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 autoinjector for personnel trained in the use of these devices and authorized by the local medical control authority.

MFR/EMT/SPECIALIST/PARAMEDIC

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
   E. Severe Vomitin

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. Follow **Decontamination Protocol**
   B. Removal of outer clothing provides significant decontamination
   C. Clothing should be removed before transport
   D. 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

SPECIALIST/PARAMEDIC

4. Establish vascular access

PARAMEDIC

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 per **Seizure Protocols**
   A. **Adult**
      a. Administer diazepam 2-10 mg IVP **OR**
      b. Midazolam 0.05 mg/kg to max 5 IVP
      c. Administer Midazolam 0.1 mg/kg to max 10 mg IM
      d. If available, Valium auto-injector

B. **Pediatrics**
   a. Diazepam 0.2 mg/kg (maximum individual dose 10 mg) via intravenous route ***or*** 0.5 mg/kg (maximum individual dose 10 mg) via rectal route.
   b. Midazolam 0.15 mg/kg (maximum individual dose 5 mg) via intravenous or intramuscular route

7. Monitor EKG
8. Contact Medical Control

PARAMEDIC
Post Medical Control
1. Additional Atropine 2 mg IV/IM for continued secretions (0.05 mg/kg for pediatrics)
2. Seizure Prophylaxis per Seizure Protocol for patients with severe signs

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*Mark I Kit Dosing Directive				
	Clinical Findings	**Signs/Symptoms**	**Required Conditions**	**Mark I Kits To Be Delivered**
SELF-RESCUE	**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 Mark I 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 Mark I Kit
	Moderate Symptoms and Signs	• Constricted pupils • Difficulty breathing • Severe vomiting	Constricted Pupils	2 Mark I Kits
	Severe Signs	• Constricted pupils • Unconsciousness • Seizures • Severe difficulty breathing	Constricted Pupils	3 Mark I Kits (If 3 Mark I 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 Mark I Kits Age < 8 years old: • 1 Mark I Kit Contact Medical Control as needed

***NOTE: 1 Mark I Kit equals 1 Duo Dote**