

SECTION: R-8

PROTOCOL TITLE: Cyanide/Hydrogen Sulfide Poisoning

REVISED: January 27, 2010

GENERAL COMMENTS: While not normally available to field medics (outside the HAZMED responses), some of the following treatments are kept on location at certain manufacturing facilities and may be administered by Ada County EMS personnel. Begin or continue such treatment as indicated, contact medical control as soon as possible.

BLS SPECIFIC CARE: See adult General Toxicological Care Protocol R-1

- Maintain safety. *Do not enter a HOT ZONE without proper PPE*
 - Generally speaking, level B protection or higher is recommended
- Do not accept a patient who has not been appropriately decontaminated
- Patients suffering from Cyanide and Hydrogen Sulfide poisoning may expose providers by means of respiratory off gassing even after being decontaminated. Ensure good ventilation in enclosed spaces
- Give priority to decontamination of the eyes with water. Remove contaminated clothing and decontaminate the skin as appropriate with soap and water
- If pediatric patient, determine patient's color category on length based resuscitation tape (Broselow Tape if available)
- Obtain patient's temperature and cool/warm as necessary
- Position patient as appropriate

ILS SPECIFIC CARE: See adult General Toxicological Care Protocol R-1

ALS SPECIFIC CARE: See adult General Toxicological Care Protocol R-1

- Attempt to identify co-morbid factors and other medical issues, including poly-pharm involvement

HMMRT Drugs as needed for confirmed exposures. These drugs are part of the Cyanide Antidote Kit (AKA "The Lilly Kit", AKA "The Pasadena Kit"), carried by EMS HMMRT (AKA HAZ-MED) and some industrial facilities. When available, non HMMRT personnel may initiate treatment for *confirmed exposures only*. Begin or continue such treatment as indicated, *contact medical control as soon as possible*.

- Amyl Nitrite (Ampule, popped and inhaled)
 - Inhaled: Inhalation for 30 seconds interposed with high flow oxygen for 30 seconds. Continue for 10-15 min., or until sodium nitrite is initiated

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- Sodium Nitrite
 - IV: 300 mg over 5 minutes, repeat in 30 minutes at ½ dose if still symptomatic
- Sodium Thiosulfate
 - IV: 12.5 g over 5 minutes. Repeat in 30 minutes at ½ dose if still symptomatic

Hydroxocobalamin: (“Cyanokit”)*

- IV Initial dose: 5 g administered over 15 minutes
- Depending upon severity of the exposure and clinical response to the initial dose, a second dose may be administered
- Second dose: A second 5 g dose may be administered may be infused over 15 minutes to 2 hours depending upon severity of signs and symptoms
- Be prepared to treat seizures

Anticonvulsant therapy

- Valium (diazepam)
 - Adult:
 - IV/IO: 2-10 mg every 5-10 minutes as needed to a maximum of 20 mg
 - Pediatric:
 - IV/IO: 0.1-0.2 mg/kg every 5 minutes as needed to a maximum total dose of 10 mg
 - PR: 0.5 mg every 5 minutes as needed to a maximum total dose of 10 mg
- Versed (midazolam):
 - Adult:
 - IV/IO: 0.5-2.5 mg every 5-10 minutes as needed to a maximum of 5 mg
 - IN (intranasal): 5mg (2.5 mg each nare) to a maximum total dose 5 mg
 - IM: 5mg to maximum dose 5 mg
 - Pediatric:
 - IV/IO/IM: 0.05-0.2 mg/kg every 5-10 minutes as needed to a maximum total dose of 10 mg
 - IN/PR: 0.2-0.4 mg/kg every 5 minutes as needed to a maximum total dose of 5 mg

PHYSICIAN PEARLS:

- Initiate antidote therapy with nitrites and sodium thiosulfate as soon as possible. Do not delay treatment for confirmatory RBC cyanide levels.
- Aggressive management of seizure activity with benzodiazepines is crucial.
- Only use amyl nitrite as a temporizing measure if IV access has not been established, since administration of IV sodium nitrite is more effective in creating therapeutic methemoglobin levels.
- Do not use sodium nitrite or use it only with extreme caution in the setting of concomitant carbon monoxide poisoning. However, in cases of smoke inhalation in which cyanide toxicity is suspected, administration of sodium thiosulfate is safe.
- Cyanide inhibits brain glutamate decarboxylase, which causes a decrease in the inhibitory neurotransmitter GABA and contributes to convulsions. Drugs such as benzodiazepines, which act at the GABA receptor complex, therefore can help control seizures.

Protocol

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