Neonatal Resuscitation

Aliases: newborn treatment, newborn resuscitation

This protocol should be followed for all newly born infants.

1. History
   a. Date and time of birth
   b. Onset of symptoms
   c. Prenatal history (prenatal care, substance abuse, multiple gestation, maternal illness)
   d. Birth history (maternal fever, meconium, prolapsed or nuchal cord, bleeding)
   e. Estimated gestational age (may be based on last menstrual period)

2. Exam
   a. Respiratory rate and effort (strong, weak, or absent; regular or irregular)
   b. Signs of respiratory distress (grunting, nasal flaring, retractions, gasping, apnea)
   c. Heart rate (fast, slow, or absent), auscultation of chest is the preferred method
   d. Muscle tone (poor or strong)
   e. Color/Appearance (central cyanosis, peripheral cyanosis, pallor, normal)
   f. APGAR score

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance – skin color</td>
<td>Bluish or paleness</td>
<td>Pink or ruddy; hands or feet are blue</td>
<td>Pink or ruddy; entire body</td>
</tr>
<tr>
<td>Pulse – heart rate</td>
<td>Absent</td>
<td>Below 100</td>
<td>Over 100</td>
</tr>
<tr>
<td>Grimace – reflex irritability to foot slap</td>
<td>No response</td>
<td>Crying; some motion</td>
<td>Crying; vigorous</td>
</tr>
<tr>
<td>Activity – muscle tone</td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Active; good motion in extremities</td>
</tr>
<tr>
<td>Respiratory effort</td>
<td>Absent</td>
<td>Slow and Irregular</td>
<td>Normal; crying</td>
</tr>
</tbody>
</table>

g. Estimated gestational age (term, late preterm, premature)

h. Pulse oximetry should be considered if prolonged resuscitative efforts or if supplemental oxygen is administered (goal 85-95% at 10 minutes)

3. Procedure
   a. Clamp cord in two places and cut cord between clamps
      i. Should be two to three minutes post delivery
      ii. One clamp 8” from the infant’s abdominal wall and second 2” further
   b. Warm, dry, and stimulate
      i. Wrap infant in dry towel or blanket to keep infant warm, keep head covered if possible
ii. If strong cry, regular respiratory effort, good tone, and term gestation, infant should be placed skin-to-skin with mother and covered with dry linen.

c. If weak cry, signs of respiratory distress, poor tone, or preterm gestation then position airway (sniffing position) and clear airway as needed.
   i. If thick meconium or secretions present and signs of respiratory distress, then suction mouth then nose.

d. If heart rate >100 beats per minute
   i. Monitor for central cyanosis, provide blow-by oxygen as needed.
   ii. Monitor for signs of respiratory distress. If apneic or significant distress:
      1. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute.
      2. If unable to ventilate, consider intubation per Emergency Airway Procedure.

e. If heart rate < 100 beats per minute
   i. Initiate bag-valve-mask ventilation with room air at 40-60 breaths per minute.
      1. Primary indicator of improvement is increased heart rate.
      2. Only use minimum necessary volume to achieve chest rise.
   ii. If no improvement after 90 seconds, provide ventilations with supplemental oxygen (100%) until heart rate normalizes (100 or above).
      1. If unable to ventilate, consider intubation per Emergency Airway Procedure.

f. If heart rate < 60 beats per minute
   i. Ensure effective ventilations with supplementary oxygen and adequate chest rise.
   ii. If no improvements after 30 seconds, initiate chest compressions.
      1. Two-thumb-encircling-hands technique is preferred.
   iii. Coordinate chest compressions with positive pressure ventilation (3:1 ratio, 90 compressions and 30 breaths per minute).
      1. Per MCA selection, consider intubation per Emergency Airway Procedure.

4. Maintain warm environment
   a. Dry off infant and discard wet linen.
   b. Swaddle infant to mother skin to skin if infant is stable.
   c. Use extreme caution if chemical heat packs are used.
Pediatric Altered Mental Status

The purpose of this protocol is to provide for the assessment and treatment of pediatric patients with altered mental status of unknown etiology such as alcohol, trauma, poisonings, seizures, behavioral problems, stroke, environmental causes, infection, etc.

1. Follow Pediatric Assessment and Treatment Protocol.
2. Restrain patient if necessary, refer to Patient Restraint Procedure.
3. For a known diabetic, consider small amounts of oral glucose paste, buccal or sublingual.
4. If the patient is alert but demonstrating signs of hypoglycemia, measure blood glucose level (per MCA selection).
5. If less than 40 mg/dL for patients less than 1 year or 60 mg/dL for patients 1 year and above, administer small amounts of oral glucose paste, buccal or sublingual.
6. If glucose is less than 40 mg/dL for patients less than 1 year or 60 mg/dL for patients 1 year and above, administer Dextrose according to MI-MEDIC cards.
7. If MI-MEDIC unavailable, administer Dextrose 0.5 g/kg
   A. For patients up to 2 months of age, utilize Dextrose 12.5%
   B. For patients between 2 months and 6 years of age, utilize Dextrose 25%
   C. For patients age 7 or greater, utilize Dextrose 50%
8. Per MCA selection, if unable to start IV, administer Glucagon according to MI-MEDIC cards.
9. If MI-MEDIC unavailable
   A. For patients up to 4 years of age, administer Glucagon 0.5 mg IM
   B. For patients aged 5 or greater, administer Glucagon 1 mg IM
10. If respiratory depression is present, administer Naloxone according to MI-MEDIC cards. If MI-MEDIC is unavailable, administer Naloxone 0.1 mg/kg IV/IO/IN/IM.
11. Repeat Dextrose as indicated.
12. Repeat Naloxone as indicated.

NOTE:
1. To obtain Dextrose 12.5%, discard 37.5 ml out of one amp of D50, then draw 37.5 ml of NS into the D50 amp; administer as indicated above.
2. To obtain Dextrose 25%, discard 25 ml out of one amp of D50, then draw 25 ml of NS into the D50 amp; administer as indicated above.
3. To avoid extravasation, a patent IV must be available for IV administration of Dextrose. Dextrose should always be pushed slowly (e.g., over 1-2 minutes).
**Pediatric Fever**

This protocol is intended to assist EMS providers in reducing fever in the pediatric patients prior to arrival to the emergency department. Fever is defined as a core temperature of **101 degrees Fahrenheit (38 degrees Celsius) or greater**. Emergency management of the febrile child involves an assessment to determine if any associated problems are present which may require emergency treatment.

1. Obtain baseline temperature and document method used.
2. Facilitate passive cooling by removing excess clothing and blankets.

3. If the child has not been given Acetaminophen in last four (4) hours, is alert, and:
   a. The patient’s weight is known, utilize that weight and MI-MEDIC for dosing.
   b. The patient’s weight is not available, utilize length based tape and MI-MEDIC for dosing.
   c. If MI-Medic is not available, give Acetaminophen 15 mg/kg PO or see chart.

4. If any question concerning alertness or ability to swallow, **DO NOT ADMINISTER**.
5. Dosing questions should be directed to online medical control.

### Acetaminophen Dosing Chart

<table>
<thead>
<tr>
<th>Child's Weight</th>
<th>Children's Age</th>
<th>Children's Suspension Liquid (160 mg/5mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6-12 lbs.</td>
<td>0-2 mos.</td>
<td>¼ tsp or 1.25 mL (40 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>13-16 lbs.</td>
<td>3-6 mos.</td>
<td>½ tsp or 2.5 mL (80 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>17-20 lbs.</td>
<td>7-10 mos.</td>
<td>¾ tsp or 3.75 mL (120 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>21-25 lbs.</td>
<td>11-18 mos.</td>
<td>¾ tsp or 3.75 mL (120 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>26-31 lbs.</td>
<td>19-35 mos.</td>
<td>1 tsp or 5 mL (160 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>32-40 lbs.</td>
<td>3-4 yrs.</td>
<td>1 ½ tsp or 7.5 mL (240 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>41-51 lbs.</td>
<td>5-6 yrs.</td>
<td>1 ½ tsp or 7.5 mL (240 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>52-64 lbs.</td>
<td>7-9 yrs.</td>
<td>2 tsp or 10 mL (300 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
<tr>
<td>65-79+ lbs.</td>
<td>10-14 yrs.</td>
<td>2 ½ tsp or 12.5 mL (400 mg) PO q 4h prn; Max 75 mg/kg/day</td>
</tr>
</tbody>
</table>
Pediatric Respiratory Distress, Failure or Arrest

1. Follow Pediatric Assessment and Treatment Protocol.

2. Assess the patient’s airway; if the airway is obstructed, refer to Emergency Airway Procedure
   A. Consider possibility of partial airway obstruction presents with acute respiratory distress of sudden onset accompanied by fever, drooling, hoarseness, stridor, and tripod positioning.
   B. If unable to ventilate patient after airway repositioning, assume airway obstruction.

3. Allow the patient a position of comfort

4. Titrate oxygen saturation to 94% (Having a parent assist with blow by may be necessary)

5. Airway should be managed by least invasive method possible.

6. Suction as needed if excessive secretions are present.

7. Consider CPAP if available, per CPAP/BiPAP Procedure.

8. Do not delay transport for interventions.

9. Attempt vascular access only if necessary for patient treatment.

Suspected Bronchospasm (Wheezing):

1. Assist the patient in using their own Albuterol Inhaler, if available

2. Administer inhaled medications according to Nebulized Bronchodilators Procedure.

3. Consider CPAP, if available, per CPAP/BiPAP Procedure.

4. In cases of respiratory failure:
   A. If child appears to weigh less than 10 kg (approx. 20 lbs.), contact medical control prior to Epinephrine if possible.
   B. If child weighs between 10-30 kg (approx. 60 lbs.); administer Pediatric Epinephrine Auto-Injector.
   C. Child weighing greater than 30 kg; administer Epinephrine Auto-Injector.

5. Per MCA selection, if a second nebulized treatment is needed also administer Prednisone OR Methylprednisolone.

Medication Options:

- Prednisone
  50 mg tablet PO
  (Children 6 and above, if tolerated)

  □ YES □ NO

- Methylprednisolone
  2 mg/kg IV/IO
  (Maximum dose 125 mg)

  □ YES □ NO
6. For MCA with both selected, Prednisone PO is the preferred medication. Methylprednisolone is secondary and reserved for when a patient can't take a PO medication.

7. If patient is in respiratory failure:
   A. If child appears to weigh less than 10 kg (approx. 20 lbs.), contact medical control prior to Epinephrine if possible.
   B. If child weighs between 10-30 kg (approx. 60 lbs.); administer Epinephrine 1:1000, 0.15 mg (0.15 ml) IM OR via Pediatric Epinephrine Auto-injector, if available.
   C. Child weighing greater than 30 kg; administer Epinephrine 1mg/1mL, 0.3 mg (0.3 ml) IM OR via Epinephrine Auto-Injector, if available.

Suspected Croup:
1. Notes:
   A. Croup is most common in the fall and winter with the onset of symptoms at night.
   B. Croup is most common in children 6 months to 6 years of age.
   C. Patients will likely have a recent history of upper airway infection or fever.
   D. If foreign body is suspected, contact Medical Control prior to administration of epinephrine.

2. Consider humidified oxygen

3. If patient presents with moderate to severe croup administer Epinephrine per MCA selection:

   MCA Selection
   ☐ Racepinephrine 2.25% inhalation solution via nebulizer
   Administer by placing 0.5 mL of Racepinephrine 2.25% inhalation solution in nebulizer and dilute with 3 mL of normal saline.
   ☐ Epinephrine 0.5 mg (1mg/10ml) nebulized

4. Do not delay transport.
5. Symptom improvement should occur within 10 to 30 minutes.

Respiratory Failure or Arrest:
1. Ventilate the patient using an appropriately sized BVM with supplemental oxygen.
   A. Chest rise is the best indicator of successful ventilation
   B. Ventilate at a rate appropriate for the patient:
      i. Infant: 30 breaths per minute
      ii. Child: 20 breaths per minute

2. Airway management should take place in order of least invasive to most invasive, titrating to effective ventilation and oxygenation.

3. If opioid overdose is suspected, administer Naloxone according to MI-MEDIC cards. If MI-MEDIC is unavailable, administer Naloxone 0.1 mg/kg IV/IO/IN/IM while ventilating with the BVM.
Pediatric Seizures

I. Follow Patient Assessment Protocol.

II. IF PATIENT IS ACTIVELY SEIZING:
   A. Protect patient from injury.
   B. Do not force anything between teeth.
   C. Administer Midazolam IM according to the MI-MEDIC cards
      a. If MI-MEDIC unavailable administer Midazolam 0.1mg/kg IM
      b. Maximum individual dose 10 mg
   D. Measure blood glucose level.
   E. Start IV/IO if needed.
   F. If glucose is less than 40 mg/dL for patients less than 1 year or 60 mg/dL for patients 1 year and above, administer Dextrose according to MI-MEDIC cards.
   G. If MI-MEDIC unavailable, administer Dextrose 0.5 g/kg
      a. For patients up to 2 months of age, utilize Dextrose 12.5%
      b. For patients between 2 months and 6 years of age, utilize Dextrose 25%
      c. For patients age 7 or greater, utilize Dextrose 50%
   H. Per MCA selection, if unable to start IV, administer Glucagon according to MI-MEDIC cards.
      a. For patients up to 4 years of age, administer Glucagon 0.5 mg IM
      b. For patients aged 5 or greater, administer Glucagon 1 mg IM

*The IO route is a last resort if IV cannot be established and glucagon is not available with online Medical Control approval.

J. If IV established and Midazolam IM has not been administered, administer Midazolam, or Lorazepam per MCA selection.

**Medication Options:**
(Choose One)

- Midazolam 0.05 mg/kg IV/IO, maximum individual dose 5 mg

  OR

- Lorazepam 0.1 mg/kg IV/IO, max single dose 4 mg, may repeat in 5 minutes if seizure activity continues; not to exceed 0.2 mg/kg total (maximum of 8 mg)
K. If seizures persist, per MCA selection, repeat Midazolam, or Lorazepam at the same dose or contact medical control for further instructions.

III. If patient is not currently seizing, but has altered mental status, refer to ALTERED MENTAL STATUS PROTOCOL.
Michigan
Pediatric Treatment Protocols
PEDIATRIC MEDICATION EMERGENCY DOSING AND INTERVENTION CARDS

**Pediatric Medication Emergency Dosing and Intervention Cards**

**Purpose:** Instructions for using the **Michigan Medication Emergency Dosing and Intervention Cards** (MI-MEDIC). Protocols are dynamic and may change based on current science. EMS personnel must be familiar with the most current set of approved protocols which take precedence over the information included in the MI-MEDIC.

1. Obtain correct weight of the child
   a. If patient’s actual weight is known, use MI MEDIC card for that weight. (DO NOT CONFUSE POUNDS and KILOGRAMS)
   b. If patient’s weight is not known, use length-based resuscitation tape to determine the proper color zone.
   c. If a length-based resuscitation tape not available, use patient’s age to determine color of card to use. DO NOT GUESS THE WEIGHT OF THE CHILD.
2. Select appropriate weight based medication for intervention.
3. Select the corresponding colored card
4. Select desired medication from Cardiac Resuscitation or Medical Conditions
5. ASSURE medication CONCENTRATION on hand is as specified on card
6. Some medications should be diluted as instructed on card
7. If dilution is required, follow steps to dilute entire vial of medication prior to drawing up final ml volume to administer.
8. Confirm medication dose and volume to be delivered.
9. Administer volume of medication as desired.
10. Contact Medical Control for questions or concerns.

**NOTE:** Some medication doses have been rounded for safety and ease of use for the prevention of medication errors. These doses may not exactly correspond with the mg/kg dose in the pediatric treatment protocols. The use of these rounded doses has been approved for use and administration will be acceptable as long as the dose was referenced from the MI MEDIC cards.
**Pediatric Bradycardia**

**Aliases:** Slow heart rate, heart block

Bradycardia should be considered to be due to hypoxia until proven otherwise. This protocol applies to pediatric patients with bradycardia, a pulse, and poor perfusion (cardiopulmonary compromise).

1. If heart rate is < 60 despite adequate oxygenation and ventilation, perform CPR.
2. Establish vascular access
3. Apply cardiac monitor to identify rhythm
4. If HR continues to be less than 60, despite oxygenation & ventilation
   A. Administer Epinephrine 1mg/ 10mL,
      i. 0.01 mg/kg (0.1 ml/kg) IV/IO up to 1 mg (10 ml),
      ii. Repeat every 3-5 minutes.
   B. If HR is unresponsive to epinephrine:
      i. Administer Atropine 0.02 mg/kg IV/IO (minimum dose 0.1 mg, maximum single dose 0.5 mg)
      ii. May repeat once in 5 minutes, if effective.
   C. If HR is unresponsive to Epinephrine and Atropine:
      i. Consider transcutaneous pacing at rate up to 100 bpm per Electrical Therapy Procedure.
      ii. Sedation may be used to facilitate transcutaneous pacing per MCA selection. Refer to Patient Sedation Procedure.

**Notes:**

1. Signs of cardiopulmonary compromise include:
   a. Hypotension is SBP less than 70 + (age x 2).
   b. Acutely altered mental status.
   c. Signs of shock - indicated by absent or weak peripheral pulses, increased capillary refill time, skin cool/mottled.
   d. Respiratory difficulty indicated by increased work of breathing (retractions, nasal flaring, grunting), cyanosis, altered level of consciousness (unusual irritability, lethargy, failure to respond to parents), stridor, wheezing.
2. When CPR is required, a precise diagnosis of the specific bradyarrhythmia is not important.
3. If severe hypothermia follow Hypothermia Cardiac Arrest Protocol
**Pediatric Tachycardia with a Pulse**

**Aliases:** Supraventricular tachycardia (SVT), atrial fibrillation (a-fib), atrial flutter, ventricular tachycardia (V-tach)

This protocol is for paramedic use only.

This protocol is intended for symptomatic pediatric patients with elevated heart rate, relative for their age. Refer to MI-MEDIC for appropriate vital signs and medication doses.

I. **General Treatment**
   A. Manage airway as necessary
   B. Provide supplemental O2 as needed to maintain O2 saturation > 94%
   C. Initiate monitoring and perform 12-lead EKG
   D. Establish vascular access
   E. Identify and treat underlying causes of tachycardia such as dehydration, fever, vomiting, sepsis and pain.
   F. Administer fluid bolus 20cc/kg for patients with likely fluid depletion
   G. Consider the following additional therapies if specific dysrhythmias are recognized:

II. **Specific Dysrhythmia Treatment**
   A. **Regular Narrow Complex Tachycardia – Stable (SVT)**
      i. Perform vagal maneuvers
      ii. Administer Adenosine
         1. 0.1 mg/kg (max of 6 mg)
         2. May repeat with 0.2 mg/kg (max of 12 mg)

   B. **Regular Narrow Complex Tachycardia – Unstable**
      i. Deliver a synchronized shock; 0.5-1 J/kg for the first dose
      ii. Repeat doses should be 2 J/kg

   C. **Regular, Wide Complex Tachycardia – Stable**
      i. Consider Adenosine 0.1 mg/kg (max of 6 mg) for SVT with aberrancy
      ii. If ventricular in origin, give Lidocaine 1 mg/kg IV (max of 100 mg)

   D. **Regular, Wide Complex Tachycardia – Unstable**
      i. Synchronized cardioversion 0.5-1.0 J/kg

   E. **Unstable, Irregular, Wide Complex Tachycardia –**
      i. Defibrillate according to Electrical Therapy Procedure
      ii. Refer to Pediatric General Cardiac Arrest Protocol
**Pediatric Cardiac Arrest – General**

This protocol should be followed for all pediatric cardiac arrests.

- If an arrest is of a known traumatic origin refer to the [Dead on Scene Protocol](#).
- If it is unknown whether the arrest is traumatic or medical, continue with this protocol.
- If known traumatic in origin, refer to [Traumatic Arrest Protocol](#).
- Once arrest is confirmed, emphasis should be on avoiding interruptions in CPR.
- CPR should be done in accordance with current guidelines established by the American Heart Association.

**Note:** Primary cardiac arrest in the pediatric patient is rare. Most arrests are secondary to respiratory failure. Consider maintaining basic airway management techniques if effective. Advanced airway insertion attempts should be performed in such a manner as to keep CPR interruptions to a minimum. Medications given during cardiac arrest are given IV or IO.

1. **Confirm Arrest**
   a. Assess for signs of normal breathing.
   b. Check a carotid or brachial pulse as age appropriate for not more than 10 seconds.
2. **Initiate CPR or continue CPR if already in progress and apply and use AED per [Electrical Therapy Procedure](#) as soon as possible.**
3. **Ensure CPR quality**
   a. Compressions at least 1.5” in depth for infants, 2” in depth for children.
   b. Compression rate at least 100 per minute (An FDA approved mechanical CPR device operating at the manufacturers pre-set rate meets this requirement).
   c. Avoid excessive ventilation (volume and rate).
4. **Continue CPR with minimal interruptions, changing the rescuer doing compressions every 2 minutes, when possible.**
5. **Initiate ALS response if available.**
6. **Establish a patent airway, maintaining C-Spine precautions if indicated, using appropriate airway adjuncts and high flow oxygen. Ventilations with BVM may be as effective as endotracheal intubation in children. Any patient 8 years and under shall be ventilated via BVM or other basic maneuver.**
7. **If Return of Spontaneous Circulation (ROSC) has not been achieved after three, two minute cycles of CPR and ALS is not available or delayed, contact medical control, initiate transport.**
8. **If unable to ventilate or unable to maintain a patent airway, establish an airway with a supraglottic airway when indicated per [Emergency Airway Procedure](#).**
   a. Minimize interruptions in compressions during airway placement to less than 10 seconds.
   b. After insertion provide continuous CPR, without pauses for ventilation. Ventilations delivered at 10 breaths per minute or 1 breath every 6 seconds. See [Emergency Airway Procedure](#).
c. All airway adjuncts should be utilized with high flow oxygen.
d. Utilize waveform capnography (if available).

9. Verify CPR quality frequently and anytime rescuer providing compressions or ventilations change.

10. Start an IV/IO NS KVO. IO may be the first choice. See Vascular Access & IV Fluid Therapy Procedure.

11. Check rhythm, shock if indicated (2 J/kg) and continue CPR.
12. Administer Epinephrine
   a. 1 mg/10 ml, 0.01 mg/kg (0.1 ml/kg)
   b. Max dose 1mg (10 ml)
   c. Repeat every 3-5 minutes

13. If airway has not been established, and unable to ventilate, establish airway per Emergency Airway Procedure.
   a. Minimize interruptions in compressions during airway placement to less than 10 seconds.
   b. Supraglottic airways are an acceptable alternative for endotracheal intubation.
   c. After interventional airway is established, ventilation rate is 10 breaths per minute

14. Utilize waveform capnography; if PETCO2 is < 10 mm Hg attempt to improve CPR quality.

15. Recheck rhythm every 2 minutes

16. If shockable rhythm persists
   a. Shock at 4 J/kg every 2 minutes with immediate resumption of compressions. Subsequent shocks must be at least 4 J/kg, but may escalate to 10J/kg or adult dosage.
   b. Administer Amiodarone
      i. 5 mg/kg
      ii. Max dose 300 mg
      iii. May be repeated if continuous shockable rhythm up to 2 more times (maximum total dose 15 mg/kg or 450 mg)

17. Consider causes of arrest (non-shockable)
   a. Hypovolemia – Administer 20 ml/kg NS IV/IO bolus
   b. Tension pneumothorax – see Pleural Decompression Procedure
   c. Hypothermia – see Hypothermia Cardiac Arrest Protocol, consider rapid transport
   d. Hyperkalemia (renal failure) – Contact Medical Control
      i. Administer Calcium Chloride (10%), 20 mg/kg (0.2 ml/kg), max dose 1 gm
      ii. Administer Sodium Bicarbonate 1 mEq/kg IV/IO with 20 ml NS flush between medications

18. Additional basic and/or advanced life support care as appropriate.

Return of Spontaneous Circulation (ROSC)

This protocol should be followed for all adult cardiac arrests with ROSC. If an arrest is of a known traumatic origin, refer to the Trauma Protocol and MCA Transport Protocol. If it is unknown whether the arrest is traumatic or medical, consider other treatable causes. Initiate ALS response if available.

1. If ventilation assistance is required, ventilate at 10-12 breaths per minute. Do not hyperventilate.
2. Reassess patient, if patient becomes pulseless
   a. Begin CPR
   b. Follow Adult or Pediatric Cardiac Arrest General Protocol.
3. Monitor vital signs.
4. Check blood glucose (MFR, if MCA approved).
5. Start an IV/IO NS KVO.
6. Treat hypotension (SBP less than 90 mm/Hg) with an IV/IO fluid bolus consistent with Shock Protocol.
7. Perform 12-lead ECG (Per MCA selection, may be BLS skill per 12 Lead ECG Procedure).
8. If ventilation assistance is required, target ETCO2 of 35-40 mm Hg.
9. Consider Transport to a facility capable of Percutaneous Coronary Intervention (PCI) per MCA protocol.
10. If hypotension persists after IV/IO fluid bolus, administer Epinephrine by push dose (dilute boluses).
    a. Prepare (10 mcg/mL) by adding 1mL of 1mg/10mL Epinephrine in 9mL NS, then
    b. Adults:
       i. Administer 1-2 mL
       ii. Repeat every 3 to 5 minutes
       iii. Titrate SBP greater than 90 mm/Hg.
    c. Pediatric
       i. Administer 0.1 ml/kg (0.01 mg/kg)
       ii. Maximum dose 10 mcg (1 ml)
       iii. Repeat every 3-5 minutes
11. If patient is agitated with advanced airway in place, refer to Patient Sedation Protocol.

Notes:
1. If a mechanical ventilator is available or there are spontaneous respirations in the non-intubated patient, titrate inspired oxygen on the basis of monitored oxyhemoglobin saturation to maintain a saturation of ≥94% but <100%.
2. Consider extubation only if wide awake, following commands, and unable to tolerate endotracheal tube.
This protocol should be followed for all adult cardiac arrests with ROSC.

Assist ventilations 10-12 per minute, as needed

If patient becomes pulseless begin CPR and refer to Cardiac Arrest – General Protocol

Monitor Vital Signs (glucose per MCA selection)

Establish Vascular Access

Treat Hypotension per Shock Protocol

- 12 lead ECG
- Target ETCO2 of 35-40 mmHg
- Consider transport to PCI facility, per local

Administer Epinephrine per Epinephrine Administration Procedure

Agitated patient with advanced airway? Patient Sedation Procedure
Medication Administration

Purpose:
During EMS responses personnel routinely administer medications to patients with a wide range of needs due to a wide range of clinical conditions. An error associated with the administration of medications is a concern throughout the medical establishment. Therefore, in order to reduce and/or eliminate the potential for medication errors, it is important that the "6 Rights" of Medication Administration be observed during these instances.

Information:
EMS providers preparing to administer medications in the out of hospital setting should review and/or recite the "6 Rights" prior to administering any medication to a patient. While all 6 elements are important, in the out of hospital setting, special attention should be paid to the right medication, right dose, and right route - as these are frequently the areas of error in the EMS environment. In addition, EMS providers should ensure the patient is informed as to what medications they are receiving, and afford an opportunity for the patient to refuse. Lastly, documentation is essential so that medications administered in the out of hospital setting become part of the patient's clinical medical record. By following the "6 Rights" of medication administration, EMS providers will significantly decrease the potential and number of errors associated with medication administration.

Definitions:
I. Medication: Any pharmacological intervention used to treat, prevent, or reduce signs and symptoms of diseases, disorders, and/or traumatic injuries.
II. Medication administration routes include the following: Intramuscular, Intravenous, Intraosseous, Oral, Buccal, Rectal, Inhaled, and Subcutaneous.

Procedure:
I. Prior to the administration of any medication ensure the following are reviewed and/or verbalized by at least two providers – if available (checked, and double checked):
   A. 6 Rights of Medication Administration –
      1. Right Patient
      2. Right Dose
      3. Right Medication
      4. Right Route
      5. Right Time
      6. Right Documentation
   B. Following administration of controlled medications, EMS personnel shall follow their individual department's policy on the correct accounting, disposal, and restocking of these medications.
II. Calculating medications when given a dosage range and a per kg dose:
   A. Calculate weight in kilos and multiply by the prescribed dosage (e.g. - mg/kg)
B. The resultant dose should be less than the maximum single dose.
   1. In adults, for ease of administration, doses may be rounded to the
      nearest whole number within the range for those calculated doses at
      or above 1 dosage unit, or to the nearest tenth for those below 1
      dosage unit (examples: 1.2 mg rounded to 1 mg, and 0.26mg rounded
      to 0.3mg). That calculated and rounded dose may be given and
      repeated in timed intervals, as indicated for that medication, to the
      control of symptoms or maximum stated cumulative dose if symptom
      control is not previously achieved.
   2. For pediatric patients, utilize MI-MEDIC and a length based tape for
      all medication calculations.
C. Pediatric patients will never be given a single or total dose that exceeds the
   maximum single or total adult dose.
Medication Substitution

Purpose:
This protocol allows for MCA to substitute medications during a time of shortage without having to enact emergency protocols within the MCA. This protocol does not replace or override any portion of the Medication Shortage Procedure. All procedures within that procedure must still be followed in regards to substitutions in concentration or medication.

Indications:
1. Medications indicated in the primary protocol are not available.
2. No other medication is listed in primary protocols as accepted by the MCA for use.

Procedure:
1. Follow Medication Shortage Procedure.
2. Alternate concentrations are listed within this protocol for reference; these do not require a protocol change and are outlined in the Medication Shortage Procedure.
3. Notification and education of providers within the MCA should be done as soon as the substitution is known.
   a. It is the responsibility of the MCA to distribute information on the shortages and substitutions to agencies for distribution to providers.
   b. If a substitution is imminent, it is acceptable for an MCA to distribute information prior to the medication being substituted.
4. The MCA should notify the Division of EMS and Trauma if a substitution is suspected to last more than 60 days so that a more permanent protocol solution can be enacted.
5. All uses of substitute medications will be reviewed by PSRO for appropriateness.

<table>
<thead>
<tr>
<th>Current Medication</th>
<th>Alternate A</th>
<th>Alternate B</th>
<th>Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atropine</td>
<td>Epinephrine 2-10 mcg/min infusion&lt;br&gt; Pediatric 0.1 mcg/kg/min</td>
<td>Transcutaneous Pacing</td>
<td>Bradycardia</td>
</tr>
<tr>
<td>Amiodarone</td>
<td>Lidocaine 1-1.5 mg/kg IV&lt;br&gt; Pediatric 1 mg/kg IV</td>
<td>Procainamide 20 mg/min, max 17 mg/kg IV/IO&lt;br&gt; Pediatric 15 mg/kg IV/IO over 60 minutes</td>
<td>Adult and Pediatric Cardiac Arrest – General&lt;br&gt; Adult and Pediatric Tachycardia</td>
</tr>
<tr>
<td>Calcium Chloride</td>
<td>Calcium Gluconate 20 ml of 10% solution administered over 1 to 2 minutes IV (adults only)</td>
<td>Glucagon 1 mg&lt;br&gt; Pediatric 0.05 mg/kg, up to 1 mg IM</td>
<td>Poisoning/Overdose Cardiac Arrest – General (Adult)</td>
</tr>
<tr>
<td>Dextrose 50%, 50 ml</td>
<td>Dextrose 10%, 250 ml IV&lt;br&gt; Pediatric Dextrose 10% 5 ml/kg IV</td>
<td></td>
<td>Adult and Pediatric Altered Mental Status&lt;br&gt; Adult and Pediatric Seizures</td>
</tr>
<tr>
<td>Diphenhydramine</td>
<td>Famotidine 20 mg IV&lt;br&gt; Pediatric 0.25 mg IV&lt;br&gt; Or&lt;br&gt; Ranitidine 50 mg IV&lt;br&gt; Pediatric 0.1 mg/kg IV</td>
<td>Hydroxyzine 50 mg IM&lt;br&gt; Pediatric 0.1 mg/kg IM</td>
<td>Allergic Reaction</td>
</tr>
</tbody>
</table>
### MEDICATION SECTION

#### MEDICATION SUBSTITUTION

**Initial Date:**

**Revised Date:**

**Section XX-XX**

<table>
<thead>
<tr>
<th>Medication</th>
<th>Prescription Details</th>
<th>Administration</th>
<th>Side Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lidocaine</strong></td>
<td>1. For Recurrent VF/VT: Adults 300 mg IV/IO repeat 150 mg one time. Pediatrics 5 mg/kg IV 2. Wide complex Tach 150 mg x 2 PRN, pediatric 5 mg/kg IV</td>
<td>Procainamide 20 mg/min, max 17 mg/kg IV/IO Pediatric 15 mg/kg IV/IO over 60 minutes</td>
<td>Adult and Pediatric Cardiac Arrest – General Adult and Pediatric Tachycardia</td>
</tr>
<tr>
<td><strong>Morphine</strong></td>
<td>Fentanyl 1 mcg/kg</td>
<td>Hydromorphone 2 mg IV or IM Pediatric 0.05 mg/kg max dose 2 mg</td>
<td>Pain Management</td>
</tr>
<tr>
<td><strong>Fentanyl</strong></td>
<td>Morphine 4 mg IV/IO Pediatrics 0.1 mg/kg IV</td>
<td>Hydromorphone 2 mg IV or IM Pediatric 0.05 mg/kg max dose 2 mg</td>
<td>Pain Management</td>
</tr>
<tr>
<td><strong>Midazolam (Versed)</strong></td>
<td>Lorazepam 2 mg or 0.05 mg/kg IV</td>
<td>Diazepam 5 mg IV Pediatric 0.1 mg/kg</td>
<td>Adult and Pediatric Seizures Patient Sedation Excited Delirium</td>
</tr>
<tr>
<td><strong>Ondansetron (Zofran)</strong></td>
<td>Promethazine 12.5 mg IM Pediatric 0.25 mg/kg IM</td>
<td>Compazine 10 mg Pediatric 0.1mg/kg</td>
<td>Nausea/Vomiting</td>
</tr>
<tr>
<td><strong>Diazepam (Valium)</strong></td>
<td>Midazolam 5 mg IV Pediatrics 0.1 mg/kg</td>
<td>Lorazepam 2 mg IV Pediatrics 0.1 mg/kg IV</td>
<td>Adult Seizures</td>
</tr>
<tr>
<td><strong>Ketamine</strong></td>
<td>Midazolam 5 mg IV Pediatrics 0.1 mg/kg</td>
<td>Fentanyl 1 mcg/kg</td>
<td>Patient Sedation Excited Delirium</td>
</tr>
<tr>
<td><strong>Midazolam</strong></td>
<td>Patient Sedation: Ketamine 0.2 mg/kg IV/IO slowly Excited Delirium Adults only 4 mg/kg IM</td>
<td>Lorazepam 2 mg IV Pediatrics 0.1 mg/kg IV</td>
<td>Patient Sedation Excited Delirium</td>
</tr>
</tbody>
</table>

### Epinephrine 1mg/1ml 30mL Vial

1. Expel 1mL of normal saline from a 10mL syringe (pre-filled)
2. Instill 1mg(mL) of Epinephrine 1:1,000 from 30 mL vial in to pre-filled syringe
3. 30mL vials are to be single patient use only

#### Epinephrine 1mg/ml Ampule

1. Expel 1mL of normal saline from a 10mL syringe (pre-filled)
2. Instill 1mg(mL) of Epinephrine 1:1,000 from ampule in to pre-filled syringe
2-Pam Chloride

Protocols:
1. Nerve Agent Organophosphate exposure

Indications:
1. Exposure to organophosphate or nerve agents
2. Given in conjunction with atropine in DuoDote or Mark-1 kit

Contraindications:
1. None

Dosing:
1. Self-Rescue – 1 DuoDote (Mark-1) Injector
2. Mild Reaction
   a. Adults (8 years and over) – 1 DuoDote (Mark-1) Injector
   b. Pediatrics – Contact Medical Control
3. Moderate Reaction
   a. Adults (8 years and over) – 2 DuoDote (Mark-1) Injectors
   b. Pediatrics – Contact Medical Control
4. Severe Reaction
   a. Adults (8 years and over) – 3 DuoDote (Mark-1) Injectors
   b. Pediatrics – 1 DuoDote (Mark-1) Injector, Contact Medical Control as needed

Expected Effects:
1. Decrease in symptoms

Side Effects:
1. Blurred vision
2. Headache
3. Dizziness
4. Nausea
Acetaminophen

Protocols:
1. Pediatric Fever
2. Pain Management (per MCA selection)

Indications:
1. Fever
2. Mild pain

Contraindications:
1. Hypersensitivity
2. Known severe acute liver disease

Dosing:
1. Adults – 15 mg/kg PO, maximum dose 1 gm
2. Pediatrics – 15 mg/kg PO, maximum dose 500 mg

Expected effects:
1. Decrease temperature
2. Pain Relief

Side effects:
1. Nausea/vomiting
Adenosine (Adenocard)

Protocols:
1. Tachycardia

Indications:
2. Consider for regular or wide complex tachycardia.

Contraindications:
1. Sick sinus syndrome
2. Hypersensitivity to adenosine
3. 2nd or 3rd degree heart block

Dosing:
1. Adult
   a. 6 mg rapid IV/IO push over 1-3 seconds
   b. Repeat at 12 mg after 1-2 minutes x2, if no conversion
   c. Medication should be followed by a rapid 30 ml NS bolus
2. Pediatric
   a. 0.1 mg/kg IV/IO rapid bolus. (Max dose 6 mg)
   b. Repeat at 0.2 mg/kg after 2 minutes (Max dose 12 mg)
   c. Medication should be followed by rapid 5-10 ml NS flush

Expected Effects:
1. Slowed conduction through the AV node
2. Conversion to NSR

Side Effects:
1. Hypotension
2. Flushing
3. Dyspnea
4. Light-headedness
5. Nausea
Albuterol (Ventolin®)

Protocols:
1. Nebulized Bronchodilators
2. Crush Injury
3. Adult and Pediatric Respiratory Distress
4. Adult and Pediatric Allergic Reaction/Anaphylaxis

Indications:
1. Bronchospasm (wheezing)
2. Crush injury syndrome with evidence of hyperkalemia

Contraindications:
1. Hypersensitivity to albuterol

Dosing:
1. Adults and pediatric
   a. 2.5 mg in 3 ml NS via nebulizer

Expected Effects:
1. Dilated bronchi
2. Improvement in capnographic waveform (if available)
Amiodarone (Cordarone)

Protocols:
1. General Cardiac Arrest – Adult and Pediatric
2. Tachycardia

Indications:
1. Recurrent ventricular fibrillation or recurrent pulseless ventricular tachycardia
2. Recurrent hemodynamically unstable ventricular tachycardia
3. Stable ventricular tachycardia in consultation with online medical control

Contraindications:
1. Hypersensitivity to Amiodarone

Dosing:
1. Adult
2. Pediatric

Expected Effects:
1. Prolongs refractory period
2. Inhibits alpha and beta adrenergic stimulation

Side Effects:
1. Prolonged QT
2. Vasodilation
3. Hypotension
Aspirin

Protocols:
1. Chest Pain/Acute Coronary Syndrome

Indications:
1. Suspected cardiac chest pain
2. Suspected Myocardial Infarction

Contraindications:
1. Hypersensitivity to aspirin or nonsteroidal anti-inflammatories

Dosing:
1. Adult Only Medication
   a. 324-325 mg chewable tablet PO
Atropine

Protocols:
1. Bradycardia (Adult and Pediatric)
2. Poisoning
3. Nerve Agents

Indications:
1. Symptomatic bradycardia with a suspected vagal origin
2. Exposure to organophosphates or other nerve agents

Contraindications:
1. Known hypersensitivity (no absolute contraindications)

Dosing:
1. Symptomatic Bradycardia
   a. Adult:
      i. Administer 0.5 mg IV/IO every 3-5 minutes
      ii. Max dose 3 mg
   b. Pediatric:
      i. Given ONLY if primary AV block, or if bradycardia is unresponsive to oxygenation, ventilation and epinephrine.
      ii. Administer 0.01-0.02 0.02 mg/kg IV/IO
      iii. Minimum single dose 0.1 mg
      iv. Maximum single dose 1 mg
      v. Repeat prn in 5 minutes, maximum total dose 3 mg
2. Organophosphate/Nerve Agent Exposures
   a. Adults
      i. 2-6 mg IV/IM per Mark 1 Kit Dosing Directive (each kit contains 2 mg of atropine)
      ii. If kit is not available administer 2-6 mg IV/IM as needed
   b. Pediatrics
      i. Infant 0.05-0.1 mg/kg IM/IV/IO (0.2-1 mg), Pediatric Atropen or Vial
      ii. Child 1-4 mg IM/IV/IO, Pediatric Atropen, Vial, or Mark 1

Expected Effects:
1. Increased heart rate
2. Dilated pupils
Calcium Chloride

Protocols:
1. Poisoning/Overdose
2. Crush Injury
3. Cardiac Arrest General

Indications:
1. Cardiac arrest in the renal failure patient
2. Calcium channel blocker toxicity
3. Crush Injury with suspected hyperkalemia

Precautions:
1. May precipitate digitalis toxicity
2. Extremely important to flush IV line fully after administration

Dosing:
1. Cardiac Arrest
   a. Adult:
      i. 1 gm slow IV
2. Calcium channel blocker toxicity
   a. Adult: 0.5 – 1 gm IV
3. Crush Injury
   a. Adult: 1 gm slow IV over 5 minutes, after extrication

Expected Effects:
1. Increased force of myocardial contraction
2. Rise in arterial pressure
**Dextrose**

**Protocols:**
1. Adult and Pediatric Seizures
2. Adult and Pediatric Altered Mental Status

**Indications:**
1. Hypoglycemia
2. Altered mental status in the absence of a glucometer

**Contraindications:**
None

**Concentration:**
1. Dextrose 10% 25 gm in 250 ml
2. Dextrose 12.5% (for patients up to 2 months of age)
   a. Created by expelling 37.5 ml from Dextrose 50% 50 ml syringe and drawing up 37.5 ml of NS
   b. Creates 6.25 gm/50 ml concentration of 12.5%
3. Dextrose 25% (for patients between 2 months and 6 years of age)
   a. Created by expelling 25 ml from Dextrose 50% 50 ml syringe and drawing up 25 ml of NS
   b. Creates 12.5 gm/50 ml concentration of 25%
4. Dextrose 50% (prefilled syringe of 25 gm in 50 ml)

**Dosing (ensure patent IV):**
1. Pediatric (weight based)
   a. 3-5 kg, Dextrose 12.5%, dose: 2.5g, Volume: 20mL or Dextrose 10%, 25 ml
   b. 6-7 kg, Dextrose 25%, dose: 3.25g, volume 13 mL or Dextrose 10%, 33 ml
   c. 8-9 kg, Dextrose 25%, dose: 4.25g, volume 17 mL or Dextrose 10%, 43 ml
   d. 10-11 kg, Dextrose 25%, dose: 5g, volume 20 mL or Dextrose 10%, 50 ml
   e. 12-14 kg, Dextrose 25%, dose 6.25g, volume 25 mL or Dextrose 10%, 63 ml
   f. 15-18 kg, Dextrose 25%, dose 8 g, volume 32 mL or Dextrose 10%, 80 ml
   g. 19-23 kg, Dextrose 25%, dose 10g, volume 40 mL or Dextrose 10%, 100 ml
   h. 24-29 kg, Dextrose 50%, dose 12.5g, volume 25 mL or Dextrose 10%, 125 ml
   i. 30-36 kg, Dextrose 50%, dose 15g, volume 30 mL or Dextrose 10%, 150 ml
2. Adult
   a. Dextrose 50%, 25 gm, 50 ml
   b. Dextrose 10%, 25 gm, 250 ml

**Incompatibilities/Drug Interactions:**
1. Sodium bicarbonate
2. Diazepam will precipitate if given concurrently without flushing
Diazepam

Protocols:
1. As indicated in Medication Substitution Protocol

Indications:
1. Seizures when first line medications are not available

Precautions:
1. Respiratory depression
2. Hypotension

Dosing:
1. Adult: 5-10 mg IM/IV
2. Pediatric: 0.2 - 0.5 mg/kg IM/IV

Expected Effects:
1. Skeletal muscle relaxation
2. Ceasing of seizure activity
**Diphenhydramine (Benadryl ®)**

**Protocols:**
1. Anaphylaxis/Allergic reaction
2. Poisoning/overdose

**Indications:**
1. Anaphylaxis
2. Mild or moderate allergic reaction
3. Urticaria

**Contraindications:**
1. Lower respiratory distress
2. Hypersensitivity to diphenhydramine

**Dosing:**
1. Adult: 25-50 mg IM or IV
2. Pediatric: 1-1.5 mg/kg IM or IV

**Expected Effects:**
1. Antihistamine, decreased urticarial, itching
2. Drowsiness
Dopamine

Protocols:
1. As indicated in the Medication Substitution protocol

Indications:
1. Cardiogenic shock
2. Bradycardia with hypotension

Contraindications:
1. Hemorrhagic shock

Dosing:
1. Adults and Pediatric
   a. Mix 400 mg/250 ml (1600 mcg/ml)
   b. Administer 5 – 20 mcg/kg/min, titrated to effect of BP 90 systolic

Expected Effects:
1. Increased BP
2. Increased HR
Epinephrine

Protocols:
1. Anaphylaxis/Allergic Reaction
2. Shock
3. Respiratory Distress (Adult)
4. Pediatric Respiratory Distress, Failure, or Arrest
5. Adult Cardiac Arrest – General
6. Adult Bradycardia
7. Pulmonary Edema/CHF
8. Adult Cardiac Arrest – ROSC
9. Pediatric Cardiac Arrest - General
10. Pediatric Bradycardia
11. Neonatal Assessment and Resuscitation

Indications:
1. Anaphylaxis
2. Bradycardia
3. Respiratory distress
4. Hypotension
5. Cardiac arrest

Contraindications:
1. No contraindications in critical patients

Dosing:
1. Epinephrine auto-injector (Protocols 1, 3, 4, MFR per MCA selection in protocol 1)
   a. Adults 0.3 mg, IM
   b. Pediatrics
      i. 0.15 mg, IM
      ii. Pediatric auto-injector indicated for patients greater than 10 kg and less than 30 kg
2. Epinephrine 1mg/1mL (Protocols 1, 3, 4)
   a. Adults 0.3 mg IM
   b. Pediatrics
      i. For patients less than 10 kg contact medical control prior to administration
      ii. For patients greater than 10 kg, administer 0.01 mg/kg, up to 0.3 mg
3. Nebulized (Protocol 4)
   a. Racepinephrine 2.25%
      i. Place 0.5 ml in nebulizer
      ii. Dilute with 3 ml normal saline
   b. Epinephrine (1mg/10mL), 5 mL (0.5 mg) nebulized
4. **Epinephrine 1mg/10mL**  
   a. **IV Bolus (Protocols 5, 9, 11)**  
      i. Adults 1 mg every 3 to 5 minutes in cardiac arrest  
      ii. Pediatrics 0.01 mg/kg (0.1ml/kg)  
   b. **Push dose (Protocols 2, 6, 8, 10, 12)**  
      i. Adults  
         1. Prepare 10 mcg/mL by adding 1 ml to 9 ml normal saline  
         2. Administer 1-2 mL every 2 to 5 minutes  
         3. Titrate to SBP greater than 90 mm/Hg  
      ii. Pediatrics  
         1. Prepare 10 mcg/mL by adding 1 ml to 9 ml normal saline  
         2. Administer 0.01 mg/kg (0.1 mL/kg), max dose 10 mcg  
         3. Every 3-5 minutes

**Expected Effects:**  
1. Decreased wheezing  
2. Increased BP  
3. Increased HR
Fentanyl

Protocols:
1. Intranasal Medication Administration
2. Pain Management
3. Patient Sedation

Indications:
1. Pain management
2. Patient sedation

Contraindications:
1. Altered Mental Status
2. Hypotension
3. Respiratory Depression
4. Hypersensitivity to Fentanyl

Dosing:
1. Adult
   a. 1 mcg/kg
   b. Single dose less than 100 mcg
   c. May repeat, total dose less than 200 mcg
2. Pediatric
   a. 1 mcg/kg
   b. Single dose less than 40 mcg (otherwise dose as adult)
   c. May repeat, total dose less than 80 mcg

Expected Effects:
1. Decreased pain
2. Decreased agitation

Side Effects:
1. Drowsiness
2. Hypotension
3. Respiratory Depression
4. Vomiting

Special Notes:
1. Naloxone will reverse the effect of Fentanyl
2. Administration with Ondansetron for nausea is encouraged
Glucagon

Protocols:
1. Altered Mental Status (Adult and Pediatric)
2. Seizures (Adult and Pediatric)

Indications:
1. Hypoglycemia with inability to obtain IV access

Contraindications:
1. Adrenal gland tumor
2. Hypersensitivity to glucagon

Dosing:
1. Adult: 1 mg IM/SQ
2. Pediatric: 0.05 mg/kg up to 1 mg IM/SQ

Expected Effects:
1. Increased blood glucose

Side Effects:
1. Nausea
2. Vomiting
**Cyanokit® (Hydroxocobalamin)**

**Protocols:**
1. Cyanide Exposure Supplement Protocol

**Indications:**
1. Known or suspected cyanide poisoning

**Contraindications:**
1. Hypersensitivity to hydroxocobalamin or cyanocobalamin
2. Can not be administered in the same line as dopamine or fentanyl

**Dosing:**
1. A two vial kit with 2.5g of hydroxocobalamin each in powder form which must be reconstituted with 100mL of normal saline each, rotated or tipped for 30 seconds each (not shaken) and then administered through its own IV line (not used with any other medications) over 7.5 minutes each.
2. A one vial kit with 5g of hydroxocobalamin powder which must be reconstituted with 200mL of normal saline, be rotated or tipped for 60 seconds (not shaken) and administered through its own IV line (not used with any other medication) over 15 minutes.
3. The starting dose of hydroxocobalamin for adults is 5g (i.e., two 2.5g vials OR one 5g vial) administered as an intravenous (IV) infusion over 15 minutes.
4. **Pediatrics:**

<table>
<thead>
<tr>
<th>AGE GROUP</th>
<th>AMOUNT</th>
<th>DOSAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFANT / TODDLER (0-2 YEARS)</td>
<td>¼ BOTTLE</td>
<td>0.625G</td>
</tr>
<tr>
<td>PRESCHOOL (3-5 YEARS)</td>
<td>½ BOTTLE</td>
<td>1.25G</td>
</tr>
<tr>
<td>GRADE SCHOOL (6-13 YEARS)</td>
<td>1 BOTTLE</td>
<td>2.5G</td>
</tr>
<tr>
<td>ADULT &gt;14 YEARS (ENTIRE KIT)</td>
<td>2 BOTTLES</td>
<td>5G</td>
</tr>
</tbody>
</table>

**Expected Effects:**
1. Increased blood glucose

**Side Effects:**
1. Nausea
2. Vomiting
3. Abdominal pain
4. Red colored urine, skin, mucus membranes
5. Rash
Ipratropium Bromide (Atrovent ®)

Protocols:
1. Nebulized Bronchodilators

Indications:
1. Bronchial asthma
2. Bronchospasm in emphysema
3. Chronic bronchitis
4. Other wheezing in adults and pediatrics

Contraindications:
1. Hypersensitivity to ipratropium bromide
2. Hypersensitivity to atropine or its derivatives

Dosing:
1. Adult: 500 mcg/33 ml combined with Albuterol 2.5 mg/3ml, nebulized
2. Pediatric: For children aged 5 or under, Ipratropium 250 mcg should be given

Expected Effects:
1. Decreased wheezing
2. Decreased respiratory distress

Side Effects:
1. Palpitations
2. Dry Mouth
3. Anxiety
Ketamine

Protocols:
1. Excited Delirium
2. Patient Sedation
3. Pain Management
4. Patient Restraint

Indications:
1. Patients with excited delirium
2. Agitation
3. Significant pain

Contraindications:
1. Known hypersensitivity

Dosing:
1. Excited Delirium
   a. Adults only – 4 mg/kg IM
2. Patient Sedation
   a. Adults and Pediatrics
      i. 0.5 mg/kg IN, if available or
      ii. 0.2 mg/kg IV/IO
      iii. Maximum single dose 50 mg
      iv. May repeat after 10-15 minutes to a maximum dose of 2 mg/kg
3. Pain Management
   a. Adults and Pediatrics
      i. 0.5 mg/kg IN, if available or
      ii. 0.2 mg/kg IV/IO
      iii. Maximum single dose 50 mg
      iv. May repeat after 10-15 minutes to a maximum dose of 2 mg/kg
4. Patient Restraint
   a. Adults only – 4 mg/kg IM or IN

Expected Effects:
1. Sedation
2. Decreased agitation
3. Decreased pain

Side Effects:
1. Nausea/vomiting
2. Nystagmus


**Lidocaine**

**Protocols:**
1. Adult Cardiac Arrest – General (MCA Selection)
2. Adult and Pediatric Tachycardia (MCA Selection)
3. Vascular Access & IV Fluid Therapy (IO placement)

**Indications:**
1. Alternative to amiodarone in cardiac arrest from VF/VT
2. Alternative to amiodarone in pulsatile VT
3. As an anesthetic agent when administering medications via intraosseous route

**Contraindications:**
1. Hypersensitivity to lidocaine
2. Bradycardia or heart block

**Dosing:**
1. Cardiac Arrest (Adult) 100 mg IV/IO
2. Wide complex tachycardia
   a. Adults: 1 mg/kg
   b. Pediatric: 1 mg/kg (only with medical direction)
   c. May repeat after 5-10 minutes to a maximum of 3 mg/kg
3. For conscious patients with pain from IO infusion
   a. Adults: 20 mg IO
   b. Pediatrics: 0.5 mg/kg, maximum dose 20 mg

**Expected Effects:**
1. Increased VF threshold
2. Decreased ventricular irritability
3. Decreased pain with infusion
Lorazepam (Ativan®)

Protocols:
1. Adult and Pediatric Seizures
2. Medication Substitution

Indications:
1. Seizures (per MCA selection)
2. Seizures when Midazolam is unavailable

Contraindications:
1. Hypersensitivity to lorazepam
2. Hypotension
3. Respiratory failure

Dosing:
1. Adults: 4 mg IV/IO
2. Pediatrics:
   a. 0.1 mg/kg
   b. Max single dose 4 mg, may repeat to maximum of 8 mg

Expected Effects:
1. Seizure cessation
2. Sedation

Side Effects:
1. Respiratory depression
2. Hypotension
3. Nausea/Vomiting
Magnesium Sulfate

Protocols:
1. Adult Cardiac Arrest - General
2. Adult Tachycardia
3. Adult Respiratory Distress
4. Adult Seizures

Indications:
1. Suspected Torsades de Pointes
2. VF/VT in hypomagnesemia
3. Seizures secondary to toxemia of pregnancy
4. Asthma exacerbation not responding to first line treatments

Contraindications:
1. Hypersensitivity to magnesium sulfate
2. Should not be given for 2 hours preceding delivery

Dosing:
1. Cardiac Arrest (and Wide Complex Tachycardia)
   a. 2 grams diluted in 10 ml NS
   b. Administered IVP
2. Asthma exacerbation (refractory)
   a. 2 grams diluted in 10 ml normal saline
   b. Administered over 10 to 20 minutes
   c. Administer with open line of normal saline
3. Seizures in pregnancy
   a. 4 grams diluted in 20 ml
   b. Administered over 10-20 minutes
   c. Administer with open line of normal saline

Expected Effects:
1. Seizure cessation
2. Decreased respiratory distress

Side Effects:
1. Respiratory depression
2. Hypotension
3. Asystole
4. Burning in IV site for conscious patients
**Methylprednisolone**

**Protocols:**
1. Anaphylaxis/Allergic Reaction
2. Adrenal Crisis
3. Adult Respiratory Distress
4. Pediatric Respiratory Distress, Failure, or Arrest

**Indications:**
1. Allergic reactions
2. Airway inflammation
3. Reactive airway disease
4. Acute adrenal insufficiency

**Contraindications:**
1. Hypersensitivity to methylprednisolone (or similar)
2. Inability to swallow (by age or patient status)

**Dosing:**
1. Adult 125 mg IV/IO
2. Pediatrics 2 mg/kg IV/IO (max dose 125mg)

**Expected Effects:**
1. Decreased inflammation

**Side Effects:**
1. Dizziness
2. Nausea/vomiting
Midazolam (Versed®)

Protocols:
1. Adult and Pediatric Seizures
2. Excited Delirium
3. Heat Emergencies
4. Patient Restraint
5. Patient Sedation
6. Nerve agent/Organophosphate Pesticide Exposure

Indications:
1. Adult or pediatric seizures
2. Sedation for patients receiving electrical therapy
3. Excited delirium or severe agitation to enable assessment and/or treatment

Contraindications:
1. Hypersensitivity to midazolam
2. Shock

Dosing:
1. Seizures
   a. Adults
      i. 10 mg IM
      ii. 5 mg IV/IO
      iii. May repeat with medical direction
   b. Pediatrics
      i. 0.1 mg/kg IM (maximum dose 10 mg)
      ii. 0.05 mg/kg IV/IO (maximum dose 5 mg)
      iii. May repeat with medical direction
2. Excited Delirium and Chemical Restraint (Adults ONLY)
   a. 10 mg IM or
   b. 5 mg IN
3. Patient Sedation (and for tremors in heat emergencies)
   a. Adults
      i. 1-5 mg IV/IO/IN (0.05 mg/kg)
      ii. Titrated slowly
      iii. May repeat once in 5 minutes to a maximum of 0.1 mg/kg
   b. Pediatrics
      i. 0.05 mg/kg IV/IO (max single dose 5 mg)
      ii. Titrated slowly
      iii. May repeat once in 5 minutes to a maximum of 0.1 mg/kg

Expected Effects:
1. Seizure cessation
2. Sedation
Side Effects:
1. Respiratory depression
2. Hypotension
Morphine

Protocols:
1. Pain Management (MCA Selection)
2. Medication Shortage

Indications:
1. Severe pain

Contraindications:
1. Hypersensitivity to morphine
2. Hypotension

Dosing:
1. 0.1 mg/kg
   a. Adults administer in 2-4 mg increments
   b. Pediatrics administer no more than 1 mg in a single dose
2. May repeat
   a. Adults up to 10 mg
   b. Pediatrics up to total dose of 5 mg

Expected Effects:
1. Decreased pain

Side Effects:
1. Respiratory depression
2. Hypotension
Naloxone (Narcan ®)

Protocols:
1. Adult and Pediatric Altered Mental Status
2. Pediatric Respiratory Distress, Failure, or Arrest
3. Poisoning/Overdose
4. Naloxone Administration

Indications:
1. Known opioid overdose with respiratory depression
2. Respiratory depression or arrest of unknown or suspicious origin

Contraindications:
1. Hypersensitivity to naloxone

Dosing:
1. For MFR and EMT-Basic (Per MCA selection)
   a. 0.4 mg IN
   b. 2.0 mg pre-filled syringe IN
   c. 4.0 mg intranasal spray
2. For Specialist and Paramedic
   a. 0.4 mg IN/IM/IV/IO
   b. Repeat as needed
   c. May need larger doses dependent on substance
3. Pediatrics (Specialist and Paramedics Only)
   a. 0.1 mg/kg IV/IO/IM
   b. Max dose 2 mg

Expected Effects:
1. Decreased pain

Side Effects:
1. Respiratory depression
2. Hypotension
Nitroglycerin

Protocols:
1. Chest Pain/Acute Coronary Syndrome
2. Nitroglycerin Drip Supplement (Optional)
3. Pulmonary Edema/CHF

Indications:
1. Chest, arm, or neck pain thought to be caused by cardiac ischemia
2. Pulmonary edema
3. Nitroglycerin drip may be used as a supplement to both above indications when sublingual nitroglycerin has not relieved symptoms and the MCA has both adopted the supplement and trained the providers. The provider must use vented IV tubing and an infusion pump.

Contraindications:
1. Use of erectile dysfunction medications within the previous 48 hours

Dosing:
1. MFR and EMT Basic may assist patients with their own sublingual nitroglycerin
2. Sublingual nitroglycerin
   a. 0.4 mg sublingual if BP is above 100 mmHg
   b. May repeat at 3 to 5 minute intervals if pain persists and BP sustains
   c. May be administered prior to IV start if BP is above 120 mmHg
3. Nitroglycerin IV drip (MCA selection)
   a. Begin drip at 10 mcg/min
   b. Increase by 10 mcg/min at 5 minute intervals, titrating to pain and BP
   c. Maximum dose is 200 mcg/min

Expected Effects:
1. Decreased blood pressure
2. Relief of chest pain

Side Effects:
1. Headache
2. Flushing
3. Hypotension
Ondansetron (Zofran®)

Protocols:
1. Nausea/Vomiting
2. Pain Management

Indications:
1. Nausea and vomiting
2. Prophylactic use in patients receiving opioids for pain management to prevent nausea/vomiting

Contraindications:
1. Hypersensitivity to ondansetron (or similar)

Dosing:
1. Adult
   a. 4 mg ODT (oral dissolving tablet)
   b. 4 mg IM
   c. 4 mg slow IV (at least 30 seconds, recommended over 2 minutes)
2. Pediatrics
   a. For patients less than 40 kg, 0.1 mg/kg slow IV
   b. For patients greater than 40 kg, 4 mg slow IV
   c. Not routinely give IM in pediatrics, administer over at least 30 seconds, recommended over 2 minutes

Expected Effects:
1. Diminished nausea

Side Effects:
1. Headache
2. Dry mouth
3. Drowsiness
Prednisone

Protocols:
1. Anaphylaxis/Allergic Reaction
2. Adrenal Crisis
3. Adult Respiratory Distress
4. Pediatric Respiratory Distress, Failure, or Arrest

Indications:
1. Nausea and vomiting
2. Prophylactic use in patients receiving opioids for pain management to prevent nausea/vomiting

Contraindications:
1. Hypersensitivity to ondansetron (or similar)

Dosing:
1. Adult
   a. 4 mg ODT (oral dissolving tablet)
   b. 4 mg IM
   c. 4 mg slow IV (at least 30 seconds, recommended over 2 minutes)
2. Pediatrics
   a. For patients less than 40 kg, 0.1 mg/kg slow IV
   b. For patients greater than 40 kg, 4 mg slow IV
   c. Not routinely give IM in pediatrics, administer over at least 30 seconds, recommended over 2 minutes

Expected Effects:
1. Diminished nausea

Side Effects:
1. Headache
2. Dry mouth
3. Drowsiness
Sodium Bicarbonate (NaHCO₃)

Protocols:
1. Excited Delirium
2. Adult and Pediatric Cardiac Arrest – General
3. Poisoning/Overdose
4. Crush Injury

Indications:
1. Cardiac arrest with suspected hyperkalemia
2. Tricyclic antidepressant (TCA)
3. To cause alkalization in significant acidosis

Contraindications:
1. Hypersensitivity to sodium bicarbonate
2. Severe pulmonary edema
3. Known Alkalosis

Dosing:
1. Adults in Excited Delirium: 50 mEq IV
2. Adult and Pediatric Cardiac Arrest: 1 mEq/kg IV/IO
3. TCA overdose with widened QRS
   a. 1-2 mEq/kg IV/IO
   b. May be repeated to narrow QRS and improve blood pressure
4. Crush Injury: 1 mEq/kg IV/IO, max dose 50 mEq

Precautions:
1. Must flush IV line between medications
2. Administer slowly
3. Only given if acidosis is suspected
Tetracaine Hydrochloride

Protocols:
1. Poisoning/Overdose
2. Chemical Exposure

Indications:
1. Used before/after eye irrigation for pain
2. Chemical exposure to eyes

Contraindications:
1. Hypersensitivity to anesthetics
2. Large area application
3. Infants less than 1 year

Dosing:
1. Adults and Pediatrics great than 1 year old
   a. 1 to 2 drops per eye
2. May be used before/after flushing eye

Expected Effects:
1. Numbing of eye

Side Effects:
1. Burning
2. Irritation
3. Rash
Tranexamic Acid (TXA)

Protocols:
1. Shock

Indications (TRAUMATIC CAUSE ONLY):
1. Evidence of marked blood loss
2. Sustained tachycardia (>110/Min, despite a 500 ml bolus of IVFs)
3. Initial systolic BP < 90
4. Sustained hypotension (<100 systolic, despite a 500 ml bolus of IVFs)
5. Major trauma with suspicion for pelvic and/or abdominal injury
6. Major arterial bleeding requiring tourniquet

Contraindications:
1. Hemorrhagic shock from a non-traumatic cause (massive Gastrointestinal or Gynecological bleeding)

Dosing:
1. Adults
   a. 1 g of TXA mixed in 100 ml of normal saline
   b. Administered over 10 minutes
2. Pediatrics
   a. 15 mg/kg TXA
   b. Administered over 10 minutes

Precautions:
1. TXA delivered in the field is a loading dose
   a. It is not effective if a second dose is not given at the appropriate time in the hospital
   b. It is very important that the administering provider make note of the time that the loading dose is given
**Dispatch**

**Purpose:**
As mandated under Public Act 368 of 1978, as amended, Section 20919 (1)(b): “A local medical control authority shall establish written protocols for the practice of life support agencies and licensed emergency medical services personnel within its region. The protocols shall be developed and adopted in accordance with procedures established by the department and shall include medical protocols to ensure the appropriate dispatching of a life support agency based upon medical need and the capability of the emergency medical services system.”

Local municipalities shall determine, in accordance with the rules and regulations of their local Medical Control Authority, the level of agency licensure, as well as who will provide EMS service in their area.

**Protocol**
1. Enhanced 911 shall be utilized and will dispatch the closest appropriate vehicle. By communicating effectively with the use of an EMD program, the dispatcher may be able to reduce the frequency of death or the severity of disability.
2. Since ALS may provide additional medical care and delay may negatively impact patient outcome, in areas where ALS is available it shall be simultaneously dispatched to certain medical emergencies including, but not limited to:
   a. Cardiac Arrest
   b. Chest Pain
   c. Stroke
   d. Drug Overdose / Poison
   e. Altered Mental Status / Unconscious
   f. Allergic Reaction
   g. Difficulty Breathing
   h. Drowning or Near Drowning
   i. Injury with Bleeding or Immobility
   j. Seizures / Convulsions
   k. Diabetic Reactions
   l. Child Birth
   m. Burns
   n. or as determined through prioritized dispatch developed through an MCA approved EMD program.

All callers shall have access to pre-arrival instructions through an Emergency Medical Dispatch program approved by the MCA. Pre-arrival instructions will minimally include cardiac arrest.
Mass Casualty Incidents

The purpose of this protocol is to provide a uniform initial response to a Mass Casualty Incident (MCI).

I. **Definition of MCI**: For the purpose of this document, an MCI will be defined as any incident, which because of its physical size, the number and criticality of its victims, or its complexity, is likely to overwhelm those local resources, which would typically be available.

II. **Overall MCI Management – DISASTER Paradigm™**

The DISASTER Paradigm™ is part of the National Disaster Life Support (NDLS) Program and provides a framework for management of MCIs. The components may be pursued concurrently.

A. **Detection**: Do we have an MCI? If yes, immediately declare to dispatch.

B. **Incident Command**: Establish or interface with the Incident Command System (ICS)

C. **Safety and Security**: Immediate action steps to immediately protect responders, casualties, public.

D. **Assess Hazards**: Actively assess (initially and ongoing) for hazards that can harm responders, casualties, public.

E. **Support**: Request resources needed to effectively manage incident

F. **Triage and Treatment**: Initiate SALT Triage and provide treatment to casualties

G. **Evacuation**: Transport of casualties to appropriate hospitals (avoiding overloading individual hospitals) or alternate treatment centers

H. **Recovery**: Return responders and community to pre-incident status and identify lessons learned.

III. **MCI Detection**

A. Actively assess the scene to determine if MCI is (or maybe) present

B. Alert dispatch and assure hospitals and other stakeholders made aware

C. For major incidents (including incidents involving multiple counties/MCA resources) RMCC should be alerted

IV. **Incident Command System**

A. All incidents shall be managed in accordance with the National Incident Management System and the National Response Framework.

B. If Incident Command (IC) has not been established, the most qualified EMS personnel shall assume the role of IC until command is transferred.

C. The IC is responsible for all functions of the Incident Command System (ICS) until other personnel are assigned those functions.

D. Establish EMS Branch Director/EMS Group Supervisor

1. Established by IC
2. Responsible for all EMS activities
3. Reports to IC or Operations Chief

E. Establish functional subordinate EMS ICS positions, as appropriate. Note, positions may be combined (e.g., Treatment/Transport) when appropriate.

1. Triage Unit Leader Role
a. Report to EMS Branch Director/Group Supervisor
b. Coordinates rapid triage process
c. Determines number/severity of casualties

2. Treatment Unit Leader Role
   a. Within EMS Branch/Group Operations, establish Casualty Collection Point (CCP)
   b. Assigns personnel to treatment area(s)
   c. Supervise care in treatment areas and/or establish subordinate treatment unit leaders for selected casualty types (e.g., Red, Yellow, Green, etc.).

3. Transportation Unit Leader Role
   a. Prioritize transportation of patients from scene assuring high priority patients transported first and departing ambulances maximally utilized.
   b. With information from coordinating resource, assigns destination hospital or alternate care center
   c. Maintains log and tracking of patients transported

V. Safety and Security
   A. Responders should don appropriate personal protective equipment (PPE)
   B. Identify any immediate threats to responders, patients, or the public

VI. Assess for Hazards
   A. Actively assess scene for hazards
   B. Ongoing assessment for new hazards

VII. Support – Request Additional Resources for Incident
   A. Ambulances
      1. Request additional ambulances
      2. Ideally, one ambulance for every two Red/Yellow patients
   B. Non-Ambulance Medical Transport
      1. Non-licensed vehicles may be used for emergency transport when licensed ambulances are not readily available.
      2. Non-Licensed vehicles include (but are not limited to):
         a. Wheelchair vans
         b. Busses
         c. Other public safety vehicles
   C. Request specialized resources, as appropriate
      1. Local/regional mass casualty resources
      2. Decontamination units

If an ambulance operation is unable to respond to an emergency patient within a reasonable time, this part does not prohibit the spontaneous use of a vehicle under exceptional circumstances to provide, without charge or fee and as a humane service, transportation for the emergency patient. Emergency medical personnel who transport or who make the decision to transport an emergency patient under this section shall file a written report describing the incident with the medical control authority. MCL 333.20939

2. Non-Licensed vehicles include (but are not limited to):
   a. Wheelchair vans
   b. Busses
   c. Other public safety vehicles

C. Request specialized resources, as appropriate
   1. Local/regional mass casualty resources
   2. Decontamination units
3. Air medical units
4. Activate MEDDRUN/CHEMPAC per protocol

D. For major incidents, RMCC may be appropriate for coordination of support

VIII. **Triage and Treatment**

**A. Initiate SALT Triage - Preferred**

1. **Sort** – Perform global assorting
2. **Assess** – Perform individual assessment
3. **Life Saving Interventions**
   a. Control major hemorrhage
   b. Open airway (if child, 2 rescue breaths)
   c. Chest decompression, as needed (Paramedic only)
   d. Auto-injector antidote (e.g., Duodote®)
4. **Treatment and Transport**

**B. Triage other than SALT must be compliant with the Model Uniform Core Criteria for Mass Casualty Incident Triage (MUCC)**

**C. Categorize Patients**

1. **Immediate (Red):** Unable to follow commands or make purposeful movements, OR they do not have a peripheral pulse, OR they are in obvious respiratory distress, OR they have a life-threatening external hemorrhage; provided their injuries are likely to be survivable given available resources. Examples include:
   a. Physiologic and anatomic Trauma Triage Criteria
   b. Major burns (>20% BSA)
   c. Moderate to severe respiratory distress

2. **Delayed (Yellow):** Able to follow commands or make purposeful movements, AND they have peripheral pulse, AND they are not in respiratory distress, AND they do not have a life-threatening external hemorrhage, AND they have injuries that are not considered minor. Examples include:
   a. Mechanism of injury Trauma Triage Criteria
   b. Isolated fractures/dislocations
   c. Large and/or multiple lacerations with controlled bleeding
   d. Deep burns <20% BSA

3. **Minimal (Green):** Able to follow commands or make purposeful movements, AND they have peripheral pulse, AND they are not in respiratory distress, AND they do not have a life-threatening external hemorrhage, AND their injuries are considered minor. Examples include:
   a. Minor wounds (abrasions, isolated laceration)
   b. Contusions
   c. Minor head trauma (GCS 15)

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4. **Expectant (Gray):** unable to follow commands or make purposeful movements OR they do not have a peripheral pulse, OR they are in obvious respiratory distress, OR they have a life-threatening external hemorrhage, AND they are unlikely to survive given the available resources. These patients should receive resuscitation or comfort care when sufficient resources are available. Examples include:
   a. Major head trauma (open skull fracture with exposed brain, blown pupil, etc)
   b. Major burns (>75% BSA)
5. **Dead (Black):** No spontaneous breathing after establishing a basic airway (and 2 ventilations in a child). Patients triaged as Dead should be reassessed after initial triage to confirm no signs of life.

D. Establish Casualty Collection Point(s)
   1. One or more sites to provide triage and treatment
   2. May be subdivided into treatment areas based on triage category
   3. Emphasis should be on providing lifesaving treatment and rapid transport
   4. Minimal patients can be sequestered in a designated area
   5. Perform secondary triage within each treatment area as able

E. Treatment
   1. Treatment should be provided in accordance with Michigan EMS State Protocols
   2. ALS should be limited to essential medical interventions, including pain relief

IX. **Evacuation**
   A. Transport Unit Leader should assure all departing ambulances and non-licensed transport vehicles depart scene with highest acuity patients
      1. Assure distribution of patients to appropriate hospitals (e.g., trauma centers)
      2. Maintain a tracking log of patients, acuities, and destinations
   B. Non-hospital alternate care centers may be established in major incidents for lower acuity patients
   C. Licensed EMS personnel should accompany injured patients when transported in non-licensed vehicles whenever possible

X. **Recovery**
   A. Responder rehabilitation (e.g., hydration, nutrition)
   B. Responder recovery (e.g., physical and emotional)
   C. Agency recovery (e.g., resupply, workforce recovery) and completion of After Action Review
   D. Community recovery
Michigan
SPECIAL OPERATIONS
MASS CASUALTY INCIDENTS

Initial Date: June 2009
Revised Date: 08/28/2017

SALT Mass Casualty Triage

Step 1 - Sort: Global Sorting
- Walk
- Assess 3rd
- Wave / Purposeful Movement
- Assess 2nd
- Still / Obvious Life Threat
- Assess 1st

Step 2 - Assess: Individual Assessment

LSI:
- Control major hemorrhage
- Open airway if alive
- Consider 2-stage breathing
- Chest decompression
- Auto-injector administration

Breathing:
Yes → Major Injuries Only?
  - Yes → Minimal
  - No → Dead

Dead

Any No

Expectant

Immediate

Likely to survive given current resources

Delayed

MCA Name: Click here to enter text.
MCA Board Approval Date: Click here to enter text.
MCA Implementation Date: Click here to enter text.
Protocol Source/References: Click here to enter text.
XI. REGIONAL MEDICAL COORDINATION CENTER (RMCC)

The RMCC serves as a regional multi-agency coordination center entity as defined by the National Incident Management System (NIMS). The RMCC serves as a single regional point of contact for the coordination of healthcare resources. The RMCC is intended to optimize resource coordination among hospitals, EMS agencies, medical control authorities and other resources. The RMCC serves as a link to the Community Health Emergency Coordination Center (CHECC).

The RMCC acts as an extension and agent of the Medical Control Authority.

A. RMCC Responsibilities include, but are not limited to:
1. Maintain communications with all involved entities
   a. EMS Branch Directors
   b. EMS Division/Group Supervisors
   c. EMS Unit Leaders
   d. Hospitals
   e. Local EOCs (when activated)
   f. CHECC (when activated)
   g. Alternate care sites (when activated)
   h. Other RMCCs (as appropriate)
2. Provide initial and update alerts via available communications resources.
3. Provide frequent updates to on-scene EMS Branch Directors/Group/Supervisors (or designee) regarding hospital casualty care capacity.
4. May relay casualty transport information to receiving facilities.
5. May relay urgent and routine communications to appropriate entities.
6. May assist in coordination and distribution of resources.
7. Other appropriate tasks as necessary for an effective regional medical response.

B. RMCC Immunity from Liability

It is the intent of this protocol that the Regional Medical Coordination Center and the personnel staffing the RMCC and performing the functions are afforded immunity from liability whether or not a Mass Casualty Incident has occurred, as provided through MCL 333.20965 of Part 209 of PA 368 of 1978, as amended. This section specifically provides immunity from liability protection to Medical Control Authorities in the development and implementation of department-approved protocols (see language below):

Sec. 20965 (3) Unless an act or omission is the result of gross negligence or willful misconduct, the acts or omissions of any of the persons named below, while participating in the development of protocols under this part, implementation of protocols under this part, or holding a participant in the emergency medical services system accountable for department-approved protocols under this part, does not impose liability in the performance of those functions:
(a) The medical director and individuals serving on the governing board, advisory body, or committees of the medical control authority or employees of the medical control authority.

(b) A participating hospital or freestanding surgical outpatient facility in the medical control authority or an officer, member of the medical staff, or other employee of the hospital or freestanding surgical outpatient facility.

(c) A participating agency in the medical control authority or an officer, member of the medical staff, or other employee of the participating agency.

(d) A nonprofit corporation that performs the functions of a medical control authority.

333.20965 Immunity from liability

XII. STATE COMMUNITY HEALTH EMERGENCY COORDINATION CENTER (CHECC)
   A. Operated by MDHHS Bureau of EMS, Trauma and Preparedness
   B. EMS Personnel should be aware of the existence of CHECC but are not expected to directly interface with CHECC.
Appendix 1:

Definitions:

**Incident Command System:** The ICS organizational structure develops in a top-down fashion that is based on the size and complexity of the incident, as well as the specific hazard environment created by the incident.

**Unified Command:** In incidents involving multiple jurisdictions, a single jurisdiction with multi-agency involvement, or multiple jurisdictions with multi-agency involvement, unified command can be implemented. Unified command allows agencies to work together effectively without affecting individual agency authority, responsibility, or accountability.

**Incident Commander (IC):** The IC is the individual responsible for all incident activities, including the development of strategies and tactics and the ordering and the release of resources. The IC has overall authority and responsibility for conducting incident operations and is responsible for the management of all incident operations at the incident site. EMS will typically fall under the IC through a subordinate Branch, Division or Group.

**Section Chief:** A Section Chief may be assigned to Operations, Logistics, Planning, or Administration/Finance depending on the size of the incident. Not all incidents will require all 4 sections to be assigned.

**Branch Director:** A Branch Director may be assigned under the Operations Section Chief. Branch Directors are responsible for managing a specific discipline including Fire, EMS, Law Enforcement, Public Works, Public Health, etc.

**Division Supervisor:** A Division Supervisor is assigned to an area that is separated by a barrier. Examples of a Division would be a multi-level structure, include separated by a river, etc. Numbers are primarily used to identify divisions.

**Group Supervisor:** A Group Supervisor functions within the Operation Section and is assigned to a specific group. Letters of the alphabet are primarily used to identify groups.

**Unit Leaders:** Units can be assigned to the Command and General Staff or within a Group or Division.

**Medical Unit Officer:** The Medical Unit Officer is the individual responsible for the management of incident responder medical treatment and rehab.

**Safety Officer:** The IC shall appoint a Safety Officer who will ensure safety of responders and victims during the incident operations. With the concept of Unified Incident Command there is valid reasoning to have Assistant Safety Officers to include all disciplines involved in the operation. The Safety Officer appointed by the IC shall have the authority designed
within the Incident Command System with the input and advice of all Assistant Safety Officers.

**Deputies:** Deputies are used within the Command and General Staff or Sections of the ICS. A Deputy may be a higher-ranking responder that assists the IC or Section Chief however does not assume Command.

**Coordinating Resource:** the entity within the local EMS system responsible for the notification and coordination of the mass casualty response. Examples include: medcom, resource hospital, MCA, medical control, dispatch

**Regional Medical Coordination Center:** The RMCC serves as a regional multi-agency coordination entity as defined by the National Incident Management System (NIMS). The RMCC serves as a single regional point of contact for the coordination of healthcare resources. The RMCC is intended to optimize resource coordination among hospitals, EMS agencies, medical control authorities and other resources. The RMCC serves as a link to the Community Health Emergency Coordination Center (CHECC).

**Community Health Emergency Coordination Center:** The CHECC serves as a statewide multi-agency coordination entity as defined by NIMS. CHECC is intended to coordinate state-level healthcare and public health resources, to serve as a central point of contact for regional RMCC’s, and to serve as a resource to the State EOC. CHECC is expected to be activated following a major disaster or other public health emergency and should be operational within hours of activation.

Commented [BN(1): Search for SHOC in place of CHECC]
Appendix 2:

Example ICS Organizational Chart for Simple Incident

- Command
  - Staging
  - Triage
  - Treatment
  - Transport

Example ICS Chart for Complex Incident

- Command
  - PIO
  - Safety
  - Operations
  - Staging
  - Rescue Branch
    - Extrication
    - Spill Group
  - Medical Branch
    - Triage
    - Treatment
  - Law Branch
    - Transport
    - Traffic Control
    - Perimeter Security
General CBRNE Identification of Agents

Purpose: This is written to provide general pre-arrival information for suspected HAZMAT and CBRNE (chemical, biological, radiological, nuclear, and explosive) incidents.

NOTE: This information is an overview of different types of incidents and agents.

Signs of an Incident
1. A chemical or biological incident may not always be obvious.
2. Many of the early signs and symptoms produced by chemical agents may resemble those of a variety of disorders. Biological symptoms are generally delayed.
3. The patient's clinical presentation may offer clues about the type of toxic substance exposure.
   A. CHEMICAL INCIDENT
      i. Explosions or suspected release of liquids, vapors or gases
      ii. Mass casualties without obvious trauma
      iii. Define pattern of casualties and common symptoms
   B. BIOLOGICAL INCIDENT
      i. An unusual increase in the number of individuals seeking care, especially with similar symptoms such as respiratory, neurological, gastrointestinal or dermatological symptoms.
      ii. Any clustering of patients in time or location (e.g., persons who attended the same public event).
   C. RADIOLOGICAL INCIDENT
      i. Notification of the detonation of a nuclear device.
      ii. Dirty bomb
      iii. Known issues with nuclear power plant or other radioactive source.
   D. NUCLEAR INCIDENT
      i. Explosion with mushroom cloud and devastation of a large geographical area
   E. EXPLOSIVE INCIDENT
      i. Responders should be aware of the possibility of secondary incendiary devices and agents.
      ii. Obvious trauma.

Medical Response
4. First responding units must approach with caution.
5. Approach upwind, uphill and upstream, as appropriate.
6. Utilize resource materials such as the Emergency Response Guidebook or Emergency Care for Hazardous Materials Exposure.
7. Utilize appropriate PPE.
8. Be aware of contaminated terrain and contaminated objects.
9. Hazmat response protocols must be initiated, as well as unified incident command.
10. Maintain a safe distance from the exposure area.
11. Attempt to identify the nature of the exposure by looking for placards, mode of dispersal (vehicle explosion, bomb, aerosolized gas, etc.)
12. Victims and potential victims must be evacuated rapidly from the contaminated area and decontaminated as quickly as possible, if appropriate.
13. Treatment may be initiated within the hot and/or warm zones of an incident by properly trained, protected and equipped personnel.

Select Agents

1. Chemical Agents
   A. Chemical agents are compounds that may produce damaging or lethal effects.
   B. The potential of the agent to do damage is measured by how readily it disperses. Wind and rain will increase the dispersion rate of a chemical agent.
      i. **Persistent agents** have low volatility, evaporate slowly and are particularly hazardous in liquid form. They stay around for long periods of time (24 hours or longer) and contaminate not only the air but objects and terrain as well. Mustard and the nerve agent VX are examples of persistent agents.
      ii. **Non-persistent agents** are volatile and evaporate quickly, within several hours. Gases, aerosols, and highly volatile liquids tend to disperse rapidly after release. Phosgene, cyanide and the G series of nerve agents (with the exception of GD-Soman) are non-persistent agents. Because of their volatility, they pose an immediate respiratory hazard but are not particularly hazardous in liquid form.
   C. Chemical agents are classified by their effects:
      i. **Nerve agents**, the most deadly of all chemical agents, disrupt nerve transmission within organs and are quickly fatal in cases of severe exposure.
      ii. **Blood agents** (cyanides) interfere with the blood's ability to transport oxygen throughout the body; often rapidly fatal.
      iii. **Blister agents**, or vesicants, cause a blistering of the skin and mucous membranes, especially the lungs.
      iv. **Choking agents**, or pulmonary agents, irritate the lungs, causing them to fill with fluid.
      v. **Incapacitating agents**, cause an intense (but temporary) irritation of eyes and respiratory tract.

2. Biological Agents: Microorganisms and toxins, generally, of microbial, plant or animal origin to produce disease and/or death in humans, livestock and crops
   A. Biological agents
      i. Bacterial Agents (e.g. Anthrax, Cholera, Plague, Tularemia, Q-Fever)
      ii. Viral Agents (e.g. Smallpox, Viral Hemorrhagic Fevers)
      iii. Biological Toxins (e.g. Botulinum Toxins, Staphylococcal Enterotoxin B, Ricin, Trichothecene Mycotoxins (T2))
*Biological agents utilized as a CBRNE may not become evident until hours, days or weeks after the exposure due to the various incubation periods for each pathogen.

3. **Radiological Agents**: Exposure typically has no immediate effect. The sooner the victim has symptoms the worse the exposure.

2. **Nuclear Agents**: Primary risk is massive trauma and devastation as the result of a large scale blast.

3. **Explosives**: Threats with explosive devices may be of large or small scale.

### Personal Protective Equipment

1. **NIOSH/OSHA/EPA classification system**:
   
   A. **Level A**: Fully encapsulating, chemical resistant suit, gloves and boots, and a pressure demand, self-contained breathing apparatus (SCBA) or a pressure-demand supplied air respirator (air hose) and escape SCBA. (Maximum protection against vapor and liquids)
   
   B. **Level B**: Non-encapsulating, splash-protective, chemical-resistant suit that provides Level A protection against liquids but is not airtight. (Full respiratory protection is required but danger to skin from vapor is less)
   
   C. **Level C**: Utilizes chemical resistant clothing along with a full-faced/half mask air purifying respirator or PAPR rather than an SCBA or air-line.
   
   D. **Level D**: Limited to coveralls or other work clothing, boots and gloves

2. **Universal Precautions**:

   A. Assume that all patients are potentially contagious and use appropriate barriers to prevent the transmission of pathogenic organisms. PPE include gloves, gowns, HEPA respirators, face shields and appropriate handwashing.

   B. If a chemical exposure is suspected, appropriate protective suits and respirators (PAPR) with Organic Vapor/HEPA cartridges should be donned.
Chemical Exposure

**Purpose:** To provide guidance for the treatment of chemical exposure patients.

**Assessment/Management – Chemical Agents**
If there is a confirmation of, or symptoms indicative of, a chemical incident, utilize appropriate protective suits and respirators (PAPR) with Organic Vapor/HEPA cartridges should be donned.

I. Nerve Agents & Cyanide Compounds – refer to **Nerve Agent/Organophosphate Pesticide Exposure Treatment** and **Cyanide Exposure Protocol**.

II. Choking Agents (e.g. Phosgene, Chlorine, Chloropicrin)
   A. Exposure Route: Inhalation
   B. Signs and symptoms:
      1. Cough, dyspnea, irritation of mucous membranes, pulmonary edema
   C. Patients should be promptly removed from the area to a clean atmosphere.
   D. Treatment
      1. Assist ventilations, as necessary
      2. 100% Oxygen
      3. If wheezing, administer Albuterol
         a. 2.5 mg/3 ml nebulized
         b. 2-3 puffs from metered dose inhaler
      4. For severe exposure consider early interventional airway and aggressive ventilatory support. (Evidence of non-cardiogenic pulmonary edema)
      5. If eye exposure,
         a. Eye irrigation
            i. Remove contact lenses
            ii. Flush with 1000cc of NS each eye
         b. For eye pain, use Tetracaine hydrochloride 1-2 drops in each eye, if available.

III. Vesicant Agents (Blister agents)
   A. Examples: Sulfur Mustard (HD), Nitrogen Mustard (HN), Lewisite, Phosgene Oxime (CX) Vesicant agents are named for their tendency to cause blisters.
   B. Exposure Route: Dermal/Inhalation
   C. Decontamination is critical:
      1. Medical providers will require the proper PPE as determined by unified command before decontaminating patient.
      2. Remove patient’s clothing, if necessary.
      3. Patients may begin self-decontamination by removing clothing and using soap (if available) and water.
      4. Decontaminate by blotting and cleansing with soap (if available) and water.
      5. Remember that time is critical for effective mustard decontamination.
D. Management/Treatment
   1. Immediate attention should be directed toward:
      a. Assisted ventilation
      b. Administration of 100 % oxygen
   2. Symptomatic treatment per protocol.

IV. Lacrimator Agents (Tear Gas)
   A. Information: Lacrimator (tearing) agents are widely used by law enforcement,
      the military, and widely available to the public.
   B. Exposure Route: Inhalation/Ocular
   C. Signs and Symptoms: The most common effects are nasal and ocular
      discharges, photophobia, and burning sensations in the mucous membranes.
   D. Decontamination:
      1. Patients should be decontaminated with soap and water.
      2. Medical providers require protective masks and clothing for patient
         management since lacrimator agents are transmitted by physical
         contact.
      3. Decontaminate by blotting and cleansing with soap (if available) and
         water.
   E. Treatment
      1. Symptomatic treatment per protocol (no specific antidote).
      2. Eye irrigation
         a. Remove contact lenses
         b. Flush with 1000cc of NS each eye
         c. Use Tetracaine hydrochloride, if available, 1-2 drops in each eye.
**Cyanide Exposure**

**Purpose:** This Protocol is intended for EMS personnel at all levels to assess and treat patients exposed to cyanide. Additionally, the protocol allows trained and authorized paramedics to administer antidotes when available.

**NOTE:** A single medical control order in a mass casualty incident may be applied to all symptomatic patients.

**Medications in this protocol are not required to be carried on EMS vehicles and may be available through special response units.**

**Chemical Agent**
1. Agents of Concern (e.g. Hydrogen Cyanide, Potassium/Sodium Cyanide, Cyanogen Chloride)
2. Detection: The presence of these agents can be detected through specialized environmental monitoring equipment available to hazardous materials response teams.
3. Modes of Exposure
   A. Inhalation (including smoke inhalation)
   B. Ingestion
   C. Skin absorption unlikely
4. Alert receiving hospital ASAP to prepare additional antidotes

**Assessment**
1. Shortness of breath
   A. Generally not associated with cyanosis
   B. Pulse oximetry levels usually normal
   C. Usually associated with increased respiratory rate and depth
   D. Potential for rapid respiratory arrest
2. Chest pain
3. Confusion, decreased level of consciousness, coma
4. Seizures
5. Headache, dizziness, vertigo
6. Pupils may be normal or dilated.

**Personal Protection**
1. Be Alert for secondary device in potential terrorist incident
2. Personal Protective Equipment (PPE) as directed by Incident Commander.
3. Assure EMS personnel are operating outside of Hot and Warm Zones, unless appropriately trained and in proper PPE.
4. Avoid contact with vomit if ingestion suspected – off gassing possible
5. Decontamination of victims usually not indicated unless additional unknown chemical(s) suspected
Patient Management (in Cold zone)

1. Evaluate and maintain the airway
2. Provide oxygenation and support ventilation as needed
3. Note: Patients in respiratory arrest (i.e., not breathing but still having a pulse) have been found to respond to antidote therapy and should receive positive pressure ventilation when operationally feasible.
4. This is in contrast to most triage systems that would categorize non-breathing patients as non-survivable.
5. Establish vascular access
6. Administer antidote:
   a. Cyanokit® (5g. adult; 70 mg/kg pediatric maximum dose 1g.) per Cyanokit® Protocol (preferred, per MCA Selection)
   b. Sodium Thiosulfate
      i. Adults: 50 ml (12.5 g) IV over 10 minutes if available
      ii. For pediatric patients: 1.65 ml/kg (12.5 g/50 ml solution) IV over 10 minutes
7. Cardiac monitoring
8. Special Considerations for Smoke Inhalation
   a. Smoke inhalation victims may have cyanide poisoning along with burns, trauma, and exposure to other toxic substances making a diagnosis of cyanide poisoning particularly difficult.
   b. Prior to administration of Cyanokit®, smoke inhalation victims should be assessed for the following:
      i. Exposure to fire or smoke in an enclosed area
      ii. Presence of soot around the mouth, nose or oropharynx
      iii. Altered mental status
   c. The Cyanokit® should be considered for all serious smoke inhalation victims (including cardiac arrest).
Nerve Agent/Organophosphate Pesticide Exposure Treatment

Purpose: This Protocol is intended for EMS personnel at all levels to assess and treat patients exposed to nerve agents and organophosphate pesticides. The protocol includes the use of the Mark I/Duo Dote Antidote Kits and the Atropen auto injector for personnel trained in the use of these devices and authorized by the local medical control authority.

Chemical Agents

1. Agents of Concern
   A. Military Nerve Agents including: Sarin (GB), Soman (GD), Tabun (GA), VX
   B. Organophosphate Pesticides (OPP) including Glutathione, Malathion, Parathion, etc.

2. Detection: The presence of these agents can be detected through a variety of monitoring devices available to most hazardous materials response teams and other public safety agencies.

Patient Assessment

1. **SLUDGEM** Syndrome
   A. S Salivation / Sweating / Seizures
   B. L Lacrimation (Tearing)
   C. U Urination
   D. D Defecation / Diarrhea
   E. G Gastric Emptying (Vomiting) / GI Upset (Cramps)
   F. E Emesis
   G. M Muscle Twitching or Spasm

2. Threshold Symptoms: These are symptoms that may allow rescuers to recognize that they may have been exposed to one of these agents and include:
   A. Dim vision
   B. Increased tearing / drooling
   C. Runny nose
   D. Nausea/vomiting
   E. Abdominal cramps
   F. Shortness of breath

**NOTE:** Many of the above may also be associated with heat related illness.

3. Mild Symptoms and Signs:
   A. Threshold Symptoms plus:
   B. Constricted Pupils*
   C. Muscle Twitching
   D. Increased Tearing, Drooling, Runny Nose
   E. Diaphoresis

4. Moderate Symptoms and Signs
   A. Any or all above plus:
   B. Constricted Pupils
   C. Urinary Incontinence
5. **Severe Signs**
   
   A. Any or All of Above plus
   B. Constricted Pupils*
   C. Unconsciousness
   D. Seizures
   E. Severe Respiratory Distress

   *NOTE*: Pupil constriction is a relatively unique finding occurs early and persists after antidote treatment. The presence of constricted pupils with SLUDGEM findings indicates nerve agent / OPP toxicity.

### Personal Protection

1. Be Alert for secondary device in potential terrorist incident
2. Personal Protective Equipment (PPE)
   
   A. Don appropriate PPE as directed by Incident Commander.
   
   B. Minimum PPE for Non-Hot Zone (i.e., DECON Zone)
      
      a. Powered Air Purifying Respirator or Air Purifying Respiratory with proper filter
      
      b. Chemical resistant suit with boots
      
      c. Double chemical resistant gloves (butyl or nitrile)
      
      d. Duct tape glove suit interface and other vulnerable areas
3. Assure EMS personnel are operating outside of Hot Zone
4. Avoid contact with vomit if ingestion suspected – off gassing possible
5. Assure patients are adequately decontaminated prior to transport
   
   A. Removal of outer clothing provides significant decontamination
   
   B. Clothing should be removed before transport
   
   C. DO NOT transport clothing with patient
6. Alert hospital(s) as early as possible

### Patient Management (After Evacuation and Decontamination)

1. Evaluate and maintain the airway, provide oxygenation and support ventilation as needed.
2. **NOTE**: Anticipate need for extensive suctioning
3. Antidote administration per Mark I Kit/Duo Dote auto injector Dosing Directive – See Chart

4. Establish vascular access

5. Atropine 2-6 mg IV/IM per Mark I Kit Dosing Directive if Mark I Kit is not available
   (each Mark I Kit/Duo Dote auto injector contains 2 mg of atropine)
6. Treat seizures
   A. Adult
      a. Administer **Diazepam** 2-10 mg IV/IM OR Midazolam 0.05 mg/kg to max 5 IV/IM
      b. Administer **Midazolam** 0.1 mg/kg to max 10 mg IM
      c. If available, **Valium** auto-injector
   B. Pediatrics
      a. **Midazolam** 0.15 mg/kg IV/IM (maximum individual dose 5 mg)
      b. If available, **Valium** auto-injector

7. Monitor EKG

8. Additional **Atropine** 2 mg IV/IM for continued secretions (0.05 mg/kg for pediatrics)
<table>
<thead>
<tr>
<th>Clinical Findings</th>
<th>Signs/Symptoms</th>
<th>Required Conditions</th>
<th>NA Kits To Be Delivered</th>
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<tr>
<td>SELF-RESCUE</td>
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<tr>
<td>Threshold Symptoms</td>
<td>• Dim vision</td>
<td>Threshold Symptoms -and- Positive evidence of nerve agent or OPP on site</td>
<td>1 NA Kit (self-rescue)</td>
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<tr>
<td></td>
<td>• Increased tearing</td>
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<td>• Runny nose</td>
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<td>• Abdominal cramps</td>
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<td></td>
<td>• Shortness of breath</td>
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<td>ADULT PATIENT</td>
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<tr>
<td>Mild Symptoms and Signs</td>
<td>• Increased tearing</td>
<td>Medical Control Order</td>
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<tr>
<td></td>
<td>• Increased salivation</td>
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<td></td>
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<tr>
<td></td>
<td>• Dim Vision</td>
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<td></td>
<td>• Runny nose</td>
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<td>• Abdominal cramps</td>
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<td></td>
<td>• Diarrhea</td>
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<tr>
<td>Moderate Symptoms and Signs</td>
<td>• Constricted pupils</td>
<td>Constricted Pupils</td>
<td>2 NA Kits</td>
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<td></td>
<td>• Difficulty breathing</td>
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<tr>
<td></td>
<td>• Severe vomiting</td>
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<tr>
<td>Severe Signs</td>
<td>• Constricted pupils</td>
<td>Constricted Pupils</td>
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<td></td>
<td>• Unconsciousness</td>
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<td></td>
<td>• Seizures</td>
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<td></td>
<td>• Severe difficulty breathing</td>
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<td>PEDIATRIC</td>
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<td>Pediatric Patient with Non-Severe Signs/Symptoms</td>
<td>Mild or moderate symptoms as above</td>
<td>Positive evidence of nerve agent or OPP on site</td>
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*NA Kit Dosing Directive*
**Pediatric Patient with Severe Signs/Symptoms**

- Constricted pupils
- Unconsciousness
- Seizures
- Severe difficulty breathing

**Severe breathing difficulty Weakness**

| Age ≥ 8 years old: | 3 NA Kits
| Age < 8 years old: | 1 NA Kit

Contact Medical Control as needed

---

*NOTE: Nerve-agent Antidote (NA) = 1 Duo Dote or 1 Mark I*
CHEMPACK/MEDDRUN

Purpose: The CHEMPACK Project provided the State of Michigan, in collaboration with the Center for Disease Control (CDC) and the U.S. Department of Homeland Security, with a sustainable, supplemental source of pre-positioned nerve agent/organophosphate antidotes and associated pharmaceuticals. A large-scale event would rapidly overwhelm both the pre-hospital and hospital healthcare systems.

The CHEMPACK project is one component of the Michigan Emergency Preparedness Pharmaceutical Plan (MEPPP), a comprehensive statewide plan for coordinating timely application of pharmaceutical resources in the event of an act of terrorism or large-scale technological emergency/disaster.

The Michigan Emergency Drug Delivery and Resource Utilization Network (MEDDRUN) established standardized caches of medications and supplies strategically located throughout the State of Michigan. In the event of a terrorist incident or other catastrophic event resulting in mass casualties, MEDDRUN is intended to rapidly deliver medications and medical supplies, when local supplies are not adequate or become exhausted. The goal is to deploy MedPack within 15 minutes of the request.

Only authorized agencies and officials can request MEDDRUN. These agencies include any Michigan Hospital, local public health agency, or emergency management program. Authorized officials include designated representatives from the Bureau of EMS, Trauma and Preparedness (BETP), the Michigan State Police (MSP) and the Regional Bioterrorism Preparedness projects.

Activation

I. Recognition of need can come from EMS personnel or it may be a hospital, public health, EOC, or Emergency management that identifies the need for activation.
   A. EMS Identifies a need for medication support.
      1. Contact Central Dispatch or a hospital/MCA
      2. Central Dispatch or hospital/MCA contacts MEDDRUN Communications Agency
         a. Primary: Survival Flight 877-633-7786
   B. Hospital, Public Health, EOC or Emergency Management
      1. Identifies need
      2. Contact MEDDRUN Communications Agency
         a. Primary: Survival Flight 877-633-7786

II. CHEMPACK/MEDDRUN Communications Agency:
   A. Conducts analysis & issues deployment orders to selected CHEMPACK/MEDDRUN storage sight, (CSS) Point of Contact (POC).
   B. Contacts the state agency (BETP) Point of Contact: BEEPER: 517-232-0007
III. Storage site notifies the transport unit and moves cache to designated loading area.  
   A. If confirmed, the Agency loads CHEMPACK/MEDDRUN supplies onto transport unit.  
   B. If deployed, Dispatch notifies the MCA regarding dispatching transport vehicle.  

Responsibilities  
I. BETP follow-up will include:  
   A. Contacting the requesting agency to authenticate the request.  
   B. Contacting Communications Agency to provide confirmation or initiate recall.  
      If confirmed, advise if Alert Orders should be initiated.  
   C. Contacts Michigan State Police (MSP) East Lansing Operations Center (ELOP)  
   D. Coordinates potential Inter-Hospital Formulary Distribution.  
   E. Coordinates a MI-HAN Alert.  

II. Communications:  
   A. Provides Certificate Order/Recall Order.  
   B. Notifies storage site Point of Contact of either a Certification Order or Recall Order.  
   C. If BETP issues an alert, Communications Agency issues an Alert Order to appropriate CHEMPACK storage site(s) for possible deployment.  

III. Storage Site:  
   A. Once confirmed, the Agency loads the supplies into the transportation vehicle and transports to the specific location.  

IV. Designated Transportation Agency:  
   A. Ensure adequate security of the cache materials while being transported to the delivery point.  
   B. Maintain communications with the storage site’s Point of Contact while en route to the delivery point, providing periodic updates regarding present location/circumstances that may impact time of delivery.  
   C. Follow the routes specified by the CSS POC and advise upon arrival to the delivery point.  

DELIVERY OF CACHE  
I. When the cache arrives at the delivery point, the Incident Command (IC) will take receipt of the cache as the person in charge by completing the Transfer of Custody form that will accompany the cache. The IC will ensure accurate accounting of the antidote supplies in coordination with the senior medical/EMT at the scene.  
   A. If additional antidotes are required, the IC will Inform Central Dispatch/911.  
   B. If it appears that the amount of antidote needed will be less than anticipated, the transport vehicle will remain in the area to take custody of the unused antidotes to return them to the CSS POC.  
   C. Advise the CSS POC when the mission is completed.  

POST DEPLOYMENT  
I. Within 72 hours of a deployment, the Agencies, BETP and Communications will prepare a Preliminary After Action Report (AAR) using the format prescribed by BETP. (See AAR attachment) BETP will review each AAR with the intent of improving future responses.
Re-STOCKING MEDPACKS

I. It is important that a packs be restocked and placed back in service as quickly as possible. The Agency may be returned to service on a limited basis with a partially depleted MedPack/Chempack. Depending on the availability of federal funds, the Regional Emergency Preparedness Coordinator, in collaboration with BETP, will be responsible for ordering the supplies to re-stock the MedPack(s)/Chempack(s) used.

II. BETP and Communications will be notified upon the MedPack/Chempack being returned to FULL SERVICE.

*MEDDRUN may also be pre-deployed for special events, designated by the State and Regional Leadership.
APPENDIX A – MEDDRUN/CHEMPACK Activation and Deployment Algorithm

Biological, Chemical, Radiological or Mass Casualty Incident

Existing supplies are depleting

Identifies Need for Nerve Agent Antidote Support or Dirty Bomb
MEDDRUN / CHEMPACK Supplies
Confers with Incident Commander
Provide Report to Central Dispatch or Hospital

Central Dispatch or Requesting Agency

MEDDRUN/CHEMPACK Communication Agency

Primary: 877-633-7786
Secondary: 616-391-5330

First Deployment Orders to selected MEDDRUN Dispatch and/or CHEMPACK POC/APOC

Second Contact BETP POC

Selected Agency notifies transport personnel and moves desired cache to designated loading area

Desired cache is loaded on transport vehicle

Agency delivers supplies to requesting location

Agency returns to service

BETP POC will contact Requesting Agency to authenticate request

BETP POC then contacts Communication Agency to provide confirmation and determines need for additional resources

BETP POC Contacts MSP MIOC
BETP POC Contacts BETP Director

BETP POC Contacts Regional MCC

BETP POC coordinates a MI-HAN Alert consistent with guidelines

Abbreviations
APOC: Alternate Point of Contact
CSS: CHEMPACK Storage Site
EOC: Emergency Operations Center
EEI: Essential Elements of Information
MCA: Medical Control Authority
MCC: Medical Coordination Center
MI-HAN: Michigan Health Alert Network
NA: Nerve Agent
POC: Point of Contact

MCA Name: Click here to enter text.
MCA Board Approval Date: Click here to enter text.
MCA Implementation Date: Click here to enter text.
Protocol Source/References: Click here to enter text.
# Essential Elements of Information (EEI) Report

<table>
<thead>
<tr>
<th>Essential Elements of Information Report</th>
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<tbody>
<tr>
<td><strong>1. Name, Position, and Contact Information for the Individual Requesting Deployment of CHEMPACK Cache</strong></td>
</tr>
<tr>
<td>Name: ______________________________________________</td>
</tr>
<tr>
<td>Position/Title: _______________________________________</td>
</tr>
<tr>
<td>Telephone/Other Contact: ____________________________</td>
</tr>
</tbody>
</table>

| **2. Name of Physician/Officer in Charge of Medical Management at the Scene (if different than above)** |
| Name: ______________________________________________ |
| Position/Title: _______________________________________ |
| Employer:____________________________________________ |
| Telephone/Other Contact: ____________________________ |

| **3. Location of Incident** |
| Jurisdiction Name:___________________________________ |
| Closest Intersection: _________________________________ |
| OR |
| Name of Site: _______________________________________ |

| **4. Estimated Number of Casualties** |
| None | 5-10 | 100-300 |
| 1 | 10-20 | 300-500 |
| 2-3 | 20-40 | 500-1000 |
| 4-5 | 40-100 | 1000+ |

| **5. Symptoms of Casualties** |
| Pinpoint Pupils | Twitching |
| Dimness of Vision | Seizures |
| Slurred Speech | Chest Tightness |
| Difficulty Breathing | Unconsciousness |

| **6. Local Supplies of Antidotes and Pharmaceuticals are Exhausted, multiple lives remain at risk, and CHEMPACK supplies are needed to save lives** |
| ☐ Yes | ☐ No |
Pre-hospital (EMS) MCA Mutual Aid Agreement

Purpose: Establish a mechanism allowing EMS agencies/Medical Control Authorities (MCA) to give prehospital care across jurisdictional boundaries during “disaster” conditions.

1. This agreement between the MCAs demonstrates the intention to assist and support each other during a disaster situation. It provides an approved/authorized process allowing EMS agencies to function within a MCA during a disaster.

2. During “disaster” conditions, whether natural or otherwise, MCAs may need assistance from other MCAs. For the purpose of this agreement, a “disaster” is considered to be an emergency event where a “declared” emergency and/or disaster condition as defined by local, state, or federal statutory laws, exists in which the responding MCA and EMS resources may be unable to handle the patient care needs without additional resources from outside its own Medical Control area.

3. Requests for support may be made to the MCA or EMS agencies within the jurisdiction. It is agreed that mutual aid response is dependent on the availability of equipment and personnel.

4. It is in the best interests of participating MCAs to include each other in disaster in planning efforts. It is expected that upon request, participating MCAs will extend any relevant information on emergency planning to other MCAs as deemed reasonably appropriate by the participating MCA distributing the information.

5. Participating MCAs agree to adopt, as a minimum, the State Model Protocols for responding to a disaster event, and those agencies/EMS personnel will follow these when responding outside their own MCA, unless prior arrangements with that MCA.

6. It is agreed that signatories may terminate this agreement without cause by providing a 30 day written notice to all other participating MCAs.