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
   D. Respiratory Distress with Wheezing
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)
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| Threshold Symptoms                            | • Dim vision  
• Increased tearing  
• Runny nose  
• Nausea/vomiting  
• Abdominal cramps  
• Shortness of breath   | Threshold Symptoms  
-and-  Positive evidence of nerve agent or OPP on site                                                                                       | 1 NA Kit  (self-rescue)                                                                                     |
| **ADULT PATIENT**                             |                                                                                                                                                        |                                                                                                          |                                                  |
| Mild Symptoms and Signs                       | • Increased tearing  
• Increased salivation  
• Dim Vision  
• Runny nose  
• Sweating  
• Nausea/vomiting  
• Abdominal cramps  
• Diarrhea    | Medical Control Order                                                                                                                               | 1 NA Kit                                                                                                                                 |
| Moderate Symptoms and Signs                   | • Constricted pupils  
• Difficulty breathing  
• Severe vomiting   | Constricted Pupils                                                                                                                                | 2 NA Kits                                                                                                   |
| Severe Signs                                  | • Constricted pupils  
• Unconsciousness  
• Seizures  
• Severe difficulty breathing   | Constricted Pupils                                                                                                                                | 3 NA Kits                                                                                                   |
|                                               |                                                                                                                                                       | (If 3 NA Kits are used, administer 1st dose of available benzodiazepine)                                     |                                                  |
| **PEDIATRIC**                                 |                                                                                                                                                        |                                                                                                          |                                                  |
| Pediatric Patient with Non-Severe Signs/Symptoms | **Mild or moderate symptoms as above**                                                                                                                   | Positive evidence of nerve agent or OPP on site                                                          | Age ≥8 years old:  
• As Above  
Age <8 years old  
• Per Medical Control                                                                                     |
| 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*