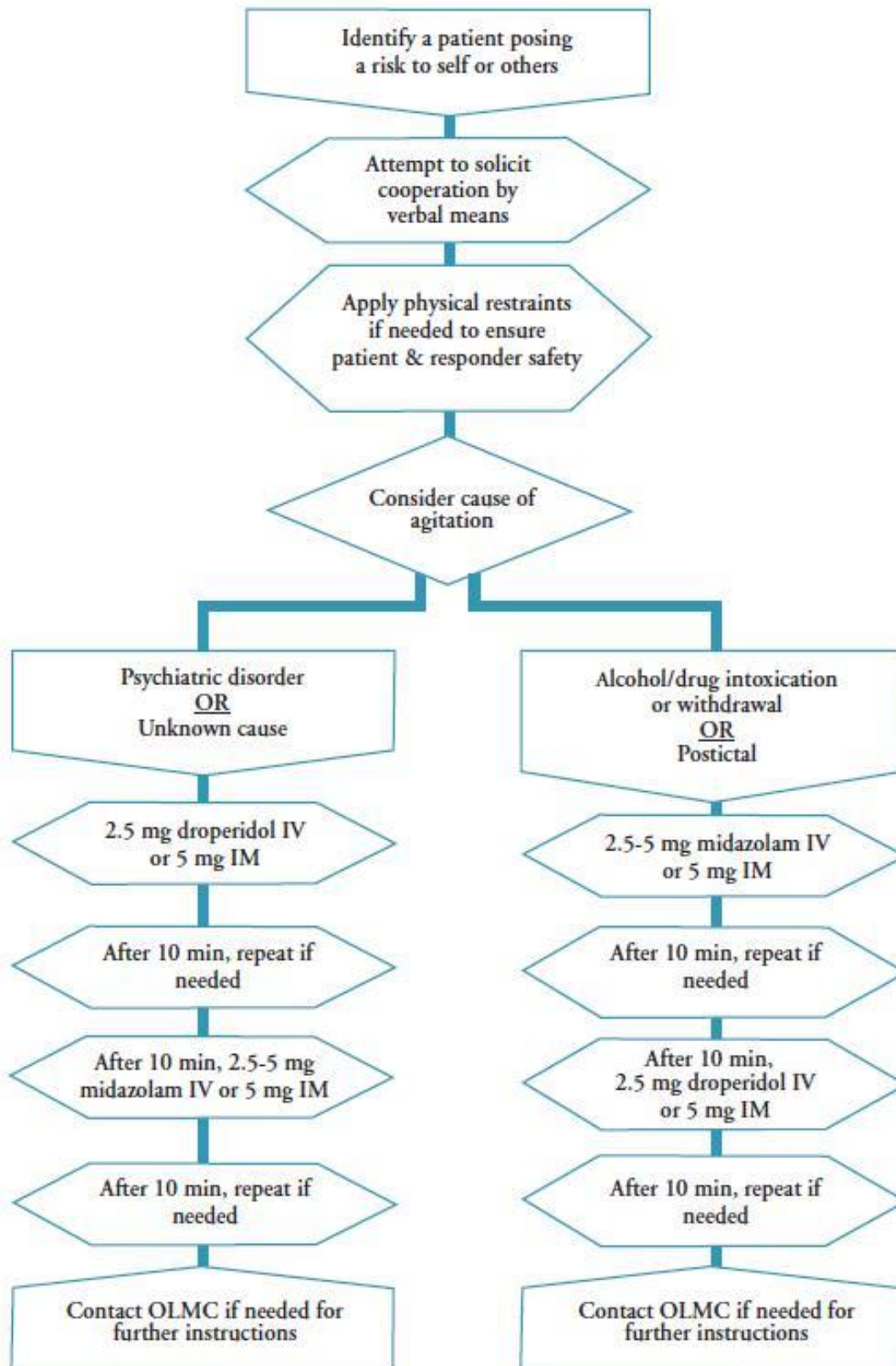
1. Evaluate the personnel needed to safely attempt restraining the patient.
2. Attempt to determine if the patient's agitation is related to a drug/alcohol intoxication or withdrawal, medical or psychiatric problem.
3. If the cause of the patient's agitation is due to a psychiatric disorder or is unknown:
  - a. Administer droperidol 2.5 mg IV or 5 mg IM.
  - b. If initial dose has no effect after 10 minutes, repeat dose of 2.5 mg (5mg IM). Maximum dose is 5 mg IV or 10 mg IM.
4. If the cause of the patient's agitation is likely drug ingestion (especially stimulants) or withdrawal or postictal state:
  - a. Administer midazolam 2.5 – 5 mg IV or 5 mg IM.
  - b. If initial dose has no effect after 10 minutes, give an additional dose. Maximum dose both IV and IM is 10 mg.
5. Consider and treat medical causes of combativeness (hypoxia, head injury, hypoglycemia)

6. If, 10 minutes after administration of the second dose the patient remains combative, administer the alternate medication as described above.
7. Vital signs should be assessed within the first 5 minutes and thereafter as appropriate (at least every 10 minutes and before additional medication) if possible.
8. After administration of droperidol, consider diphenhydramine 25 mg IV or IM if the patient shows signs of acute dystonic reaction. May repeat once.
9. Monitor patients ECG, obtain 12-lead, and start IV if possible.

### **NOTES & PRECAUTIONS:**

- A. Side effects of Droperidol may include hypotension, tachycardia, and acute dystonic reactions.
- B. Droperidol (Inapsine<sup>®</sup>) may induce Torsades de Pointes in patients with history of prolonged QT or patients taking QT-prolonging drugs.
- C. Droperidol is preferred for patients with known psychiatric disorders. Midazolam is preferred for patients who are known or suspected to be under the influence of stimulants or other intoxicants, who are in withdrawal, or who are postictal.

PATIENT RESTRAINT FLOWCHART



### INDICATIONS:

- A. For pelvic instability in the presence of trauma.
- B. For pelvic pain without instability as a comfort measure.

### PELVIC WRAP PROCEDURE:

- A. Fold the sheet smoothly lengthwise to about 9 inches wide (do not roll) and apply underneath the pelvis, centered on the greater trochanters. Assure the patients pockets are empty (if applicable) to avoid placing pressure on the objects into the patient.
- B. Tighten the sheet around the pelvis and adjust the tension to try to return the pelvis to normal anatomical position.
- C. Secure using a knot or clamps if available.



### PELVIC SLING PROCEDURE:

- A. Place the Pelvic Sling underneath the pelvis, centered on the greater trochanters. Assure the sling is smooth and that the patients pockets are empty (if applicable) to avoid placing pressure on the objects into the patient.
- B. Move the adjustable strap so that it will allow enough tension to be made.
- C. Place the strap through the buckle and pull tension until the buckle makes a popping sound. This indicates sufficient tension has been achieved.
- D. Secure the strap by the Velcro to the side of the splint.



### NOTES & PRECAUTIONS:

- A. Blood loss in a pelvic fracture can be significant. Monitor closely and treat per Shock Protocol.
- B. Consider placing prior to extrication from a vehicle if feasible.
- C. The Pelvic Sling is contraindicated in isolated hip fractures.

## PICC Line Access – 30.140

A Peripherally Inserted Central Line (PICC) is a common method of maintaining long-term venous access in select patients. PICC lines are typically inserted into the antecubital fossa, and then threaded into central circulation. PICC lines are flushed with heparin to maintain patency and therefore it is imperative to aspirate 5 ml of blood from the line prior to use.

### INDICATIONS:

- A. PICC lines may be accessed when there is a need for drug or fluid administration and traditional means of venous access are unsuccessful.
- B. Patient or patient's caregiver requests use of PICC line.

### CONTRAINDICATIONS:

- A. Inability to aspirate or infuse through the catheter.
- B. Catheter located in any place other than the patient's upper arm.
- C. Need for rapid fluid resuscitation.

### PROCEDURE:

- A. Use clean gloves and maintain sterility as much as possible.
- B. If there is a needleless type port on the distal end of the catheter, perform the following: (figure 1)
  1. Scrub the port with an alcohol pad for at least 15 seconds and allow to dry for at least 5 seconds.
  2. Attach a 10 ml syringe (without saline) to the port.
  3. Unclamp if necessary (needleless port may not have a clamp)
  4. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, remove the syringe and DO NOT use the catheter for access.
  5. If blood aspirates freely, remove the 10 ml syringe with blood and discard.
  6. Attach a 10 ml syringe with NS and gently flush the line. Never use a smaller syringe. If line does not flush, remove the syringe and DO NOT use the catheter for access.
  7. If line flushes, remove the syringe and attach the catheter to the end of the IV tubing and begin infusion of NS. Adjust the rate to the needs of the patient within the limits of the catheter.
  8. Administer medications through IV tubing port if indicated.
- C. If there is a capped needle-type port on the distal end of the catheter, perform the following: (figure 2)
  1. Scrub the cap with an alcohol pad for at least 15 seconds and allow to dry for at least 5 seconds.
  2. Clamp the catheter tubing using ONLY the existing clamp on the catheter and then remove the cap. **Never allow a central line to be open to air.**
  3. Attach a 10 ml syringe on the catheter end.
  4. Unclamp the catheter.
  5. Attempt to aspirate at least 5 ml of blood. Blood should draw freely. If it does not, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
  6. If blood aspirates freely, clamp the catheter again.
  7. Remove the 10 ml syringe with blood and discard.
  8. Attach a 10 ml syringe with NS.
  9. Unclamp and gently flush the line. Never use a smaller syringe. If line does not flush, re-clamp the line and remove the syringe. DO NOT use the catheter for access.
  10. If line flushes, re-clamp and remove the syringe.
  11. Attach the catheter to the end of the IV tubing.

12. Unclamp the catheter and begin infusion of NS. Adjust the rate according to the needs of the patient within the limits of the catheter.
13. Administer medications through IV tubing port if indicated.

### NOTES & PRECAUTIONS:

- A. **Do not administer medications, flush or aspirate with less than a 10 cc syringe. Smaller size syringes generate too much pressure and can damage the catheter.**
- B. **Do not attempt to reinject aspirated blood as it may contain clots.**
- C. The maximum flow rates for a PICC line is 125 ml/hr for less than size 2.0 French, and 250 ml/hr for catheters over 2.0 size French.
- D. Keep patient's arm straight to avoiding kinking the PICC line and obstructing flow.
- E. Ensure all line connections are secure.
- F. PICC lines access the patient's central circulation and the risk of infection is high. Avoid contamination to ports and connections while accessing.
- G. **Do not administer the following medications through a PICC line:**
  - a. **Adenosine** - The line may rupture during rapid infusion due to over pressurization.
  - b. **Dextrose 50%** – The catheter can be damaged by due to the viscosity of the fluid.

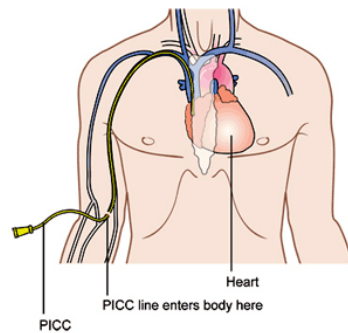


Figure 1- Needleless port

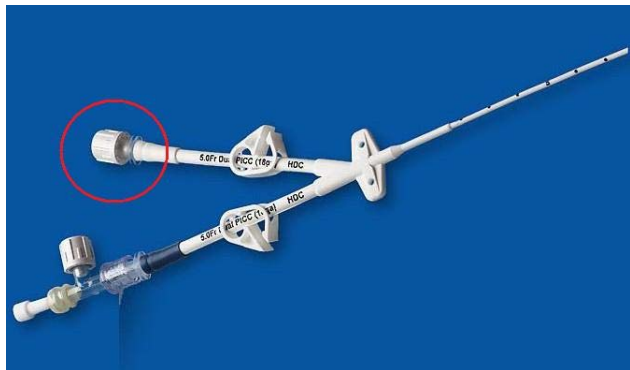


Figure 2 – Needle type port with cap

## Sports Equipment Removal – 30.160

### **DEFINITION:**

To provide direction on the safe removal of protective sports equipment that includes helmet and shoulder pads. This procedure page uses football gear as an example, but these guidelines can be used with other sports equipment as well.

### **PROCEDURE:**

#### **A. Initial Evaluation**

1. The initial evaluation should begin by assessing level of consciousness, breathing, and circulation. If the athlete is breathing and stable, but a neck injury is suspected-quick sensory and motor nerve exam should be initiated.
2. After the quick neurological exam on a stable athlete, the facemask should always be removed.

#### **B. Face Mask Removal**

1. Stabilize head.
2. Cut side and top attachments at loop to remove face mask.

#### **C. Guidelines for Helmet Removal on the Field**

1. If athlete has neck pain, numbness or tingling, extremity weakness or is unconscious, the helmet should not be removed on the playing field.
2. If access to airway is compromised, removal of helmet and shoulder pads as a unit may be initiated.

While backboard and straps are being prepared:

#### **D. Chest Access**

1. Cut jersey and front laces of shoulder pads
2. Flip out shoulder pads
3. Place hands on shoulders with thumbs grasping the clavicle and fingers surrounding the upper trapezius muscles.
4. Secure the athlete's head between the EMT's forearms.

#### **E. Back Board Utilization**

1. Person at head initiates commands and oversees proper placement and techniques
2. Three on each side of body: one at shoulders, one at hips, and one at legs.
3. One other person is in charge of backboard and slides it into place
4. Person at head gives command to lift athlete and slide backboard into place from feet. If helmet is not resting on board, padding can be added to fill space
5. Fasten straps and tape helmet to board
6. Chinstrap remains in place unless it interferes with airway
7. Recheck sensory and motor nerve vitals for changes and document

## Sports Equipment Removal – 30.160

### **F. If Removal of Helmet and/or Shoulder Pads are necessary, remove as a unit**

1. Cut chin straps
2. Release cheek pad snaps with 3 tongue depressors
3. Cut shoulder pad straps
4. Cut both the jersey and shirt up sleeves towards midline of body
5. Person at head stabilizes maxilla and occiput and gives commands
6. Three people on each side, with one stabilizing head. Another person removes the equipment. Person tilts helmet slightly forward and slides off head.

**CAUTION: DO NOT SPREAD APART SIDES OF HELMET.** Shoulder pads, jersey, and shirt are then slid off with great care as a unit.

### **NOTES & PRECAUTIONS:**

If athlete is face down, person at head crosses arms and a log roll technique is used to initiate evaluation.

## INDICATIONS:

When patient is exhibiting respiratory difficulty secondary to secretions in airway or the potential for aspiration exists.

## PROCEDURE:

### A. Oral Suctioning

1. Pre-oxygenate patient with 100% oxygen.
2. Assemble equipment: Suction unit with tonsil tip or dental tip, personal protective equipment (gloves, goggles, gown).
3. Attach required monitoring equipment.
4. Turn suction unit on and confirm mechanical suction is present.
5. Insert tip without suction.
6. Cover thumbhole to begin suction if using a tip other than dental tip.
7. Apply suction for < 15 seconds.
8. Monitor patient's oxygen saturation.
9. Re-oxygenate patient for at least 2 – 3 minutes between suction attempts.

### B. Tracheal Suctioning

1. Pre-oxygenate patient with 100% oxygen.
2. Assemble equipment: Suction unit, correct size suction catheter, sterile rinse, personal protective equipment (gloves, goggles, gown).
3. Attach required monitoring equipment.
4. If patient is being ventilated with BVM prior to suctioning, have someone else remove the bag from end of ET tube prior to suction attempt.
5. Insert catheter into the ET tube without applying suction.
6. Advance catheter as far as possible.
7. Withdraw slowly using **intermittent** suction while rotating catheter.
8. Do not suction more than 15 seconds.
9. Monitor patient's oxygen saturation.
10. Rinse catheter in sterile saline.
11. Re-oxygenate patient for at least 2 – 3 minutes between suction attempts.

### C. Suctioning with Meconium Aspirator

1. **If meconium is lightly stained and newborn is vigorous do not suction infant.**
2. Assemble equipment: Suction unit, appropriate size ET tube, personal protective equipment (gloves, goggles, gown.)
3. Attach required monitoring equipment.
4. Turn suction unit on and confirm mechanical suction is present.
5. After infant has been intubated, attach meconium aspirator to end of ET tube.
6. Cover thumbhole to begin suctioning while slowly withdrawing the ET tube. (Do not suction for more than 15 seconds.)
7. Monitor patient's oxygen saturation and heart rate and stop if patient becomes bradycardic.
8. Re-oxygenate patient for at least 2 – 3 minutes between suctioning attempts.
9. If patient has not been intubated and meconium is thick, at the least, aggressive oropharyngeal suctioning should be carried out with the largest diameter suction device available.

## NOTES & PRECAUTIONS:

Oral and tracheal suctioning can cause trauma to the oropharynx and airway, bradycardia, or hypoxia. It should not delay other resuscitation.

## INDICATIONS:

Taser® barbs should be removed at the request of law enforcement if:

- A. The patient has been adequately subdued so as not to pose a danger to Fire/EMS personnel. AND,
- B. The barbs are not embedded in the face, neck or groin areas.

## PROCEDURE:

- A. Perform patient assessment.
- B. Monitor vitals and LOC. Ensure that vitals are in the normal limits for the situation.
- C. Expose the area where Taser barb has implanted under the skin.
- D. Cut wires from the barb if still attached.
- E. Place thumb and forefinger above and below the barb parallel to the portion of the shaft implanted in the patient's skin.
- F. Spread your thumb and forefinger apart to stretch the skin tightly over the barb.
- G. Holding tension, use needle-nose pliers (or similar tool) with gripping strength and grasp the end of the barb protruding out of the skin near the wire lead and firmly pull out the barb with one quick jerking motion.
- H. Assess the skin where the barb was removed. The skin should be cauterized from the electrical current. Dress the wound to prevent infection.
- I. Contact OLMC if unsure whether to transport.

## NOTES & PRECAUTIONS:

- A. Patients should be in police custody and monitored by Police for the safety of medical personnel.
- B. Do not remove Taser® Barbs from the face, neck or groin area. Stabilize the barbs and transport to the Emergency Department.
- C. Tasers® emit two barbs. Make sure both are removed. Treat all barbs as a bio-hazard and dispose as you would any other sharps.
- D. Potential trauma may have occurred before (during a struggle) or after the patient was hit by the Taser® (patient falls and hits head).
- E. Consider whether the patient meets criteria for Altered Mental Status or Poisonings and Overdoses protocols.
- F. CAUTION: Where barbs have wires still connected to the Taser® Gun, shock can still be delivered.

**For agencies supervised by the Washington County Medical Director, Taser® barbs may be removed after a full assessment and only if the patient will be transported to a hospital.**

## Tension Pneumothorax Decompression – 30.170

### DEFINITION:

The emergency decompression of a tension pneumothorax using an over-the-needle catheter.

### INDICATIONS:

**To warrant chest decompression in the field, the patient must be significantly symptomatic or in extremis (at risk of death) with:**

- A. High clinical suspicion and;
- B. Progressive respiratory distress and;
- C. Shock symptoms with low or rapidly decreasing blood pressure.

**and** at least one of the following:

- A. Decreased or absent breath sounds
- B. Consistent history (i.e., chest trauma, COPD, asthma).
- C. Distended neck veins.
- D. Tracheal shift away from affected side (late sign).
- E. Asymmetrical movement on inspiration.
- F. Hyper-expanded chest on affected side.
- G. Drum-like percussion on affected side.
- H. Increased resistance to positive pressure ventilation, especially if intubated.

**EMS witnessed traumatic arrest patients with abdominal or chest trauma for whom resuscitation is indicated should have bilateral chest decompression performed even in the absence of the above signs.**

### PROCEDURE:

- A. Expose the entire chest.
- B. Establish landmarks to identify second intercostal space, mid-clavicular line.
- C. Clean chest vigorously with appropriate antiseptic.
- D. On affected side, locate the mid-clavicular line and insert a large gauge over-the-needle catheter with syringe attached along **the superior margin** of the third rib.
- E. If the air is under tension, the barrel will pull easily and "pop" out of the syringe.
- F. Remove syringe, advance catheter, and remove needle.
- G. Secure from movement.

### NOTES & PRECAUTIONS:

- A. Patient's chest should be auscultated often for return of tension or other respiratory complications.
- B. Tension Pneumothorax is a rare condition, but can occur with trauma, spontaneously, or as a complication of intubation. Tension takes time to develop, but forceful positive ventilation may increase the rate of development.
- C. Simple or non-tension Pneumothorax is not life threatening and should not be decompressed in the field.
- D. The ideal decompression catheter length is three inches.

## Tension Pneumothorax Decompression – 30.170

- E. Possible complications:
  - a. Creation of Pneumothorax if none existed previously.
  - b. Laceration of lung or pericardium. Stop needle advancement once it has popped through the pleura and advance the catheter only.
  - c. Laceration of blood vessels. (Always slide the needle above the rib).
  - d. Infection. Clean rapidly but vigorously; use sterile gloves if possible.
- F. Tension Pneumothorax can be precipitated by the occlusion of an open chest wound. If the patient deteriorates after dressing an open chest wound, remove the dressing.

**DEFINITION:**

Transcutaneous pacing is the technique of electronic cardiac pacing accomplished by using skin electrodes to pass repetitive electrical impulses through the thorax.

**INDICATIONS:**

Transcutaneous pacing should be considered in bradycardia with evidence of inadequate perfusion, (e.g. altered mental status, chest pain, hypotension, other signs of shock).

**PROCEDURE:**

- A. Ensure ECG pads are attached and monitor displays a rhythm.
- B. Attach pacing electrodes to anterior and posterior chest just to the left of the sternum and spinal column, respectively. Alternatively pads may be placed in the standard anterior and lateral position as with defibrillation. If there is difficulty in obtaining capture, try alternative position.
- C. Begin pacing at a heart rate of 80 beats per minute and 30mA current output.
- D. Increase current by increments of 10mAs while observing monitor for evidence of electrical capture. Confirm mechanical capture by checking pulses and BP.
- E. If patient is comfortable at this point, continue pacing. If patient is *uncomfortable*, administer Versed<sup>®</sup> 2.5 mg slow IV push or if no IV, 5.0 mg IM.
- F. If patient still complains of pain, repeat dose of Versed<sup>®</sup> and contact OLMC.
- G. If the patient remains unconscious during pacing, assess capture by observing the monitor and evaluating pulse and blood pressure changes. In the event of electrical capture and no pulses, follow PEA protocol.
- H. If there is no response to pacing and drugs, consult with OLMC. If a change in pacing rate is desired, contact OLMC.

**PEDIATRIC PATIENTS:**

Use above guidelines except:

- A. Give Versed 0.1 mg/kg IV to a MAX of 2.5mg. (May repeat once after 5 minutes.) If more needed, call OLMC.
- B. Use anterior/posterior pad placement first for patients less than 1 year.
- C. Begin pacing at smallest mA output.
- D. Increase current in increments of 10 mAs while observing monitor for evidence of electrical capture.
- E. Confirm mechanical capture by checking pulses and BP.
- F. Contact OLMC for adjustments to rate based on age and response to pacing.

**NOTES & PRECAUTIONS:**

Transcutaneous pacing should not be used in the following settings:

- A. Asystole.
- B. Patients meeting Death In The Field criteria.
- C. Patients in traumatic cardiac arrest.

# Operations

## Advance Directives, DNR and POLST – 50.005

### **PURPOSE:**

This EMS system believes in respect for patient autonomy. The patient with decision-making capacity has the right to accept or refuse medical intervention. This includes the right to specify, in advance, patient preferences when the person is no longer able to communicate wishes.

### **PROCEDURE:**

The EMS system shall honor POLST forms, Advance Directives and other Do Not Resuscitate orders (DNAR) under the following circumstances:

- A. **Do Not Attempt Resuscitation:** In the pulseless and apneic patient who does not meet the criteria of the DEATH IN THE FIELD protocol, but is suspected to be a candidate for withholding resuscitation, BLS protocols will be followed until one of the following occurs:
  1. The EMT sees a written DNAR order, which should be honored and resuscitation stopped.
  2. The patient's physician is contacted and directs EMTs to discontinue resuscitation.
  3. The EMT sees a valid Advance Directive or Directive to Physician which directs them not to continue resuscitation.
  4. The patient's attorney-in-fact (PAHC or DPAHC) directs the EMTs not to resuscitate the patient.
  5. OLMC directs the EMTs not to continue resuscitation.
  6. If a person who is terminally ill appears to have ingested medication under the provisions of the Oregon Death with Dignity Act. (See Section F below)
- B. **Advance Directives:** DNAR (DNR) orders only apply if the patient is in cardiopulmonary arrest. If the patient's PAHC, DPAHC, or other Advance Directive is available to convey the patient's wishes, and the EMTs have seen a copy of the document, the EMTs must honor the treatment preferences as expressed.
- C. **Physician Orders for Life-Sustaining Treatment (POLST):** If a POLST form is available and it clearly expresses the patient's wishes and is signed by a physician, nurse practitioner or physicians assistant, EMTs shall honor the patient's treatment care preferences as documented in the EMS section of the POLST. [Cite: OAR 847-035-030 (7)] If an electronic registry is available and the POLST form is not immediately available, EMTs may also follow orders documented in the electronic POSLT registry.
- D. If there are questions regarding the validity or enforceability of the health care instruction, begin BLS treatment and contact OLMC.
- E. It is always appropriate to provide comfort measures as indicated.

## Advance Directives, DNR and POLST – 50.005

- F. **Death with Dignity Act:** If a person who is terminally ill and appears to have ingested medication under the provisions of the Oregon Death with Dignity Act, the EMT should:
1. Provide comfort care as indicated.
  2. Determine who called 9-1-1 and why (i.e. to control symptoms or because the person no longer wishes to end their life with medications).
  3. Establish the presence of DNAR orders and/or documentation that this was an action under the provisions of the Death with Dignity Act.
  4. Contact OLMC.
  5. Withhold resuscitation if:
    - a. DNAR orders are present, and
    - b. There is evidence that this is within the provisions of the Death with Dignity Act, and
    - c. OLMC agrees.

### DEFINITIONS:

- A. **Do Not Attempt Resuscitation Order (DNAR):** An order written by a physician stating that in the event of cardiopulmonary arrest, cardiopulmonary resuscitation will not be administered. DNAR orders apply only if the patient is pulseless and apneic.
- B. **Health Care Instruction:** A document executed by a person to indicate the person's instructions regarding health care decisions.
- C. **Advance Directive:** A document that contains a health care instruction or a power of attorney for health care.
- D. **Living Will:** A document that may confirm an Advance Directive or Directive to Physician informing her/him that if the patient has a terminal illness and death is imminent, the patient would not wish to be placed on artificial life support that will only prolong the process of dying. In general, the traditional Living Will document alone is not helpful in the out-of-hospital setting because of its multiple restrictions and lack of clarity on when it should take effect.
- E. **Attorney in Fact:** An adult appointed to make health care decisions for a person.
- F. **Power of Attorney for Health Care (PAHC):** Power of attorney document that authorizes an attorney-in-fact to make health care decisions for a person when the person is incapable.
- G. **Physician Orders for Life-Sustaining Treatment (POLST):** The POLST is a voluntary form that was developed to document and communicate patient treatment preferences across treatment settings. It includes a section for documentation of DNAR orders and a section communicating patient preferences for EMS care. While these forms are most often used to limit care, they may also indicate that the patient wants everything medically appropriate done. **Read the form carefully!** When signed by a physician (MD or DO), nurse practitioner, or physician's assistant, the POLST is a medical order and the EMTs are directed to honor it in their Scope of Practice. If the POLST is not immediately available, a POLST form as documented in the Electronic POLST registry hosted at MRH (503-494-7333) may also be honored.

# Ambulance Diversion Guidelines – 50.015

## GREATER PORTLAND METROPOLITAN AREA HOSPITALS AND AMBULANCE PROVIDERS AMBULANCE DIVERSION GUIDELINES

Approved: Oregon ED Managers and EMS Providers Group 5/26/00

Revised: 7/11/02, 4/29/03, 11/11/05, 06/09/06 and 9/9/11.

### I. PURPOSE

The Ambulance Diversion Guidelines exist to provide guidance for emergency departments and ambulance providers during capacity times. The guidelines are a collaborative effort between affected hospital emergency departments, ambulance providers, County Emergency Medical Services (EMS) agencies, and the Oregon Association of Hospitals and Health Systems (OAHHS).

### II. OBJECTIVES

- A. To promote and maintain efficient and effective provision of 9-1-1 EMS ambulance services in accordance with County Codes, as well as State and Federal Regulations.
  - 1. EMS agencies will actively manage the availability of resources to the public under the authority of the EMS Medical Director, county authority or designee.
- B. To provide definitions and standard procedures if ambulance diversion is determined to be necessary.
- E. To identify hospitals utilizing these guidelines and their respective geographical zones in the Greater Portland Metropolitan Area that may be impacted by ambulance diversion.
- F. To identify a zone management system when multiple hospitals attempt ambulance diversion simultaneously.
- E. To identify a system of accountability and quality improvement by providing ambulance diversion data and EMS Turnaround Times at various institutions to all participants on a monthly basis.

### III. DEFINITIONS

- A. 9-1-1 EMS Ambulance Diversion – The diversion of a 9-1-1 EMS ambulance from an intended receiving facility to an alternate receiving facility due to a temporary lack of emergency department resources such as staffing or space.
- B. Inter-Facility Transfers – Hospital destination is pre-determined by physician-to-physician communication as a formal transfer.
- C. Regional Hospital – A regional medical coordination center for all hospitals in the Portland Metro Area designated to coordinate MCI or disaster situations and allocations of resources co-located with Trauma Center Communications (TCC) and Medical Resource Hospital (MRH) which provides online medical control for Multnomah and Clackamas counties. This center is currently located at Oregon Health and Sciences University (OHSU).

## Ambulance Diversion Guidelines – 50.015

- D. Zone Manager - a medical agency or facility authorized to provide coordination to pre-hospital care providers and hospitals during times of zone wide diversion.
- E. HOSCAP (EMResource) - the statewide system that the hospitals and ambulance providers use to designate emergency department status, hospital status information and incident management.
- F. Categories
  - 1. **ED Diversion**
    - a. GREEN – The ED is open, except for those patients they do not normally treat per EMS protocols.
    - b. BLACK – Not applicable. This facility does not have an emergency department.
    - c. RED – Closed; the ED is requesting re-route of EMS traffic to other facilities.
      - i. If RED, the ED is unable to accept patient(s) transported from a 9-1-1 EMS call, except:
        - patients too unstable to transport to another facility
        - patient refuses an alternate facility
        - pregnant patients >20 weeks gestation or illness or injury which could have a potential life threatening effect on the mother and/or the fetus
        - patients requiring time sensitive intervention (e.g. STEMI or CVA.) Contact hospital to determine ability to accept patient.
  - 2. **Trauma**
    - a. GREEN – Open; no trauma restrictions.
    - b. BLACK – Not Applicable.
    - c. RED – Closed; this facility is closed to trauma traffic.
      - i. Trauma Red – A designated trauma hospital will divert to another trauma hospital when it has exceeded its capacity of personnel, equipment or facilities to assess and care for trauma patients.
  - 3. **Critical Care**
    - a. GREEN – Open; no limitations.
    - b. BLACK – Not applicable.
    - c. YELLOW – Limited; limited ICU services--(ED is nearing critical care divert due to resource (bed/staff/monitor/ventilator/etc.) issues.
    - d. RED – Closed; this facility currently has no ICU services.

## Ambulance Diversion Guidelines – 50.015

### 4. CT Scan

- a. GREEN – CT is currently operational.
- b. BLACK – Facility does not have a CT scanner on site.
- c. RED – CT scanner is currently non-operational.
  - i. If CT Status is BLACK or RED, the ED is unable to take patients who many need a CT scan; examples include, but are not limited to:
    - any neurological concern (CVA, deficit)
    - suspected aortic aneurysm
    - isolated abdominal injury which would not otherwise meet criteria for Trauma System entry

### 5. Cath Lab

- a. GREEN – Cath Lab is currently operational.
- b. BLACK – Facility does not have a Cath Lab on site.
- c. RED – Cath Lab is currently non-operational.

### 6. Interventional NeuroRadiology (INR)

- a. GREEN – INR is currently operational.
- b. BLACK – Facility does not have INR on site.
- c. RED – INR is currently non-operational.

### G. Life Flight Network Status

- Green – Available
- Yellow – On stand-by for another patient
- Red – Unavailable

### H. Destination Hospital/Services Abbreviations

PA	Adventist Medical Center - Portland
DC	Doernbecher Children's Hospital (located within Portland OHSU ED)
SK	Kaiser Sunnyside Medical Center - Clackamas
EC	Legacy Emanuel Children's Hospital - Portland
EM	Legacy Emanuel Hospital - Portland
GS	Legacy Good Samaritan Hospital -Portland
MP	Legacy Meridian Park Hospital - Tualatin
MH	Legacy Mount Hood Hospital - Gresham
SCA	Legacy Salmon Creek Hospital - Vancouver
UH	Oregon Health and Sciences University Hospital - Portland
SW	Peace Health SW Washington Medical Center - Vancouver
PM	Providence Milwaukie Medical Center - Milwaukie
PR	Providence Portland Medical Center - Portland
SV	Providence St. Vincent's Medical Center - Portland
WF	Providence Willamette Falls Hospital -Oregon City
TH	Tuality Community Hospital - Hillsboro

## Ambulance Diversion Guidelines – 50.015

- FG Tuality Forest Grove Hospital - Forest Grove  
VA Veteran's Administration Medical Center – Portland  
LF Life Flight Network Aurora

### IV. **AMBULANCE DIVERSION POLICY**

- A. Ambulance diversion is not initiated because of:
- Lack of in-patient staffing or beds.
  - Key resources being reserved for anticipated elective patient care, i.e. elective surgical cases or radiological studies.
- B. The ED staff determines that the emergency department is reaching capacity and attempts to accommodate by following their internal plan.
- C. The objective of the Trauma System is that only one of the designated Level 1 Trauma Centers may divert at a time: OHSU or Legacy Emanuel.
- D. When one of the Level 1 Trauma Centers goes on ambulance diversion status, notification of divert status to the other designated trauma center must occur. Trauma patients will then be diverted to the other Trauma Center.
- E. When both Level 1 Trauma Centers are at capacity the Trauma Center Communications will be notified to begin rotating trauma patients between the two trauma hospitals until the situation has stabilized or either hospital is able to return to standard operations. Regional Hospital may also need to do an “All Call” to other community hospitals activating the MCI or disaster system in order to coordinate distribution of trauma patients.
- F. Designated ED staff changes their status in HOSCAP.
- G. In the event a hospital is unable to change their status, i.e. connection problems, the hospital may contact Regional Hospital to authorize it to change the hospital status.
- H. A hospital’s status at the time ambulance transport begins with a loaded patient will determine the ability of the hospital to accept patients. To insure the up-to-the-minute ability of a hospital to accept a patient, a transporting unit will contact dispatch requesting the status of the preferred destination hospital when the patient has been loaded and as they are preparing to depart the scene. Diversion of an ambulance shall not occur after the transport has begun.
- I. Every effort will be made to reopen to green status as soon as possible.

## Ambulance Diversion Guidelines – 50.015

### V. ZONE MANAGEMENT

- A. Occasionally, multiple hospitals will go on ambulance diversion at the same time. This poses a challenge to other hospitals trying to stay open to serve their community.
- B. Hospitals are grouped into the following geographical zones:

West Zone	Central Zone	East Zone
Providence St. Vincents	OHSU	Portland Adventist
Legacy Meridian Park	Dornbecher Children's	Kaiser Sunnyside
Tuality Hillsboro	Providence Portland	Legacy Mt. Hood
Tuality Forest Grove	Legacy Emanuel	Providence Willamette Falls
	Randall Children's at Legacy Emanuel	Providence Milwaukie
	Legacy Good Samaritan	
	Legacy Salmon Creek	
	Portland Veteran's	
	Peace Heath SW Washington MC	
Zone Manager	Zone Manager	Zone Manager
Metro West Ambulance	Regional Hospital	Regional Hospital
503-648-6656	503-494-7333	503-494-7333

- C. Management of the hospital resources for any zone may begin if there is only one green hospital in the West or East Zones or two green hospitals in the Central Zone. Zone management may apply even when hospitals are closed to critical care.
- D. Zone Management Steps:
  1. If hospital resources meet the criteria for zone management as specified in item C, the zone manager will initiate "Active Zone Management" for the zone(s) affected.
  2. The zone manager will initiate an "all call" via the 800 MHz radio to hospitals informing them of the "Active Zone Management" status.
  3. Local transporting EMS agencies/ dispatch centers will notify their respective EMS units that zone management is in effect for the defined zone(s) and that their units are to contact the zone manager to obtain hospital destination(s).
  4. Under zone management, the zone manager will determine the destination of all EMS transporting units within the affected zone(s). EMS may transport to any hospital outside of the affected zone if it is green status.
  5. Ambulances may go outside their zone during Zone Management as long as their destination hospital is green and as long as the transport does not significantly impact an ambulance provider's ability to provide coverage in their area. This includes honoring previously agreed upon destinations.

## Ambulance Diversion Guidelines – 50.015

6. Rotation will continue with one patient per hospital as determined by the zone manager. Each zone has identified “small hospitals” (West – Tuality Forest Grove (FG); East – Providence Milwaukie (PM). These hospitals will be skipped in the rotation every other time. The VA will be included (for Veterans only) at the discretion of the zone manager. Note: the rotation will not apply to the trauma hospitals for trauma entry patients.
  7. Prior to discontinuing zone management, the zone manager will monitor key area hospitals and emergency transport agencies. When system resources are above the activation threshold the zone manager may discontinue zone management. When appropriate, the Multnomah County EMS Medical Director will participate in this discussion for the Central and East zones.
- E. Disaster Management (Epidemic, Pandemic, Multiple Patient Incident or Mass Casualty Incident):
- Hospital destinations will be coordinated by Regional Hospital through HOSCAP and/or EMTrack and according to regionally and locally adopted emergency medical services protocols.

### **VI. ACCOUNTABILITY AND QUALITY IMPROVEMENT**

- A. The hospitals shall develop:
  - An internal system for timely acceptance of patients from EMS providers.
  - An internal system and resources to avoid ambulance diversion.
  - An internal policy related to ambulance diversion.
  - Internal mechanisms to monitor ambulance diversion including number of hours and reasons why.
- B. Hospitals are encouraged to track their own ambulance diversion hours via a report in HOSCAP (EMResource).
- C. Multnomah County EMS will report number of hours and category of divert to all East and Central Zone participants and Washington County for all West Zone participants. EMS agencies will report turnaround times for all hospitals as needed.
- D. The Portland Metropolitan Area ED/EMS Managers' Committee shall address 9-1-1 EMS ambulance diversion issues including monitoring diversion hours and categories. This committee will be a cooperative effort between involved EMS agencies, hospitals, and ambulance providers.
  1. Problems related to the implementation of these guidelines should be forwarded to this committee.
  2. EMS providers will report percentage of time EDs fall out of 25 minute window of arrival to return to available service.

## **VII. ORGANIZATIONS IN SUPPORT OF THESE GUIDELINES**

### **HOSPITALS**

Adventist Medical Center  
Doernbecher Children's Hospital  
Kaiser Sunnyside Medical Center  
Legacy Emanuel Children's Hospital  
Randall Children's Hospital at Legacy Emanuel Hospital  
Legacy Emanuel Hospital  
Legacy Good Samaritan Hospital  
Legacy Meridian Park Hospital  
Legacy Mt. Hood Medical Center  
Legacy Salmon Creek Hospital  
Oregon Health and Sciences University Hospital  
Peace Health Southwest Washington Medical Center  
Providence Milwaukie Hospital  
Providence Portland Medical Center  
Providence St. Vincent Medical Center  
Providence Willamette Falls Medical Center  
Tuality Community Hospital  
Tuality Forest Grove Hospital  
Veterans Administration Medical Center

### **OREGON ASSOCIATION OF HOSPITALS AND HEALTH SYSTEMS**

### **COUNTY EMS AGENCIES**

Washington County  
Clackamas County  
Clark County  
Multnomah County

### **AMBULANCE PROVIDERS**

American Medical Response  
Canby Fire Department  
Camas Fire Department  
Molalla Fire Department  
Metro West Ambulance  
North Country Ambulance  
Life Flight Network

# Ambulance Diversion Guidelines – 50.015

**TABLE: HOSPITAL SERVICES**

HOSPITAL	BURN UNIT	CARDIAC SURGERY	DECON	HELIPAD	HYPER BARIC	OB	NICU	PEDS INPT.	PICU	PSYCH IN IN PT	TRAUMA CENTER	CATH LAB	INR
Adventist		X	X	X		X				X		X	
Doernbecher Children's		X	X	X			X	X	X	X	X		
Kaiser Sunnyside		X	X			X				X		X	
Randall Children's Hospital Legacy Emanuel	X	X	X	X (2)		X	X	X	X	X	X		
Legacy Emanuel	X	X	X	X		X				X	X	X	X
Legacy Good Samaritan		X	X			X				X		X	
Legacy Meridian Park			X	X		X						X	
Legacy Mount Hood			X	X		X						Dx only	
Legacy Salmon Creek			X	X		X	X	X		X		Dx only	
OHSU		X	X	X (3)		X	X	X	X	X	X	X	X
Peace Health SW Washington		X	X	X		X	X	X		X	X	X	X
Providence Milwaukie			X	Designated area		X							
Providence Portland		X	X	X	X	X				X		X	X
Providence St. Vincent		X	X	X		X	X	X		X		X	X
Providence Willamette Falls			X	X		X							
Tuality Community		X	X	X		X						X	
Tuality Forest Grove			X							> Age 60			
Veteran's Administration			X							X			

### **PURPOSE:**

Law enforcement agencies stress that their first priority on any crime scene is the preservation of life with reconstruction of the crime scene second. EMS personnel can be of assistance by adhering to the following guidelines regarding crime scene response.

### **PROCEDURE:**

#### A. Response and Arrival

1. Be conscious of physical and weather conditions around the site. Tire tracks of suspect vehicles are often located in or adjacent to a driveway.
2. Limit the number of personnel allowed onto the scene. Consult with police on the scene to direct placement of vehicles and route of personnel onto the scene.

#### B. Access and Treatment

1. Select a single route to the victim. Maintaining a single route decreases the chance of altering or destroying evidence or tracking blood over a suspect's footprints.
2. Note the location of furniture, weapons, and other articles, and avoid disturbing them. If they need to be moved, someone should note the location the article was moved from, by whom it was moved, and where it was placed.
3. Remove from the scene all EMS generated debris that is contaminated with blood or body fluid and dispose of through established channels.
4. Be conscious of any statements made by the victim or other persons at the crime scene. Write down what these statements were and report to the investigating officers.
5. Note the specific garments worn by the patient at the time of treatment. It is also important not to tear the clothing off or cut through any holes, whether made by a knife, bullet, or other object.
6. The victim should be placed on a clean sheet when ready for transport. At the hospital, please try to obtain the sheet once the victim is moved off of it, fold it carefully in on itself, and give it to the investigating officers. This is especially important in close contact crimes such as rape, serious assault and death cases.

#### C. Documentation

1. A detailed report is important in case you are later called to testify in court. An incident report should be completed and should cover your observations, conversations with family or witnesses, location of response vehicles and equipment, furniture, weapons, clothing that has been moved, items that were handled and your route to the victim.
2. An Unusual Event Report may be helpful for you to complete. This is a protected document and if you are called to court may be used by you to refresh your memory of aspects of the call that are not included in the Patient Care Report.
3. Do not offer your opinions or evaluations about the crime scene.

### **REMINDER:**

Any location can be, or become, a crime scene. When responding, and upon arrival, if something does not appear to be right, notify police. If you suspect a crime scene and police are not present, secure area and document what you see.

### **PURPOSE:**

The purpose of the Death in the Field Protocol is to define under what conditions medical care can be withheld or stopped once it has been started.

### **PROCEDURE:**

#### **Resuscitation efforts may be withheld if:**

- A. The patient qualifies as a "DNR". (See Advance Directives Protocol)
- B. The patient is pulseless and apneic in a mass casualty incident or multiple patient scene where the resources of the system are required for the stabilization of living patients.
- C. The patient is decapitated.
- D. The patient has rigor mortis in a warm environment.
- E. The patient is in the stages of decomposition.
- F. The patient has skin discoloration in dependent body parts (dependent lividity).

### TRAUMATIC ARREST:

1. A victim of trauma (blunt or penetrating) who has no vital signs in the field may be declared dead on scene. If opening the airway does not restore vital signs/signs of life, the patient should NOT be transported unless there are extenuating circumstances.
2. A cardiac monitor may be beneficial in determining death in the field when you suspect a medical cause or hypovolemia: A narrow complex rhythm (QRS < .12) may suggest profound hypovolemia, and may respond to fluid resuscitation.
3. At a trauma scene, the paramedic should consider the circumstances surrounding the incident, including the possibility that a medical event (cardiac arrhythmia, seizure, and hypoglycemia) preceded the accident. When a medical event is suspected, treat as a medical cardiac event. VF should raise your index of suspicion for a medical event.
4. In instances prior to transport where the patient deteriorates to the point that no vital signs (i.e. pulse/respiration) are present, a cardiac monitor should be applied to determine if the patient has a viable cardiac rhythm. A viable rhythm especially in patients with penetrating trauma may reflect hypovolemia or obstructive shock (tamponade, tension pneumothorax) and aggressive care should be continued.

### MEDICAL CARDIAC ARREST:

1. If the patient's ECG shows asystole or agonal rhythm upon initial monitoring, and after at least two lead changes, the patient, in the paramedic's best judgment, would not benefit from resuscitation:
  - a. The PIC should determine DIF and notify the Medical Examiner or Law Enforcement;
  - OR -**
  - b. Begin BLS procedures, and contact OLMC with available patient history, current condition, and with a request to discontinue resuscitation.
2. If after the airway is established and the asystole protocol has been exhausted the patient persists in asystole, (confirm in 3 leads) consider termination of efforts. The PIC may declare the patient to be dead in the field.
3. The patient who has PEA and has not responded to the initial cycle of ACLS may be determined to be dead at the scene after appropriate consultation with OLMC.
4. All patients in VF should be treated and transported.

### NOTES & PRECAUTIONS:

1. ORS allows a layperson, EMT or Paramedic to determine “Death in the Field”
2. The EMT is encouraged to consult OLMC if any doubt exists about the resuscitation potential of the patient.
3. A person who was pulseless or apneic and has received CPR and has been resuscitated, is not precluded from later being a candidate for solid organ donation.
4. ETCO<sub>2</sub> may be a useful adjunct in the decision to terminate resuscitation with PEA. An ETCO<sub>2</sub> of 10 or less in patients in PEA after 20 minutes of ACLS resuscitation does not correlate with survival.
5. Survival from trauma arrest is low, but not completely zero.
6. If person has been identified as an organ donor, contact the Medical Examiner as soon as is reasonably possible.

### PROCEDURE:

- A. A patient care report shall be generated for each identified patient and shall be completed on an approved State EMS patient care form.
- B. Documentation shall include, at least:
  1. The patient's presenting problem.
  2. Vital signs with times.
  3. History and physical findings as directed in by individual protocols.
  4. Treatment(s) provided, and time(s).
  5. If monitored, ECG strip and interpretation.
  6. Any change in the condition of patient.
  7. OLMC contact:
    - a. Include physician name
    - b. Time of contact
    - c. Orders received from physician
- C. A copy of the Prehospital Care Report must be left at the receiving hospital whenever a patient is transported per ORS 333-250-0044.
- D. If a patient refuses treatment and/or transport, refer to Refusal and Informed consent procedure.

### **PURPOSE:**

These guidelines are intended to provide paramedics with direction during the difficult emotional times immediately before and following death. They suggest words to say, steps to take, and directions for dying patients and grieving family and friends. They are not intended to rigidly codify or regulate how one should respond during this intensely personal experience, rather, the following recommendations and resources are offered as a guide.

### **RESUSCITATION PHASE:**

- A. As time allows give accurate and truthful updates about the patient's prognosis. If available, assign one person to interact with and support family members.
- B. Consider gently remove children from the resuscitation area.
- C. Depending upon the emotional state of family members, consider allowing them to watch and/or participate in a limited and appropriate way.
- D. If family or friends were doing CPR prior to your arrival, commend their efforts.
- E. If family or friends are disruptive consider removing them or try assigning simple tasks, such as helping bring in the stretcher, holding doors open, telling other family about the event and calling the doctor or minister.
- F. Be respectful. Make requests. Don't give orders.

### **ONCE DEATH IS DETERMINED:**

- A. Treat the recently dead with respect.
- B. Tell family and friends of the death honestly. Use the words "death" or "dead". Avoid using euphemisms such as "passed away" or "gone".
- C. Avoid using past tense terms when speaking to survivors of the recently dead.
- D. Allow family and friends to express their emotions. Listen to them if they want to talk but don't push them.
- E. Give factual information.
- F. Genuine warmth and compassion will be more helpful than almost anything else for survivors. Don't feel it necessary to say the "right" things. Listening often provides grieving people with the most comfort.

### **FOCUSING ON THE SURVIVORS:**

- A. See to it that survivors have a support system present before you leave. Consider calling TIP through EMS Dispatch, if available in your jurisdiction. Call friends, family, clergy, or neighbors to be with them. Respect the survivor's wishes to be alone.
- B. Explain the next steps to them after you have pronounced death. This will include the police coming to make reports, possibly the medical examiner, and the possible need for an autopsy in certain instance.
- C. Contact the Medical Examiner's office before moving or altering the body (as soon as possible).
- D. Allow family and friends to say their good-byes if possible.
- E. A chaplain may be helpful in assisting with survivors. It is advisable to call early, as the chaplains do not have code-3 capabilities.
- F. Help survivors make decisions such as which people should be called. If they ask you to make calls, try to comply, mention the need to find a funeral home, if one has not already been chosen. Clergy may also be helpful with this decision.

### **DEATH OF A CHILD:**

- A. Do not accuse the parents of abuse or neglect, but take careful note of the patient's surroundings and the general physical condition of the child.
- B. Do not be overly silent, which may imply guilt to the parents.
- C. Ask the parents only necessary questions and do not judge or evaluate them. Do not tell them what they "should have" been doing before your arrival.
- D. Remind parents to arrange for child care of other children.
- E. Listen carefully to their statements and answer only with accurate information.
- F. If there is a police investigation, tell the parents that this is only routine.
- G. Successful management of child deaths requires supportive, compassionate and tactful measures.

### **DYING PATIENTS:**

- A. Look for Advance Directives and/or POLST forms and attempt to honor patient preferences for or against treatment. Always provide comfort measures.
- B. Be aware of your own fears regarding death.
- C. Be ready to admit when a dying person reminds you of a loved one. If a particular person is too disturbing, have your partner or other members of the responding team take over.
- D. Treat dying persons with warmth and understanding. Do not avoid them. Allow them to discuss their situation, but do not push them to talk.
- E. Many dying people are not upset by discussions of death as long as you do not take away all of their hope.
- F. Touching a dying person is important. Use words like "death". Do not use meaningless synonyms.
- G. Ask the person how you might help. Patients can frequently guide you to make them feel more comfortable.
- H. Give factual information.

## Hazardous Materials Response – 50.060

### **PURPOSE:**

Paramedics may be first on the scene of a hazardous materials situation because of shorter response times or no knowledge of dispatch that hazardous materials are involved. This protocol is intended to guide paramedics who do not normally function in hazardous materials scenes. If the scene you are responding to is a known or suspected (based on information from dispatch) hazardous materials situation, stage and wait for the hazardous materials personnel. When you have arrived at the scene and find out during scene assessment that hazardous materials are involved, stage and wait for the hazardous materials personnel. All scenes (MVA, Industrial, etc.) should be considered as being a potential hazardous materials situation. The following approach procedure should be used:

### **PROCEDURE:**

#### **A. Approach**

1. All scenes:
  - a. Be cautious all times.
  - b. The reported location may be inaccurate, response into a contaminated area might occur.
  - c. Approach upwind and upgrade if possible.
  - d. Position vehicle well away from the incident.
  - e. Communicate your actions to the 9-1-1 Center.
  - f. Remember: contaminated and/or exposed response personnel may add to the overall problem and reduce their effectiveness to help.
  
2. If at any time you suspect a hazardous materials situation:
  - a. Confirm that fire and police have been notified. The agency responsible for hazardous materials response may respond with different levels of personnel and equipment based upon the information received. Do not always expect a hazardous materials team to respond.
  - b. If you are a first-in responder, the first priority is scene isolation.
  - c. If you believe that you or your vehicle is contaminated, stage in an isolated area. KEEP OTHERS AWAY! KEEP UNNECESSARY EQUIPMENT FROM BECOMING CONTAMINATED.

#### **B. Person in Charge**

1. If the paramedic is the first medical person on the scene, he/she should assume the role of PIC (medically) until a "hazardous materials trained paramedic" (HMP) arrives. If at all possible the Incident Command Structure should be implemented.
2. The HMP will direct all care.
3. The HMP will determine the method of transport of the exposed patient (air vs. ground).
4. The HMP will determine who will provide care during transport (HMP may remain in that position during transport).

## Hazardous Materials Response – 50.060

### C. Patient Care for the Contaminated Patient

- i. Types of incidents which may require decontamination of the patient:
  - a. Radiation
  - b. Biological hazards
  - c. Chemical
  - d. Toxic substances
- ii. Contamination can occur through:
  - a. Smoke
  - b. Vapor
  - c. Direct contact
  - d. Run-off
- iii. Determine the hazardous substance involved and provide treatment as directed by the Haz-Mat Paramedic (HMP). In the absence of an HMP, consult Poison Control through OLMC.
- iv. The hazardous materials team must be contacted about removal of contaminated clothing and packaging of the patient with regard to your protection and the patient's.

### D. Ambulance Preparation

1. The HMP shall determine the process needed for ambulance preparation.
2. Remove any supplies and equipment that will be needed for patient care.
3. Seal cabinets and drape interior, including floor and squad bench, with plastic (available from hazardous materials team).

### E. Transport and Arrival at the Hospital (if requested by "HMP")

1. If an ambulance has transported a patient from an incident that is subsequently determined to involve hazardous materials exposure, scene personnel must immediately relay all relevant information to the transporting unit(s) and/or receiving facility(s) involved (via EMS dispatch or OLMC).
2. OLMC and the receiving hospital should be contacted as soon as possible. The paramedic should communicate the material involved, degree of exposure, decontamination procedures used and patient condition.
3. The ambulance should park in an area away from the emergency room or go directly to a decontamination center or area.
4. Patient(s) should not be brought into the emergency department before paramedics receive permission from the hospital staff.
5. Once the patient(s) has been released to the hospital, follow the HMP's direction and if necessary double bag the plastic sheeting used to cover the gurney and the floor. Double bag any equipment, which is believed to have become contaminated.
6. After unloading the patient from the ambulance, check with the "HMP" to see where the ambulance can be safely decontaminated and whether or not there is equipment available for this purpose. Do not begin decontamination without direction from the "HMP". After consultation with the Hazardous Materials Team leader the HMP may recommend that the ambulance be decontaminated.
7. Following decontamination recommendations from the "HMP", decontaminate the ambulance and personnel before returning to the incident scene. When returning to the incident scene, bring bags containing contaminated materials, equipment, clothing, etc., and turn them over to the "HMP".

## Hazardous Materials Response – 50.060

### Paramedic/EMT Exposure

1. If a paramedic/EMT is exposed or is concerned with the possibility of exposure, medical help should be sought immediately.
2. Report all exposures to the HMP, Poison Center, and supervisor, and the on-call OHDP nurse.
3. Follow your agencies guidelines for Communicable Disease: Bloodborne/Airborne Pathogens), including appropriate Personnel Exposure Report.
4. Do not return to service until cleared to do so by the HMP or Poison Center.

**FOR ADDITIONAL INFORMATION SEE THE HAZMAT PROTOCOL**

## Multiple Toxic Exposure – 50.070

### **PURPOSE:**

To provide guidelines for emergency response personnel on scenes that involve multiple victims who have been exposed to a hazardous material or hazardous environment. This procedure would be used when MSDS and DOT information indicate that victims **may** suffer untoward effects from their exposure and need **short-term, continuing medical assessment**. It would also apply when victims are symptomatic and have been exposed to a hazardous environment that poses little risk of long-term effects, such as discharge of tear gas. *This protocol is NOT intended for use when there are symptomatic patients and the substance they were exposed to is unknown or when there is a potential for serious or long-term medical consequences.*

### **PROCEDURE:**

- A. Triage determines that there are multiple victims who have been exposed to a hazardous material or environment, and that these victims are presently asymptomatic or have been exposed to an agent that has transient effects (e.g., tear gas).
- B. Triage will assist the Hazardous Materials (trained) Paramedic/EMT (HMP) in coordinating removal of the victims from the potentially hazardous environment, then isolate the victims as best as possible in a safe, well lit, and climate controlled environment (Consider using a bus or a room in a nearby building). If clothing is contaminated, removal of contaminants and proper procedures will be employed prior to isolating victims.
- C. Access to and egress from the Triage and Treatment Area must be strictly controlled at all times. It is necessary to keep track of patients who are under the care of EMTs, especially when the patient is a minor and his/her parent(s) are present. Patients should not be allowed to leave the treatment or triage area without Triage or Treatments knowledge. It is recommended that a guard be posted at the entrance and exit to control patient movement.
- D. The HMP will attempt to determine the type and level of exposure. The HMP will then contact MRH with information on the type of chemical and level of exposure. MRH will consult with Poison Control to determine any symptoms that are to be expected, the approximate time line for onset of symptoms, and recommended treatment modalities. When possible, a three-way phone link among the scene, MRH, and Poison Center should be arranged. The HMP will report this information to Triage and to Medical.
- E. All potential patients entering the area will be triage tagged and baseline vitals will be obtained and recorded. It is recommended that the Triage consult with the Medical and assign one EMT for every 8 to 10 patients. If any exposure victim starts exhibiting symptoms, they will be immediately removed to the designated Treatment Area.

## Multiple Toxic Exposure – 50.070

- F. In consultation with MRH, Triage and HMP will make a determination regarding how long the victims will be observed and the frequency of evaluating and taking vital signs of each patient. A log will be maintained of all patients treated and released. This log will include the patient's name, DOB, the date, symptoms (if any), and disposition.
  - 1. If the patients are asymptomatic after the designated observation time, they may be released. The HMP or Triage will individually brief the patients regarding the symptoms they should watch for and should recommend further medical evaluation by their own physician. Minor patients should only be released to their parent or guardian.
  - 2. Triage or the HMP will inform Medical of the number of patients being released.
- G. It is recommended that Medical proceed with initiating procedures normally undertaken during an MCI. Regional shall be notified that the all-call is precautionary.

### **PURPOSE:**

The purpose of this protocol is to describe who is in charge of patient care on the scene of medical emergencies and how to resolve disputes with other medical professionals in attendance. **This protocol does not apply to MCI/MPS events where ICS is established.**

### **PROCEDURE:**

- A. EMTs/Paramedics/Prehospital Providers On-Scene: The first arriving, highest certified EMT will be the Person-In-Charge (PIC) and will assume responsibility for directing overall patient care. The team approach to patient care assessment and treatment should be utilized by the PIC.
- B. When a higher level EMT arrives, in an EMS role, that individual shall assume the role of PIC, after receiving verbal report from the initial PIC.
- C. The responsibilities of the PIC directing overall patient care include:
  1. Assuring that treatment, operations, and communications follow protocols.
  2. Coordinating patient care activities. This PIC must watch over the entire patient care scene activities and be sure that the patient care activities are being accomplished in a rapid, efficient, and appropriate manner.
  3. Directing other EMTs to establish airway management, start IVs, etc.
  4. Establishing the appropriate time to be spent at the scene for doing patient care.
  5. Determining when transportation of the patient is to occur.
  6. Performing medical coordination with all agencies and personnel.
- D. The PIC directing overall patient care will be held responsible and accountable for patient care activities performed at the scene and be identified on all patient care reports.
- E. If a patient requires transport and the first arriving PIC is from a non-transporting agency, provision of patient care will be turned over to the transporting EMT-P or flight personnel when:
  1. The patient is placed on the transport unit's gurney, **OR**
  2. At a time agreed upon by both EMTs, continued patient care will then become the responsibility of the transporting unit. There will be a verbal agreement anytime transfer of care from one EMT (EMT-P) to another takes place.

### **Paramedic Direction On Scene:**

EMTs and Paramedics take medical direction from:

1. Physician Supervisors.
2. Regional Protocols.
3. On-Line Medical Control (OLMC) as directed in protocols.

### **Physician On Scene Policy, (within office):**

- A. When EMS is called to a physician's office, the EMTs and paramedics should receive information from the physician and attempt to provide the service requested by the physician.
- B. While in the physician's office, the physician shall remain in charge of the patient. The EMTs and paramedics may follow the direction of the physician as long as it is within the Scope of Practice and protocols of the PIC. Anytime there is a conflict between a physician's orders and the protocols, OLMC shall be contacted.

- C. Once the patient is in the ambulance, unless the physician accompanies the patient, paramedics shall follow the protocols.

### **Physician On-Scene Policy, (outside office):**

- A. Any physician (MD or DO) at the scene of an emergency may be qualified to provide assistance to EMTs and paramedics and shall be treated with professional courtesy.
- B. A licensed physician requesting control of patient care at the scene shall be:
  - 1. Thanked for the offer by the PIC.
  - 2. Advised that the EMTs and Paramedics work under regional protocols and On-Line Medical Control.
  - 3. Advised that we are not permitted to relinquish medical control to a physician on the scene without agreement from On-Line Medical Control.
- C. If the physician requesting control is not the patient's "physician of record," EMTs and paramedics shall be authorized to proceed under the direction of the physician **ONLY IF ALL THREE OF THE FOLLOWING PROVISIONS ARE MET:**
  - 1. OLMC is contacted and authorizes transfer of patient care.
  - 2. The physician agrees to accompany the patient to the hospital in the ambulance.
  - 3. The physician agrees to complete and sign the appropriate patient care report.
- D. If communication with OLMC cannot be established, care may be provided only according to approved ALS protocols. No direction from an on scene physician may be accepted.

### **Disputes On-Scene Between EMTs or Other Medical Professionals:**

- A. Disagreements about care should be handled in a professional manner and shall not detract from patient care.
- B. To the extent possible, the ALS and BLS protocols shall be followed and provide the basis for resolving disputes.
- C. If an unresolved dispute continues between EMTs or other medical professionals concerning the care of a patient, **OLMC shall be contacted.**
- D. If a dispute arises which results in transfer of patient care from one PIC to another, the approximate time of the transfer shall be included on the patient care report.
- E. **DISPUTES SHALL NOT APPEAR ON PATIENT CARE REPORTS.** Written "Unusual Event Forms" should be completed pursuant to any dispute arising at the scene.

### **PURPOSE:**

This protocol describes the steps an EMT should follow in contacting Medical Resource Hospital (MRH) and/or a Receiving Hospital for On-Line Medical Control (OLMC), and describes the contents of the various reports.

### **PROCEDURE:**

- A. Calls to MRH or the Receiving Hospital: EMTs shall contact MRH or the Receiving Hospital by radio or telephone in the following situations:
  1. As required by the protocols
  2. As required in approved studies
  3. As required for trauma services
  4. When On-Line Medical Control is needed
- B. All scenes involving OLMC contact:
  1. One person at the scene must be designated as the contact person in charge of communications. The EMT designated as “in charge” of communications shall contact MRH or the Receiving Hospital by the time transport has begun, including all air ambulance transports
  2. For OLMC, MRH shall be contacted if a patient’s destination is in Multnomah or Clackamas County, excluding Meridian Park Hospital. If an MRH physician cannot be contacted, contact the Receiving Hospital
  3. The Receiving Hospital should be contacted if a patient’s destination hospital is in Washington County, including Meridian Park Hospital. If a Receiving Hospital physician cannot be contacted, call MRH
  4. If BLS responders have initiated OLMC communications, ALS responders shall continue to use that medical direction source
- C. When requesting OLMC, the following information must be relayed
  1. Unit number, identity and certification level of person making contact
  2. Location of the call, street address if appropriate
  3. Purpose of call (Identify the protocol being followed)
  4. Age and sex of patient
  5. Patient’s chief complaint
  6. Brief history, prior medical history, medications, and allergies
  7. Vital signs
  8. Pertinent physical findings
  9. Treatment at scene
  10. Destination hospital and ETA, including loading time

- D. When contacting the TCC for trauma system patients, the following information must be relayed:
1. Unit number, identity and certification level of person making contact
  2. Location of the incident, street address if appropriate
  3. Number of patients. Follow *Multiple Patient Scene* or *Multiple Casualty Incident* protocol, if applicable.
  4. Age and sex of the patients
  5. Trauma System entry criteria (be as specific as possible)
  6. Trauma Band number(s)
  7. Patient's vital signs. Specify if not taken or not present.
  8. Approximate ETA of patient(s) to Trauma Center; include loading time if appropriate
  9. Unit number and mode of transport
  10. Patient destination based on incident location or request

### **PURPOSE:**

- To establish the process of obtaining informed consent.
- To define which persons may be left at the scene because they are not considered in need of EMS.
- To describe the process of obtaining and documenting patient refusal.

### **PROCEDURE:** (Refer to Refusal Flow sheet)

#### A. Determine if there is an "Identified Patient":

Determine "No Patient Identified" if the person meets **ALL** of the following criteria:

- No significant mechanism of injury.
- No signs of traumatic injury.
- No acute medical condition.
- No behavior problems that place the patient or others at risk.
- Person is **NOT** less than 18 years of age.
- Person is **NOT** the 911 caller.

#### B. **Identified Patient** who is refusing medical care or transport:

Determine if the patient appears to have impaired decision making capacity.

Consider conditions that may be complicating the patient's ability to make a decision:

- Head injury.
- Drug or alcohol intoxication.
- Toxic exposure.
- Psychiatric problems.
- Language barriers (consider translator or ATT language line through dispatch).
- Serious medical conditions.

#### C. Identified Patient **WITH** decision making capacity who refuses **needed** treatment and/or transport:

1. Explain the risks and possible consequences of refusing care and/or transport.
2. If a serious medical need exists, contact OLMC for physician assistance.
3. Enlist family, friends, or law enforcement to help convince patient.
4. If patient continues to refuse, complete the Patient Refusal Information Form and have them sign it. Give the top copy to the patient with self-care instructions.

#### D. Identified Patient **WITH IMPAIRED** decision making capacity:

1. Treat and transport any person who is incapacitated and has a medical need.
2. Patients with impaired decision making capacity should **NOT** sign a release form.
3. With any medical need, make all reasonable efforts to assure that the patient receives medical care. Attempt to contact family, friends, or law enforcement to help.
4. If deemed necessary, consult with OLMC and consider chemical or physical restraint per Restraining of Patients Protocol.

### **DOCUMENTATION:**

All instances of an identified patient, with or without impaired decision making capacity, must be fully documented on a Patient Care Form with an attached signed refusal form. The following is considered minimum documentation criteria:

- General appearance and level of consciousness (mental status).
- History, vital signs, and physical exam.
- Presence of any intoxicants.
- Assessment of the person's decision making capacity.
- Risks explained to patient.
- Communication with family, friends, police, and/or OLMC.

### **GUIDELINES & DEFINITIONS:**

- A. **Decision Making Capacity:** The ability to make an informed decision about the need for medical care based on:
  - Accurate information given the patient regarding potential risks associated with refusing treatment and/or transport.
  - The persons perceived ability to understand and verbalize these risks.
  - The person's ability to make a decision that is consistent with his/her beliefs and life goals.
- B. **Impaired Decision Making Capacity:** The inability to understand the nature of the illness or injuries, or the risks and consequences of refusing care.
- C. **Emergency Rule:** EMTs may treat and/or transport under the doctrine of implied consent a person who requires immediate care to save a life or prevent further injury. Minors may be treated and transported without parental consent if a good faith effort has been made to contact the parents or guardians regarding care and transport to a hospital, and the patient, in the opinion of EMTs, needs transport to a hospital. When in doubt, contact OLMC.
- D. **Required OLMC Contact:** EMTs are required to contact OLMC for the following refusal situations:
  - Suspected impaired decision making capacity.
  - Suspected serious medical condition such as:
    - Respiratory distress.
    - Sustained abnormal vital signs.
    - Compromised airway.
    - Uncontrolled bleeding.
    - Suspected cervical spine injury.
    - Infants under 3 months of age.
    - Chest pain.
    - Cardiac dysrhythmia.
    - Poisons and overdoses.
    - First time seizures.
  - Suspected abuse situation involving a minor or the elderly.
  - Any unconscious or altered mental status (individual or parent/guardian for a minor).
  - Conflict on scene regarding refusal of care.
  - Minor without a parent or guardian who is refusing care.

# Refusal and Informed Consent – 50.117

## ASSESS PATIENT'S MEDICAL NEED

### NO IDENTIFIED PATIENT

- No significant mechanism.
- No visible signs of traumatic injury
- No known acute medical condition
- No identifiable behavior problems.
- **NOT** less than 18 years old.
- **DID NOT** request medical assistance.

### ACTION

- No Information Form required.

### IDENTIFIED PATIENT

### ASSESS ABILITY TO MAKE DECISIONS

#### Consider:

- Head injury.
- Drug or alcohol intoxication.
- Medical conditions (e.g., hypoglycemia).
- Toxic exposure.
- Psychiatric problems.
- Language barriers.

### ABLE TO MAKE DECISIONS

Ambulance transport advised, but refused.

#### -ACTION-

- Explain risks of refusal.
- If serious medical need exists, contact OLMC.
- Enlist family, friends, police, etc. to help convince patient.
- Complete Information Form, obtain patient signature, & give them the top copy.
- Follow *Documentation* protocol.

### ABLE TO MAKE DECISIONS

With no apparent need for ambulance transport.

#### -ACTION-

- PIC must agree with patient's course of action.
- Fully document physical findings.
- Fully document advice given to patient.
- Follow *Documentation* protocol.

### UNABLE TO MAKE DECISIONS

(Impaired Capacity)

#### -ACTION-

- Treat & transport if medical emergency exists. Use *Restraining of Patients* protocol if needed.
- Make all reasonable efforts to assure patient gets medical care.
- Consult OLMC.
- **DO NOT** have patient sign an Information Form

### MINIMUM DOCUMENTATION

#### For ALL Identified Patients

- General appearance & level of consciousness.
- History, vital signs, & physical exam.
- Presence of any intoxicants.
- Assessment of patient's decision-making capacity.
- Any risks that were explained to the patient.
- Communications with family, police, and/or OLMC.

### OLMC CONTACT REQUIRED

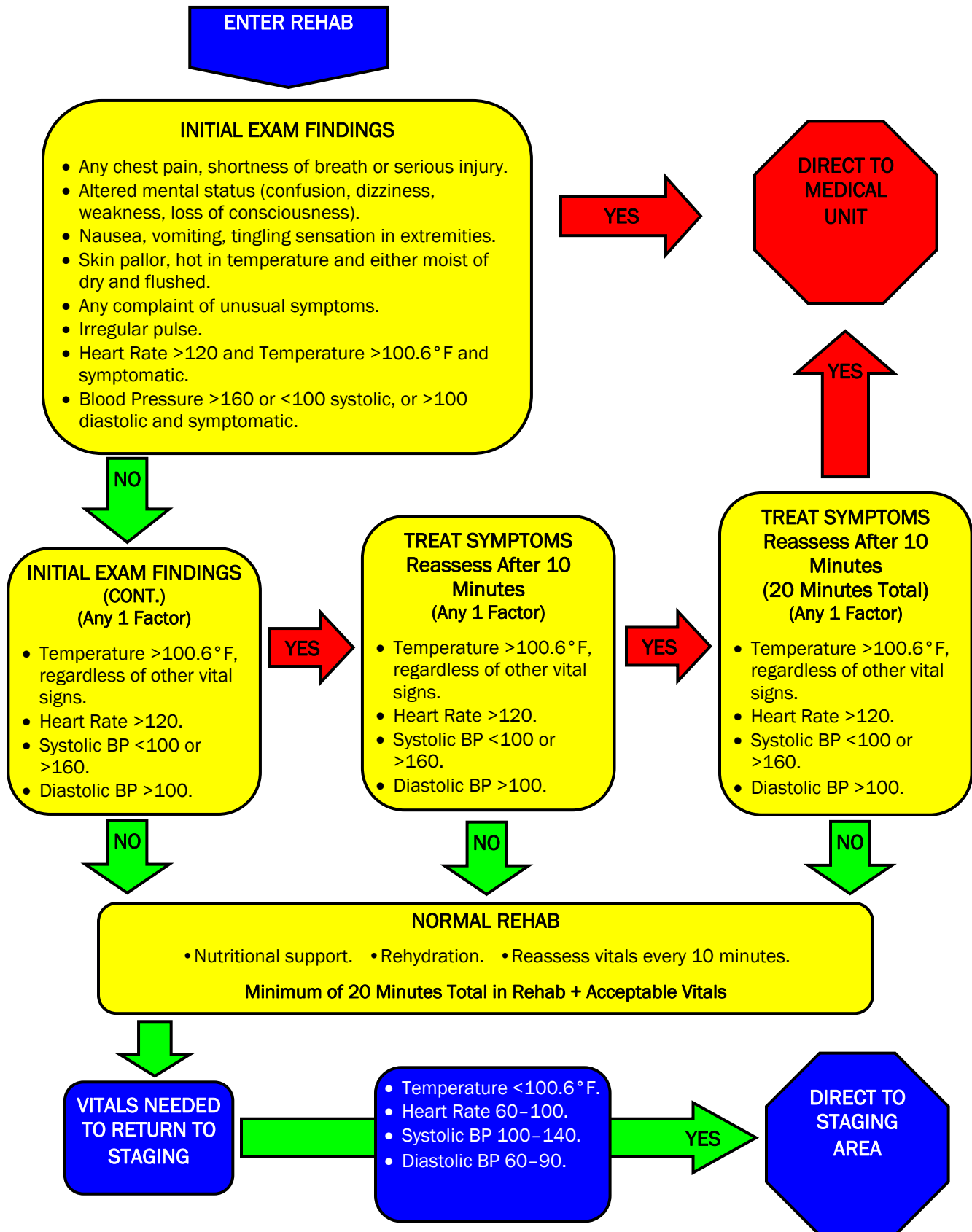
- Impaired decision-making capacity.
- Suspected serious medical condition.
- Suspected abuse – child or elderly.
- First-time seizures (all).
- Scene conflict regarding medical care.
- Minor without guardian refusing care.

**PURPOSE:**

To establish guidelines for the evaluation and treatment of personnel in the Rehabilitation Group (Rehab).

**PROCEDURE:**

- A. Personnel in Rehab will undergo an initial medical evaluation that will consist of a physical assessment including mental status and vital signs (blood pressure, pulse and temperature, pulse ox and CO monitoring [if available]). All medical evaluations will be recorded on the Medical Evaluation Form.
  
- B. Medical treatment or a resting period will be determined according to the following triage criteria based on entry findings:
  1. Findings mandating that the individual be transferred to the Medical Unit:
    - a. Any chest pain, shortness of breath or serious injury.
    - b. Altered mental status (confusion, dizziness, weakness, loss of consciousness).
    - c. Nausea, vomiting, tingling sensation in extremities.
    - d. Skin pallor, hot in temperature and either moist or dry and flushed.
    - e. Any complaint of unusual symptoms.
    - f. Irregular pulse.
    - g. Heart Rate >120 and Temperature >100.6°F and symptomatic.
    - h. Blood Pressure >160 or <100 systolic, or >100 diastolic and symptomatic.
  2. If initial exam findings include any of the following the individual will require reassessment within 10 minutes:
    - a. Temperature >100.6°F, regardless of other vital signs.
    - b. Heart Rate >120.
    - c. Systolic BP <100 or >160.
    - d. Diastolic BP >100.
  3. If reassessment exam findings include any of the following, the individual will require an additional reassessment in 10 minutes:
    - a. Temperature >100.6°F, regardless of other vitals.
    - b. Heart Rate >120
    - c. Systolic BP <100 or >160.
    - d. Diastolic BP >100.
  4. If, after an additional 10 minutes (20 minutes total in Rehab), reassessment exam findings include any of the following, the individual will be sent to the Medical Unit for further evaluation and/or treatment:
    - a. Temperature >100.6°F, regardless of other vitals.
    - b. Heart Rate >120.
    - c. Systolic BP <100 or >160.
    - d. Diastolic BP >100.
  5. Exam findings allowing an individual to enter Staging for reassignment include:
    - a. Temperature <100.6°F.
    - b. Heart Rate 60–100.
    - c. Systolic BP 100–140.
    - d. Diastolic BP 60–90.



**Emergency Incident Medical Evaluation Form (CONFIDENTIAL)**

Incident #: \_\_\_\_\_ Location: \_\_\_\_\_ Forward to: \_\_\_\_\_ Date: \_\_\_\_\_

Name	Unit	Time In/Out	# SCBA Cylinders	Exam Period	BP Sys	BP Dia	Pulse	Temp	Pulse Ox	Co	Notes			
				INITIAL	If sys>160 or <100 or Dia>100 (1)	If >120 (2)	If >100.6 (2)	<95 (3)	>0 (3)					
			10 Min											
			20 Min											
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										
				INITIAL										
				10 Min										
				20 Min										

Individuals with any of the following symptoms should have aggressive treatment and may be sent to the Medical Unit:  
 Chest pain, weakness, dizziness, altered mental status, disorientation, headache, nausea, vomiting, muscle cramps, exhaustion, fainting, moist, pale or cool skin, abdominal cramps.

(1) Reassess in 10 minutes  
 (2) Hold 20 minutes; if unresolved after 20 min, send to Medical Unit  
 (3) Refer to Carbon Monoxide Exposure Protocol

## Transport by Fire Medic Unit - 50.130

### **PURPOSE:**

To define instances when a Fire Department Medic Unit may transport patients.

### **PROCEDURE:**

- A. Fire Department paramedic staffed unit may transport if the following conditions are met:
  1. AFTER assessment, it is determined by the Fire PIC that the patient needs immediate transport; AND the patient is packaged and ready to be transported; AND the ambulance has not yet arrived; AND a fire department transport unit is closer. (The following conditions are a non-exclusive list of when immediate transport may be necessary.)
    - Inability to secure an adequate airway.
    - Inability to stabilize BP.
    - Abnormal childbirth.
    - Trauma system entry patients.
    - Cardiac or respiratory arrest.
    - Seizures, unresponsive to treatment.
    - Severe respiratory distress, unresponsive to treatment.
  2. In an MCI or MPS where transport will be delayed due to ambulance depletion.
  3. Periods of high volume, where ambulance arrival on scene may be delayed for more than 15 minutes after the patient (non-critical) is packaged and ready for transport, and the fire department transport unit is on scene or nearby (especially in inclement weather, when the patient is outside).
- B. A hard copy of the Patient Care Report will be left at the hospital.

# Trauma System

## I. **PATIENT ENTRY:**

The paramedic is required to report the reason for patient entry to the Trauma Communications Center (TCC). Patients are to be entered into the Trauma System if they meet any of the following criteria:

### **MANDATORY:**

#### A. Physiological Criteria:

1. Systolic BP < 90 mm/Hg.
2. Respiratory Rate < 10 or > 29, or airway management is required.
3. GCS  $\leq$  12

#### B. Anatomical Criteria:

1. Flail chest.
2. Two or more obvious fractures of femur or humerus.
3. Penetrating injury of the head, neck, torso, or groin associated with energy transfer.
4. Amputation above wrist or ankle.
5. Spinal cord injury with limb paralysis.

#### C. Mechanism of Injury:

1. Heavy extrication > 20 minutes.
2. Death of same car occupant.
3. Patient ejected from enclosed vehicle.

### **DISCRETIONARY:**

#### D. High-Energy Transfer Situation:

1. Significant falls.
2. Auto vs. Pedestrian collisions.
3. Rollover.
4. Motorcycle, ATV or Bicycle Crash.
5. Impact/Significant Intrusion.

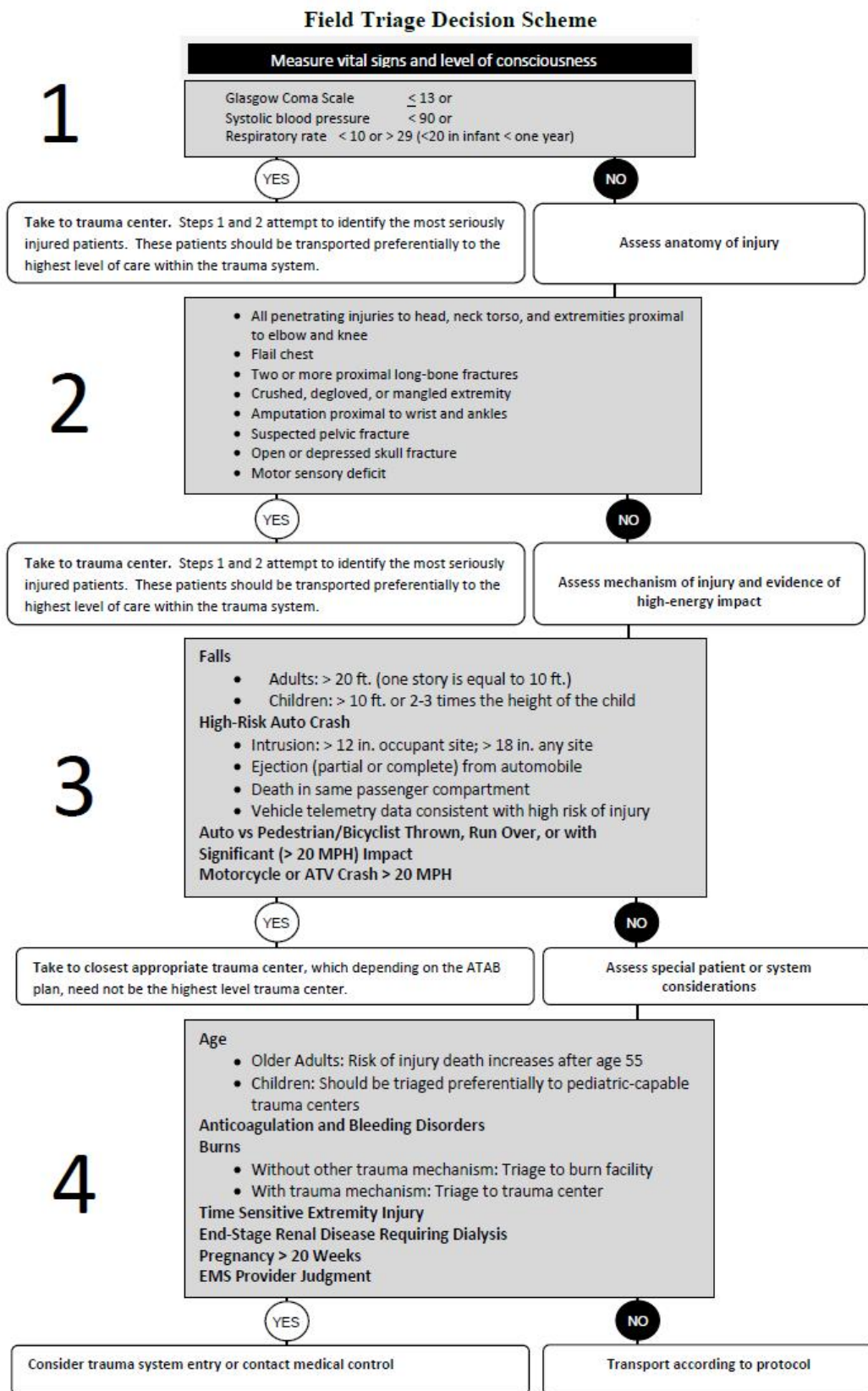
#### E. Comorbid Factors:

1. Age (< 12 or > 60 years).
2. Presence of intoxicants.
3. Hostile environment (hot/cold).
4. Pregnancy (especially third trimester).
5. Significant medical history (e.g., anticoagulant therapy).
6. Morbid obesity.

**THIS PAGE INTENTIONALLY LEFT BLANK**

# Trauma System Guidelines – 60.100

## I. PATIENT ENTRY:



**THIS PAGE INTENTIONALLY LEFT BLANK**

### II. **MEDICAL DIRECTION:**

- A. Off-line medical direction for trauma patients is controlled by the Treatment Protocols.
- B. OLMC is provided by Medical Resource Hospital (MRH). OLMC may override off-line medical direction. Any instances where this occurs will be reported to the EMS Office.

### III. **COMMUNICATIONS:**

- A. Communications with TCC:  
The following information will be provided:
  - 1. Unit number and the location of the incident.
  - 2. Number of patients.
  - 3. Age and sex of the patients.
  - 4. Trauma system entry criteria and vital signs.
  - 5. Glasgow Coma Scale.
  - 6. ETA to Trauma Center.
  - 7. Patient destination based on incident location or request.
- B. Communications from TCC or OLMC to the paramedics in the field will be as follows:
  - 1. TCC will inform the paramedic if more information is needed by the trauma center.
  - 2. TCC will inform the paramedic if the chosen trauma center is unable to receive the patient and will assist in designating an alternate destination.
  - 3. In the event that there are multiple Trauma System entries, TCC will assist the paramedic at the scene in determining the destinations of all patients.

### IV. **TRAUMA CENTER DESTINATION:**

- A. **Emanuel Hospital Service Area:** Patient origin on or north of: Tualatin Valley Highway beginning at the West city limits of Hillsboro, to Canyon Road, Canyon Road to Highway 26, to I-405, I-405 to NW Lovejoy, NW Lovejoy across the Broadway Bridge to the East bank of the Willamette, and South on the riverbank to Burnside. From this point, all patients North of, but not on the following line are to be transported to Emanuel: East on Burnside to NE Sandy Blvd, Sandy To NE Glisan at its intersection with 21st, and then East on Glisan St. to 242nd Ave in Gresham.
- B. **Oregon Health Sciences University Hospital Service Area:** Patient origin on or South of Glisan St. beginning at 242nd Street in Gresham, West on Glisan St. to Sandy Blvd at its intersection with 21st, Sandy Blvd. to E. Burnside, then West on Burnside to the East Bank of the Willamette, and North along the riverbank to the Broadway Bridge. From this point, all patients South of but not on the following line will be transported to University: West on the Broadway Bridge to Lovejoy, to I-405, to Highway 26 and then South of but not including Highway 26, to Canyon Road, to Tualatin Valley Highway to the west city limits of Hillsboro.

- C. **Patients or Guardians Request:** If the alert, competent patient or his/her competent guardian demands transport to a specific hospital, the EMT must honor that request and notify the TCC immediately.
- D. **Multiple Patients:** From the same scene, all patient destinations are to be that assigned by the above service areas unless the designated Trauma Center advises the TCC that the facility cannot accept additional patients. In this instance, the Trauma Communications Center (TCC) will assist the paramedic in determining patient destinations. If there are more than two critical trauma patients (e.g., intubated, significant trauma) ready to be transported from the same scene, only the first two will be sent to the Level 1 facility designated by catchment area. Subsequent patients shall be directed to the next Level 1 center.
- E. **Diversion To Local Hospital:** If the paramedic is unable to establish an airway, the patient should be transported to the nearest acute care facility. In the event this occurs, TCC should be notified of the diversion.

### V. MODE OF TRANSPORT:

An air ambulance should be used when it would reduce total pre-hospital time by 10 minutes or greater. This is usually achieved whenever the ground transport time will exceed 25 minutes (Scene is > 15 miles from Portland, or other circumstances exist).

### VI. PATIENT EVALUATION PROTOCOL:

- A. Treatment Priority Should Be Approached In This Order:
  1. Airway Maintenance (Including control of the cervical spine).
  2. Breathing.
  3. Control of circulation and hemorrhage.
  4. Treatment of shock.
  5. Neurological examinations.
  6. Complete secondary survey.
  7. Splinting of fractures.

### VII. SCENE TIME:

After gaining access to the patient, scene time should not exceed ten minutes for any patient who is entering the Trauma System. Plan to start IV/IOs and initiate other care once en-route to the hospital if necessary.

# **Multi-Casualty Incidents**

### **The National Incident Management System (NIMS) will be used to manage all incidents.**

1. Incident Command (IC) is the responsibility of the agency having jurisdiction (AHJ).
2. Each assisting agency shall retain full authority to operate within the scope of its agency operational and administrative protocols and procedures.
3. Agencies that are assisting in the support of a single jurisdiction will function under the direction of that jurisdiction's designated Unified Incident Command.
4. Incident Command of a multi-discipline event should be predicated on the "Primary Hazard" of the event.
5. In a Unified Command, the "Lead Agency" may change as priorities change.

The **Mass Casualty Incident Protocol** is a tool that may be used in part or whole as determined by the on-scene Incident Commander in situations where the number of patients exceeds the resources of the on-scene responders. There is no set number of patients that will automatically initiate this protocol. If the Incident commander determines that additional resources or incident structure is needed to better manage due to the complexity of the incident, he/she shall announce to dispatch that an MCI is being declared. This may be done upon arrival or at any time during the incident.

- If the incident involves multiple asymptomatic patients (HazMat exposure) set up secure evaluation area. See **Multiple Toxic Exposure** protocol.
- During a declared MCI, the Trauma System is not in effect.
- "Licensed ambulances" are not needed for transport.
- If transport resources are limited, more than one critical patient may be placed in an ambulance.

## MCI Task Card - Medical

Reports to Incident Commander (or Operations in larger incidents)

### **OBJECTIVES:**

- 1. Coordinate all On-Scene EMS activity.**
- 2. Coordinate Medical activities with Incident Commander (IC), and other ICS branches as needed.**
- 3. Provide accountability for supervised personnel.**

### **ACTIONS:**

- Establish Medical with Command.
- Obtain a separate working radio channel for use by Medical.
- Establish the following roles/functions and hand out vest, triage tags and task cards.
  - Triage**
  - Treatment**
  - Transportation**
  - Destination** (reports to Transportation)
  - Staging Area** (confirm area, and proper talk group)
  - An assistant to help you with radio and face-to-face communications.**
  - Landing Zone (LZ)**
- Order additional resources and ambulances through Incident Command.
- Establish accountability system for personnel working within Medical.
- Refer to Medical checklists (over).
- Monitor performance of subordinates. Provide support and changes as needed.

## MCI Task Card - Medical

### SCENE CHECKLIST

Functional Assignments:	Ops:	Order Resources:	Ops:	HazMat:
Triage		Ambulances (specify #)		Mass Decon
Treatment		Police (Secure Area)		Safety
Transportation		Buses		Rescue
Destination		Vans		
Staging Area		Medical Examiner		
Landing Zone		Red Cross		
		Specialty Teams		

### OTHER ASSIGNMENTS

Incident Commander	Triage	Treatment	Transportation	Destination
				<b>Staging Area</b>

## MCI Task Card – Treatment

Reports to Medical (Use assigned radio channel) Coordinates with Triage and Transportation

### **OBJECTIVES:**

- 1. To rapidly treat and transport all patients.**
- 2. Identify and establish large treatment area(s) to stabilize and care for patients until transported.**
- 3. Coordinate all activities within the treatment area.**
- 4. Coordinate movement of patients from treatment area(s) with Transportation.**
- 5. Provide accountability for personnel working in Treatment.**

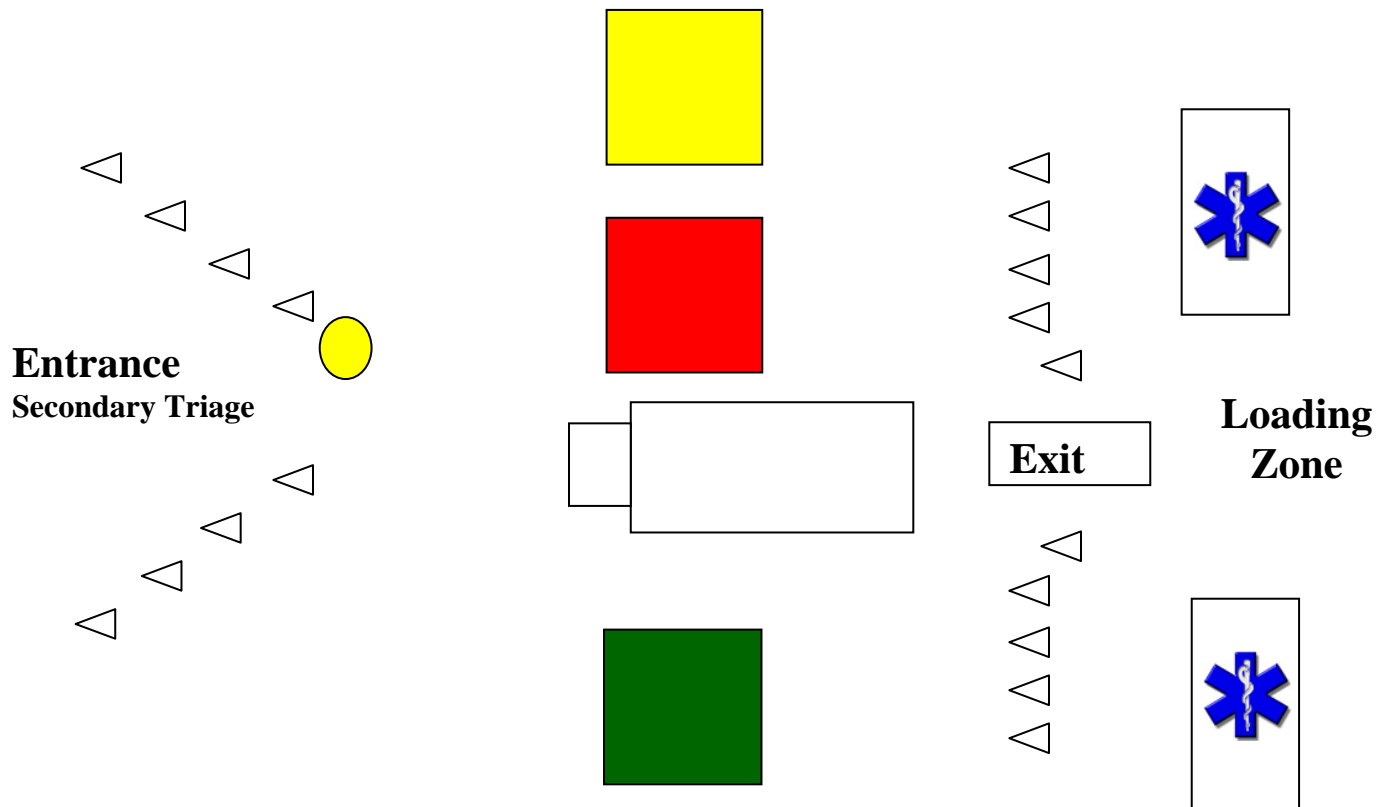
### **ACTIONS:**

- Establish treatment area(s) large enough to receive estimated number of patients. Set up area with room to expand if necessary. Provide for environmental protection of victims and allow easy ambulance access and egress. If multiple treatment areas are needed, identify each geographically. (e.g. - North/South, street name, division name, etc.). See Diagram.
- Order additional resources through Medical.
- Clearly identify treatment area entry point. Assign a person at the entrance to conduct primary or secondary triage, attach triage tags and direct patients to correct treatment area.
- Consider appointing “Red,” “Yellow,” and “Green” Treatment Team Leaders and assign support personnel.
- Establish a medical supply drop area for incoming ambulances and fire units.
- Provide BLS care in the treatment area until resources allow a higher level.
- Ensure all patients in treatment area have been tagged with a triage tag.
- Identify the order in which patients are to be transported. Coordinate patient movement to the loading zone with Transportation.
- Provide accountability for personnel working within treatment area.

# MCI Task Card – Treatment

## Treatment Area Guidelines

- Set up treatment area WELL AWAY from Hazardous. Consider ambulance access/egress, wind direction and slope.
- Make it BIG. Set up in an area that will allow you to expand.
- Clearly identify entry point and exit point for patient transportation.
- Utilize colored tarps and flags to identify each treatment area.
- Separate the green area from yellow/red area. Consider separating with CBRNE unit or other natural barrier.
- Assign treatment team leaders to each area and identify them with the appropriate colored vests.



# MCI Task Card – Treatment

## SCENE CHECKLIST

OPS Channels	Medical:	Treatment:	Transport:
Assign Treatment Team Leaders		Current Patients in Treatment Area	
RED Team Leader:		Red	
YELLOW Team Leader:		Yellow	
GREEN Team Leader:		Green	
Supply:		Black	
Additional Company Assignments		<u>Notes:</u>	
Company	Assignment		

**Other Assignments:**

Command	Operations	Triage	Staging	Destination
OPS: _____ _____	OPS: _____ _____	OPS: _____ _____	OPS: _____ _____	OPS: _____ _____

## MCI Task Card - Triage

- Manage the triage function at the incident (should not perform task level triage)
- Coordinate personnel/crews performing primary and secondary triage
- Maintain accountability of all triage personnel/crews
- Ensure rapid primary triage is performed – no more than 30 seconds per patient
- Ensure secondary triage point is established when necessary or that secondary triage is accomplished in place
- Coordinates movement of triaged patients to treatment/collection/transport area. (order personnel and equipment as appropriate to accomplish this)
- Ensures appropriate patient triage log is initiated and maintained. (multiple logs may need to be managed and information integrated depending on the scope of the incident)
- Relay triage information up the chain-of-command and updates status as needed
- After triage is completed, assists treatment and transport supervisors/teams to locate their patients.
  - *In a hazardous incident, patients may not be able to be triaged until they are removed from the hazard zone.*
  - *Consider having crews utilize triage tags during secondary triage so that primary triage may be performed at appropriate speed.*

### **Triage & identify patients by category utilizing “ABC” method:**

- Red\*** Immediate life threat. (Must have rapid transport to survive.)
- Yellow\*** Delayed (Injuries can wait 1-3 hours before transport.)
- Green\*** Ambulatory (Injuries can wait 3+ hours before transport)
- Black\*** Dead (No transport) Move only if needed to reach other live patients.

## MCI Task Card - Transportation

Reports to Medical (Use assigned radio channel)

### **OBJECTIVES:**

- 1. Coordinate movement of patients from treatment area with Treatment.**
- 2. Coordinate all activities within the loading zone.**
- 3. Coordinate flow of transport vehicles with staging.**
- 4. Provide accountability for personnel working in Transportation.**

### **ACTIONS:**

- Establish patient loading zone.
- Establish one-way vehicle access/egress with Staging.
- Request additional resources as needed from Medical.
- Assign Medical Communications.
- Supervise patient movement to loading zone with Treatment.
- Monitor medical radio channel to estimate number of incoming patients.

# MCI Task Card - Transportation

**Loading Zone Location:**

---

---

**Access/Egress Location:**

---

---

**Resources Requested:**

Time	Resource	Unit/Agency
------	----------	-------------

---

---

---

---

---

---

---

**Medical Communications:**

Name: \_\_\_\_\_

Unit/Agency: \_\_\_\_\_

## MCI Task Card –Destination

### Reports to Transportation

#### **OBJECTIVES:**

- 1. Coordinate hospital destination for patients leaving the loading zone.**
- 2. Maintain the patient transport log using web based or protocol approved alternative.**

#### **ACTIONS:**

- Establish communications with “Regional Hospital.” (Via MCI channel, phone number or approved alternative. (800 radio MCI channel or phone (503) 494-7333.)
- Confirm MCI has been declared with Regional Hospital and Dispatch.
- Provide total number of estimated patients.
- Establish communication with loading zone to receive information on patients ready for transport (e.g., face-to-face, runner, radio etc.).
- When a unit is ready to transport, contact Regional Hospital. Provide & record the following information.
  1. Triage Tag #'s/ UPI if available
  2. Triage color/category
  3. Age/gender
  4. Unit number of transporting vehicle
- Confirm hospital destination with Regional and record.
- Inform the transporting unit of its destination.



TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>1</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>2</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>3</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>4</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>5</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>6</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>7</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>8</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

TAG #	PATIENT LOCATION	TRANSPORT NUMBER
<b>9</b>		
TRIAGE	<div style="display: inline-block; width: 15px; height: 15px; background-color: red; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: yellow; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: green; border: 1px solid black;"></div> <div style="display: inline-block; width: 15px; height: 15px; background-color: black; border: 1px solid black;"></div>	
GCS & MAJOR INJURIES		
AGE & SEX		
TRAUMA BAND ID		
TRANSPORT UNIT		
HOSPITAL		

# **Hazardous Materials**

### DECONTAMINATION ZONE

Note: All victims suspected of ingestion or significant exposure to **hydrogen cyanide** solution **require decontamination**. Others may be transferred immediately to the Support Zone.

#### A. Decontamination

1. Victims who are able and cooperative may assist with their own decontamination.
  - a. **RAPIDLY REMOVE CONTAMINATED CLOTHING** while flushing exposed skin and hair with plain water for 2 to 3 minutes
  - b. Then wash twice with mild soap
  - c. Rinse thoroughly with water
  - d. Double bag contaminated clothing and personal belongings
2. Irrigate exposed or irritated eyes with plain water or saline for 5 minutes.
  - a. Continue eye irrigation during other basic care or transport.
  - b. Remove contact lenses if present and easily removable without additional trauma to the eye

#### B. Transfer to Support Zone as soon as decontamination is complete.

## IDENTIFICATION

CAS 74-90-8

UN 1051

Synonyms include formic anammonide and formonitrile. Aqueous solutions are referred to as hydrocyanic acid and prussic acid.

Hydrogen cyanide is very volatile, producing potentially lethal concentrations at room temperature. At temperature below 78°F, hydrogen cyanide is colorless or pale blue liquid (hydrocyanic acid); at higher temperatures, it is a colorless gas. It has a faint bitter almond odor and a bitter burning taste. It is soluble in water. **Hydrogen cyanide is lighter than air.**

## PRECAUTIONS

- A. Persons whose clothing or skin is contaminated with cyanide containing solutions can secondarily contaminate personnel by direct contact or through off-gassing vapor.
  - 1. Avoid dermal contact with cyanide-contaminated victims and their bodily fluids.
  - 2. **Take special care with victims who may have ingested cyanide, as cyanide salts dissolve in the stomach and react with hydrochloric acid to produce hydrogen cyanide gas. Transport patients in vehicles with windows opened and/or good ventilation. These patients who meet *Death in the Field* criteria should be considered a Hot Zone.**
  - 3. Victims exposed only to hydrogen cyanide gas do not pose contamination risks to rescuers.
- B. Hydrogen cyanide is a volatile flammable liquid at room temperature; as a gas, it is flammable and potentially explosive.
- C. Hydrogen cyanide is absorbed well by inhalation and can produce death within minutes.
  - 1. Substantial absorption can occur through intact skin if vapor concentration is high.
  - 2. Exposure by any route may cause systemic effects.

## HEALTH EFFECTS

HCN is classified a systemic (chemical) asphyxiant. Cyanides interfere with the intracellular utilization of oxygen resulting in cellular dysfunction and cell death. Effects are most profound and first evidenced in the CNS and cardiovascular system. Initial symptoms may include CNS excitation and cardiovascular compensation followed by depression/collapse of both systems.

## ROUTES OF EXPOSURE

- A. Inhalation
  - 1. Hydrogen cyanide is readily absorbed from the lungs; symptoms of poisoning begin within seconds to minutes
  - 2. *The odor of cyanide does not provide adequate warning of hazardous concentrations. Perception of the odor is a genetic trait (20% to 40% of the general population cannot detect hydrogen cyanide); also rapid olfactory fatigue can occur.*
- B. Skin/Eye Contact: Exposure to hydrogen cyanide can cause skin and eye irritation and can contribute to systemic poisoning with delayed symptoms.
- C. Ingestion of hydrogen cyanide solutions or cyanide salts can be rapidly fatal

### **SIGNS AND SYMPTOMS**

- A. Signs and symptoms usually develop rapidly. Initial symptoms are nonspecific and include excitement, dizziness, n/v, HA and weakness.
- B. Progressive signs and symptoms may include: Drowsiness, tetanic spasm, convulsions, hallucinations and loss of consciousness.
- C. Cardiovascular – Can cause various life threatening dysrhythmias.
- D. Respiratory
  - 1. Victims may complain of shortness of breath and chest tightness
  - 2. Pulmonary findings may include rapid breathing and increased depth of respiration
  - 3. As poisoning progresses, respirations become slow and gasping; cyanosis may be present, and pulmonary edema may develop

### **RESCUER PROTECTION**

- A. Respiratory protection: Pressure demand self-contained breathing apparatus (SCBA) is recommended in response situations that involve exposure to potentially unsafe levels of hydrogen cyanide
- B. Skin protection: Chemical protective clothing is recommended because both hydrogen cyanide vapor and liquid can be absorbed through the skin to produce systemic toxicity.

### **DECONTAMINATION ZONE**

- A. Refer to Decontamination page.
- B. Transfer to Support Zone as soon as decontamination is complete.

### **SUPPORT ZONE**

- A. Be certain that victims have been decontaminated properly. Additional decontamination may be required for exposed skin and eyes.
- B. Decontaminated victims or those exposed only to vapor, pose no serious risks of secondary contamination to rescuers. In these cases, Support Zone personnel require no specialized protective gear.

### **TREATMENT**

Patients who rapidly regain consciousness and who have no other signs or symptoms may not require antidote treatment. Patients who remain comatose or develop shock should be treated promptly with the antidotes per OLMC direction. In cases of ingestion—**emesis and activated charcoal are *contraindicated***.

- A. High flow oxygen, establish IV access, apply cardiac monitor and secure protected airway following Airway Management protocol.
- B. If Cyanide Toxicity is suspected based on findings (soot in mouth, nose or oropharynx, known exposure) and patient is comatose, in cardiac or respiratory arrest, or has persistent hypotension despite fluid resuscitation:
  1. Administer Hydroxocobalamin (Cyanokit®) 5 g IV as an infusion and monitor for clinical response. Contact OLMC for advice regarding a second 5 g dose.
  2. If Hydroxocobalamin (Cyanokit®) is not available, then administer Sodium Thiosulfate 50 ml of 25% solution over 10-20 minutes. Pediatric dose is 1.65 ml/kg
  3. Do NOT administer Hydroxocobalamin (Cyanokit®) and Sodium Thiosulfate to the same patient.
  4. Treat other presenting symptoms per appropriate protocol.
  5. Initiate emergent transport to appropriate facility.
  6. Patients in shock or having seizures should be treated according to existing protocols. These patients may be seriously acidotic; consider giving sodium bicarbonate 50 mEq, with OLMC direction.
- C. **MULTI-CASUALTY TRIAGE** - Patients who have only brief inhalation exposure and mild or transient symptoms may be discharged.

## **IDENTIFICATION**

**CAS 7664-39-3**

**UN 1052 (Anhydrous)**

**UN 1790 (Solution)**

Synonyms include fluoric acid, hydrofluoride, hydrofluoric acid, and fluorine monohydride.

Hydrogen fluoride is a colorless, corrosive fuming liquid or gas (boiling temperature 67°F) with a strong irritating odor. It is usually shipped in cylinders as a compressed gas. Hydrogen fluoride readily dissolves in water to form colorless hydrofluoric acid solutions. Dilute solutions are indistinguishable from water. It is present in a variety of over-the-counter products at concentrations of 6% to 12%.

## **PRECAUTIONS**

- A. Victims whose clothing or skin is contaminated with HF liquid, solution or condensed vapor, can secondarily contaminate response personnel by direct contact or through off-gassing vapor.
- B. Inhalation hazards result not only from HF gas but also from fumes arising from concentrated hydrogen fluoride liquid **or from the patient's bodily fluids.**
- C. Rapid flushing of exposed areas with water is critical. HF is water-soluble.

## **HEALTH EFFECTS**

The toxic effects of hydrogen fluoride are due primarily to the fluoride ion. The fluoride ion combines with endogenous calcium and magnesium to form insoluble calcium fluoride and magnesium fluoride.

- A. This results in cell destruction and local bone demineralization
- B. Life threatening hypocalcemia, hypomagnesemia, and hyperkalemia can occur.
- C. The adverse action of the fluoride ion may progress for several days

## **ACUTE EXPOSURE**

- A. **Respiratory**—Due to HF's water solubility, effects of exposure generally occur in the upper airway including the glottis. However, people incapacitated in large clouds of HF can have severe deep lung injury.
  1. **Mild effects**— mucous membrane irritation, cough and narrowing of the bronchi.
  2. **Severe effects.**
    - a. Almost immediate narrowing and swelling of the throat, causing upper airway obstruction.
    - b. Lung injury may evolve rapidly or may be delayed in onset for 12 to 36 hours.
    - c. Pulmonary edema and constriction of the bronchi. Partial or complete lung collapse can occur
    - d. Pulmonary effects can result even from splashes on the skin.
- B. **Dermal**—Depending on the concentration and duration of exposure, skin contact may produce pain, redness of the skin, and deep, slow healing burns with symptoms delayed up to 24 hours. HF can penetrate tissues deeply, causing both local cellular destruction and systemic toxicity.

### C. Ocular

1. **Mild effects**— rapid onset of eye irritation
2. **More severe effects**— may result from even minor hydrofluoric acid splash include, sloughing of the surface of the eye, swelling of the structures of the eye, and cell death due to lack of blood supply. Potentially permanent clouding of the eye surface may develop immediately or after several days

### D. Gastrointestinal

1. A small amount of ingested HF is likely to produce systemic effects including acid-base imbalance and may be fatal.
2. Ingestion of hydrofluoric acid may cause corrosive injury to the mouth, throat and esophagus as well as inflammation and bleeding of the stomach.
3. Nausea, vomiting, diarrhea and abdominal pain may occur

- E. **Electrolyte disturbances**—exposure by any route may result in systemic effects: hypocalcemia and/or hypomagnesemia and/or hyperkalemia.

## PREHOSPITAL MANAGEMENT

### HOT ZONE

#### Rescuer Protection

- A. SCBA is recommended in response situations that involve exposure to potentially unsafe levels of hydrogen fluoride
- B. Skin protection: Chemical protective clothing, i.e. level A or level B, is recommended because skin exposure to either vapor or liquid may cause severe consequences.

### DECONTAMINATION ZONE

- A. Victims exposed only to hydrogen fluoride gas or vapor who have no skin or eye irritation do not need decontamination, they may be transferred immediately to the Treatment Area.
- B. Rescuer Protection: If exposure levels are determined to be safe, personnel wearing a lower level of protection than that worn in the Hot Zone may conduct decontamination.
- C. ABC Reminders
  1. Quickly ensure a patent airway— anticipate airway edema.
  2. Stabilize the cervical spine with a c-collar and a backboard if trauma is suspected
  3. Administer supplemental O<sub>2</sub>
  4. Assist ventilation with a bag-valve-mask device if necessary
- D. Basic decontamination
  1. Victims who are able and cooperative may assist with their own decontamination
    - a. **RAPIDLY REMOVE CONTAMINATED CLOTHING** while flushing exposed skin and hair with plain water for 15 minutes.
    - b. If either of the treatments recommended below is available, water flushing may be reduced to 5 minutes and the treatment should be started immediately.
      - I. 2.5 G calcium gluconate in 100 ml of water soluble lubricant such as KY<sup>®</sup> Jelly, **OR**,
      - II. 2 ml of 10% calcium gluconate per ounce of KY<sup>®</sup> Jelly
    - c. Double bag contaminated clothing and personal belongings

2. Irrigate exposed or irritated eyes with plain water or saline or 5 minutes
  - a. Continue eye irrigation during other basic care or transport
  - b. Remove contact lenses if present and easily removable without additional trauma to the eye.
3. In case of ingestion, **do not induce emesis or administer activated charcoal**
  - a. Victims who are conscious and able to swallow should be given 4 to 8 ounces of water or milk.
  - b. If available, also give 2 to 4 ounces of an antacid containing magnesium (e.g., Maalox, Milk of Magnesia) or calcium (e.g., TUMS)
4. As soon as basic decontamination is complete, move the victim to the Treatment Area.

### **TREATMENT**

Be certain that victims have been decontaminated properly. Treatment Area personnel require no specialized protective gear if victims have undergone decontamination.

- A. ABCs, C-spine (p.r.n.), Pulse Oximetry, ECG obtain baseline QT interval a (may be of benefit for this).
- B. Treat patients who are or have per existing protocols.
- C. Observe for signs of hypocalcemia and contact OLMC regarding treatment with Calcium Gluconate.
  1. ECG—prolonged Q-T interval or QRS or ventricular dysrhythmias.
  2. Other—Muscular tetany. This is probable after ingestion of even small amounts of HF.
- D. **For inhalation victims.**
  1. Administer 2.5% calcium gluconate by nebulizer. Mix 1cc of 10% Calcium Gluconate with 3ccs of Normal Saline into the nebulizer.
  2. If wheezes are present consider use of Albuterol per Respiratory Distress protocol.
- E. **Minor Burns.**
  1. Initially, the health care provider should wear rubber or latex gloves to prevent secondary contamination
  2. Vigorously massage the burned areas with calcium gluconate gel—2 ml of 10% calcium gluconate per ounce of KY<sup>®</sup> Jelly
  3. Continue this procedure until pain is relieved or more definitive care is rendered
- F. **Hand Exposure**
  1. Subungual (under the nail) burns often do not respond to immersion treatment. The treatment for hand burns requires expert assistance; consult with OLMC
  2. Treatment of hand exposures can be accomplished by placing calcium gluconate gel into an exam glove and placing the glove on the affected hand.
- G. **Optical Exposure**—Irrigate exposed eyes with a 1% aqueous solution of calcium gluconate (10 ml of 10% solution in 90 ml of sterile saline in Buretrol) using a nasal cannula.
  1. Up to 500 ml over 1 to 2 hours may be used
  2. If calcium gluconate is not available, use normal saline for irrigation.

## Hydrogen Fluoride – 70.030

### **MULTI-CASUALTY TRIAGE**

Consult with the OLMC for advice regarding triage of multiple victims. Persons who have had only minor or brief exposure to hydrogen fluoride gas or vapor and are initially asymptomatic are not likely to develop complications. See Multiple Toxic Exposure Protocol.

## **IDENTIFICATION**

**CAS 56-38-2**

**UN 2783**

Synonyms include Alkron, Alleron, Danthion, DNTP, DPP, Ethyl Parathion, Etilon, E-605, Stathion, Sulphos, and Thiophos.

The term organophosphate (OP) is generally understood to mean an organic derivative of phosphoric or similar acids. There are many different OPs and they differ to some extent in their properties. Many OPs inhibit an enzyme known as acetylcholinesterase. This is a class effect of OPs, but not all OPs (e.g. glyphosate) demonstrate this effect. Inhibitors of acetylcholinesterase affect certain nerve junctions in animals, as well as parasympathetic effector sites (the heart, lungs, stomach, intestines, urinary bladder, prostate, eyes and salivary glands). By inhibiting the enzyme acetylcholinesterase, OPs prevent the nerve junction from functioning properly.

## **PRECAUTIONS**

- A. Organophosphates are highly contaminating.
- B. Victims whose skin or clothing is contaminated with liquid or powdered organophosphate can secondarily contaminate response personnel by direct contact or off gassing of solvent vapor.
- C. Clothing and leather goods (e.g., belts or shoes) cannot be reliably decontaminated; they should be incinerated.
- A. Special care should be taken to avoid contact with the vomitus of a patient who has ingested organophosphate.

## **PHYSICAL PROPERTIES**

- A. At room temperature, organophosphate powders or combustible liquids.
- B. Organophosphates are almost insoluble in water, slightly soluble in petroleum oils, and miscible with many organic solvents. Accordingly, most commercial products contain hydrocarbon solvents.
- C. Organophosphates have low vapor pressures, thus significant inhalation is unlikely at normal temperatures (Exception: Dichlorvos (a.k.a. DDVP and Vapona) when in a poorly ventilated confined space). However, the hydrocarbon solvents remain volatile and flammable, as well as possessing toxic properties.

## **ROUTES OF EXPOSURE**

- A. Inhalation
  - 1. Toxic inhalation of organophosphate vapor is unlikely at ordinary temperatures because of its low volatility, but toxic effects can occur after inhalation of organophosphate sprays or dusts
  - 2. The hydrocarbon solvents (most commonly toluene and xylene) used to dissolve organophosphate are more volatile than organophosphate itself, and toxicity can result from inhalation of solvent vapor as well
- B. Skin/Eye Contact—Organophosphates are rapidly absorbed through intact skin or eyes, contributing to systemic toxicity.
- C. Ingestion—Acute toxic effects. May be rapidly fatal.

## HEALTH EFFECTS

### A. Introduction:

1. Organophosphates are known as cholinesterase inhibitors. Normally, the neurotransmitter acetylcholine (ACh) is broken down by acetylcholinesterase (AChE). Organophosphates inhibit the activity of AChE and thus ACh is not broken down. The resulting accumulation of ACh overstimulates ACh receptors (aka cholinergic receptors) within the central and peripheral nervous systems. The toxic effects of organophosphates result from this overstimulation of ACh receptors. There are two types of ACh receptors, muscarinic and nicotinic.
2. Signs and symptoms of poisoning vary according to age, dose, and concentration
  - a. **CNS effects**—Irritability, nervousness, giddiness, fatigue, lethargy, impairment of memory, confusion, slurred speech, visual disturbance, depression, impaired gait, convulsions, loss of consciousness, coma, and respiratory depression. CNS effects can be some of the earliest symptoms.
  - b. **PNS Effects**—nicotinic and muscarinic stimulation can provide opposing effects. In general, nicotinic signs and symptoms predominate early in organophosphate poisoning, while muscarinic signs and symptoms predominate later.
    1. **Muscarinic effects**— **SLUDGE** (Salivation, Lacrimation, Urination, Defecation, Gastroenteritis, Emesis), or **DUMBELS** (Diarrhea, Urination, Miosis, Bradycardia, Bronchorrhea, Bronchospasm, Emesis, Lacrimation, Salivation, Secretion, Sweating)
    2. **Nicotinic effects**— **MTWHF** (Mydriasis, Tachycardia, Weakness, Hypertension, Hyperglycemia, Fasciculations, Flaccidity)

## PREHOSPITAL MANAGEMENT

### • **HOT ZONE**

- A. Respiratory Protection: SCBA is recommended in response situations that involve exposure to potentially unsafe levels of organophosphates.
- B. Skin Protection: Chemical-protective clothing is recommended because organophosphates are rapidly absorbed through the skin and may cause systemic poisoning.

### • **DECONTAMINATION ZONE**

All victims suspected of organophosphate ingestion, or substantial exposure to aerosolized organophosphates, or who have skin or eye exposure to liquid or powdered organophosphates require thorough decontamination.

## BASIC DECONTAMINATION

Follow Decontamination General Guidelines. Then, move the victim to the Treatment Area upon completion.

## **SIGNS AND SYMPTOMS**

- A. Mild poisoning HA, n/v, abdominal cramps, diarrhea.
- B. Moderate poisoning: Generalized muscle weakness and twitching, slurred speech, pinpoint pupils, excessive secretions, and shortness of breath.
- C. Severe poisoning: Seizures, skeletal-muscle paralysis, respiratory failure, and coma.

### TREATMENT

- A. Secure protected airway in cases of respiratory compromise per Airway Management protocol.
- B. There is no contra-indication to the use of paralytic agents in this setting, however both **succinylcholine and vecuronium will have a significantly sustained duration of paralysis in the presence of organophosphates.**
- C. The initial intravenous dose of atropine in adults should be determined by the severity of symptoms. In seriously poisoned patients, very large doses may be required. Alterations of pulse rate and pupillary size are unreliable indicators of treatment adequacy. **Atropine works only to correct muscarinic effects.**
  - 1. Mild poisoning—1 mg.
  - 2. Moderate poisoning—1 to 2 mg.
  - 3. Severe poisoning—2 to 5 mg.

*Doses should be repeated every 5 minutes until excessive secretions and sweating have been controlled*

- D. Administer pralidoxime (2-PAM), if profound weakness or paralysis present.
  - 1. Moderate symptoms—1,200 mg (two Mark 1 injectors or one Duodote)
  - 2. Severe symptoms—1,800 mg (three Mark 1 injectors or three Duodote injectors)**CAUTION:** When administering 2-PAM intravenously, administer at rate of less than 200 mg/minute, (4 mg/minute for children).

**Note: The Mark 1 auto-injector atropine is 2 mg. The 2-Pam auto-injector is 600 mg pralidoxime. The Duodote Auto-Injector is atropine 2.1 mg/0.7 mL and pralidoxime chloride 600 mg/2 mL.**

- E. Patients who are comatose, hypotensive, have seizures or cardiac dysrhythmias should be treated according to ALS protocols.

### TRANSPORT TO MEDICAL FACILITY

- A. Report to OLMC, and the receiving medical facility, the condition of the patient, treatment given, and estimated time of arrival at the medical facility.
- B. If organophosphate has been ingested:
  - 1. Prepare the ambulance in case the victim vomits toxic material.
  - 2. Prepare several towels (or other absorbent material) and open plastic bags to quickly clean up and isolate vomitus

### MULTI-CASUALTY TRIAGE

Patients who have histories or evidence suggesting substantial exposure and all persons who have ingested organophosphate should be transported to a medical facility for evaluation.

- A. Others may be discharged from the scene after their names, addresses, and telephone numbers are recorded.
- B. They should be advised to seek medical care promptly if symptoms develop or recur.

**PEDIATRIC PATIENTS:**

Atropine: In children, dosages range from 0.02 to 0.05 mg/kg.

Pralidoxime: Pediatric dose: 25 to 50 mg/kg and must be given slowly via IV (4 mg/min.)

# Special Studies

# Cardiac Arrest (V-Fib / Pulseless VT) ALPS Study – 90.010

## INCLUSION CRITERIA:

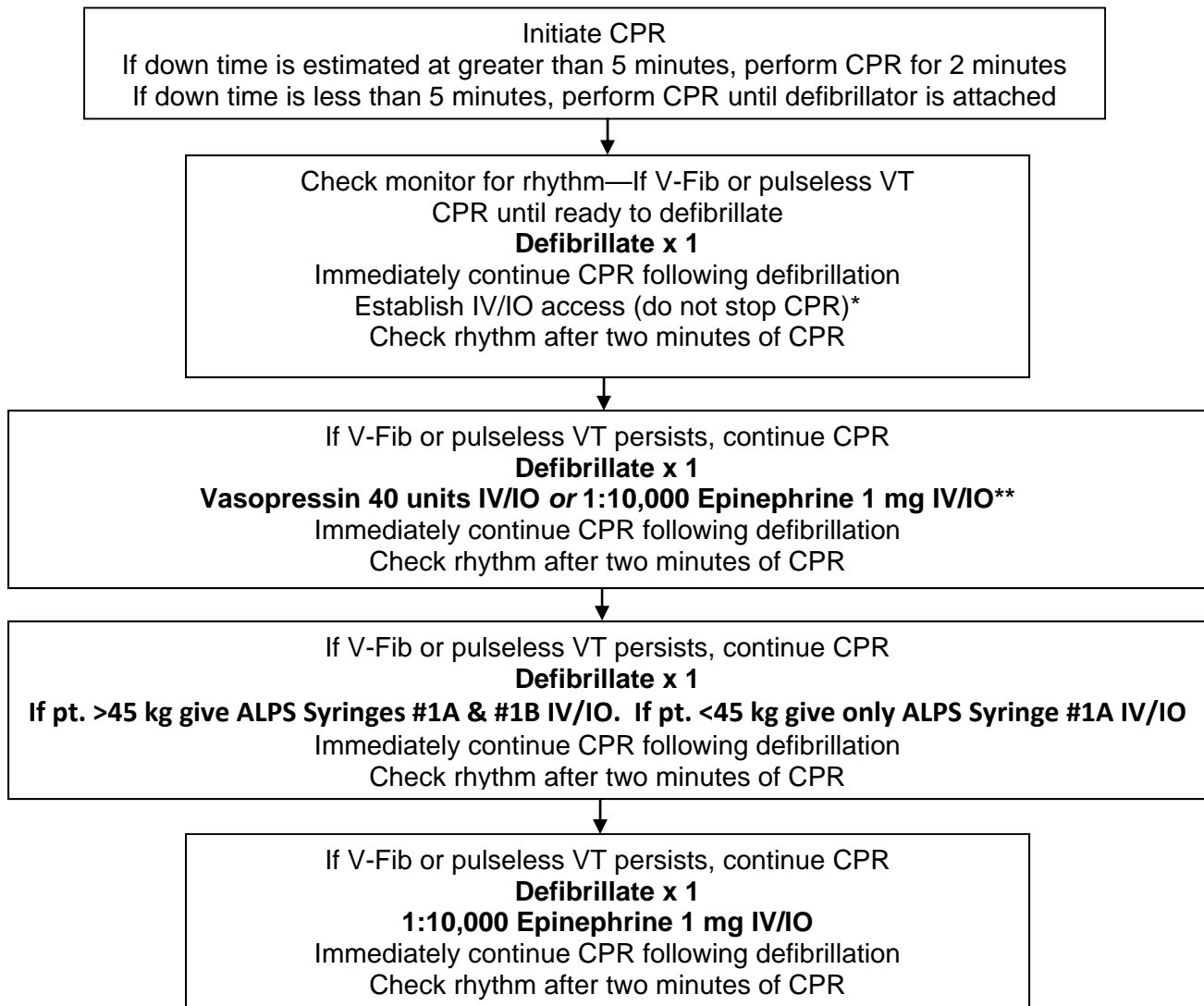
Non-traumatic cardiac arrest patients with persistent VF following one or more defibrillatory shocks, in which vascular access (IV/IO) is obtained.

## EXCLUSION CRITERIA:

Known pregnancy, children under 18 years of age, prisoners, patients with known allergy or hypersensitivity to amiodarone or lidocaine, patients with DNR orders or a “No Study” bracelet.

## TREATMENT:

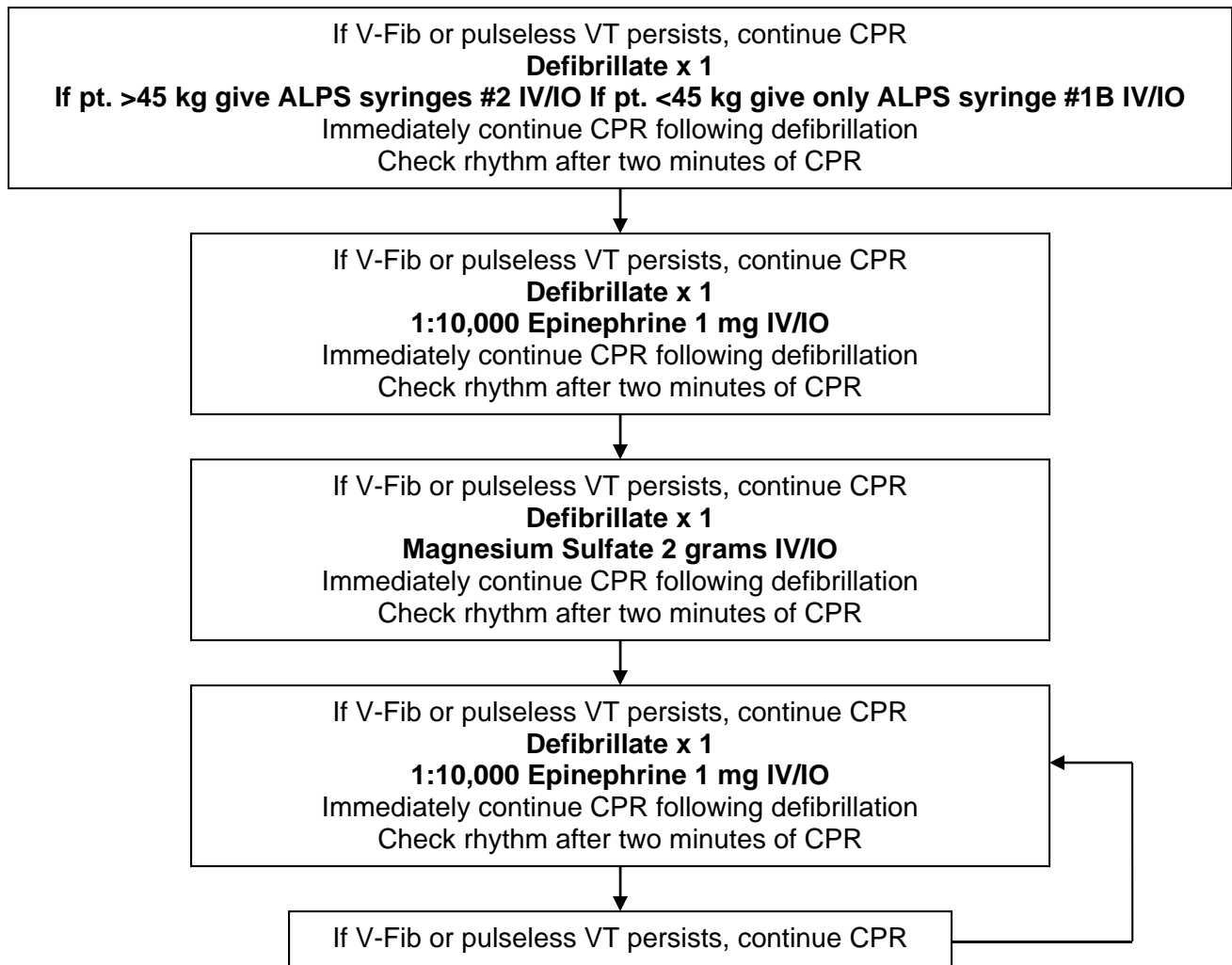
Flow of algorithm presumes that the initial rhythm is continuing. If the rhythm changes, begin the appropriate algorithm. Interruptions to CPR should be avoided. When necessary they should be less than 10 seconds. Follow manufacturer’s recommendations for defibrillation settings.



\*Vasopressin or epinephrine may be given immediately after IV/IO is established.

\*\*After flushing first, ALPS syringes may be given immediately after the first vasopressin or epinephrine

## Cardiac Arrest (V-Fib / Pulseless VT) ALPS Study – 90.010



## Cardiac Arrest (V-Fib / Pulseless VT) ALPS Study – 90.010

### AFTER ENROLLMENT:

- A. Notify ROC via the toll-free number, as soon as feasible, that a patient was enrolled (both fire first responders and transport agencies should call).
- B. On arrival at the hospital, the emergency department MUST be provided with a copy of the *ALPS Hospital Notification* form. A barcode label from the ALPS kit must be affixed to the form.
- C. PCR: In addition to the usual information documented for a cardiac arrest, include the:
  1. ALPS syringe number and time each was administered.
  2. Shock number that followed each administration of the ALPS drug.
  3. Drug kit number (barcode) from the ALPS kit that was used.
  4. The “CPR process” file from the cardiac monitor(s) used in the case MUST be uploaded and attached to the patient care record in accordance with your agency’s usual procedure.

### NOTES & PRECAUTIONS:

- A. Airway should be addressed with minimal interruption to CPR. Ventilation rate should be 8-10 breaths per minute.
- B. Sodium Bicarbonate is not recommended for the routine cardiac arrest sequence, but should be used early in cardiac arrest of known cyclic antidepressant overdose or in patients with hyperkalemia. It may also be considered after prolonged arrest. If used, administer 1 mEq/kg. It can be repeated at 0.5 mEq/kg every 10 minutes.
- C. If patient has return of spontaneous circulation, start cooling per Induced Hypothermia protocol.
- D. If at any time conversion results in a rhythm other than V-Fib or pulseless VT, treat per applicable protocol.
- E. Once a patient has received a study medication, **do not** administer further open-label amiodarone or lidocaine, even with return of circulation. Do not administer lidocaine for analgesia with IO.

### HEART MONITOR ADULT DEFIBRILLATION SETTINGS

- Medtronic Lifepak—200j, 300j, 360j then repeat at 360j as needed.
- Philips MRX—150j all shocks.
- Zoll E-Series—120j, 150j, 200j, then repeat at 200j as needed.